

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Engineering Mechanics (1)			
Course Code (according to the bylaw):	ENG 001			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1		3
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Ahmed Abd El Badie			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Introduction to engineering mechanics. Vector analysis. Force in space, moment of force, resultant of system of forces and its resultant moment. Equilibrium of particles and rigid bodies. Applications (beams, mechanism). Analysis of simple structures. Geometrical properties of surface area; centroid and moment of inertia.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS 2018) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A8, A9		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	LO1	Recognize the types of forces, moments and the equilibrium of Rigid Body.
		LO2	Identify support reactions and subjects of centroids.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	Evaluate the characteristics of complete free-body diagrams.
		LO4	Demonstrate effective written communication using technical terminology.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO5	Select appropriate solutions to simplify systems of forces and moments to equivalent systems.
		LO6	Apply knowledge of mathematics to write appropriate equilibrium equations from the free-body diagram, including the support reactions on a structure.
		LO7	Analyze simple structures using computational tools.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓					✓	✓								

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Force in space, direction angles, unit vectors, rectangular components.	3	2	1	-
2	Position vector, force defined by magnitude and two points on line of action.	3	2	1	-
3	Resultant of concurrent forces, conditions of equilibrium free body diagram.	3	2	1	-
4	Examples illustrating equilibrium of a particles' linear elastic springs.	3	2	1	-
5	Force transmissibility, vector product, moment of a force about a point.	3	2	1	-
6	Couple, reduction of a system of forces to a force and a couple at point.	3	2	1	-

7	Revision and Mid Exam				
8	Rigid body equilibrium, examples.	3	2	1	-
9	Rigid body equilibrium, examples.	3	2	1	-
10	Beams, types of loads, concentrated and uniform loads, equilibrium.	3	2	1	-
11	Beams, equilibrium.	3	2	1	-
12	Properties of an area, centroid.	3	2	1	-
13	Moments of Inertia of an area.	3	2	1	-
14	Mechanism, two and three force bodies, force diagram.	3	2	1	-
15,16	Final Exam.				

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	4	10	10 %
2	Exam 2 written (Semester work or quiz)	10	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical/Clinical/... Exam	--	--	--
6	Final Oral Exam	--	--	--
7	Assignments / Project /Portfolio/ Logbook	12	10	10%
8	Field training	--	--	--
9	Other (Activity)	--	10	10 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- HTI Book (Engineering Mechanics (1)) J. L. Meriam, and L. G. Kraige, "Engineering Mechanics: Statics, 8th Edition", John Wiley, New York, 2016.

		J. L. Meriam, L. G. Kraige, 2014, Engineering Mechanics, Statics, 8th Edition, John Wiley Publisher. R. C. Hibbeler, Kai Beng Yap, 2013, Engineering Mechanics, Statics, 13th Edition, Pearson Education South Asia Ltd.
	Other References	R. C. Hibbeler, "Engineering Mechanics: Statics and Dynamics, 14th Edition", Prentice-Hall, New Jersey, 2016.
	Electronic Sources (Links must be added)	NA
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and laptop.
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr. Ahmed Abd El Badie	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Engineering Drawing& Projection (1)			
Course Code (according to the bylaw):	ENG 003			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	3	--	4
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Ahmed Shaaban			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Techniques and skills of engineering drawing, normal and auxiliary projections. Solid geometry. Intersections between planes and solids.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (ARS).

Program Outcomes (ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A3&A4&A8		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	LO1	Accurately sketch various types of 2D and 3D engineering drawings using standard projection methods.
		LO2	Apply dimensioning and lettering techniques correctly to produce detailed and clear engineering sketches.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	LO3	Construct engineering drawings using standard lines, shapes, and drawing conventions aligned with engineering codes and practices
		LO4	Create accurate 3D geometric models by applying isometric projection techniques using contemporary CAD tools.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO5	Demonstrate orthographic projections of 3D objects with appropriate views and clarity using technical drawing tools or software.
		LO6	Analyze and distinguish the interaction between projection planes and 3D solids to accurately interpret and communicate technical information.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓			✓	✓	✓				✓				

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Identify the course and the tools required for the drawing.	4	1	-	3
2	Introduction of principles of engineering lines used in drawing	4	1	-	3
3	Drawing engineering operations and some application on it.	4	1	-	3
4	Drawing engineering operations and some application on it.	4	1	-	3
5	Drawing of some exercise on engineering operations.	4	1	-	3
6	Geometric construction theories of view derivation.	4	1	-	3
7	Revision and Mid Exam				

8	Orthographic projection of engineering bodies.	4	1	-	3
9	Drawing of simple isometrics and its projections.	4	1	-	3
10	Drawing of some exercise for simple isometrics its projections	4	1		3
11	Drawing of some exercise for complicated isometrics.	4	1		3
12	Some exercise on the drawing of the third projection with the knowledge of the other projectors.	4	1		3
13	Drawing of the third projection with the knowledge of the other projectors.	4	1		3
14	Drawing of the third projection with the knowledge of the other projectors.	4	1		3
15&16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Practice on computer graphics packages such as AUTOCAD, SOLIDWORKS, ...etc.
2	Practice on Inserting Dimensions with simple examples.

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	--	-	--
2	Exam 2 written (Semester work or quiz)	--	-	--
3	Midterm exam	7	30	30 %
4	Final Written Exam	15, 16	30	30 %
5	Final Practical/Clinical/... Exam	--	--	--
6	Final Oral Exam	--	-	--
7	Assignments / Project /Portfolio/ Logbook	According to the schedule.	40	40%
8	Field training	--	--	--

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	F.E. Giesecke, A.E. Mitchell, "Technical Drawing with Engineering Graphics", 15th Edition, Peach pit Press, 2016. Dennis K. Lieu, Sheryl A. Sorby, "Visualization, Modelling, and Graphics for Engineering Design", 2nd Edition, Cengage Learning Publisher, 2016. David E. Goetsch, Raymond L. Rickman, William S. Chalk, "Technical Drawing for Engineering Communication", 7th Edition, Cengage Learning Publisher, 2015.
	Other References	-Richard Shelton Kirby, The Fundamentals of Mechanical Drawing, Nabu Press, 2009. • Cecil Jensen, Jay Helselj Dennis Short, Engineering Drawing and Design, McGraw Hill, 7th' Ed., 2007
	Electronic Sources (Links must be added)	NA
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and laptop.
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr. Ahmed Shaaban	Dr. Mohamed Ashraf
Signature		

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

تاريخ الهندسة				اسم المقرر: (تبعاً لما ورد باللائحة)
ENG 006				كود المقرر: (تبعاً لما ورد باللائحة)
				القسم/الأقسام العلمية التي شاركت في التدريس:
إجمالي	أخرى (تحدد)	عملي	نظري	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
1			1	
اجباري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
العلوم الأساسية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
أ.م.د/ أحمد معروف				اسم منسق المقرر:
مجلس القسم العلمي للبرنامج				جهة مناقشة واعتماد تقرير المقرر:
7/26/2025				تاريخ اعتماد تقرير المقرر:

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

تاريخ الحضارة وتطور التكنولوجيا الانسانيات والعلوم الاجتماعية التعليم الهندسي والتخصصات المختلفة التفكير العلمي والتحليل التدريب والتكنولوجيا منهاجيات العمل الهندسي وسلوكياته امثله تطبيقه مشروع مقرر.

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)		نواتج التعلم للمقرر	
A5,A6,A10		A5,A6,A10	
الكود	الكود	النص	الكود
A5	A5	LO1 معرفة المسميات المتعلقة بالهندسة والتكنولوجيا.	A5
		LO2 فهم دور الهندسة والتكنولوجيا في العصور القديمة والعصور الوسطى والحديثة وكيفية انتقال التكنولوجيا حديثاً.	
		LO3 معرفة المعايير الأساسية الواجب اتباعها من جانب المهندس ومعرفة منهجيات العمل الهندسي.	
		LO4 إدراك تطور التعليم الهندسي في مصر من عصر الحملة الفرنسية إلى عصر الاحتلال البريطاني.	
A6	A6	LO5 يقارن بين دور الهندسة والتكنولوجيا في العصور القديمة والوسطى.	A6
		LO6 توظيف المعارف والمهارات التي حصل عليها في مجال العمل.	
		LO7 العمل بحب واتقان داخل الفريق.	
		LO8 القدرة على التفكير بطريقة علمية وهندسية.	
A10	A10	LO9 القدرة على تحليل الخبرات والتجارب الحياتية خاصة في مجال العمل.	A10
		LO10 التمتع بمهارة حل المشكلات بطريقة هندسية.	

4- طرق التعليم والتعلم للمقرر:

التدريس المباشر		التدريس الغير مباشر										استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات			
المحاضرات	التمارين العملية والتجارب	العصف الذهني	التعلم القائم على المشروعات الجماعية	استراتيجية دراسة الحالة	حل المشكلات	كتابة التقارير / الأبحاث	الحوار والمناقشة	التدريب الميداني	الزيارات الميدانية	التعلم الذاتي	التعلم بالإكتشاف	برامج المحاكاة أو النمذجة	المعمل الافتراضية	التعلم الإلكتروني	الذكاء الاصطناعي في التعليم
✓		✓				✓				✓				✓	

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة		
			تدريس نظري	تدريب تمارين	أخرى (تحدد)
1	تعريف بالمقرر الدراسي ومقدمة عامة	1	1		
2	العلاقة بين الهندسة التكنولوجية والعلم	1	1		
3	تعريف الفن والفنان	1	1		
4	دور الهندسة والتكنولوجيا في العصور القديمة	1	1		
5	استغلال المواد الطبيعية	1	1		
6	دور الهندسة والتكنولوجيا خلال العصور الوسطى	1	1		
7	مراجعة وامتحان منتصف الفصل الدراسي				
8	دور علماء المسلمين في الهندسة والتكنولوجيا	1	1		
9	انتقال تكنولوجيا العصر الحديث بين الدول	1	1		
10	مشاكل نقل التكنولوجيا بين الدول	1	1		
11	مجال العمل الهندسي ومسؤولية المهندس	1	1		
12	تطور تاريخ التعليم الهندسي في مصر من عصر محمد علي وأبنائه	1	1		
13	تطور تاريخ التعليم الهندسي في مصر من عصر الحملة الفرنسية وحتى عصر الاحتلال البريطاني	1	1		
14	مراجعة عامة	1	1		
16-15	إختبارات الفصل الدراسي النهائية				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	5	10	10 %
2	امتحان 2 تحريري (أعمال سنة)	12	10	10 %
3	امتحان منتصف الفصل الدراسي	7	20	20 %
4	امتحان نهائي تحريري	15 و 16	40	40 %
5	تكليفات / تقارير	طوال الفصل	20	20 %

6- مصادر التعلم والتسهيلات المادية:

كتاب المقرر ويتم تسليمه للطلاب في بداية الفصل	المرجع الأساسي للمقرر (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
1- د. مصطفى محمود سليمان: تاريخ العلوم والتكنولوجيا في العصور القديمة والوسطى، الهيئة العامة للكتاب، القاهرة 2017. برتران جيل: موسوعة تاريخ التكنولوجيا ترجمة هيثم المع 2019.	المراجع الأخرى	
تاريخ الهندسة فبراير 2025	المصادر الإلكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office ENG 006 مقرر تاريخ الهندسة والتكنولوجيا General Microsoft Teams	المنصة التعليمية (لابد من إضافة الرابط)	
	الأجهزة	التجهيزات التعليمية المساندة للتعليم والتعلم *
Data show, White board	المستلزمات	
Microsoft Teams	البرامج الإلكترونية	
	معامل المهارات/ المحاكيات	
	المعامل الافتراضية	
	أخرى (تذكر)	

منسق البرنامج	منسق المقرر	
أ.د. أحمد عبدالغفار	أ.م.د/ أحمد معروف حسن	الإسم
		التوقيع

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	English (1)			
Course Code (according to the bylaw):	LNG 001			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	LAB	Total
	<u>1</u>		<u>2</u>	<u>3</u>
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	<u>BASIC SCIENCE</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mai Abouzaid			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

How to talk about the people in your life - how to talk about greeting customs - how to explain who people are - how to correct a misunderstanding - writing a self -introduction - how to talk about your background - how to talk about tourism - how to describe objects - how to tell an anecdote - writing an intercultural experience - how to talk about your schooldays - how to talk about your achievements - how to offer hospitality - how to talk about your education and career - writing a CV - how to say how you feel about things - how to talk about music - how to compare and discuss preference - comparing with as - how to explain what a film is about - writing a description of a film or book - how to talk about countries and governments - how to talk about rules and laws - how to talk about stories in the news - how to talk about past events - writing a story - how to express strong feelings - how to tell and show interest in an anecdote - how to talk about people in your neighborhood (pronouns in reported speech) - how to report what people said - writing exchanging news in a personal letter - how to say how people

look - how to talk about fashion -how to talk about plans and intentions - how to express guesses - writing a letter of application - how to talk on the phone - how to talk about ability - how to report an interview - how to report a conversation - writing a report - how to make small talk -how to talk about your future - how to give advice - how to talk about unreal situations - writing an opinion - how to exchange opinion - how to talk about your shopping habits - how to talk about recent activities - how to ask about products in a shop - writing a letter of complaint - how to give and ask about directions - how to talk about holiday accommodation - how to give health advice - how to give extra information - writing a website recommendation - how to explain your point of view -how to talk about hopes and wishes - how to describe the plot of a story - how to talk about important decisions - writing a story with a moral.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A8, A9, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A8	Enhance and Develop the students' abilities and awareness for appropriate analysis and interpretation to all the scientific topics written in English words.	LO1	Have a mix of skills in English Language.
		LO2	Study different grammatical Rules.
		LO3	Work effectively in team of multi-disciplinary or multi-culture.
A9	Communicate effectively, verbally and in writing with a range of audiences.	LO4	Enhance students' abilities in expressing themselves
		LO5	Apply the four skills of language freely.
A10	Acquire and apply new knowledge and practice through English language.	LO6	Express themselves in English with confidence.
		LO7	Understand English and respond correctly.

4. Course Teaching and Learning Methods:

Direct Instruction	Indirect Instruction	Information Technology-Assisted Learning

Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√		√				√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	UNIT ONE: How do you make a good first impression?	3	1	0	2
2	UNIT ONE: Continued...	3	1	0	2
3	UNIT TWO: What does it take to be successful?	3	1	0	2
4	UNIT TWO: Continued...	3	1	0	2
5	UNIT THREE: Do people communicate better now than in the past?	3	1	0	2
6	UNIT THREE: Continued...	3	1	0	2
7	Revision and Mid Exam				
8	UNIT FOUR: Does advertising help or harm us?	3	1	0	2
9	UNIT FOUR: Continued...	3	1	0	2
10	UNIT FIVE: How can we prevent diseases?	3	1	0	2
11	UNIT FIVE: Continued...	3	1	0	2

12	Supplementary Material and Quiz	3	1	0	2
13	Presentations	3	1	0	2
14	Final Exam.				

Experiment Topics: (If any) Laboratory Topics

Serial	Topic
1	The psychology of first impression
2	What can we learn from success and failure?
3	Who are you talking to?
4	How can advertisers change our behaviors?
5	Is it possible to be clean?

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	QUIZ 1 written (Semester work)	4	10	10%
2	QUIZ 2 written (Semester work)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15	40	40 %
5	Assignments (Report & Sheet)	10,12	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Rasha Osman & Mai M. Abouzaid, "English Language (1) for Engineering Students"; HTI; 2024, Available Hard copy.
	Other References	1-Debra Daise & Charl Norloff, Q Skills for Success. Oxford Publishing Inc, 2024. 2-Liz, Jo Mccaul & John Soars, Headway. Oxford Publishing Inc, 2023. 3-Adrian Doff, Craig Thaine & Herbert Puchta. Empower. Cambridge University Press, 2022. 4-Jeff Stranks & Peter Lewis-Jones. Cutting Edge. Cambridge University Press, 2024

	Electronic Sources (Links must be added)	https://englishworld.com/
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Teaching aids and computers.
	Skill Labs/ Simulators	English Lab Room
	Other (to be mentioned)	Notebook and data show equipped lecture room.

	Course Coordinator	Program Coordinator
Name	Dr. Mai Abouzaid	Prof. Ahmed Abd El-Gafar
Signature	<i>Mai Abouzaid</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Mathematics 001			
Course Code (according to the bylaw):	MTH 001			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>	<u>2</u>		<u>4</u>
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr Sabry El-Shourbagy			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

Matrices - Logarithmic and Exponential functions- Derivatives and integrals(Natural Logarithm Function Natural Exponential function- General Exponential - and general Logarithmic functions)- Inverse trigonometric functions- Derivatives and integrals involving inverse trigonometric functions- Hyperbolic and inverse hyperbolic functions- Derivatives and integrals involving Hyperbolic functions- inverse Hyperbolic Functions)- Techniques of integration (integration by parts- Trigonometric integrals, Trigonometric Substitutions, integrals of rational functions and partial fraction)- integrals involving Quadratic- L'Hôpital's Rule (Different types of indeterminate forms). Improper integrals- improper integrals of the first and second types)- Application of integrations (area – volume – arc length – surface area).

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, A8, A10)		Upon completion of the course, the student will be	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	LO1	Apply the matrix operations as: multiply, adding, and determent to solve the linear systems of equal
		LO2	Identify the domain and range of the logarithmic, trigonometric, hyperbolic functions.
		LO3	Assess the derivative actions to compute the differ for exponential and logarithmic functions.
		LO4	Assess the derivative actions to compute the differ for trigonometric, inverse trigonometric, hyperbo inverse hyperbolic functions.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate indings, and use statistical analyses and objective engineering judgment to draw conclusions	LO5	Evaluate the integration for exponential and loga functions.
		LO6	Evaluate the integration for trigonometric, invers trigonometric, hyperbolic, and inverse hyperbolic
A8	Communicate effectively graphically, verbally and in writing with a range of audiences using contemporary tools	LO7	Apply the integration techniques as integration b substitution to evaluate the integration problems.
		LO8	Describe the integration to determine the area and volume bounded and generated by graph function
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO9	Assess the L'Hopital's rule to calculate the limits undetermined functions.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√			√	√	√			√					

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction and overview of matrix and operation on matrices	4	2	2	0
2	Solving linear system of $n \times n$ equations and discuss the type of solutions. And Revision	4	2	2	0
3	Identify and Derivative of the exponential and logarithmic functions	4	2	2	0
4	Integrate the exponential and logarithmic functions and Revision	4	2	2	0
5	Derivative and Integrate of the Trigonometric and inverse Trigonometric functions	4	2	2	0
6	Derivative and Integrate of the hyperbolic and inverse hyperbolic functions and Revision	4	2	2	0
7	Revision and Mid Exam				
8	Integration by parts	4	2	2	0
9	Techniques of integrations (substitution, partial fractions ,...)	4	2	2	0

10	Techniques of integrations and revision	4	2	2	0
11	Applications on integral (Area, Volume, area, ...)	4	2	2	0
12	Applications on integral (Arc length, surface area) and Revision	4	2	2	0
13	Limits and L'Hopital's Rule, and Revision	4	2	2	0
14	Proper and Improper integrals and discuss convergence and divergence for improper integral	4	2	2	0
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	QUIZ 1 written (Semester work)		10	10%
2	QUIZ 2 written (Semester work)		10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15	40	40 %
7	Assignments (Report & Sheet)		20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific reference s, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Erwin Kreyszig, Advanced Engineering Mathematics - Earl W. Swokowski, "Calculus". - Thomas' Calculus: Early Transcendentals
	Other References	Schaum's Outline of Fourier Analysis with Applications to Boundary Value Problems 1st Edition
	Electronic Sources (Links must be added)	https://archive.org/details/AdvancedEngineeringMathematicsKreyszigE.9thEdWiley20061245s

		https://archive.org/details/calculus00swok https://www.amazon.com/Calculus-Classic-Earl-W-Swokowski/dp/0534435386 https://dokumen.pub/thomas-calculus-early-transcendentals-15-global-in-si-unitsnbsped-9780137559893-1292725907-9781292725901-9781292457628.html
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Teaching aids and computers.
	Other (to be mentioned)	Notebook and data show equipped lecture room.

	Course Coordinator	Program Coordinator
Name	Dr Sabry El-Shourbagy	Prof. Ahmed Abd El-Gafar
Signature	<i>Dr Sabry El-Shourbagy</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Physics (1)			
Course Code (according to the bylaw):	PHY 001			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>	<u>1</u>	<u>2</u>	<u>5</u>
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Asst. Prof. Mohamed Ragab Abdo			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	<u>7/26/2025</u>			

2. Course Overview (Brief summary of scientific content):

Measurements: Physics and measurements - (length, mass, time, the international system of unite SI) Elastic properties of solid (stress, strain, elastic modules...) -Dynamic of ideal fluid (static and dynamic)– oscillatory motion: wave motion, sound waves, thermodynamics, temperature, heat and first law of thermodynamics, kinetic theory of gases, heat engines, entropy and the second law of thermodynamics.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes (CLOs)	
A		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Identify the physical laws of the course.
		LO2	Formulate the concepts and physical phenomena of the course
		LO3	Derive the basic rules that relate to the content of the Physics 1 course.
		LO4	Solve the problems of the course.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO5	Conduct experimental in lab to achieve some of the physical theories and their equations.
		LO6	Interpret the findings of experimental work to draw a conclusion.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO7	Implement scientific reports depending on the scientific foundations of his study.
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO8	Acquire the ability to work in a team
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO9	Share the gained knowledge orally, in writing, and graphically
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO10	Acquire the ability to self-learn in application engineering physics.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓	--	--	✓	--	✓	--	--	✓	--	--	✓	--	--

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Practical Lab /
1	Physical units – dimensions analysis	5	3	1	1
2	Elasticity	5	3	1	1
3	Density – pressure in fluids	5	3	1	1
4	Archimedes principle – force against the dam	5	3	1	1
5	Bernoulli's equation and its application	5	3	1	1
6	Viscosity and application – Poiseuille's law- Stock's law-	5	3	1	1
7	Revision and Mid Exam				
8	Waves and oscillations- Wave speed in stretching string – energy and power of waves	5	3	1	1

9	Dispersion and resonance of waves – standing waves	5	3	1	1
10	Sound waves – intensity and sound level – source of musical sound – beats- Doppler effect	5	3	1	1
11	Concept of temperature- Thermometers – Temperature scale - Thermal expansion – thermal stress	5	3	1	1
12	Heat capacity and specific heat – latent heat work and heat in thermodynamic process	5	3	1	1
13	The first law of thermodynamic and its application	5	3	1	1
14	Heat transfer by conduction	5	3	1	1
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Evaluate the free fall acceleration using simple pendulum tool.
2	Find the viscosity coefficient of transparent viscous liquid using Stokes' law.
3	Determine the density of solid and liquid material using Archimede's principle.
4	Verify the Hook's law of elasticity.
5	Calculate the fusion latent heat of ice using calorimetry principle.

5- Methods of students' assessment:

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	2	5	5%
2	Exam 2 written (Semester work)	4	5	5%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical Exam	14	10	10
6	Assignments / Project /Portfolio/ Logbook	9	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.)	The main (essential) references	1- Ahmed Abd El Ghaffar & Mohamed Ragab & Mustafa Fadel, " Physics 1"; HTI; Available Hard copy 2- D. Halliday, R. Resnick, and J. Walker, Fundamentals of Physics, 12th ed. Wiley, 2022. 3- Raymond A. Serway, Chris Vuille, J. Hughes. College Physics Global Edition, 11th ed. Cengage Learning, 2018.
	Other References	1- I. Lyublinskaya et al., College Physics for AP Courses OpenStax. XanEdu Publishing Inc, 2022. 2- W. Sears Richards, Mark W. Zemansky, and Hung D. Young, University Physics, 6th edition, Addison – Wesley 2020
	Electronic Sources (Links must be added)	• http://hyperphysics.phy-astr.gsu.edu/hbase/index.html • https://www.physicsclassroom.com/ • https://en.wikipedia.org/wiki/Physics • https://physicsworld.com/
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Whiteboard—whiteboard color pens—eraser
	Other	Scientific Videos

	Course Coordinator	Program Coordinator
Name	Asst. Prof. Mohamed Ragab Abdo	Prof. Ahmed Abd El-Gafar
Signature	<i>Asst Prof./ Mohamed Ragab Abdo</i>	

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Engineering Chemistry			
Course Code (according to the bylaw):	CHM 001			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	2	2	1	5
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	All Programs			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass Prof / Soad Abdel Aziz El Metwaly			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Equations of State - Introduction to Chemical Thermodynamics - Material & Energy Balance in Fuel Combustion and Chemical Processes - General Properties of Solutions - Dynamic Equilibrium in Physical and Chemical Processes - Basic Principles in Electrochemistry - Introduction to Corrosion Engineering - Selected topics in process Chemical Industries (Industry & Chemistry of Cement - Chemical Fertilizer Industries - Sugar Industry - Dyes & Dyeing Industry - Petrochemical Industries - Sulfuric acid Industry).

Laboratory:

- 1 Acid - Base Titration.

- 2 pH measurement and application in acid base titration.
- 3 Predicting heating and cooling curves and interrelating with phase diagram.
- 4 Molecular weight Determination from General Properties of Solutions.
- 5 Determination of solubility and evaluating solubility product constant (ksp).
- 6 Determination of acid and base constants for weak acids (ka) & for weak bases (kb).
- 7 Determination of Dissolved oxygen in water.
- 8 Determination of iron in cement powder.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics	LO1	Calculate different parameters of gases, liquids and solutions
		LO2	Apply the fundamentals of mass and energy balances for chemical equipment in case of physical or chemical changes.
		LO3	Identify the main parameters affecting the electro-chemical cells, corrosion of metals, dynamic equilibrium, chemical engineering thermodynamics, Liquefaction of gases and others
		LO4	Understand an industrial chemical engineering process with its applications, different diagrams parameters and manufacturing steps
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO5	Estimate the solution concentration (different concentration definitions) from either given theoretical data or from experimental results obtained (acid/base, redox, total water hardness, etc.) by titration reactions and/or pH measurements

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology- Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√			√		√								

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/ Projects/ ...)
				Tutorial	Practical / Lab	
1	<u>Chapter1:</u> Units and dimensions - States of matter – Gases – Gas laws – Ideal gases and Kinetic theory – gas mixtures - Dalton's law	5	2	1	2	
	<u>Lab: week (1)</u> Safety instructions – Introduction to Volumetric Analysis					
2	<u>Chapter1(cont.)</u> Gases: Ideal and Real gases – Deviation from ideality – Critical states – Compressibility chart – Real gases and	5	2	1	2	

	equations of states – Van Der Waals Equation - Liquefaction of gases (basics and applications) – Joule-Thompson effect					
	Lab: week (2) Solution - Ways of expressing concentrations of solutions - Neutralization reactions					
3	Chapter 1(cont.): Performance of external work - liquefaction cycles Chapter 2: Solutions (Types of solutions – solution concentration calculations – Solubility – Factors affecting solubility - Henry's law)	5	2	1	2	
	Lab: week (3) Acid / Base Titration (SA/WB – SA/SB)					
4	Chapter 2, (cont.): Colligative properties of non-electrolytic and electrolytic solutions – Van't Hoff coefficient – Problems on colligative properties calculations	5	2	1	2	
	Lab: week (4) Titration Curves - pH measurement and application in acid - base titration					
5	Chapter 3 Dynamic Equilibrium in Physical and Chemical Processes – Equilibrium Constant - Factors affecting equilibrium.	5	2	1	2	
	Lab: week (5) Molecular weight Determination from General Properties of Solutions					

6	<u>Chapter 3, (cont.):</u> Factors affecting equilibrium (cont.) – Le Chatelier principles, Effect of temperature on equilibrium constant, Van't Hoff equation, Dynamic equilibrium applications.	5	2	1	2	
	<u>Lab:</u> Lab evaluation mid exam					
7	Revision and Mid Exam					
8	<u>Chapter 4:</u> Mass and energy balances for both: physical and chemical processes Combustion reactions – Application of different methods for heat of reaction calculations at standard conditions (Hess law- bond dissociation method - ...etc.)	5	2	1	2	
	<u>Lab: week 8</u> Cooling and Heating curves					
9	<u>Chapter 4:</u> Mass and energy balances for chemical processes, Combustion reactions, Application of different methods for heat of reaction calculations at standard conditions (Hess law- bond dissociation method - ...etc.)	5	2	1	2	
	<u>Lab: week 9</u> Determination of Dissolved oxygen in water					
10	<u>Chapter 5:</u> Electro chemistry - Redox reactions – Electro-chemical cells - Nernst equation – Corrosion Engineering: types and methods of protection.	5	2	1	2	

	Lab: week 10 Redox Titration (KMnO_4 and FeSO_4) & (I_2 and $\text{Na}_2\text{S}_2\text{O}_3$)					
11	Chapter 6: Introduction to Chemical Thermodynamics - First law of thermodynamics-Second law of thermodynamics – Thermodynamic Applications in the Chemical Engineering field	5	2	1	2	
	Lab: week 11 Determination of solubility and evaluating solubility product constant (ksp)					
12	Chapter 7: Chemical Engineering industries introduction – Block diagrams - Selected topics in process chemical industries with applications including some of the most updated chemical engineering industries in important various fields (Cement industry, Natural gas processing, sugar industry, sulfuric acid manufacture,)	5	2	1	2	
	Lab: week 12 Determination of iron in cement powder.					
13	Chapter 7: Chemical Engineering industries – Block diagram - Selected topics in process chemical industries with applications including some of the most updated chemical engineering industries in important various fields (organic, inorganic, petrochemicals and natural gas industries)	5	2	1	2	

	Lab: Final practical Lab.exam					
14	Chapter 7: Chemical Engineering industries – Block diagram - Selected topics in process chemical industries with applications including some of the most updated chemical engineering industries in important various fields (organic, inorganic, petrochemicals and natural gas industries)	5	2	1	2	
15,16	Final Exam.					

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Midterm exam	7	20	20 %
2	Final Written Exam	15, 16	40	40 %
3	Exams (1&2) written - (Semester work)	5, 9	10	10%
4	Exam (3) practical/written - (Semester work)	4	10	10%
5	Exam (4) - Semester Final Practical Exam	13	10	10%
6	Laboratory assessments/ Assignments/ Logbook (Semester work)	Weekly	10	10%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• Deepa Sharma, „Text Book of Engineering Chemistry“, ed-Tech-Press, UK, 2022 (16911) • Theodore L. Brown, et al, "Chemistry the Central Science", Prentice Hall Int. (Pearson International latest edition), 2021. • Lewis Allison, "Chemical Engineering : Operations and Applications“, Cambridge, USA,

		2023 (16902) - Shriver and Atkins', " Inorganic Chemistry", Oxford University Press, 2010. - Austin, G.T., Shreve's Chemical Process Industries, McGraw- Hill Book Co, 5th' Ed., 1984.
	Other References	- David M. Bastidas, Corrosion and Protection of Metals, Mdpi AG, 2020 - Yatish T Shah, Chemical Energy from Natural and Synthetic Gas, 1st edition, CRC Press, 2017 - Dr. Robert Reining, Titration Handbook, Theory and Practice of Titration, 2018 - Mall I.D. - Chemical Process Technology, CBS Publishers & Distributors Pvt. LTD, 2024
	Electronic Sources (Links must be added)	--
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Lab instruments – Glassware (pipette, burette, flasks, beakers, etc.) – pH-meter – dissolved oxygen meter – water bath – thermometers – weight balances – Dryer and laboratory Furnace (110°C) and others.
	Supplies	Essential supplies
	Electronic Programs	-
	Skill Labs/ Simulators	Department laboratories
	Virtual Labs	-
	Other (to be mentioned)	Chemicals, indicators and materials necessary for different experiments

	Course Coordinator	Program Coordinator
Name	Ass. Prof. Soad Abd El.aziz El Metwally	Dr. Noha Fawzy M. El Hussein
Signature	<i>Soad Abdel Aziz Awad</i>	<i>Noha El Hussein</i>

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	COMPUTER SKILLS			
Course Code (according to the bylaw):	CSC 001			
Department/s that participated in the teaching:	Electrical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	LAB	Other (specify)	Total
	<u>2</u>	<u>3</u>		<u>5</u>
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Ahmed Atef			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/11/2025			

2. Course Overview (Brief summary of scientific content):

The goal of this course is to teach and assess basic computer concepts and skills so that students can use computer technology in everyday life to develop new social and economic opportunities for themselves, their families, and their communities. This curriculum will help students to develop a fundamental understanding of computers; from using the Internet, to sending e - mail, to creating a resume. This curriculum helps in developing the essential skills the student needs to begin computing with confidence. The course consists of five modules: 1) Computer Basics (Introduction to Computers

- Common Computer Terminology - Computer Performance and Features - Computer Operating Systems - Career Opportunities); 2) The Internet and the World Wide Web (The Internet - The World Wide Web - Using e - mail - Other Methods of Communicating on the Internet); 3) Productivity Programs (Introduction to Productivity Programs - Common Features and Commands - Introduction to Word Processing - Introduction to Spreadsheet Programs - Introduction to Presentation Programs - Introduction Database Programs); 4) Computer Security and Privacy (Introduction to Computer Security and Privacy - Protecting Your Computer - Protecting Your Family from Security Threats - Keeping Your Computer Secure and Updated - Computer Ethics); 5) Digital Lifestyles (The Digital Experience, Introduction to Digital Audio - Introduction to Digital Video - Introduction to Digital Photography - Digital Technology and Career Opportunities)

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS)		Course Learning Outcomes	
(A2, A4, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO 1	Study the different data types by means of different applications.
		LO 2	Edit the data types for future applications
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	LO 3	Apply gained design skills to solve real applications which related to electrical department.
		LO 4	Study the last types of computer peripherals
A10	Acquire and apply new knowledge and practice self, lifelong and other learning strategies.	LO 5	Handle the principles of network fundamentals to troubleshoot simple network connections.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√		√			√	√			√		√			

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Lab / Practical
1	Computer Basics (Introduction to Computers - Common Computer Terminology - Computer	4	2	2	
2	Performance and Features - Computer Operating Systems - Career Opportunities);	4	2	2	
3	The Internet and the World Wide Web (The Internet - The World Wide Web	4	2	2	
4	Using e - mail - Other Methods of Communicating on the Internet);	4	2	2	
5	Productivity Programs (Introduction to Productivity Programs - Common Features and Commands	4	2	2	
6	Introduction to Word Processing - Introduction to Spreadsheet	4	2	2	

	Programs - Introduction to Presentation Programs -				
7	Revision and Mid Exam				
8	Introduction Database Programs);	4	2	2	
9	Computer Security and Privacy (Introduction to Computer Security and Privacy - Protecting Your Computer	4	2	2	
10	Protecting Your Family from Security Threats - Keeping Your Computer Secure and Updated - Computer Ethics);	4	2	2	
11	Digital Lifestyles (The Digital Experience	4	2	2	
12	Introduction to Digital Audio - Introduction to Digital Video	4	2	2	
13	Introduction to Digital Photography - Digital Technology and Career Opportunities).	4	2	2	
14	Revision				
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	<u>Word Processing:</u> • Understand the key concepts of word processing. • Identify the different file formats and how to save them. • Recognize good practice applying formatting options. • Understand the different elements, objects, and data that can be added to a document. • Know how to finalize a document and prepare it for printing. • Prepare and create documents using mail merge.

2	<u>Excel (Spreadsheets):</u> - Understand the key concepts of spreadsheets. - Use available help resources and shortcuts to enhance productivity. - Recognize good practice in inserting, editing, and deleting data. - Apply a range of mathematical and logical formulas and functions. - Know how to communicate information using charts and graphs.
3	<u>Power Point (Presentation):</u> - Understand the key concepts of using presentation software. - Identify the options available in built- in layouts, designs, and themes. - Developing presentations views for slides and master slides. - Recognize good practice in formatting text and tables. - How to add charts, pictures, and drawn objects to enhance presentations. - Enhancing presentations through animations and slide transition. - Prepare a presentation to be used for presenting or printing.

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)		0	
2	Exam 2 written (Semester work)		0	
3	Midterm exam	7	30	30 %
4	Final Written Exam	16	30	30 %
5	Final Practical/Clinical/... Exam		0	
6	Final Oral Exam		0	
7	Assignments / Project /Portfolio/ Logbook	3,5,10	40	30 %
8	Field training		0	
9	Other (Mention)	12	10	10 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference	- Available Presentation (handed to students part by part). - Introduction to Computers Software and Hardware 2020.
	Other References	
	Electronic Sources	

	Learning Platforms	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show
	Supplies	whiteboard
	Electronic Programs	
	Skill Labs/ Simulators	Computers labs
	Virtual Labs	
	Other	

	Course Coordinator	Program Coordinator
Name	Dr. Ahmed Atef	Assoc.Prof. taghreed said
Signature	<i>Ahmed Atef</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Production Technology and Workshop			
Course Code (according to the bylaw):	ENG 005			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	4	--	6
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Hossam Ramadan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Engineering Materials, Manufacturing Processes: Casting and molding processes, metal forming, forming plastics, powder metallurgy; Material Joining processes: welding, soldering, brazing, riveting, joining by mechanical elements; Material removal processes, metal cutting and finishing processes; Practical training.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Explain the concepts of production engineering and basics of industrial safety.
		LO2	Identify types and properties of engineering materials.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO3	Describe the basics of benchmarking and apply workshop safety practices.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Differentiate between metal casting and forming techniques using appropriate criteria
		LO5	Compare metal machining methods and justify the selection of appropriate techniques.
		LO6	Describe the basic concepts and common techniques of welding.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓		✓		✓	✓								✓

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	The concepts of production engineering and basics of industrial safety	6	2	1	3
2	Types and properties of engineering materials	6	2	1	3
3	Types and properties of engineering materials	6	2	1	3
4	Bench working	6	2	1	3
5	Metal casting	6	2	1	3
6	Metal casting	6	2	1	3
7	Revision and Mid Exam				
8	Metal forming	6	2	1	3

9	Metal forming	6	2	1	3
10	Machining	6	2	1	3
11	Machining	6	2	1	3
12	Welding	6	2	1	3
13	Welding	6	2	1	3
14	Revision	6	2	1	3
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	<i>Practice on standard machining operations.</i>
2	<i>Practice on standard welding operations.</i>
3	<i>Practice on standard Soldering operations</i>
4	<i>Practice on standard Brazing operations.</i>
5	<i>Practice on standard riveting operations</i>

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	6	10	10 %
2	Exam 2 written (Semester work or quiz)	11	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical/Clinical/... Exam	---	--	--
6	Final Oral Exam	14	10	10 %
7	Assignments / Project /Portfolio/ Logbook	14	10	10 %
8	Field training	--	--	---

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	-Lecture Notes in Production Technology (2025) - Black, Bruce. <i>Workshop processes, practices and materials</i> . Routledge, 2015.
	Other References	- SeropeKalpakjian , Steven Schmid, <i>Manufacturing Engineering & Technology</i> , Prentice Hall,6th- Ed., 2009.
	Electronic Sources (Links must be added)	NA
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and laptop.-Lathe, Miller, Hand Tools and welding equipment's
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr. Hossam Ramadan	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	English (2)			
Course Code (according to the bylaw):	<u>LNG 002</u>			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>1</u>	<u>2</u>		<u>3</u>
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mai Abouzaid			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

Question tags (check information) - futures overview - verb phrase about work (talk about future plans & make predictions) - narrative tenses - time expressions - (write a short story) if structures (1) - (write a dairy entry) - used to/get used to/would -appearance (describe appearance) - present perfect simple & continuous -adjectives with ed & ing endings - (write an informal email) - countable & uncountable nouns -food & cooking - (describe how to prepare & cook a dish) - it's time/I'd rather/ I'd better - describing personality(describe different types of people) - sequencing devices e.g. after + ing - vocabulary: law & insurance (tell a funny story) - reflexive pronouns - (ask about & give your own beliefs & opinions), present/future modals of possibility - noises) make speculations(- in case - write a formal letter

of application -adjectives & adverbs - verb phrases with take - (give a presentation about a place -present/future modals of possibility - noises - (make speculations - in case - (write a formal letter of application - adjectives& adverbs -verb phrases with take - (give a presentation about a place) - emphasis -phrasal verbs without - (compare & contrast photographs) - although /but/however/nevertheless -feelings - (talk about books -making comparisons - verb phrases about moving/ travelling - (make comparisons about places & people - have/get something else -animal expression - (talk about services - hard and hardly - (write a report of survey findings - Relative clauses -(write an article) - if Structure (2) - speaking - (talk about your regrets & resolutions).

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A8, A9, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A8	Enhance and Develop the students' abilities and awareness for appropriate analysis and interpretation to all the scientific topics written in English words.	LO1	Understanding spoken english in various contexts, including lectures, conversations and media and extracting relevant information.
		LO2	Enhancing students' abilities in expressing themselves
		LO3	Working effectively in team of multi-disciplinary or multi-culture.
A9	Communicate effectively, verbally and in writing with a range of audiences.	LO4	Mastering the grammatical structures and conventions of the English Language.
		LO5	Developing communicative competence, critical thinking and cultural awareness.
A10	Acquire and apply new knowledge and practice through English language.	LO6	Communicating ideas effectively, participating in discussions, and using appropriate pronunciation and vocabulary.
		LO7	Producing clear and coherent writing for diverse tasks, purposes and audiences, using appropriate vocabulary and grammar.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√		√				√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			LOs covered by course
			Theoretical teaching (lectures)	Training		
				Tutorial	/ Practical Lab	
1	UNIT ONE: What makes someone admirable?	3	1	2	0	LO1
2	UNIT ONE: Continued...	3	1	2	0	LO3
3	UNIT TWO: Does school prepare you for work?	3	1	2	0	LO1
4	UNIT TWO: Continued...	3	1	2	0	LO4
5	UNIT THREE: How has technology affected your life?	3	1	2	0	LO2&LO7
6	UNIT THREE: Continued...	3	1	2	0	LO2&LO5
7	Revision and Mid Exam					
8	UNIT FOUR: : How can we make cities better places to live?	3	1	2	0	LO3 , LO4&LO5
9	UNIT FOUR: Continued...	3	1	2	0	LO6

10	UNIT FIVE: Why is it important to play?	3	1	2	0	LO5&LO6
11	UNIT FIVE: Continued...	3	1	2	0	LO5
12	Supplementary Material and Quiz	3	1	2	0	LO6
13	Presentations	3	1	2	0	LO6
14	Final Exam.					

Experiment Topics: (If any) Laboratory Topics

Serial	Topic
1	Myths of effective leadership.
2	Growing up quickly.
3	Online friendships
4	Are we responsible for the world we live in?
5	Training Chinese Athletes.

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	QUIZ 1 written (Semester work)	4	10	10%
2	QUIZ 2 written (Semester work)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15	40	40 %
5	Assignments (Report & Sheet)	10,12	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Rasha Osman & Mai M. Abouzaid, "English Language (2) for Engineering Students"; HTI; 2024, Available Hard copy.
	Other References	1-Debra Daise & Charl Norloff, Q Skills for Success. Oxford Publishing Inc, 2024.

		2-Liz, Jo Mccaul & John Soars, Headway. Oxford Publishing Inc, 2023. 3-Adrian Doff, Craig Thaine& Herbert Puchta. Empower. Cambridge University Press, 2022. 4-Jeff Stranks & Peter Lewis-Jones. Cutting Edge. Cambridge University Press, 2024
	Electronic Sources (Links must be added)	https://englishworld.com/
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Teaching aids and computers.
	Skill Labs/ Simulators	English Lab Room
	Other (to be mentioned)	Notebook and data show equipped lecture room.

	Course Coordinator	Program Coordinator
Name	Dr. Mai Abouzaid	Prof. Ahmed Abd El-Gafar
Signature	<i>Mai Abouzaid</i>	

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

اللغة العربية	اسم المقرر: (تبعاً لما ورد باللائحة)
LNG 003	كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية	القسم/الأقسام العلمية التي شاركت في التدريس:
إجمالي	إجمالي عدد الساعات المعتمدة للمقرر:
أخري (تحدد)	(تبعاً لما ورد باللائحة)
عملي	نوع المقرر:
نظري	المستوى الدراسي الذي قدم فيه المقرر:
2	البرنامج الأكاديمي:
اجباري	المعهد:
FRESHMAN YEAR	اسم منسق المقرر:
البرامج الهندسية	جهة مناقشة واعتماد تقرير المقرر:
المعهد التكنولوجي العالي	تاريخ اعتماد تقرير المقرر:
أ.م.د. ناجي عبد العال	
مجلس القسم العلمي للبرنامج	
7/26/2025	

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

الجملة العربية بين الاسمى والخبرية – حالات الاعراب والبناء للاسماء والافعال – تقدير حركة الاعراب وإنابة بعض علاماته عن بعض – نواسخ الجملة العربية وتغيرات الجملة – الافعال الخمسة والاسماء الخمسة وصور إعرابها – اللزوم والتعدى وصورة في اعراب الافعال – حالات المنع من الصرف – صور الاضافة والمشتقات – الكشف في المعجم العربى قواعد الاملاء العربية وعلامات الترقيم الواجبة .

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصنوفة في توصيف البرنامج)		نواتج التعلم للمقرر	
(A2- A8- A10)		عند الانتهاء من المقرر سيكون الطالب قادراً على	
الكود	النص	الكود	النص
A 2	تطوير وإجراء التجارب العملية المناسبة أو المحاكاة، وتحليل وتفسير وتقييم النتائج، واستخدام التحليلات الإحصائية والحكم الهندسي الموضوعي لاستخلاص النتائج	LO 1	تحليل العلاقة الترابطية بين الفكر، واللغة، والثقافة، والكلام.
A 8	ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.	LO 2	استخدام المفاهيم اللغوية والنحوية الأساسية للغة العربية في الحياة العملية.
		LO 3	استيفاء الشروط الشكلية والموضوعية للكتابة الإدارية والفنية.
		LO 4	استعمال القواعد اللغوية الأساسية (الصوتية والصرفية والنحوية).
		LO 5	توظيف القدرات اللغوية في إيجاز المعلومات وإعادة صياغتها.
		LO 6	تحقيق الكفاءة اللغوية (الاجتماعية والاستراتيجية والنحوية).
		LO 7	تطبيق القواعد العربية الصرفية والنحوية والصوتية في الاستعمال الكتابي والشفاهي.
A10	اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتي وغيرها مدى الحياة.	LO 8	توظيف الكفاءة اللغوية الأكاديمية في البحث والكتابة العلمية.
		LO 9	توظيف الكفاءة اللغوية التداولية في تشارك المعلومات وتداول مصادر المعرفة .
		LO10	توظيف القواعد العربية في ممارسة التذوق اللغوي العام.

4- طرق التعليم والتعلم المقرر:

استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات	التدريس الغير مباشر	التدريس المباشر

المحاضرات	✓	التعلم القائم على المشروعات الجامعية	✓	استراتيجية دراسة الحالة	✓	حل المشكلات	✓	كتابة التقارير / الأبحاث	✓	الحوار والمناقشة	✓	التدريب الميداني	✓	الزيارات الميدانية	✓	التعلم الذاتي	✓	التعلم بالإنترنت	✓	برامج المحاكاة أو النمذجة	✓	المعامل الافتراضية	✓	التعلم الإلكتروني	✓	الذكاء الاصطناعي في التعليم	✓

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الاسبوعية	عدد ساعات التعلم المتوقعة		
			تدريس نظري	تدريب	
				تمارين	عملي
1	- توطئة عن قضايا اللغة العربية من منظور وظيفي، وأهمية دراسة اللغة العربية، وبيان وحدات اللغة الأساسية.	2	2	0	0
2	علامات الإعراب، والبناء.	2	2	0	0
3	علامات الرفع الأصلية والفرعية، علامات النصب الأصلية والفرعية.	2	2	0	0
4	الأسماء المرفوعة. توابع الأسماء المرفوعة.	2	2	0	0
5	الأسماء المنصوبة.	2	2	0	0
6	توابع الأسماء المنصوبة.	2	2	0	0
7	مراجعة وامتحان منتصف الفصل الدراسي				
8	- الأسماء المجرورة. - توابع الأسماء المجرورة.	2	2	0	0
9	- همزة الوصل وهمزة القطع. - مواضع همزة القطع. - مواضع همزة الوصل.	2	2	0	0
10	الأعداد: - الأعداد من حيث اللفظ - العدد باعتبار المعداد	2	2	0	0
11	- العدد باعتبار العلامة الإعرابية. - العدد باعتبار التذكير والتأنيث.	2	2	0	0
12	علامات الترقيم.	2	2	0	0
13	كيفية كتابة الرسالة الإدارية.	2	2	0	0
14	مراجعة عامة	2	2	0	0
16-15	اختبارات الفصل الدراسي النهائية				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	5	10	10%
2	امتحان 2 تحريري (أعمال سنة)	9	10	10%
3	امتحان منتصف الفصل الدراسي	7	20	20%
4	امتحان نهائي تحريري	14	40	40%
5	امتحان نهائي عملي	لا يوجد	----	-----
6	امتحان نهائي شفهي	11	10	10%
7	تكاليفات / مشروع / ملف الإنجاز / كتيب الأنشطة	8	10	10%

6- مصادر التعلم والتسهيلات المادية:

المرجع الأساسي للمقرر	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
ناجي عبد العال، القواعد الأساسية للغة العربية، مذكرة للمعهد التكنولوجي العالي بالعاشر من رمضان، تاريخ النشر 2024 1- كتاب النحو، محمد عبد الشافي المكاوي، دار التقوى، 2023م 2- النحو الوافي، عباس حسن، دار المعارف 3- الإملاء والترقيم في الكتابة العربية، لعبد العليم إبراهيم، مكتبة غريب . 4- النحو المصفي، د. محمد عيد، مكتبة الشباب. 5- النحو الواضح في قواعد اللغة العربية، علي الجارم، ومصطفى أمين، الدار المصرية السعودية للطباعة والنشر والتوزيع. 6- المهارات اللغوية ومعايير جودتها : ا.د جاسم علي جاسم ، دار أمجاد حنين –السعودية ، دار إبصار – القاهرة مصر ، ط1 ، 2015م. 7- تحفة النبهاء في قواعد الإملاء: محمد عثمان ،الدار المصرية للكتاب ، 2013م. 8- من الدروس النحوية :تأليف: حفي ناصف- محمد دياب – مصطفى طمطوم – محمد صالح –محمود عمر، دار إيلاف الدولية، ط 1 ، 2006م. 9- العربية لغة حياة تقرير لجنة تحديث تعليم اللغة العربية : تقرير لجنة تحديث تعليم اللغة العربية، مكتبة لسان العرب ، الإمارات العربية المتحدة.	المراجع الأخرى
المصادر الالكترونية (لابد من إضافة الروابط)	• https://www.hosoun.com/course • https://almufti arabic.net/elementor-913
المنصة التعليمية (لابد من إضافة الرابط)	https://www.ekb.eg/ar/home

الأجهزة	(داتا شو) وجهاز كمبيوتر محمول.
المستلزمات	قاعة محاضرات مجهزة
البرامج الالكترونية	-----
معامل المهارات/ المحاكيات	-----
المعامل الافتراضية	-----
أخرى (تذكر)	-----
التجهيزات التعليمية المساندة للتعليم والتعلم *	

منسق المقرر	منسق البرنامج	
أ.م.د. ناجي عبد العال	إ.د/ أحمد عبد الغفار	الإسم
		التوقيع

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Mathematics (2)			
Course Code (according to the bylaw):	MTH 002			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>	<u>2</u>		<u>4</u>
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Hanaa Eldidamony			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	<u>7/26/2025</u>			

2. Course Overview (Brief summary of scientific content):

Conic Sections (Parabolas - Ellipses - Hyperbolas)- Plane curve- Parametric equations and applications – Tangent Lines – arc length and surface area – Polar coordinates- Integral in polar coordinates – Polar equation of conic section- Functions of several variables- limits and continuity- partial derivatives - Chain rule, implicit differentiation- Direction derivative and the Gradient- tangent planes and normal vectors- Maxima and MinimaSeries - Series with positive terms (Integral test, p-series test, Basic and limit comparison tests, ratio test)- Alternating series and absolute convergence- power series, Taylor and Maclaurin series.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A8, A10		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Describe the main concept of the conic sections, Prepare technical reports for problems in the conic sections.
		LO2	Explain the principles of parametric equations and polar coordinates.
		LO3	Define the main items of partial differentiation and study its applications.
		LO4	Discuss the principles of sequences and series.
		LO5	Analyze the system of problems in the conic sections.
		LO6	Solve problems regarding parametric equations and polar coordinates.
		LO7	Demonstrate skills regarding problems on parametric equations and polar coordinates.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO8	Communicate effectively in writing by demonstrating skills regarding solving problems on course.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO9	Apply problems regarding sequences and series.
		LO10	Proceed with test steps of the problems on partial differentiation and sequences and series.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√			√		√				√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Conic section	4	2	2	0
2	Parametric equations (slope, second derivative)	4	2	2	0
3	Arc length and surface area for the parametric curve	4	2	2	0
4	Polar coordinates (sketch the curve)	4	2	2	0
5	Slope, the arc length, and the surface area for the polar coordinates.	4	2	2	0
6	The conic section in polar coordinates.	4	2	2	0
7	Revision and Mid Exam				
8	Limits in two-dimension, partial differentiation.	4	2	2	0

9	Equation of a tangent plane and normal vector for a surface	4	2	2	0
10	Lagrange multipliers	4	2	2	0
11	Application on partial derivatives	4	2	2	0
12	Sequences and series(introduction)	4	2	2	0
13	Positive term series	4	2	2	0
14	Alternating series and power series, and Taylor and McLaurin	4	2	2	0
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	6	10	10%
2	Exam 2 written (Semester work)	13	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments	13,14	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	G. B. Thomas, J. Hass, C. Heil, P. Bogacki, M. D. Weir, J. L. Z. Estrugo, Thomas' Calculus. Early Transcendentals, 15th edition, Pearson, 2024. R. Larson, B. Edwards, Calculus, 12th edition, Cengage Learning, 2023. E. Mendelson, SCHAUM'S outlines Calculus, 7th edition, McGraw-Hill, 2022. G. Strang; Edwin "Jed" Herman, Calculus Volume 2, OpenStax, 2021.
	Other References	Institute book :Mathematics 2 (Available: soft copy).
	Electronic Sources (Links must be added)	Paul's Online Notes lumenlearning khanacademy (OpenStax)

		ap-calc
	Learning Platforms (Links must be added)	EKB - Microsoft office

	Course Coordinator	Program Coordinator
Name	Dr. Hanaa Eldidamony	Prof. Ahmed Abd El-Gafar
Signature	Dr. Hanaa Eldidamony	

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

تربية رياضية 1				اسم المقرر: (تبعاً لما ورد باللائحة)
PHE 001				كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية				القسم/الأقسام العلمية التي شاركت في التدريس:
إجمالي	أخرى (تحدد)	عملي	نظري	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
1		1	2	
اجباري				نوع المقرر:
FRESHMAN YEAR				المستوى الدراسي الذي قدم فيه المقرر:
البرامج الهندسية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
د/إيهاب جودة احمد				اسم منسق المقرر:
مجلس القسم العلمي للبرنامج				جهة مناقشة واعتماد تقرير المقرر:
7/26/2025				تاريخ اعتماد تقرير المقرر:

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

تعليم التربية البدنية ونظرياتها تأثير المقرر على إشغال وقت الفراغ وأنشطة الترفيه ، وبناء أنشطة ترفيهية في الصناعة وإصابات الملاعب وطرق العلاج.

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		(A2,A3,A4,A5,A6,A7,A8)	
النص	الكود	النص	الكود
شرح مفاهيم التربية والهندسة الرياضية ونظرياتها	LO1	تطوير وإجراء التجارب العملية والمحاكاة، وتحليل وتفسير وتقييم النتائج، واستخدام التحليلات الإحصائية والحكم 2A الهندسي الموضوعي الستخالص النتائج.	A2
توظيف معارف ومهارات التربية الرياضية للتعامل مع إصابات الملاعب وطرق علاجها	LO2		
ممارسة نشاط التربية الرياضية لتأثيره الهام على صحة العامة للجسم	LO3	تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة تلبي الاحتياجات النوعية مع مراعاة الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والأخلاقية وغيرها من الجوانب المتسقة مع النظام والظروف وضمن مبادئ وسياق التصميم والتنمية التطوير المستدامين.	A3
تنمية المهارات الحركية ورفع مستوى اللياقة البدنية للطلاب لتعرف على مستويات وقت الفراغ والأنشطة الترويحية داخل وخارج المؤسسات الترويحية	LO4 LO5	الاستفادة من التقنيات المعاصرة، والممارسات والمعايير، وإرشادات الجودة، ومتطلبات الصحة والسلامة، والقضايا البيئية ومبادئ إدارة المخاطر	A4
تطوير المعارف والمعلومات حول طبيعة ونطاق شغل اوقات الفراغ في التعلم الذاتي	LO6	ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.	A5
إنماء الثقافة الرياضية وارتباطها بالثقافة العامة	LO7		
ربط التربية البدنية والرياضية بمجالات الترويج والصحة العامة.	LO8	التخطيط والإشراف والرقابة علي تنفيذ المشاريع الهندسية مع مراعاة متطلبات الحرف الأخرى	A6
العمل على نقل الثقافة الرياضية و كيفية شغل اوقات الفراغ بعد ساعات العمل.	LO9	العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعدد الثقافات	A7
نقل المفاهيم الرياضية شفاهياً وعملياً كفرد او كفريق متكامل جميعاً	LO10	التواصل بفعالية بيانياً وشفاهه وكتابة مع مجموعات من الجماهير باستخدام الأدوات العصرية.	A8

4- طرق التعليم والتعلم للمقرر:

التدريس المباشر	التدريس الغير مباشر	استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات

المحاضرات	✓	التعلم القائم على المشروعات الجماعية	✓	استراتيجية دراسة الحالة	✓	حل المشكلات	✓	كتابة التقارير / الأبحاث	✓	الحوار والمناقشة	✓	التدريب الميداني	✓	الزيارات الميدانية	✓	التعلم الذاتي	✓	التعلم بالاكشاف	✓	برامج المحاكاة أو النمذجة	✓	المعامل الافتراضية	✓	التعلم الإلكتروني	✓	النقاء الإصطناعي في التعليم	✓

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة		
			تدريس نظري	تدريب	
				تمارين	عملي
1	معنى ومفهوم التربية البدنية- اغراض التربية البدنية- تدريبات لياقة عامة	2	1	0	
2	المصطلحات الشائعة الاستخدام في التربية البدنية – الحاجة الى التربية البدنية في عصر العولمة – تدريبات لياقة عامة	2	1	0	
3	علاقة التربية البدنية والرياضية بمجالات عمليات الترويح والصحة – نظريات اللعب وممارسة الرياضة- تدريبات لياقة عامة	2	1	0	
4	مفهوم وقت الفراغ – اهميته – مستوياته - تدريبات لياقة عامة	2	1	0	
5	معنى الترويح –ومفهومه والانشطة الترويحية والفراغية (التعريف – انواع- الاهداف –دور المجتمع) - تدريبات لياقة عامة	2	1	0	
6	المؤسسات الترويحية في المجتمع – تنظيم وإدارة النشاط الترويحي - تدريبات لياقة عامة	2	1	0	
7	مراجعة وامتحان منتصف الفصل الدراسي				
8	العلاقات العامة والعلاقات الانسانية – تدريبات لياقة عامة	2	1	0	
9	ما هي الهندسة الرياضية – تعريفها – اهميتها- تدريبات لياقة عامة	2	1	0	
10	الهدف العلم من دراسة الهندسة الرياضية ومكونات اللياقة البدنية وعلاقتها بلهندسة الرياضية - تدريبات لياقة عامة	2	1	0	
11	مراجعته عامه وتقارير وابحث – تقييم تدريبات لياقة عامه	2	1	0	
12	تقارير وابحث_ تدريبات لياقه عامة	2	1	0	
13	إختبارات الفصل الدراسي النهائية عملي				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	ابحاث تقييمية للياقة البدنية	8_9	20	20%
2	امتحان منتصف الفصل الدراسي	7	20	20%

3	امتحان نهائي تحريري	14	30	30%
4	امتحان نهائي عملي	13	30	30%

6- مصادر التعلم والتسهيلات المادية:

المرجع الأساسي للمقرر (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مدخل في التربية الرياضية 1	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
المراجع الأخرى	كمال صالح – حسن معوض : أسس التربية البدنية دار كمال درويش – محمد الحمامي : الترويح الرياضي في المجتمع المعاصر ، القاهرة 2021 المعارف 2022 عابده عبد العزيز : مذكرات في الترويح الرياضي 2023	
المصادر الالكترونية (لابد من إضافة الروابط)		
المنصة التعليمية (لابد من إضافة الرابط)	EKB - Microsoft office	
التجهيزات التعليمية المساندة للتعليم والتعلم *	قاعة محاضرات مجهزة المكتبات المركزية والفرعية. الوسائل التعليمية (داتا شو) وجهاز كمبيوتر محمول. مذكرة لتدريس المقرر وكشوف متابعة للطلاب	1 2 3 4

منسق المقرر	منسق البرنامج	
الإسم	د/إيهاب جودة احمد	ا.د/ أحمد عبد الغفار
التوقيع	إيهاب جودة احمد	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Physics (2)			
Course Code (according to the bylaw):	PHY 002			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>	<u>1</u>	<u>2</u>	<u>5</u>
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof. Ahmed Abdelghafar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	<u>7/26/2025</u>			

2. Course Overview (Brief summary of scientific content):

Principal of heat and Thermodynamics: Temperature - heat - thermal expansion - quantity of heat - First law of thermodynamic - Entropy and the second law of thermodynamic - Car not engine - the absolute temperature scale.

Electricity and Magnetism: Electrical current and resistance - Ohm's law - electric power -semiconductors - electromotive force - Kirchhoff's rules - Magnetic fields - Maxwell equations - Ampere's law, Maxwell's equations - Fraday's law - Gauss's law.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes (CLOs)	
A		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Identify the fundamental physical laws of electricity, magnetism, and modern physics.
		LO2	Formulate the advanced concepts and physical phenomena related to electromagnetism, optics, and thermodynamics.
		LO3	Derive the integral and differential forms of the laws that govern the content of the Physics 2 course.
		LO4	Solve complex, multi-step problems involving electric and magnetic fields, circuits, and wave optics.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO5	Conduct experiments in the lab to verify the principles of electromagnetism and optics.
		LO6	Analyze quantitative data from experimental work to validate theoretical models and quantify uncertainty.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO7	Compose comprehensive scientific reports that critically evaluate experimental results against established theories.
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO8	Collaborate effectively as a member of a team to manage projects and solve complex problems.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO9	Communicate complex scientific findings orally, in writing, and through graphical representations to diverse audiences.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO10	Demonstrate the ability for self-directed learning to solve advanced problems in applied engineering physics.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓	--	--	✓	--	✓	--	--	✓	--	--	✓	--	--

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Characteristics of electric charge, electric force between multi-electric charges	5	3	1	1
2	Electric field – Electric field due to dipole, charged ring, equatorial line	5	3	1	1
3	Gauss's law and electric flux – Apply the Gauss law on spherical symmetry	5	3	1	1
4	Apply the Gauss law on cylindrical, spherical, planar symmetry, applications	5	3	1	1
5	The electric potential, equipotential surface, calculating the potential due to point and group of point charges	5	3	1	1
6	Electric potential of dipole, electric potential energy of point charge-Capacitance, Applications	5	3	1	1
7	Revision and Mid Exam				

8	Capacitors and Capacitance and Calculating the capacitance parallel plate capacitors, Applications -	5	3	1	1
9	Calculating the capacitance of spherical and cylindrical capacitors, connection of capacitors, applications- storing energy in an electric field, capacitors with dielectric materials, applications	5	3	1	1
10	Dynamic electricity, Electric current, current density - electric	5	3	1	1
11	resistivity Ohm's law, electric power in electric circuit	5	3	1	1
12	- Electromotive force, calculate the current in electric circuit using energy method, Kirchhoff method, potential loop rule applications	5	3	1	1
13	Hall effect, Magnetic field, Lorentz force, circular motion of charge in uniform magnetic field	5	3	1	1
14	the magnetic force affected on wire carrying electric current, applications	5	3	1	1
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Verification of ohms law.
2	Verification of series connection.
3	Determination of the time constant of charging and discharging capacitor.
4	Determine unknown resistance of using meter bridge
5	Compare between the magnetic moment of two bare magnet.

5- Methods of students' assessment:

No .	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	2	5	5%
2	Exam 2 written (Semester work)	4	5	5%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical Exam	14	10	10

6	Assignments / Project /Portfolio/ Logbook	9	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.)	The main (essential) references	1- Eid Abdelbasat Eid & Ahmed Maarouf & Mohammed abdelaziz, " Physics 2"; HTI; Available Hard copy 2- D. Halliday, R. Resnick, and J. Walker, Fundamentals of Physics, 12th ed. Wiley, 2022. 3- Raymond A. Serway, Chris Vuille, J. Hughes. College Physics Global Edition, 11th ed. Cengage Learning, 2018.
	Other References	1- I. Lyublinskaya et al., College Physics for AP Courses OpenStax. XanEdu Publishing Inc, 2022. 2- W. Sears Richards, Mark W. Zemansky, and Hung D. Young, University Physics, 6th edition, Addison – Wesley 2020
	Electronic Sources (Links must be added)	• http://hyperphysics.phy-astr.gsu.edu/hbase/index.html • https://www.physicsclassroom.com/ • https://en.wikipedia.org/wiki/Physics • https://physicsworld.com/
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Whiteboard—whiteboard color pens—eraser
	Other	Scientific Videos

	Course Coordinator	Program Coordinator
Name	Prof. Ahmed Abdelghafar	Prof. Ahmed Abd El-Gafar
Signature	<i>Prof. Ahmed Abdelghafar</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Engineering Mechanics (2)			
Course Code (according to the bylaw):	ENG 002			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1		3
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Ahmed Abd El Badie			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Kinematics of particles; Position, displacement, velocity and acceleration in different coordinate systems. Kinetics of particle; equation of motion based on Newton's second law, work and energy, impulse and momentum.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A2&A9		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify the appropriate tools and analytical methods in solving engineering mechanics problems.	LO1	Recognize the Rectilinear and the Curvilinear motion of particles (Position, Velocity, and acceleration).
		LO2	Define the Linear Momentum of particles, rate of change of Linear Momentum.
		LO3	Identify the equations of motion.
A2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO4	Resolve the equations of motion indifferent coordinates.
		LO5	Apply to the Central Impact of two Spheres
		LO6	Solve the loss of Kinetic Energy during the Impact of two Spheres.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO7	Analyze the general curvilinear motion and projectile motion to determine position, velocity, and acceleration in various coordinate systems
		LO8	Demonstrate the concepts of Kinematics of a particle, Equations of motion in different coordinates.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓					✓	✓								

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	- Kinematics of particles. - Rectilinear motion of particles	3	2	1	
2	Curvilinear motion of a particles.	3	2	1	
3	Kinetics of particles.	3	2	1	
4	Newton's Second law of motion	3	2	1	
5	Equations of motion in different coordinates.	3	2	1	
6	Projectiles	3	2	1	
7	Revision and Mid Exam				
8	Force and acceleration	3	2	1	

9	Force and acceleration	3	2	1	
10	Work and energy	3	2	1	
11	Work and energy	3	2	1	
12	Impulse, momentum and impact	3	2	1	
13	Impulse, momentum and impact	3	2	1	
14	revision	3	2	1	
15,16	Final Exam.				

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	4	10	10 %
2	Exam 2 written (Semester work or quiz)	10	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical/Clinical/... Exam	--	--	--
6	Final Oral Exam	--	--	--
7	Assignments / Project /Portfolio/ Logbook	12	10	10 %
8	Field training	--	--	--
9	Other (Mention)	--	10	10 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method) • HTI Book Engineering Mechanics (2) • J. L. Meriam, L. G. Kraige, 2014, Engineering Mechanics, Dynamics, 8th Edition, John Wiley Publisher. • R. C. Hibbeler, "Engineering Mechanics: Statics and Dynamics,

		14th Edition", Prentice-Hall, New Jersey, 2016. • J. L. Meriam, and L. G. Kraige, "Engineering Mechanics: Statics, 8th Edition", John Wiley, New York, 2016.
	Other References	• R. C. Hibbeler, Kai Beng Yap, 2013, Engineering Mechanics, Dynamics, 13th Edition, Pearson Education South Asia Ltd.
	Electronic Sources (Links must be added)	NA
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and laptop.
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr. Ahmed Abd El Badie	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Engineering Drawing and Projection (2)			
Course Code (according to the bylaw):	ENG 004			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	3	--	4
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Ahmed Shaaban			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Development. Sectioning. Drawing and joining steel frames. Assembly drawing of some mechanical parts, Reading drawings.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	LO1	Describe the fundamental concepts and theories of orthographical projections used in engineering design
		LO2	Analyze engineering components and systems using orthographic and sectional engineering drawings
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO3	Apply orthographic projection principles to create standard 2D engineering drawings
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO5	Identify machine symbols and describe the processes involved in machine representation through technical drawings
		LO6	Use engineering drawing techniques to assemble and interpret mechanical part configurations
		LO7	Draw basic steel frame structures and apply standard techniques for representing their joints

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓			✓	✓	✓								

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Review on the drawing of the third projector with the knowledge of the other projections.	4	1	-	3
2	Drawing of some exercise for third projector.	4	1	-	3
3	Drawing of some exercise for third projector	4	1	-	3
4	How to make a section in the engineering drawing.	4	1	-	3
5	Drawing of some exercise on simple section geometrics.	4	1	-	3
6	Drawing of some exercise on simple section geometrics.	4	1	-	3
7	Midterm Exam.				
8	Definition of the different types in section bodies.	4	1	-	3
9	Intersections of bodies and surfaces and development of surfaces.	4	1	-	3

10	Exercise on the intersections of bodies.	4	1	-	3
11	Identification for different of steel sections.	4	1	-	3
12	Steel construction, Symbols of electrical circuits, fasteners	4	1	-	3
13	Assembly of some mechanical components.	4	1	-	3
14	Assembly of some mechanical components.	4	1	-	3
15&16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Practice on Normal and Auxiliary Projection using Computer Drafting Packages....etc.
2	Practice on Sectioning and Documentation with simple examples.

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Course Work (Ten Exercises through 10 different weeks)	1-13	25	25 %
2	Home Work (Ten Exercises through 10 different weeks)	1-13	15	15 %
3	Midterm exam	7	30	30 %
4	Final Written Exam	15&16	30	30 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	-Course notes are available to the students on the copy center of the Institute and Microsoft teams. -Singh, L. P., & Singh, H. (2021). <i>Engineering drawing: Principles and applications</i> . Cambridge University Press.
	Other References	Morling, K., & Danjou, S. (2022). <i>Geometric and engineering drawing</i> . Routledge, Taylor & Francis Group.
	Electronic Sources (Links must be added)	NA

	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data- show and laptop.
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	-----
	Virtual Labs	-----
	Other (to be mentioned)	-----

	Course Coordinator	Program Coordinator
Name	Dr. Ahmed Sa3ban	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Introduction to Field Training			
Course Code (according to the bylaw):	FTR 031			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	lab	Total
			18	18
Course Type:	Compulsory			
The level to which the course was introduced:	FRESHMAN YEAR			
Academic Program:	Basic Sciences			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Rasha Osman			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

The student learns to improve his skills: Drawing and identifying various production pieces and operating the various pieces of machinery, Communication skills (Computer skills, language,.....).

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1,A2,A4,A9,A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	LO1	Identify the geometric construction of different components, main parts of workshop, hand tools, workspace in MATLAB program, four skills in English language.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO2	Acquire the essential practical experience in tuning a whole mechanical system to satisfy certain specific needs, practical training in workshop, computer labs, and language labs.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	LO3	Analysis the theories, equations, and applications relating to the training in engineering drawing, workshop, computer Lab. and language.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO4	Implement the scientific reports depending on the scientific foundations of his study and appraise virtual labs results and simulation projects.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO5	Transfer the gained knowledge orally, in writing, and graphically.

4. Course Teaching and Learning Methods:

Direct Instruction	Indirect Instruction	Information Technology-Assisted Learning

Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education	
✓	✓					✓		✓		✓						

Course Schedule:

Week No.	Scientific content of the course (Course Topics)		Total Weekly Hours	Expected number of the Learning Hours		
				Theoretical teaching (lectures)	Training	
					Tutorial	Practical Lab /
1	E.D	Orthographic Projections	18			18
	E.W	Introduction-Safety- Central Lathe				
	C.S.	Introduction to Microsoft words				
	LNG	Unit 1: Technology in Use.				
2	E.D	Orthographic Projections	18			18
	E.W	Milling - Shaper - wilding				
	C.S.	Introduction to Microsoft power point				
	LNG	Unit 2: Materials Technology				
3	E.D	Isometric & Missed view	18			18
	E.W	Sheet metal				
	C.S.	Introduction to Microsoft excel				
	LNG	Unit 3: Components and Assemblies				

4		Revision and Mid Exam				
5	E.D	Isometric &Missed view				
	E.W	Wood Working				
	C.S.	Main MATLAB windows - Variables.				
	LNG	Unit 4: Engineering Design				
6	E.D	Sections				
	E.W	Measurements-Casting				
	C.S.	Create arrays and matrices- Solving linear equations using MATLAB.				
	LNG	Unit 5: Breaking point				
7	E.D	Sections				
	E.W	Forging - Hand Working				
	C.S.	Plotting graphs using MATLAB.				
	LNG	Unit 6: Technical Developments				
8		Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Final Written Exam	8	20	20 %
2	Final Oral Exam	8	20	20 %
3	Assignments / Project /Class work/ Home work	1:7	60	60%

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Midterm exam	7	20	20 %
2	Final Written Exam	15, 16	40	40 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Available Presentation (handed to students' part by part), in each of the four sectors of the training.
	Other References	• Kenneth Morling, "Geometric and Engineering Drawing". Third edition, Elsevier Ltd, 2010. • Richard Shelton Kirby, The Fundamentals of Mechanical Drawing, Nabu Press, 2009. • Serope Kalpakjian, Steven Schmid, Manufacturing Engineering & Technology, Prentice Hall, 6th- Ed., 2009. • Bjarne Stroustrup "The C++ Programming Language ". Addison Wesley publishing Company, fourth edition, 2011. • Nicolai Josuttis "C++ Standard Library Tutorial and Reference". Addison Wesley publishing Company, second edition, 2012. • Mark Ibbotson; Jeremy Day, " Cambridge English for Engineering, Cambridge University Press, 2023.
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office https://surl.lu/oqkjgh
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computers,
	Supplies	Drawing boards, Workshop equipment
	Electronic Programs	Microsoft Teams
	Skill Labs/ Simulators	Computers' lab
	Virtual Labs	
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Dr. Rasha Osman	Prof. Ahmed Abd-EL-Ghafar

Signature	<i>Rasha Osman</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Organic Chemistry			
Course Code (according to the bylaw):	CHM110			
Department/s that participated in the teaching:	Chemical Engineering Department			
Total number of credit hours of the course: (according to the bylaw): 3 credit hours	Theoretical	Practical	Tutorial	Total
	2	2	1	5
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass Prof / Soad Abdel Aziz El Metwally			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Chemical bonding, classification of organic compounds, nomenclature, organic reactions. Aliphatic compounds, Alkanes, alkenes and. alkyl halides. Alcohols, organometallic compounds, carboxylic acids, Ketones, ethers. Chemical Properties and reactions of aromatic compounds. Heterocyclic compounds.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics	LO1	Recognize different types of bonding in carbon-containing compounds.
		LO2	Identify fundamental organic reaction types and synthesis
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions	LO3	Conduct laboratory procedures/experiments involving identification and synthesis of selected organic compounds.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer	LO4	Explore recent methods of preparing organic compounds and converting functional groups.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	PPT and Movies	Brain storming	Case Study	Problem Base Learning	Reports & Research	Discussion	Cooperative	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓	✓			✓	✓	✓		✓					

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	Practical / Lab	
1	Introduction to organic chemistry: Hyperdization of carbon atom - Bonds Types – Reaction types.	5	2	1	2	--
2 & 3	Aliphatic hydrocarbons (Alkanes, Alkenes and Alkynes) - Saturated hydrocarbons: Alkanes - Unsaturated hydrocarbons: alkene. - Alkyl halides	10	4	2	4	
4 & 5	Alcohols.	10	4	2	4	
6	Carbonyl ompounds:Aldehydes .	5	2	1	2	

7	Revision and Mid Exam					
8	Carbonyl compounds: Ketones.	5	2	1	2	
9	Carboxylic acids & Amines.	5	2	1	2	
10	Aromatic compounds Aromaticity - Properties of aromatic compounds - structure of benzene.	5	2	1	2	
11	Aromatic Compounds: Electrophilic substitution on benzene ring.	5	2	1	2	
12	Aromatic Compounds: Orientation of the second substituent on substituted benzene ring.	5	2	1	2	
13	Aromatic Compounds: Preparation and uses of the recent /important aromatic compounds part 1.	5	2	1	2	
14	Aromatic Compounds: Preparation and uses of the recent /important aromatic compounds part 2.	5	2	1	2	
15,16	Final Exam.					

Experimental Topics

Serial	Experiment
1	Element test - Flame test.
2	Addition and substitution reactions
3	Oxidation reaction experiment
4	Condensation reaction
5	Investigation and identification of different aldehydes and ketones.
6	Acidity test
7	Esterification test
8	Identification of different carboxylic acids
9	Nitration test
10	Investigation of different organic compounds

11	Nitration of phenol-Part (1)
12	Nitration of phenol-Part (2)
13	Azodye Formation – Part (1)
14	Azodye Formation – Part (2)

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10 %
2	Exam 2 written (Semester work)	10	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Lab. Assessment	1-14	15	15 %
6	Reports/Participation	9	5	5%

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Xin Liu , Organic Chemistry I, LibreTexts, 2024 (https://libretexts.org/) - R.H.Grubbs , Organic Chemistry Theory Reactivity and Mechanisms in Modern Synthesis, WILEY-VCH, Germany, 2019 (16776) - S.C.Pal, Nomenclature Of Organic Compounds, New Age Inter., 2006 (14746) <u>Raj k Bansal,"A text book of organic chemistry", New age International Limited, India, 2007- 1997 (6758)</u> <u>Gerry march," March's advanced organic chemistry, Reactions, Mechanisms and structure", 6 th edition, John wiley and sons, 2007.</u> - R.K.Bansal , Laboratory Manual of Organic Chemistry, 1996 (7198)
	Other References	<u>Robert Neilson Boyd and Robert Thornton Morrison , "Organic Chemistry", 3 rd. edition, P. Hall, India, 2006 (15772) – 3 editions are available.</u> I. L. Finar, Organic Chemistry" (VI, VII), 4th edition, ELBS, London, 1990 (1680),
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show-Lab Top - Lab instruments – Glassware (pipette, flasks, beakers, Condensers-etc.) – water bath – Heater thermometers – Balances – Furnace – Filter paper-funnels-water pump.
	Supplies	-
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	Chemical reagents- organic chemicals.

	Course Coordinator	Program Coordinator
Name	Ass Prof / Soad Abdel Aziz El Metwally	Dr. Noha Fawzy M. El Hussein
Signature	<i>Soad Abd El. aziz</i>	<i>Noha ElHoseny</i>

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Inorganic Chemistry			
Course Code (according to the bylaw):	CHM 111			
Department/s that participated in the teaching:	Chemical Engineering Department			
Total number of credit hours of the course: (according to the bylaw): 3 credit hrs.	Theoretical	Practical	Other (Tutorial)	Total
	2	2	1	5
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Selem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Atomic structure, energy of electrons. Schrodinger equation Chemical bonds, hybridization, complexes. Transition & non-transition elements, occurrence, extraction, physical & chemical properties. Oxidation-reduction. Acids & bases.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, B1)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Identify atomic structure & quantum mechanics, and their concepts of elements periodic properties.
		LO2	Apply IUPAC's rules for the naming of inorganic compounds.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO3	Experiment the basic types of chemical reactions including precipitation, neutralization, and oxidation-reduction.
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design.	LO4	Discuss bonding factors in binary inorganic compounds by simple theoretical models, and bonding trends in the properties of inorganic chemistry compounds.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√					√	√							√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	Practical / Lab	
1	- Introduction for inorganic chemistry. - Atomic theory. -Atomic Structure and The Periodic Table. Lab: Safety instructions	5	2	1	2	
2	-Electronic Configuration. -Relative Atomic Mass & Relative Molecular Mass. Lab: Overview of the used laboratory devices and instruments, highlighting their functions, applications	5	2	1	2	

3	-Ions & Ionic Bonds. -Molecules & Covalent Bonds. -Macromolecules. -Apply IUPAC's rules for the naming of inorganic compounds. <u>Lab:</u> Neutralization Reaction between Strong Acids and Bases	5	2	1	2	
4	-Metallic Bonds. -The graduation of the metallic and nonmetallic property in the modern periodic table. -General properties of s-block Elements (Metals). <u>Lab:</u> Quantitative volumetric analysis of metal ions	5	2	1	2	
5	Group VII Properties & Trends: -Electronic Configuration and Reactivity in Group VII. -General properties of p-block Elements (Metals). <u>Lab:</u> Quantitative volumetric analysis of metal ions	5	2	1	2	
6	Extraction of Metals -Obtaining Metals from Their Ores. -Extraction of metal and the reactivity series. <u>Lab:</u> Identification of Cations and Anions in Salts	5	2	1	2	
7	Revision and Mid Exam					
8	-Stoichiometry Meaning. -Element Symbols. -Chemical Formulae. <u>Lab:</u> Identification of Cations and Anions in Salts	5	2	1	2	
9	-The mole concepts. -Stoichiometric calculations. <u>Lab:</u> Relative Acidity and Alkalinity	5	2	1	2	

	experimental					
10	Acids, Bases and Salts -The Characteristic Properties of Acids & Bases. Lab: Determination of the Strength of Strong Acids and Bases by Titration	5	2	1	2	
11	-Types of Oxides • Acid and Basic Oxides • Neutral & Amphoteric Oxides Lab: Acid-Base Titration: Standardization of a Strong Acid and a Strong Base	5	2	1	2	
12	Reduction-Oxidation Reactions • Oxidation state. • Ionic Equations. • Oxidizing & Reducing Agents. Lab: Preparation, Separation, and Purification of Common Laboratory Salts	5	2	1	2	
13	-Transition elements; position in periodic table, d- block elements (general properties and uses). Iron, Cobalt, and Nickel (general aspects). Lab: Preparation, Separation, and Purification of Common Laboratory Salts	5	2	1	2	
14	-Iron extraction. -Steel production. Lab: Final Practical Exam	5	2	1	2	
15,16	Final Exam.					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Quiz 1 written (Semester work)	4	10	10%
2	Quiz 2 written (Semester work)	12	10	10%
3	Midterm exam	7	20	20%
4	Final Written Exam	15, 16	40	40%
5	Practical assessment	1-14	10	10%
6	Final Practical Exam	14	10	10%

6- Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	3G E-learning, Basics of Inorganic Chemistry", 3G E-Learning, NY, USA, 2024 (16915) B. KENT, "Advanced inorganic chemistry", NY Research, 2019. (16789) - Lee J.D., A New, Concise Inorganic Chemistry, Third Edition, Van Nostrand Reinhold, (UK)., 1985 (1727) - Theodore L. Brown, et al, Chemistry the Central Science, Prentice Hall Int. (Pearson International, 2010) "Inorganic Chemistry" by Gary Miessler, Paul Fischer, and Donald Tarr - A standard textbook , 2014
	Other References	Brian M. Tissue, Basics of Analytical Chemistry and Chemical Equilibria, John Wiley & Sons, Inc, part III, 2013.
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive	Devices/Instruments	General laboratory glassware, pH meter,

facilities & equipment for teaching and learning *		Litmus and filter paper, spatula, desiccator, and analytical balance
	Supplies	-
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha Fawzy El Husseiny
Signature	Nora yehia	Noha ElHoseiny

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Physical Chemistry			
Course Code (according to the bylaw):	CHM 112			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3 credit hrs.	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	2	2	1	5
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Noha Fawzy Mohamed El Husseiny			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

States of matter, gas state & kinetic Theory of gases, liquid state, properties of liquids & solutions, dilute solutions, ideal & non- ideal solutions. Solid state, crystallographic structure. Phase equilibria, chemical kinetics, gas solid, liquid solid and solid, solid adsorption.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics	LO1	Identify the behavior of ideal and real gases using compressibility factors and equations of state.
		LO2	Apply principles of thermochemistry to calculate heats of reaction under various conditions using analytical or experimental methods
		LO3	Solve physical chemistry problems using the phase rule, Clausius-Clapeyron equation, Kirchhoff's law and units' conversion.
		LO4	Calculate key chemical engineering parameters including reaction rate constant, reaction order, half-life, equilibrium constant, and concentrations for various solutions and systems
		LO5	Estimate phase transition parameters—such as vapor pressure, boiling point, and freezing point—using appropriate equations or phase diagrams, considering colligative properties
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO6	Analyze phase equilibrium and appropriate applications using phase diagrams of pure substance and/or phase rule.
		LO7	Measure selected properties of different states of matter, such as specific gravity, surface tension, freezing point depression, distribution coefficient, and heat of combustion, using experimental or presentation-based approaches

B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO8	Identify technological applications of gas laws, phase behavior, and chemical kinetics relevant to modern chemical engineering processes.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology- Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√				√	√	√			√	√				

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/ Projects/ ...)
				Tutorial	Practical / Lab	
1	General revision including units and conversions. The ideal gas, theory and laws guiding the behavior of gases and the deviation from ideality	5	2	1	2	

	Lab (1): Introduction to lab./ Lab Tour/ Safety instructions- Revision including units conversion, solution preparation and concentration expressions					
2	The ideal gas, theory and laws guiding the behavior of gases and the deviation from ideality - Real gases, critical states and compressibility factor	5	2	1	2	
	Lab (2): Measurements and determination of some physical properties including density/Surface tension/ viscosity for Liquid/ solutions.					
3	Real gases, critical states and compressibility factor charts. Gas liquefaction	5	2	1	2	
	Lab (3): Change state of gases training system experiment. 1					
4	Volumetric properties of the fluid and some of the most important EOS	5	2	1	2	
	Lab (4): Change state of gases training system experiment. 2					
5	Introduction to solutions, solution concentration, colligative properties	5	2	1	2	

	<u>Lab (5):</u> Cooling by evacuation experiment					
6	.Chemical equilibrium – Lechatelier principles – Applications	5	2	1	2	
	<u>Lab (6):</u> Freezing point depression Experiment					
7	Revision and Mid Exam					
8	Phase rule and phase equilibrium - Properties of pure substances	5	2	1	2	
	<u>Lab: week 8</u> Determination of equilibrium constant for esterification reaction					
9	Phase transition Clausius - Clapeyron equation	5	2	1	2	
	<u>Lab (9):</u> Distribution coefficient experiments					
10	Applications of the phase rule and phase equilibria in industry	5	2	1	2	
	<u>Lab (10):</u> Lab. Assessment					
11	Heat effects, thermochemistry,	5	2	1	2	
	<u>Lab (11):</u> presentation on Calorimeters (Bomb calorimeter) experiments					

12	Different heat of reaction calculation methods , temperature dependency of ΔH – Kirchhoff's law application	5	2	1	2	
	<u>Lab (12):</u> Determination of the heat of combustion using Bomb calorimeter					
13	Introduction to Chemical Kinetics - How to calculate the rate law from experimental readings	5	2	1	2	
	<u>Lab (13):</u> Reaction Kinetics measurements including the determination of the reaction rate/Activation energy/ Effect of temperature on rate constant for a polymerization reaction/iodine clock reaction					
14	First order and second order Reaction kinetics	5	2	1	2	
	<u>Lab (14):</u> Lab assessment					
15,16	Final Exam.					

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	5	5%
2	Exam 2 written (Semester work)	10	7.5	7.5%
3	Exam 2 written (Semester work)	13	7.5	7.5%
4	Midterm exam	7	20	20 %
5	Final Written Exam	15, 16	40	40 %

6	Lab Assessment	weekly	10	10%
7	Assignments/Reports/Participation/Presentation/Logbook (Semester work)	Weekly	10	10%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Peter Atkins, Julio de Paula, James Keeler - Atkins' Physical Chemistry- Oxford University Press, 12th edition, 2018 (16778), 2023. - Mortimer R.G. Physical Chemistry, 3rd Ed., Elsevier Inc. USA, 2008 - Theodore Brown, H. LeMay, Bruce Bursten, Catherine Murphy, Patrick Woodward, Matthew Stoltzfus - Chemistry_ The Central Science in SI Units, 15th Global Edition- Pearson (2022) - Jill K. Robinson, John E. McMurry, Robert C. Fay, Chemistry, 8th edition, Pearson, USA, 2020.
	Other References	- Anthony J. Duben, Case Studies in the Virtual Physical Chemistry Laboratory, Springer, 2024 - Ira-N.-Levine, Physical-Chemistry, Sixth-Edition, Mc Graw Hill, 2009
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Lab instruments – Glassware for different experiments – water baths - stirrer – thermometers – weight balances – devices/ trainers/Equipment mentioned in the lab manual.
	Supplies	Essential supplies
	Electronic Programs	-
	Skill Labs/ Simulators	Department laboratories
	Virtual Labs	-
	Other (to be mentioned)	Chemicals, indicators and materials necessary for different experiments as mentioned in the course lab manual

	Course Coordinator	Program Coordinator
Name	Noha Fawzy M. El Hussein	Dr. Noha Fawzy M. El Hussein
Signature	Noha El Hussein	Noha El Hussein

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Introduction to Chemical Engineering			
Course Code (according to the bylaw):	CHM 113			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	1	--	2	3
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	El Shimaa M. El Zahed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Definition of chemical engineering, the chemical process industry, the flow sheets as a presentation of a chemical process. The chemical engineering concept, fundamental dimensions and conversion of units, process variable, simple mass balances. Classification of chemical engineering equipment.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, B1)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Perform a material balance on a single unit or multiple units in reactive or non-reactive processes.
		LO2	Classify the chemical engineering process variables and chemical equipment.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	LO3	Apply basic chemical engineering concepts to create simple block diagrams and process flow sheets.
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy	LO4	Apply chemical engineering principles and techniques including mass balance and degrees of freedom analysis on different processes

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√				√									√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Difference between a Unit Operation and a Unit Process, Process Variables	3	1	2	0
2	Process Classification	3	1	2	0
3	Material Balance of Non-Reactive Systems (Single unit)	3	1	2	0
4	Material Balance of Non-Reactive Systems (Single	3	1	2	0
5	Degree of Freedom on Non-Reactive Systems	3	1	2	0
6	Material Balance of Non-Reactive Systems (Multiple Units)	3	1	2	0
7	Revision and Mid Exam				
8	Material Balance of Non-Reactive Systems (Multiple Units)	3	1	2	0
9	Material Balance of Non-Reactive Systems (Multiple Units)	3	1	2	0

10	Material Balance on a Single Reactive Unit (Chemical Reaction)	3	1	2	0
11	Material Balance on a Single Reactive Unit (Limiting reactant ,	3	1	2	0
12	Material Balance on a Single Reactive Unit (Extent of reaction)	3	1	2	0
13	Material Balance on a Single Reactive Unit (Combustion)	3	1	2	0
14	Degree of Freedom on Reactive Systems	3	1	2	0
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	3	10	10%
2	Exam 2 written (Semester work)	6	10	10%
3	Midterm exam	7	20	20 %
4	Exam 3 written (Semester work)	10	10	10%
5	Exam 4 written (Semester work)	12	10	10%
6	Final Written Exam	15, 16	40	40 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- R.L. Cerro, B.G. Higgins, S. Whitaker, "Material Balances for Chemical Reacting Systems", 2023. (16903) - K.V.Narayanan , "Stoichiometry and Process Calculations", 2019.(16749)
	Other References	- Nayef Ghasem, Redhouane Henda, "Principles of Chemical Engineering Processes", 2nd Edition, 2015. - David Mautner Himmelblau, James B. Rigg, "Basic Principles and

		Calculations in Chemical Engineering “, 8th Edition, 2012. • <u>Coulson and Richardson's, "Chemical Engineering", volume 6, 2004.</u> • <u>Felder, "Elementary Principles of chemical Process", 2008.</u>
	Electronic Sources (Links must be added)	• Principles of Chemical Engineering Processes • Basic Principles and Calculations in Chemical Engineering - David Mautner Himmelblau, James B. Riggs - كتب Google
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	--

	Course Coordinator	Program Coordinator
Name	El Shima M. El Zahed	Dr. Noha Fawzy El Hussein
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Engineering Mechanics (3)			
Course Code (according to the bylaw):	ENG 101			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	--	4
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Gamal Nada			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Kinematics of rigid bodies in plane motion: Translation motion, rotation about fixed axis and general plane motion - Geometrical properties of rigid body; center of gravity and mass moment of inertia - Kinetics of rigid body in translation, rotation and general plane motion (equation of motion based on Newton's second law, work, energy and momentum).

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1 & A3& A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Identify the different types of plane motion of rigid bodies (translation, rotation or general plane motion)
		LO2	Formulate the equations of kinematics of rotation motion of rigid body.
		LO3	Solve problems of kinematics of general plane motion of rigid body.
		LO4	Identify the geometrical properties of rigid bodies.
		LO5	Formulate the equations of kinetics of plane motion of rigid body.
		LO6	Solve problems of kinetics of plane motion of rigid body (translation, rotation, or general).
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO7	Relate between the motions of the bodies to obtain the requirements for a certain dynamic design.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO8	Investigate the given system (mechanism) by applying the laws of solid mechanics, material properties and laws of dynamics.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓			✓	✓	✓			✓					✓

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	-Introduction to the dynamics of rigid body. - Kinematics of rotation of rigid body.	4	2	2	---
2	- Motion of a point on a rotating rigid body. - Problems	4	2	2	---
3	- Problems, continued - Kinematics of general plane motion of rigid body	4	2	2	---
4	- Problems - Kinematics of general plane motion of rigid body, rolling without slipping (or without sliding)	4	2	2	---

5	- Kinematics of general plane motion of rigid body, rolling with slipping or with sliding - Problems	4	2	2	---
6	- Geometrical properties of rigid body: mass center of simple body - Mass center of composite body	4	2	2	----
7	Revision and Mid Exam				
8	- Mass moment of inertia for simple and composite body - Problems				
9	- Kinetics of general plane motion of rigid body, General approach	4	2	2	
10	- Kinetics of translation of rigid body - Problems				
11	- Problems, continued - Kinetics of rotation of rigid body, centroidal rotation				
12	- Problems - Kinetics of rotation of rigid body, non-centroidal rotation				
13	- Problems - Kinetics of general plane motion of rigid body				
14	- Problems - Revision				
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	5	10	10 %
2	Midterm exam	7	20	20 %
3	Exam 2 written (Semester work or quiz)	10	10	10 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Sheets	Through Semester	10	10 %
6	In-Class questions	Through Semester	10	10 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	R. C. Hibbler "Engineering Mechanics: Dynamics", 15th Edition, Published by Pearson, 2021.
	Other References	-Andrew Pytel and Jaan Kitzelsas "Engineering Mechanics: Dynamics", 4 th Edition, Published by CL Engineering, 2016 -Course Notes available as softcopy on Microsoft teams
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and laptop.
	Supplies	White board
	Electronic Programs	Microsoft teams
	Other (to be mentioned)	Library

	Course Coordinator	Program Coordinator
Name	Dr. Gamal Nada	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Solid Mechanics			
Course Code (according to the bylaw):	ENG 105			
Department/s that participated in the teaching:	Civil Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2		4
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Civil Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass. Prof. Morcos Farid Samaan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	مجلس قسم شهر أغسطس			

2. Course Overview (Brief summary of scientific content):

Centroid. Area moment of inertia. Parallel axes theorem. Polar moment of inertia. Mass moment of inertia. Radius of gyration. Moment of inertia about inclined axes. Product of inertia about inclined axes. Principal axes of inertia (analytical & graphical). Loads, supports and reactions. Motion of Rigid Body, Newton's second law. Energy and momentum methods. Introduction to vibrations.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A2, A3		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	LO1	Describe engineering problems by applying engineering fundamentals and basic science of civil engineering.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO2	Associate appropriate simulation and objective civil engineering judgment.
		LO3	Classify data by applying civil engineering judgment.
		LO4	Interpret data and assess by using statical analyses to draw conclusions of structure elements.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO5	Apply the design specification requirements to get the most economic cross-sections for floor beams.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√		√			√									

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Practical / Lab
1	Introduction of center of gravity - center of mass and centroid.	4	2	2	---
2	moment area Computing characteristics of composite area.	4	2	2	----
3	Introduction to parallel axes theorem	4	2	2	---
4	Introduction to polar moment of area.	4	2	2	---
5	Radius of gyration.	4	2	2	---
6	Product moment of area	4	2	2	---
7	Revision and Mid Exam				
8	Moment area characteristics about inclined axes.	4	2	2	---
9	Principal moment area characteristics	4	2	2	----
10	Loads – support and reaction.	4	2	2	----

11	Introduction of internal forces	4	2	2	---
12	Motion of rigid bodies	4	2	2	----
13	Newton second law	4	2	2	---
14	Introduction to vibration characteristics	4	2	2	---
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Quiz 1 written (Semester work)	6	10	10 %
2	Quiz 2 written (Semester work)	11	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments	weekly	20	20 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Theory of structures Vol. 1, El-Dakhakhni, Dar El-Maaref, Cairo - 2018 - Engineering Mechanics – Hibbler – 2016 – New Jersey.
	Other References	Dynamics of structures – Patrick paultr – 2010 – Newdelhi.
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data Show, White Board
	Supplies	--
	Electronic Programs	--
	Skill Labs/ Simulators	--
	Virtual Labs	
	Other (to be mentioned)	--

	Course Coordinator	Program Coordinator
Name	Ass. Prof. Morcos Farid Samaan	Dr. Ghada Nashaat Mohamed
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Mathematics 3			
Course Code (according to the bylaw):	MTH 101			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>	<u>2</u>		<u>4</u>
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr/ Mahmoud Abu Zeid			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

Cartesian – Cylindrical – Spherical Coordinates – Multi integral (Double integral – Double integral in polar coordinates – Triple integral – Transformation between coordinates - Triple integral in cylindrical and spherical coordinates) – Position vector – The dot product – Cross product and its applications – Infinite integrals in vector functions – Derivative of vector function – Gradient fields – Conservative vector field – Divergence and Curl of vector field – Line integral – Green theorem in the plane – Surface integral – Flux of vector field – Gauss divergence theorem – Stokes's theorem.

3. Course Learning Outcomes CLOs:

Matrix of course learning outcomes CLOs with program outcomes Pos (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, A3, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Define the main items of the vectors, lines and planes in space.
		LO2	Describe the main concepts of vectors and integral operations.
		LO3	Explain coordinate systems and the principals of Jacobian transformation and double and triple integrations and surfaces in space.
A2	Develop and conduct appropriate and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO4	Analyze the Green, Gauss, and Stokes theorems to evaluate the applications.
		LO5	Implement the skills of vectors to estimate some mathematical modeling.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO6	Analyze the life problem to create the mathematical problem.
		LO7	Classify the problems according to the suitable integral's method (line integral, surface integral and volume integral).
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO8	Describe and contrast between different lines and planes with sketching solids and planes
		LO9	Evaluate and assess the suitable method of the double and triple integrals in cylindrical and spherical coordinates.
		LO10	Manage time and apply the skills of Gradient field, divergence and curl of vector field.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial/Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√			√	√	√			√					

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Vectors (The dot product- cross product- triple product)	4	2	2	0
2	The lines in the space	4	2	2	0
3	The plane in the space	4	2	2	0
4	Surfaces in the space	4	2	2	0
5	Coordinates in different systems	4	2	2	0
6	Multiple integrals (double and triple integral)	4	2	2	0
7	Revision and Mid Exam				
8	Triple integral in cylindrical and spherical coordinates	4	2	2	0
9	Gradient field, divergence and curl of vector field	4	2	2	0
10	Line integral of scalar field	4	2	2	0
11	Line integral of vector field	4	2	2	0

12	Green theorem	4	2	2	0
13	Gauss theorem	4	2	2	0
14	Stokes theorem	4	2	2	0
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1written (Semester work)	4,5	10	10%
2	Exam 2 written (Semester work)	10,11	10	10%
3	Midterm exam	7	20	20%
4	Final Written Exam	15, 16	40	40 %
5	Final Practical/Clinical/... Exam		0	
6	Final Oral Exam		0	
7	Assignments / Project /Portfolio/ Logbook	8,9	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	1- Erwin Kreyszig, Advanced Engineering Mathematics,Tenth Edition, JOHN WILEY & SONS, INC.
	Other References	1- Erwin Kreyszig, Advanced Engineering Mathematics 2- Advanced Calculus Theory and Practice, John Petrovic 2020 3- Advanced Calculus Fundamentals of Mathematics, Carlos Polanco 4- Advanced Engineering Mathematics by H. K. Dass. 5- Advanced Engineering Mathematics by K. A. Stroud and J. Booth, Fourth Ddition. 6- Calculus III Jerald Marsden and Alan Weinstein, Springer-Verlag 1985, Second Ddition.

	Electronic Sources (Links must be added)	• https://math.fandom.com/wiki/Hypermathematics • https://github.com/AlexCharlton/hypermath • https://www.britannica.com/science/mathematics • https://www.khanacademy.org/math • https://animated-mathematics.net/
	Learning Platforms (Links must be added)	EKB- Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	
	Supplies	
	Electronic Programs	MATLAB
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Dr Mahmoud Abu Zeid	Prof. Ahmed Abd El-Gafar
Signature	<i>Mahmoud Abu Zeid</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Mathematical Analysis			
Course Code (according to the bylaw):	MTH 104			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>	<u>2</u>		<u>4</u>
Course Type:	Elective			
The level to which the course was introduced:	JUNIOR			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	D. Hanan M. Ahmed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

Complex numbers – Polar form of complex numbers – Powers and roots – Curve and regions in the complex plane – Complex functions – Polynomials – Exponential function – Trigonometric functions – Hyperbolic function – Logarithm – General power mapping by special functions- Limits – Continuity - Derivative – Analytic functions – Cauchy Riemann equations – Harmonic function – Line integral in complex plane – Two integration methods – The method of use of the path- Cauchy integral theorem – Path independent – Existence of indefinite integral – Cauchy integral formula – Derivative of analytic function - Practical method of obtaining power series – Uniform convergence – Laurent series – Application - Zeroes and singularities – Residues – Cauchy residue theorem - Evolution of real integral.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO1	Identify the complex numbers and the polar form of complex numbers .
		LO2	Formulate the theorems of Limit Derivative and analytic Function, also the elementary functions.
		LO3	Apply Cauchy-Riemann equations and harmonic functions on complex functions to the differentiation and the concept of analytic function
A2	Develop and conduct appropriate experimentation or simulation ,analyze and interpret data , assess and evaluate findings , and use statistical analysis and objective engineering judgment to draw conclusions..	LO4	Explain the residues of the complex function with creative thinking in their applications
		LO5	Assess issues of the mathematical results
		LO6	Study the concepts of the line integrals and the Cauchy-Riemann formula
		LO7	Explain the infinite series in the complex plane (power series, Taylor's series, Laurent's series).Discuss integrations in the complex plane
		LO8	Apply the residues theorem to handle complex functions with applications.
		LO9	Communication skills.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√				√	√	√			√	√				√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Complex numbers. Polar form of complex numbers. Powers and roots. Curves and regions in the complex plane	4	2	2	-
2	Limit, Derivative, Analytic Function, Cauchy Riemann Equation, Exponential function	4	2	2	-
3	Trigonometric functions, Hyperbolic functions, Logarithm, General power, Mapping by Special function	4	2	2	-
4	Complex functions. Polynomials. Exponential function. Trigonometric functions	4	2	2	-
5	Hyperbolic function. Logarithm. General power. Mapping by special functions	4	2	2	
6	Mapping by special functions				

7	Revision and Mid Exam				
8	Line integral in the complex plane. Two integration methods.				
9	Cauchy integral theorem. Path independence. Existence of indefinite integral.				
10	Cauchy integral formulas. Derivative of analytic function. Power series Taylor series				
11	Practical methods of obtaining power series. Uniform convergence.				
12	Laurent series, Applications, Zeros and Singularities. Residues.				
13	Cauchy residue theorem.				
14	Evaluation of real integrals				
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)		10	
2	Exam 2 written (Semester work)		10	
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical/Clinical/... Exam		0	
6	Final Oral Exam		0	
7	Assignments / Project /Portfolio/ Logbook		20	
8	Field training		0	
9	Other (Mention)		0	

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	"Engineering Mathematics", zill,2013
	Other References	Complex Analysis with Applications to Number Theory (Infosys Science Foundation Series) 1st ed. 2020 Edition. Mathews, Russell W. Howell.
	Electronic Sources (Links must be added)	• https://math.fandom.com/wiki/Hypermathematics • https://github.com/AlexCharlton/hypermath • https://www.britannica.com/science/mathematics
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	
	Supplies	
	Electronic Programs	
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Hanan M. Ahmed	Prof. Ahmed Abd El-Gafar
Signature	<i>Hanan M. Ahmed</i>	

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

تربية رياضية 2				اسم المقرر: (تبعاً لما ورد باللائحة)
PHE 101				كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية				القسم/الأقسام العلمية التي شاركت في التدريس:
نظري	عملي	اخرى (تحدد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
2	1		1	
اجباري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
البرامج الهندسية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
د عصماء علي				اسم منسق المقرر:
مجلس القسم العلمي للبرنامج				جهة مناقشة واعتماد تقرير المقرر:
7/26/2025				تاريخ اعتماد تقرير المقرر:

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

المقرر يحتوى علي قوانين الحركة . الميكانيكا الحيوية : انواع الروافع، قواعد الدفع، الاجهاد العضلي، التربية البدنية والمجهود البدني، نظم إنتاج الطاقة والمشروبات الرياضية، والظروف البيئية وتأثيرها على الأنشطة الرياضية.

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصنوفة في توصيف البرنامج)		نواتج التعلم للمقرر	
A2_A4_A5_A7_A8		عند الانتهاء من المقرر سيكون الطالب قادراً على	
الكود	النص	الكود	النص
A2	تحديد وصياغة وحل المشكلات الهندسية المعقدة من خلال تطبيق الأسس الهندسية والرياضيات والعلوم الأساسية	LO1	توظيف معارف ومهارات التربية الرياضية للتعامل مع إصابات
		LO2	أهم الإصابات التي يتعرض لها اللاعبون والأفراد العاديين وأهم طرق العلاج
A4	لاستفادة من التقنيات المعاصرة، والممارسات والمعايير، وإرشادات الجودة، ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر	LO3	التعرف على أهم أسباب الانحرافات القوامية وتجنب حدوثها
		LO4	شرح مفاهيم التربية والهندسة الرياضية ونظرياتها
		LO5	تنمية المعارف والمعلومات حول حقيقة ونطاق الإصابات الرياضية
A5	ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.	LO6	تنمية المعارف والمعلومات حول حقيقة ونطاق الإصابات الرياضية
		LO7	التعرف على مبادئ الاسعافات الأولية والوسائل المستخدمة لإتجاه الإصابات الرياضية.
A7	لعمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعدد الثقافات	LO8	وتنمية المعارف والمعلومات حول الإصابات الرياضية التي يتعرض لها الرياضيين داخل الملاعب وخارجها .
A8	التواصل بفعالية ببنائياً وشفاهه وكتابة مع مجموعات من الجماهير باستخدام الأدوات العصرية.	LO9	توظيف المعارف والمهارات التي حصل عليها في مجال العمل

4 طرق التعليم والتعلم للمقرر:

استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات				التدريس الغير مباشر								التدريس المباشر			
الذكاء الاصطناعي في التعليم	التعلم الإلكتروني	المعامل الافتراضية	برامج المحاكاة أو النمذجة	التعلم بالإكتشاف	التعلم الذاتي	الزيارات الميدانية	التدريب الميداني	الحوار والمناقشة	كتابة التقارير /الأبحاث	حل المشكلات	استراتيجية دراسة الحالة	التعلم القائم على المشروعات الجماعية	العصف الذهني	التمارين العملية والتجارب	المحاضرات
	✓				✓			✓	✓				✓		✓

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس نظري	تدريب
عملية	تمارين	عملية	عملية	عملية
1	جسم الانسان (عظمى - عضلى - مفصلى - عصبى) وما هو تأثير ممارسات المشاركة الرياضية + نشاط رياضي	2	1	0
2	تعريف الاصابة- اسبابها -اعراضها - الاسعافات الاولى ومبادئها+ نشاط رياضي	2	1	0
3	اهداف واعراض الاسعافات الاولى والوسائل المستخدمة فى الاسعافات الاولية + نشاط رياضي	2	1	0
4	اصابات الجلد (الجروح - الحروق - كدمات الجلد) + نشاط رياضي	2	1	0
5	اصابات العضلات (الاجهاد العضلى - التقلص العضلى - التمزق العضلى) + نشاط رياضي	2	1	0
6	مراجعته عامه + تدريب على التقييم العملي	2	1	0
7	مراجعة وامتحان منتصف الفصل الدراسي			
8	مراجعته عامه + مناقشه ابحاث	2	1	0
9	اصابات الجهاز العصبي (الاغماء- الصدمة - كدمات الاعصاب -النزيف) + تقييم الجزء العملي	2	1	0
10	ماهى القوام - تعريفه - مبادئ المحافظة على القوام + مناقشه الابحاث و التقارير	2	1	0
11	الانحرافات القوامية (انواعها - اسبابها	2	1	0
12	مراجعته عامه	2	1	0
13	إختبارات الفصل الدراسي النهائية عملي			

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	بحث تقييمي للعملي	8_9	20	20%
2	امتحان منتصف الفصل الدراسي	7	20	20%
3	امتحان نهائي تحريري	14	30	30%
4	امتحان نهائي عملي	13	30	30%

6- مصادر التعلم والتسهيلات المادية:

مدخل في التربية الرياضية	المرجع الأساسي للمقرر (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
ابو العلا عبد الفتاح : الرياضه و انقاص الوزن ، دار الفكر العربي 2023	المراجع الأخرى	
الهام شلبي : بانورما الصحة العامه للريا ضيين القاهرة 2022	المصادر الالكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office	المنصة التعليمية (لابد من إضافة الرابط)	
قاعة محاضرات مجهزة والجيم	1	التجهيزات التعليمية المساندة للتعليم والتعلم *
المكتبات المركزية والفرعية	2	
الوسائل التعليمية (داتا شو (جهاز كمبيوتر محمول).	3	
مذكرة لتدريس المقرر وكشوف متابعة للطلاب	4	

منسق البرنامج	منسق المقرر	
د.د/ أحمد عبد الغفار	د. عصماء علي	الإسم
	عصماء علي	التوقيع

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Process Fluid Mechanics			
Course Code (according to the bylaw):	CHM 120			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	2	--	2	4
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	El Shimaa M. El Zahed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Fluid properties, hydrostatics, fluid motion, Continuity equation, Bernouli's equation, pressure losses, Poiseuille-Hagen equation, darcy equation, Types of Pumps. Non-Newtonian fluids, thixotropy, Compressible fluid dynamics, compressible fluid measurements, critical velocities, power required for gas conveyance, stagnation temperatures, Types of compressors, Turboexpanders.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, B1)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Evaluate flow aspects and factors affecting fluid mechanics.
		LO2	Apply continuity equation, Euler's equation & Bernoulli's equation and its modifications.
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Plant Design.	LO3	Analyze the properties of fluids and their type.
		LO4	Determine Pressure variation in a fluid, and the force acting on submerged body.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√				√	√								√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction & Fluid Properties	4	2	2	--
2	Pressure variation in a Fluid	4	2	2	--
3	Pressure Variation in a fluid continue	4	2	2	--
4,5	Forces acting on submerged bodies	8	4	4	--
6	Introduction to fluid kinematics	4	2	2	--
7	Revision and Mid Exam				
8	Continuity Equation	4	2	2	--
9,10	Bernoulli's equation & its modifications	8	4	4	--

11	Friction losses	4	2	2	--
12,13	Pumps& compressors,	8	4	4	--
14	Measuring devices	4	2	2	--
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Fluid Properties training system

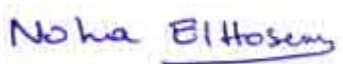
5- Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10 %
2	Exam 2 written (Semester work)	9	10	10 %
3	Midterm exam	7	20	20 %
4	Report	8	10	10 %
5	Exam 3 written (Semester work)	12	10	10 %
6	Final Written Exam	15, 16	40	40 %

6- Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method) - Emilia Liold , "Handbook of Heat Transfer and Fluid Flow", Cambridge University Press ,U. S.A, 2023 (16905) - Vikas Zaveri , "A Text Book of Chemical Engineering" Vol.I, ed- tech press, UK, 2022 (16913) - Ron Darby, Raj P. Chhabra, "Chemical Engineering Fluid Mechanics"; CRC Press; Taylor & Francis Group, 2017

	Other References	- Donald F. Elger, Barbara A. LeBret, Clayton T. Crowe, John A. Roberson, "Engineering Fluid Mechanics", 12th Australia & New Zealand Editio, July 2019 F. Holland, "Fluid Flow for Chemical Engineers", 2nd Edition; Butterworth-Heinemann, 1995.
	Electronic Sources (Links must be added)	https://www.perlego.com/book/1813960/fluid-flow-for-chemical-engineers-pdf
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	Fluid mechanics Lab
	Virtual Labs	--
	Other (to be mentioned)	--

	Course Coordinator	Program Coordinator
Name	El Shimaa M. El Zahed	Dr. Noha Fawzy El Husseiny
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Thermodynamics			
Course Code (according to the bylaw):	CHM 121			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3 credit hrs.	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	2	--	2	4
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Noha Fawzy El Hussein			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Equations of state, laws of thermodynamics, thermo chemistry and combustion. Power cycles. Free energy & entropy, chemical equilibrium. Refrigeration cycles. Mixtures, fugacity. Clapyron. Equation. Basic units and. dimensions, heat & mass balances. Stoichiometry. Chemical calculations

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, B1)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Identify basic thermodynamic concepts and physical properties of pure substances.
		LO2	Solve fundamental thermodynamic equations related to closed and open systems.
		LO3	Evaluate internal energy changes and thermodynamic properties for various thermodynamic cycles.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO4	Conduct thermodynamic experiments or simulations to determine system properties and performance under varying conditions.
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics,	LO4	Apply thermodynamic laws to analyze the performance of engineering equipment such as turbines, pumps, engines, and refrigeration systems.

Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Plant Design.	LO5	Calculate standard enthalpies and Gibbs free energies of formation to determine chemical equilibrium constants.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√				√	√								√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction to Thermodynamics. - Application of thermodynamics in chemical engineering, heat and work Units and dimensions	4	2	2	--
2	System (types- properties) Energy balance for a closed system First law of thermodynamics	4	2	2	--
3	Enthalpy Application of first law of thermodynamics on different	4	2	2	--

	processes for Ideal gas				
4	Application of the first law of thermodynamics on different processes for Ideal gas	4	2	2	--
5	Spontaneous and non-spontaneous processes- Entropy- Second law of thermodynamics	4	2	2	--
6	Standard entropy calculations for chemical reactions- calculations of entropy change				
7	Revision and Mid Exam				
8	Entropy changes of an ideal gas	4	2	2	--
9	Heat engine and Carnot cycle	4	2	2	--
10	Volumetric Properties of Pure Fluids, thermodynamic properties of water (Steam tables)	4	2	2	--
11	Rankine cycle	4	2	2	--
12	refrigeration cycle	4	2	2	
13	Refrigerator	4	2	2	--
14	heat pump, coefficient of performance or COP	4	2	2	
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Boiling Heat Transfer Training
2	Steam generation training system
3	Condensation training system

5- Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing	Marks/ Scores	Percentage of

		(Week Number)		total course Marks
1	Exam 1 written (Semester work)	4	10	10 %
2	Exam 2 written (Semester work)	6	10	10 %
3	Midterm exam	7	20	20 %
4	Report/Practical work	9	10	10 %
5	Exam 3 written (Semester work)	12	10	10 %
6	Final Written Exam	15, 16	40	40 %

6- Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• <u>J. M. Smith, H. C. Van Ness, and M. M. Abbott, "Introduction to Chemical Engineering Thermodynamics", McGraw-Hill, USA, 2018 (16653)</u> • Vikas Zaveri , "A Text Book of Chemical Engineering" Vol.I, ed- tech press, UK, 2022 (16913) • <u>Sandler, S., "Chemical and Engineering Thermodynamics," 3rd edition, Wiley, New York (1999). (4555)</u> • Kenneth R. Hall , Gustavo A. Iglesias-Silva , Thermodynamics for Chemical Engineers, Wiley-VCH, 2022
	Other References	• <u>Elliott, J.R., and C.T. Lira, "Introductory Chemical Engineering Thermodynamics," Prentice Hall, Englewood Cliffs, New Jersey (1999)</u>
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	Fluid mechanics Lab
	Virtual Labs	--
	Other (to be mentioned)	--

	Course Coordinator	Program Coordinator
Name	Dr. Noha Fawzy El Hussein	Dr. Noha Fawzy El Hussein
Signature	Noha El Hussein	Noha El Hussein

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

مبادئ هندسة التشييد والبناء				اسم المقرر: (تبعاً لما ورد باللائحة)
مدن 101				كود المقرر: (تبعاً لما ورد باللائحة)
قسم الهندسة المدنية				القسم/الأقسام العلمية التي شاركت في التدريس:
نظري	عملي	اخرى (تحدد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
2	1		3	
اختياري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة المدنية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
أ.د / شريف الترساوى				اسم منسق المقرر:
مجلس القسم العلمي للبرنامج				جهة مناقشة واعتماد تقرير المقرر:
مجلس القسم شهر أغسطس				تاريخ اعتماد تقرير المقرر:

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

لمحة عن عملية البناء، الأحمال على المباني، مقاومة الأحمال، الخصائص الإنشائية للمواد، الأنظمة الإنشائية، الخصائص الحرارية للمواد، الخصائص المتعلقة بالحريق، مبادئ البناء المستدام. المواد وأنظمة البناء و المواد الإنشائية ، الجبر، الأسمنت والخرسانة ، التربة؛ إنشاء الأساسات ، الأسقف، السلالم، أغطية الأرضيات.

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		(A1, A4, A9, A10)	
الكود	النص	الكود	النص
A1	التعرف على أنواع المباني ومبادئ البناء المستدام وأنواع الرسومات المدنية والمعمارية.	LO1	
	التعرف على دور الأساسات السطحية والعميقة، وأساليب فحص التربة وتصريف المياه الجوفية.	LO2	
	وصف أنواع حديد التسليح وأنواع الأسمنت والخرسانة وأنواع تغطيات الأرضيات.	LO3	
	دراسة أنواع البلاطات المختلفة، وحساب الأحمال المؤثرة عليها وسمكها	LO4	
	التعرف على أنواع الطوب المختلفة وحساب الكميات المطلوبة للبناء.	LO5	
A4	تطبيق الأكواد لاختيار نوع الأساس بناءً على الأحمال ونوع التربة، وتصميم وتنفيذ المنشآت الخرسانية.	LO6	
	تطبيق الإرشادات المعمارية في تصميم السلالم طبقاً للمواد والمساحات المتاحة.	LO7	
A9	تخطيط الموقع وتجهيزه لأعمال التنفيذ ما في ذلك تنفيذ الشدات للعناصر الإنشائية و استلامها	LO8	
A10	التعامل مع العطاءات والعقود والقضايا المالية للمشروعات	LO9	

4 طرق التعليم والتعلم للمقرر:

التدريس المباشر		التدريس الغير مباشر										استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات			
المحاضرات	التمارين العملية	المصنف الذهني	التعلم القائم على المشروعات الجماعية	استراتيجية دراسة الحالة	حل المشكلات	كتابة التقارير /الأبحاث	الحوار والمناقشة	التدريب الميداني	الزيارات الميدانية	التعلم الذاتي	التعلم بالإنكتشاف	برامج المحاكاة أو النمذجة	المعامل الافتراضية	ميكروسوفت تيم	الذكاء الاصطناعي في التعليم
✓	✓					✓	✓							✓	

الجدول الدراسي للمقرر:

رقم الأسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة		
			تدريس نظري	تدريب تمارين	أخرى (تحدد)
1	مقدمة	3	2	1	
2	خطوات البناء والرسومات المدنية والمعمارية والمواد الخرسانية	3	2	1	
3	حساب الكميات وأنواع الرسومات الهندسية	3	2	1	
4	العطاءات والتخطيط والإعداد للموقع	3	2	1	
5	طرق فحص التربة، الأساسات (الأساسات السطحية)	3	2	1	
6	أنواع الأساسات (الأساسات العميقة)	3	2	1	
7	مراجعة وامتحان منتصف الفصل الدراسي				
8	التخلص من المياه الجوفية	3	2	1	
9	الشدات و إستلام الأساسات	3	2	1	
10	الشدات و إستلام الأعمدة	3	2	1	
11	الشدات و إستلام البلاطات	3	2	1	
12	نواع البلاطات وتوزيع الأحمال عليها وحساب السمك	3	2	1	
13	أنواع الطوب وحساب كميات المواد للبناء	3	2	1	
14	التصميم المعماري للسلالم	3	2	1	
16-15	إختبارات الفصل الدراسي النهائية				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	3	10	10%
2	امتحان 2 تحريري (أعمال سنة)	12	10	10%
3	امتحان منتصف الفصل الدراسي	7	20	20%
4	امتحان نهائي تحريري	15 و 16	40	40%
5	تمارين و أبحاث	إسبوعيا	20	20%

6- مصادر التعلم والتسهيلات المادية:

-الكود المصري لميكانيكا التربة، اللجنة الدائمة للكود المصري، مركز بحوث الإسكان والبناء، القاهرة، 2024 -الكود المصري لتصميم وتنفيذ المنشآت، اللجنة الدائمة للكود المصري، مركز بحوث الإسكان والبناء القاهرة، 2024	المرجع الأساسي للمقرر (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
-الموسوعة الحديثة فى تكنولوجيا تشييد المباني3م، فاروق عباس حيدر، منشأة المعارف، 2006 -موسوعة التنفيذ المعماري والانشائي، حسين محمد جمعة، اللجنة الدائمة، القاهرة، 2005	المراجع الأخرى	
https://books-library.website/files/download-pdf-ebooks.org-1544385031Kk6O6.pdf -الملحق الثاني للكود المصري	المصادر الالكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office www.researchgate.net www.engineeringcivil.com http://ocw.mit.edu/ Microsoft Teams تشيد ترم الصيفى General	المنصة التعليمية (لابد من إضافة الرابط)	
سبورة بيضاء ب- جهاز عرض	الأجهزة	التجهيزات التعليمية المساندة للتعليم والتعلم *

منسق البرنامج	منسق المقرر	
د. غادة نشأت محمد	أ.د/ شريف حسين الترساوى	الإسم
غادة نشأت		التوقيع

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of engineering electrical			
Course Code (according to the bylaw):	EEC 101			
Department/s that participated in the teaching:	Electrical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1		3
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr.Eslam Mansour			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/11/2025			

2. Course Overview (Brief summary of scientific content):

Basic Concepts: Voltage, current, power, and energy, Independent and dependent voltage and current sources. DC Circuits Analysis: Ohms law, Kirchhoff's current and voltage laws. Series and parallel DC circuit's analysis, nodal analysis, and mesh analysis. Superposition, source transformation, and maximum power transfer theorems, Thevenin's and Norton's theorems. Capacitance and Inductance: series and parallel connections of capacitors and inductors. AC Circuits Analysis: Sinusoidal sources, r. m. s. value, phasor representation, complex impedances, Kirchhoff's laws in the phasor domain, parallel and series AC circuits. Experiments will be conducted to support the course including the use of computer software for circuit analysis.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, A3)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO.1	Calculate the voltage difference and current intensity through any device in a complex circuit.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO.2	Ability to use Spice simulator to calculate the current and voltage drop through any element.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO.3	Determine the optimal load of a two-terminal circuit (that absorbs the maximum power).
		LO.4	Choose the suitable load for a predefined phase shift between the AC voltage and current.
		LO.5	Check the ability of a circuit component to be connected in a circuit without be overheated.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓	✓		✓	✓	✓			✓					

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Basic Concepts: Voltage, current, power, and energy, Independent and dependent voltage, and current sources.	3	2	1	
2	Ohms law, Kirchhoff's current and voltage laws. Series and parallel DC circuit's analysis.	3	2	1	
3	Nodal analysis, and mesh analysis.	3	2	1	
4	Superposition, and source transformation.	3	2	1	
5	Maximum power transfer theorems, Thevenin's and Norton's theorems.	3	2	1	
6	Capacitance and Inductance: series and parallel connections of capacitors and inductors.	3	2	1	
7	Revision and Mid Exam				

8	Phasor representation, complex impedances.	3	2	1	
9	Kirchhoff's laws in the phasor domain.	3	2	1	
10	Parallel and series AC circuits.	3	2	1	
11	Parallel and series AC circuits.	3	2	1	
12	Parallel and series AC circuits.	3	2	1	
13	Parallel and series AC circuits.	3	2	1	
14	General Revision.	3	2	1	
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Final Exam (<i>written</i>)	15th	40	40 %
2	Midterm written Exam (<i>Term Work</i>)	7th	20	20 %
5	Quizzes/reports/presentation (<i>Term Work</i>)	6th & 11th/ during the semester	40	40 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Electric Circuits", James W. Nilsson, Susan Riedel, Eleventh edition, Global Edition-Pearson 2019
	Other References	Fundamentals of electric circuits", Charles K. Alexander, Matthew N. O. Sadiku, fifth edition, McGRAW-HILL, 2013.
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office

Supportive facilities & equipment for teaching and learning *	Supplies	White board, Projector and Microsoft teams .
	Skill Labs/ Simulators	

	Course Coordinator	Program Coordinator
Name	Dr. Eslam Mansour	Ass.Prof.Dr. Taghreed Saied
Signature	<i>eslam mansour</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Applied mechanics			
Course Code (according to the bylaw):	ENG 102			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	--	4
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof. Iman Nassar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Deflection of beam, general equations of elasticity leading to solutions for thick and thin cylindrical structures, Introduction to energy methods of analysis, superposition and dynamic loading effects. Introduction to instability and buckling, the behavior of thin-walled beams, struts and columns.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Solve internal force problems in statically determinate and indeterminate beams using fundamental engineering principles.
		LO2	Apply energy-based methods such as virtual work and force method to solve structural mechanics problems.
		LO3	Analyze the behavior of thin and thick cylindrical structures under internal pressure.
		LO4	Evaluate the buckling of columns and identify critical loads using theoretical models.
		LO5	Analyze the deformation of initially curved beams using elasticity and mechanics principles.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO6	Interpret results of structural analysis techniques and validate with theoretical models.
		LO7	Assess the effects of dynamic loads and instability in mechanical systems.
		LO8	Evaluate stress and strain distribution in thin-walled structures based on engineering judgment.
		LO9	Interpret and compare mechanical behavior of complex systems using combined theoretical and applied methods.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓				✓	✓			✓				✓	✓

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction to Internal Forces in Beams (Support Reactions & Free-Body Diagrams)	4	2	2	
2	Applications and Problems on Internal Force Analysis	4	2	2	
3	Energy Methods: Principle of Virtual Work in Structures	4	2	2	
4	Statically Indeterminate Structures: Force Method (Theory)	4	2	2	
5	Statically Indeterminate Structures: Force Method (Problem Solving)	4	2	2	
6	Mechanics of Thin-Walled Pressure Vessels	4	2	2	
7	Revision and Mid Exam				

8	Stress Analysis in Thick Cylindrical Structures	4	2	2	
9	Introduction to Initially Curved Beams	4	2	2	
10	Analysis of Curved Beams: Stress and Deflection Methods	4	2	2	
11	Buckling and Instability of Slender Columns	4	2	2	
12	Friction Effects in Mechanical Systems	4	2	2	
13	Spatial Kinematics of Rigid Bodies	4	2	2	
14	Gyroscopic Motion: Introduction and Engineering Applications	4	2	2	
15,16	Final Exam.				

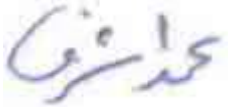
5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	4	15	15%
2	Exam 2 written (Semester work or quiz)	6	15	15%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments	9	10	10%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Beer, F.P, (2022)," Mechanics of Material ", McGraw-HILL Book Co, USA
	Other References	Khurmi, R.S.and Gupta, J.K, (2023),"Theory of Machines", Eurasia pub
	Electronic Sources (Links must be added)	https://books.google.com.eg/books?id=6FZ9UvDgBoMC&printsec=copyright&redir_esc=y#v=onepage&q&f=false
	Learning Platforms (Links must be added)	EKB - Microsoft office

Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and Laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Prof. Iman Nassar	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Design & Manufacturing Engineering			
Course Code (according to the bylaw):	ENG 103			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1	--	3
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. Prof. Dr. Said Zoalfakar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Mechanical components, Motion and power transmission elements, Standard machine elements (threads, fasteners, locking devices, keys, splines, gears, pulleys, bearings, pipe connections, etc.), Welding and riveting conventions, Basics of Machine elements design, Stress analysis, Basic machining processes, Applications of robotics technology.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1,A2&A3)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Identify standardized and customized machine elements used in mechanical design.
		LO2	Describe the basic principles of materials science, mechanical strength, and fatigue, and explain common manufacturing technologies for machine components.
A2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions	LO3	Use mathematical modeling and SolidWorks software to design mechanical elements.
		LO4	Design and select machine elements to satisfy the function of the machine for desired applications.
		LO5	Analyze and perform required calculations to select suitable standard machine components.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	LO6	Explain the fundamentals of engineering technologies and techniques in designing basic automation and robotic systems.
		LO7	Select appropriate mechanical components using manufacturers' catalogs to meet design criteria.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓	✓		✓		✓			✓					✓

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Material and their properties, manufacturing technology	3	2	1	-
2	Modes of fractures	3	2	1	-
3	Failure Theories	3	2	1	-
4	Design of fasteners	3	2	1	-
5	Power screw	3	2	1	-
6	Shaft design	3	2	1	-
7	Revision and Mid Exam				
8	Complex stress on the shafts	3	2	1	-

9	Gear design	3	2	1	-
10	Gear design	3	2	1	-
11	Rolling bearings selection	3	2	1	-
12	Sliding bearing design	3	2	1	-
13	flat pulley transmission	3	2	1	-
14	V-belt and pulley transmission	3	2	1	-
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	6	5	5%
2	Exam 2 written (Semester work or quiz)	10	5	5%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical/Clinical/... Exam	--	--	--
6	Final Oral Exam	--	--	--
7	Assignments / Project /Portfolio/ Logbook	30	0	30%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Khurmi, R. S., and J. K. Gupta. <i>A Textbook of Machine Design (LPSPE)</i> . S. Chand publishing, 2019.
	Other References	• Jonathan Wickert, An Introduction to Mechanical Engineering, CL - Engineering, 2nd' Ed., 2005. • D.K. Singh, Fundamentals of Manufacturing Engineering, CRC Press, 2008. • Robert L Mott, Machine Elements in Mechanical Design, Prentice Hall, 4th' Ed., 2003.
	Electronic Sources (Links must be added)	NA

	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and Laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Assoc. Prof. Dr. Said Zoalfakar	Dr. Mohamed Ashraf
Signature	<i>Said Zoalfakar</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Power Mechanical Engineering			
Course Code (according to the bylaw):	ENG 104			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1	--	3
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Asso. Prof. Dr. Amr Hassaan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

First Law of Thermodynamics - Energy conversion - Power cycles - principles of fluid mechanics – Prime movers (Gasoline & Diesel Engines) - Pumps & Turbines Principles of heat transfer - Simple steam plants - Refrigerators.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, A3)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Identify common gauges used in fluid mechanics, such as barometers, manometers, Bourdon gauges, and flowmeters.
		LO2	Describe representative engineering problems and explain the working principles of relevant mechanical systems.
A2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO3	Demonstrate the application of Bernoulli's equation and analyze the effect of a jet on a stationary plate.
		LO4	Analyze the physical properties and practical behavior of fluids through experimentation.
		LO5	Distinguish between various applications involving fluid machinery using fundamental fluid mechanics principles.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO6	Select the appropriate type of flowmeter based on application requirements.
		LO7	Apply fluid mechanics principles to the design of pressure vessels, such as circular cylinders and spheres, used in industry.
		LO8	Demonstrate logical, creative, and comparative thinking to solve unfamiliar engineering problems.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√			√	√	√								√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	-Introduction to power mechanical engineering.	3	2	1	-
2	-Short summary of the basics.	3	2	1	-
3	-Heat energy and modes of heat transfer	3	2	1	-
4	Thermal expansion types	3	2	1	-
5	Describes fluid pressure, together with buoyancy and hydrostatic stability. Define Archimedes principles	3	2	1	-
6	Know gauges used in fluid mechanics, such as barometers, manometers.	3	2	1	-
7	Revision and Mid Exam				
8	Bourdon pressure and vacuum gauges.	3	2	1	-
9	Categories of flowmeters.	3	2	1	-

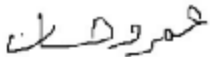
10	Demonstrates Bernoulli's equation and the impact of a jet on a stationary plate.	3	2	1	-
11	Identify relationships that exist between pressure, volume and temperature in a gas are given in a set of laws called the gas laws.	3	2	1	-
12	States the types of combustion engines and names the components of internal combustion engines.	3	2	1	-
13	Identify how the steam power plant works.	3	2	1	-
14	Basic refrigeration cycle.	3	2	1	-
15,16	Final Exam.				

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	5	20	20 %
2	Exam 2 written (Semester work or quiz)	10	20	20 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	-Bird & Carl Ross , “ Mechanical Engineering Principles “ Routledge 4 th Ed., 2019.
	Other References	- B.R. Munson, D.F. Young, T.H. Okiishi, and W.W. Huebsch, Fundamentals of Fluid Mechanics, John Wiley and Sons Inc., 9th Ed., 2021. R. E. Sonntag, C. Borgnakke and G. J. Van Wylen, Fundamentals of thermodynamics, John Wiley and sons Inc., 2009.
	Electronic Sources (Links must be added)	NA
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities &	Devices/Instruments	Data-show and Laptop
	Supplies	White board

equipment for teaching and learning *	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Associate Prof. Amr Hassaan	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Mechatronics Engineering			
Course Code (according to the bylaw):	MTE 101			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	3		4
Course Type:	Elective			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechatronics Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr.Ahmed Abu El -FADL			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	Aug. 2025			

2. Course Overview (Brief summary of scientific content):

Definitions of Mechatronics Engineering, Mechatronics Engineer skills & responsibilities. A typical Mechatronics system (Target system, Sensors, I/O signal conditioning, Control unit, Actuator, &Monitoring). Methodology of analysis and design of Mechatronics system. Examples of, sensors, control unit, electro-mechanical and electromagnetic actuators, shape memory alloys (SMA), artificial muscles using SMA, piezoelectric actuators. Pneumatic actuator, electro- Pneumatic systems- Introduction and hands on a software package used in Mechatronics system analysis and design

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1&A3 & A10 •		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Identify principles of any mechatronics system (sensors, I/O signal conditioning, Control unit, Actuator).
		LO2	Identify methodology of analysis and design of Mechatronics system.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO3	Design for the needed mechatronics system, simulation, materials and components selection, mechanical implementation, control implementation, signal conditioning and interfacing consideration, software building and full system testing and tuning.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Acquire new knowledge for the structure of electro-mechanical and electromagnetic actuators, Shape memory alloys (SMA), Artificial muscles using SMA.

4. Course Teaching and Learning Methods:

Direct Instruction	Indirect Instruction	Information Technology-Assisted Learning

Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√	√		√	√	√						√		√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Definitions of the Mechatronics Engineering	4	2	1	1
2	Mechatronics Engineer skill & responsibility	4	2	1	1
3	A typical Mechatronics system (Target system, Sensors, I/O signal conditioning)	4	2	1	1
4	A typical Mechatronics system (Control unit, Actuators, & Monitoring)	4	2	1	1
5	Methodology of analysis and design of Mechatronics system	4	2	1	1
6	Examples of Sensors	4	2	1	1
7	Revision and Mid Exam				
8	Control unit	4	2	1	1
9	Electro-mechanical and electromagnetic actuators	4	2	1	1
10	Shape memory alloys (SMA)	4	2	1	1
11	Artificial muscles using SMA	4	2	1	1
12	Piezoelectric actuators	4	2	1	1

13	Pneumatic actuators and electro-pneumatic systems	4	2	1	1
14	Introduction and hands on Software Package used in Mechatronics systems analysis and design	4	2	1	1
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Connection of mechatronics a system components .
2	Mechanical design for mechatronics system using software program
3	Electrical wiring component with electrical circuits
4	Programming of mechatronics system to acquire the required task.

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	4	10	10%
2	Exam 2 written (Semester work or quiz)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
7	Assignments / Project /Portfolio/ Logbook	According to schedule	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	W. Bolton; "Mechatronics – Electronic Control Systems in Mechanical & Electrical Engineering.", Longman, seventh edition, 2019
	Other References	Alciator & Histan, "Introduction to Mechatronics & Measurements Systems"; McGraw-Hill, Second,
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching	Devices/Instruments	Elvis LabVIEW- Breadboard –power supply
	Supplies	NON
	Electronic Programs	NON
	Skill Labs/ Simulators	NON

and learning *	Virtual Labs	NON
	Other (to be mentioned)	NON

	Course Coordinator	Program Coordinator
Name	Dr.Ahmed Abu El -FADI	Dr. Ahmed Abdalbadia
Signature	<i>Ahmed fadel</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Modern Physics			
Course Code (according to the bylaw):	PHY 101			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>	<u>2</u>		<u>4</u>
Course Type:	Elective			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Asst. Prof. Mohamad Abd El-Aziz			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

The modern Physics course is a fundamental course for diploma level students. After completion of this course, the students should have the knowledge and skills that enable them to recognize some of the light wave's phenomena e.g., interference and diffraction and enumerate the methods of polarization. In addition, they will utilize the fundamentals of photons theory of light to explain some of the quantized phenomena such as photoelectric effect and Compton effect. Also, they will employ the Bohr rules to solve and analyze the energy levels of hydrogen atom. Moreover, they study the basics of nuclear physics.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Recognize, articulate, and resolve intricate engineering challenges through the application of engineering principles, fundamental sciences, and mathematics.	LO1	Enumerate the fundamental physical concepts and rules covered in the course.
		LO2	Formulate the physical laws that related to the syllabus course.
		LO3	Derive the fundamental principles of contemporary and quantum physics pertinent to this course.
		LO4	Discuss the course's issues.
A2	Develop and execute pertinent experiments and/or simulations, appraise and review outcomes, and provide statistical analyses along with objective engineering judgment to assess the findings.	LO5	Utilize simulation software to effectively demonstrate various experiments virtually.
A5	Employ research strategies and methodologies, as well as investigative approaches, as an integral part of learning.	LO6	Write scientific reports based on the foundational concepts outlined in the course syllabus.
A7	Effectively collaborate with teams composed of individuals from diverse cultural backgrounds and academic disciplines.	LO7	Develop the capacity for collaborative teamwork
A8	Apply coeval tools to communicate with a diverse audience in writing, verbally, and graphically.	LO8	Convey the acquired knowledge verbally, in written form, and visually.
A10	Attain and implement novel knowledge while employing self-directed, lifelong, and alternative learning methodologies.	LO9	Acquire the capacity for autonomous learning in application engineering physics.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓	--	--	✓	✓	✓	--	--	✓	--	--	✓	--	--

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Lab / Practical
1	Theories of light - energy of light waves.	4	2	2	0
2	Light pressure- Interference- Young's experiment	4	2	2	0
3	Interference of thin film– Newton's rings	4	2	2	0
4	Michelson interferometer	4	2	2	0
5	Diffraction – rectangle single, circular slit diffraction	4	2	2	0
6	Diffraction from a double slit - diffraction grating	4	2	2	0
7	Revision and Mid Exam				
8	Introduction of polarization- methods of polarization	4	2	2	0

9	Photon and photoelectric effect-Compton effect- black body radiation	4	2	2	0
10	Atomic structure- Bohr's model of hydrogen atom	4	2	2	0
11	Spectrum of (H) & hydrogenic and mesic atom	4	2	2	0
12	The nuclear terminology-nuclear radii- binding energy	4	2	2	0
13	Nuclear models- nuclear energy level- the nuclear force	4	2	2	0
14	Radioactive decay – decay process- radioactive dating – radioactive dosimeter	4	2	2	0
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	2	10	10%
2	Exam 2 written (Semester work)	4	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Project /Portfolio/ Logbook	9	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.)	The main (essential) references	1- D. Halliday, R. Resnick, and J. Walker, Fundamentals of Physics, 12th ed. Wiley, 2022. 2- Raymond A. Serway, Chris Vuille, J. Hughes. College Physics Global Edition, 11th ed. Cengage Learning, 2018.
	Other References	1- I. Lyublinskaya et al., College Physics for AP Courses OpenStax. XanEdu Publishing Inc, 2022.

		2- W. Sears Richards, Mark W. Zemansky, and Hung D. Young, University Physics, 6th edition, Addison – Wesley 2020
	Electronic Sources (Links must be added)	• http://hyperphysics.phy-astr.gsu.edu/hbase/index.html • https://www.physicsclassroom.com/ • https://en.wikipedia.org/wiki/Physics • https://physicsworld.com/
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Whiteboard—whiteboard color pens—eraser
	Other	Scientific Videos

	Course Coordinator	Program Coordinator
Name	Ass. Prof. Mohamad Abd El-Aziz	Prof. Ahmed Abd El-Gafar
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Arts and Architecture			
Course Code (according to the bylaw):	ARE 101			
Department/s that participated in the teaching:	Architectural Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>1</u>	<u>2</u>	<u>0</u>	<u>3</u>
Course Type:	Elective			
The level to which the course was introduced:	JUNIOR			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. Prof. Sahar Ezz El Arab Ramadan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/10/2025			

2. Course Overview (Brief summary of scientific content):

History of fine arts (ornamental - sculpture - drawing.....) Art movements in the twentieth century: cubism, expressionism, surrealism, art collections such as De Steele and Bauhaus and their new ideas on the interconnectedness of arts, architecture, design, art education and art trends across historical times and architectural and parallel trends, contemporary artistic trends and their effects on architecture, structural values in artwork (contrast, balance, color, rhythm, movement.....) Artistic metrics and design foundations in architecture

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A5, A9, A10		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying basic science and mathematics engineering fundamentals.	LO1	Identify art and architecture with their concepts throughout the ages
		LO2	Solve complex problems in art forms in buildings.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO3	Practice research techniques in painting-sculpture-photography-interior design related to architecture.
A9	Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.	LO4	Express effectively with audiences by different techniques of art direction in various buildings.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies	LO5	Apply new knowledge from various art schools of architecture and arts.
		LO6	Practice design ideas by special application of art forms in different architectural styles.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√	√		√	√	√			√	√			√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Lab / Practical
1	Trends of art and architecture across different historical eras.	3	2	1	0
2	Fine Arts (Sculpture - Drawing - Photography - Interior Design.....) Its relationship to architecture	3	2	1	0
3	Artistic movements of the twentieth century and their influence on architecture art	3	2	1	0
4	Modern School Trends (De Steel - Bauhaus _ and Their Impact on Architecture Arts).	3	2	1	0
5	Quiz 1 & practicing of analyze School Trends (De Steel - Bauhaus _ and Their Impact on Architecture Arts).	3	2	1	0
6	Aesthetic features in architectural art formations that complement different design ideas	3	2	1	0
7	Revision and Mid Exam				
8	The foundations of the aesthetics of artistic architectural formations of (variation, poise, rhythm.....)	3	2	1	0
9	Analyze horizontal projection of formations of architectural forms that fulfill the principle of design	3	2	1	0
10	The relationship between creativity in arts and architectural design	3	2	1	0
11	Aesthetic features in contemporary and future architecture arts	3	2	1	0
12	Revision.	3	2	1	0
13	semi final	3	2	1	0
14	Final project+general discussion	3	2	1	0
15,16	Final Exam.				

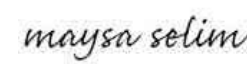
5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Quiz 1 written (Semester work)	5	10	10 %
2	Midterm exam	7	20	20 %
3	Final Written Exam	15, 16	40	40 %
4	Final Oral Exam	14	5	5 %
5	Assignments / Project /Portfolio/ Logbook	1,2,3,4,5,6,8,9,10,11,12,13,14	25	25 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Abdel-Gawad, T. A. (1955). <i>History of Architecture and Arts in the</i> <i>Early Ages</i> (in Arabic). Cairo: Supreme Council of Antiquities Cruickshank, D. (1999). <i>A History of Architecture</i>. New Delhi: CBS Publisher
	Other References	• White, Edward T (1975): A Vocabulary of Architectural Forms, Architectural Media. • William (Author) (2010): The Art of Drawings, Madison Books; Revised ed. Edition. • Architecture, Form, Space, and Order by Frank Ching • Francis D.K. Ching (2007): Architecture: Form. Space & Order, Van Nostrand • Reinhold, New York. Paul Zelenski, Mary Pat Fisher (2006): Shaping Space: The Dynamics of Three-Dimensional Design, (3rd edition). www.amazon.com • Stephen Luecking (2002): Principles of Three-Dimensional Design: Objects, Space and Meaning, www.amazon.com • Wucius Wong (1977): Principles of Three-Dimensional Design, Van Nostrand Reinhold Company, New York • "The Architecture of Happiness" by Alain de Botton (2006): Examines the relationship between architecture and human well-being, combining philosophy and design. • "The Future of Architecture in 100 Buildings" by Marc Kushner

		(2015): Explores innovative and groundbreaking architectural designs from around the world. • Bauhaus: A Conceptual Model" by Boris Friedewald (2019): A comprehensive look at the Bauhaus movement and its impact on architecture and design • The Art of Looking Up" by Catherine McCormack (2019): A visual feast exploring the diverse world of ceilings in significant buildings worldwide. • The Hare with Amber Eyes" by Edmund de Waal (2010): Though not the latest, it's a notable work exploring the history of a collection of Japanese netsuke through generations. • Norman, D. (2023). <i>Design for a better world:</i> Meaningful, sustainable, humanity centered. The MIT Press. • Peters, S. (2024). <i>Architectural material systems:</i> Conceptual design strategies. Birkhäuser. • Fowkes, M., & Fowkes, R. (2023). <i>Art and climate change:</i> A concise <i>history</i>. Thames & Hudson.
	Electronic Sources (Links must be added)	• http://www.sagradafamilia.org/en/ • https://www.skyscrapercity.com/ • http://www.design-theory.com/
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show (projector) Laptop or desktop computer

	Course Coordinator	Program Coordinator
Name	Assoc. Prof. Sahar Ezz El Arab Ramadan	Dr.Maysa Ali Selim
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Field Training (1)			
Course Code (according to the bylaw):	FTR 131			
Department/s that participated in the teaching:	Chemical Engineering Department			
Total number of credit hours of the course: (according to the bylaw): 3 credit hrs.	Theoretical	Practical	Other (specify)	Total
	--	18	--	18
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Selem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Training on general chemical industries. Industrial application of basic courses such as thermodynamic, fluid mechanics, polymer chemistry and heat transfer. Flow sheeting. Simple mass and energy balance.

3. Course Learning Outcomes CLOs:

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A4, A7, A8, A10, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	LO1	Perform simple mass and energy balances for observed field processes, adhering to safety and quality standards.
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi- cultural teams.	LO2	Function efficiently as an individual and training team member with training and department supervisor.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	Reframe field data effectively – graphically, verbally, and in writing a formal scientific report.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Practice self-learning through on-site experience and validated online resources.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO5	Demonstrate new knowledge related to recent technologies in the form of scientific reports

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
		✓			✓	✓	✓	✓	✓	✓	✓			✓	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	/ Practical Lab	
As scheduled	Overview of Chemical Industries: - Introduction to small-scale industrial sectors, their processes, and applications (water and wastewater treatment, painting industry, etc.) - Industrial workflows and main equipment	18	---	---	18	---
	Training on general chemical industries: – Introduction to workflows, equipment, and operational practices.	18	---	---	18	---

	Industrial applications of basic courses: – applying thermodynamics, fluid mechanics, polymer chemistry, and heat transfer to real industrial processes. – development and interpretation of process flow diagrams.	18	---	---	18	---
	Industrial applications of basic courses: - Mass and energy balances; performing simplified balances for chemical processes.	18	---	---	18	---
	Midterm Report and Oral Exam					
	Application of Unit Operations - Practical observation of main process units - .Equipment handling	18	---	---	18	---
	Industrial Laboratory Techniques - Industrial laboratory training during fieldwork	18	---	---	18	---
	Technical Reporting & Documentation - How to write a training report - Presentation of industrial findings	18	---	---	18	---
	Final Report/Presentation and Oral discussion					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Attendance	1-7	10	10%
2	Follow up/presentation/ report preparation/team participation	1-7	20	20%

3	Midterm Report	5	20	20 %
4	Final Report	8	20	20 %
5	Final Oral Exam	9	30	30%

6- Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Depending on the Chemical Engineering Training field/ Industry/Technology/ Application, For a technical writing scientific report, all library references appropriate to the field training are available in the different libraries on campus/online
	Other References	-
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	-
	Supplies	-
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha Fawzy El Husseiny
Signature	Nora yehia	Noha ElHosseiny

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Polymer Chemistry (1)			
Course Code (according to the bylaw):	CHM141			
Department/s that participated in the teaching:	Chemical Engineering Department			
Total number of credit hours of the course: (according to the bylaw): 2 credit hours	Theoretical	Practical	Tutorial	Total
	2	0	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass Prof / Soad Abdel Aziz El Metwally			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Classes of polymers, physical properties, chemical properties of polymers polymerization process, bulk & suspension, structure of polymers, types of polymers, methods of synthesis, molecular rearrangement, addition polymerization, composites, engineering plastics & composites, emulsion polymerization.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A10, B1, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics	LO1	Identify the characteristics, properties, and classifications of polymers with their different types
		LO2	Explain the mechanisms of production, the applications and uses of different types of polymers
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies	LO3	Examine the chemical structure of different types of polymers through guided and independent self-learning approaches.
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design	LO4	Analyze production lines for commercial polymers such as plastics, fibers, and rubber, focusing on the chemical engineering principles involved.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer	LO5	Evaluate recent developments in the thermal and mechanical properties of composite polymeric materials

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial	PPT and Movies	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√				√				√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	/ Practical Lab	
1	Different definition related to polymer	3	2	1	-	
2	Classification of polymers, and their applications	3	2	1	-	
3	Methods of polymerization	3	2	1	-	
4	Classification of polymers according to thermal effect	3	2	1	-	
5	Polyurethane, Polyurethane application	3	2	1	-	
6	Polyamides	3	2	1	-	
7	Revision and Mid Exam					
8	Classification and consumption of rubbers	3	2	1	-	
9	Nylon 6,6 and Nylon 6	3	2	1	-	

10	Classification and consumption of polyethylene (PE)	3	2	1	-	
11	Common types of polyethylene	3	2	1	-	
12	Properties and application of some commercial polymers	3	2	1	-	
13	Properties of some common commercial polymers	3	2	1	-	
14	Uses of various common commercial polymers & Revision	3	2	1	-	
15,16	Final Exam.					

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10 %
2	Exam 2 written (Semester work)	10	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Tutorial and report assessment	2,5,9,12	20	20 %

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• Drummond Spinhirne, "Polymer science and technology, fundamentals and Applications", Intelliz press, 2024 (16914) • <u>GHOSH, Polymer Science & Technology</u> 2005, (4620) • Manas Chanda, Introduction to Polymer Science and Chemistry, CRC Press, 2nd edition, 2013. • Poul C. Hiemenz, Timothy P. Lodge, Polymer Chemistry, 2nd edition, CRC Press, 2011.

		Koltzenburg, S., Maskos, M., & Nuyken, O., Polymer chemistry., 2nd edition, 2023.
	Other References	- Charles E. Carraher Jr., Carraher's Polymer Chemistry, CRC Press, 8th. Ed. 2010. - S.P. Mohanty, Experiments in Polymer Chemistry, Campus Books, 2017 (16657)
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Ass Prof / Soad Abdel Aziz El Metwally	Dr. Noha Fawzy M. El Husseiny
Signature	<i>Soad Abd El. aziz</i>	<i>Noha ElHoseiny</i>

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Computer Programming			
Course Code (according to the bylaw):	CSC 101			
Department/s that participated in the teaching:	Chemical Engineering Department			
Total number of credit hours of the course: (according to the bylaw): 2 credit hrs.	Theoretical	Practical	Other (specify)	Total
	1	2	0	3
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Selem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Principles of designing a simple program - The basic ideas of uses of the computer in programming - The basic ideas of C++ language - How to write a complete program with high level language C++ - How to design, code, debug, and document program laboratory assignments - The syntax of writing any program by C++ language

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A2, A9, B3)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO1	Employ Excel and C++ to demonstrate and classify chemical Engineering data
		LO2	Evaluate Chemical Engineering equation using C++ and /or Python
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	LO3	Costruct a mathematical model to optimize the performance of a chemical engineering system using Excel or C++
B3	Apply numerical modelling methods and/or computational techniques appropriate to chemical engineering.	LO4	Develop linear algebraic equations representing material balances for non-reacting systems using Excel and/or C++

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√	√	√			√							√	√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	Practical / Lab	
1	Introduction to C++	3	1	-	2	-
2	Determination of optimum yield of batch reactor using C++	3	1	-	2	-
3	Calculation of drag force and Reynolds number using C++	3	1	-	2	-
4	C++ conditional statements and loops	3	1	-	2	-
5	C++ conditional statements and loops	3	1	-	2	-
6	Terminal velocity of falling particles using C++	3	1	-	2	-
7	Revision and Mid Exam					
8	Introduction to Python	3	1	-	2	-
9	Introduction to Python	3	1	-	2	-
10	Solving mathematical equations using Python	3	1	-	2	-
11	conditional statements and loops using Python	3	1	-	2	-
12	Solve equations of state and vapor liquid equilibrium Chemical reaction equilibrium	3	1	-	2	-
13	Terminal Velocity of Falling Particles	3	1	-	2	-
14	Case Studies	3	1	-	2	-
15,16	Final Exam.					

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10%
2	Exam 2 written (Semester work)	10	10	10%
3	Midterm practical exam	7	30	30%
4	Workshop / Case study / Class activities	1-14	20	20%
5	Final Practical Exam	15, 16	30	30%

6. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• Bjarne Stroustrup “The C++ Programming Language “. Addison Wesley publishing Company, fourth edition, 2011. • Nicolai Josuttis “C++ Standard Library Tutorial and Reference”. Addison Wesley publishing Company, second edition, 2012. • Bruce Eckel “Introduction to Standard C++”. Bruce Eckel Publishibg Company, second Edition, 2007. • Scott Meyers “Practical C++ Programming”. O Reilly media inc., second Edition , 2005. • V.S.KORADA, “Chemical Process Modelling and Computer Simulation”, PHI Learning Private, 2017. • M.M.MARTIN, “Introduction to Software for Chemical Engineers”, CRC PRESS, 2020.
	Other References	• B.A. Finlayson, "Introduction To Chemical Engineering Computing", John Wiley & Sons, Inc., 2012 • A.K.Jana, “Chemical Process Modelling and Computer“, 2nd edition, PHI learning, 2018 • M.M.Martin, "Introduction to Software

		for Chemical Engineers“ 2nd edition, CRC press, 2020. •Bud Tenny, “A Step-by-Step Guide on C++ Programming Language Fundamentals with Practical Explanations, 2022.
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Department Computer Laboratories (C203 – C209)
	Supplies	-
	Electronic Programs	C++, Excel, and Python
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha El-Husseiny
Signature	Nora yehia	Noha ElHoseiny

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Communication & Presentation Skills			
Course Code (according to the bylaw):	HUM 108			
Department/s that participated in the teaching:	BASIC SCIENCES			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Tutorial	Other (specify)	Total
	<u>2</u>	<u>1</u>		<u>3</u>
Course Type:	Elective			
The level to which the course was introduced:	JUNIOR			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	DR. Ashraf selim			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

Course Aims to provide the student with the latest knowledge about the concepts, characteristics, and types of managerial and interpersonal communications, as well as the concepts and requirement of good listening and presentation, and Developing the student's abilities and skills of effective communication, and good listening, as well as how to use the interpersonal and managerial communication methods and the presentation techniques in performance and dealing

with others inside and outside the organization. Course Contents: Concept and nature of communication – Communication model – Formal and informal communications - Interpersonal and managerial communications – Body language – Written communications (Reports and memos) – Ten Communications of effective communication – Good listening – Elements of effective presentation model –Preparation of good presentation – Carrying out presentations – Discussion and dealing with.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A8, A9, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO1	formulate e interpersonal Communication
		LO2	embody languages communication
		LO3	Learn types of managerial and interpersonal communications
		LO4	Identify the main items of the of Communication technology
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	LO5	Define the main items of the of Presentation Skills
		LO6	presentation techniques in performance and dealing with others inside organization
A10	Acquire and apply new knowledge and practice self, lifelong and other learning strategies.	LO7	presentation techniques in performance and dealing with others and outside the organization

4. Course Teaching and Learning Methods:

Direct Instruction	Indirect Instruction	Information Technology-Assisted Learning

Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√		√				√	√							√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Practical Lab /
1	Fundamental of definition concepts, characteristics and types of Communication.	3	1	2	0
2	managerial and interpersonal communications	3	1	2	0
3	concepts and requirement of good communications	3	1	2	0
4	Communication model – Formal and informal communications	3	1	2	0
5	Interpersonal and managerial communications	3	1	2	0
6	how to use the interpersonal and managerial communication methods	3	1	2	0
7	Revision and Mid Exam				
8	Elements of effective presentation	3	1	2	0
9	presentation techniques	3	1	2	0
10	presentation techniques in performance and dealing with others inside organization	3	1	2	0

11	presentation techniques in performance and dealing with others and outside the organization	3	1	2	0
12	Interpersonal communications	3	1	2	0
13	Body language skills	3	1	2	0
14	Elements of effective presentation technique	3	1	2	0
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10
2	Exam 2 written (Semester work)	11	10	10
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	presentation skills	9,10	10	10
6	Assignments	11	10	10

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	HTI; Available Hard copy . Available Presentation (handed to students' part by part)
	Other References	• -Gary Johns and Alan M.Saks, Organization Behavior, Addison Wesley Longman, 2009. • -Scgermerhorn Jr., R. J., and Osborn, N. R., Organizational Behavior, John Wiley & Sons, Inc., New York, 10th Ed.,2008”. • Lustberg, Arch: How To Sell Yourself: Winning Techniques For Selling Yourself, Your Ideas, Your Message. Franklin Lakes: The Career Press, 2002

		• Bovee, Courtland L, John V. Thill & Barbara E. Schatzman. Business Communication Today: Tenth Edition. New Jersey: Prentice Hall, 2010 • Hasson, Gill. Brilliant Communication Skills. Great Britain: Pearson Education, 2012. • Ajmani, J. C. Good English: Getting it Right. New Delhi: Rupa Publications, 2012. • Bovee, Courtland L, John V. Thill & Barbara E. Schatzman. Business Communication Today: Tenth Edition. New Jersey: Prentice Hall, 2010. • Lesikar, Raymond V and Marie E. Flatley. Basic Business Communication: Skills for Empowering the Internet Generation: Ninth Edition. New Delhi: Tata McGraw-Hill, 2002. • -Henderson, Fiona, & Parkes, Geoff. (2023). "Improving Presentation Skills in Higher Education: A Case Study." <i>Journal of Further and Higher Education</i>, 47(2), 184-196 • -Graveline, Denise. (2023). "The Science of Effective Communication." <i>Harvard Business Review</i>, 101(3), 80-87.”. • Gallo, Carmine. (2022). Talk Like TED: The 9 Public-Speaking Secrets of the World's Top Minds. St. Martin's Griffin • Henderson, Fiona, & Parkes, Geoff. (2022). "Improving Presentation Skills in Higher Education: A Case Study." <i>Journal of Further and Higher Education</i>, 45(4), 510-523. • Graveline, Denise. (2022). "The Science of Effective Communication." <i>Harvard Business Review</i>, 99(5), 92-99. • Lesikar, Raymond V and Marie E. Flatley. Basic Business Communication: Skills for Empowering the Internet Generation: Ninth Edition. New Delhi: Tata McGraw-Hill, 2022. • Gary Johns and Alan M.Saks, Organization Behavior, Addison Wesley Longman, 2009 • Ajmani, J. C. Good English: Getting it Right. New Delhi: Rupa Publications, 2012. • Gallo, Carmine. (2022). Talk Like TED: The 9 Public-Speaking Secrets of the World's Top Mind • The Power of Saying No: The New Science of How to Say No That Puts You in Charge of Your Life by Vanessa Patrick (2023) • "Speaking with Strategic Impact: Reach, Connect, and Lead" by Kate Leavell (2023)

		"The New Rules of Marketing and PR: How to Use Content Marketing, Podcasting, Social Media, AI, Live Video, and Newsjacking to Reach Buyers Directly" by David Meerman Scott (8th Edition, 2024)
	Electronic Sources (Links must be added)	https://cadreworks.org/resources/communication-skills
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Notebook and data show
	Supplies	data show equipped lecture room
	Electronic Programs	Microsoft power point

	Course Coordinator	Program Coordinator
Name	DR.Ashraf selim	PROF. Ahmed Abd El-Gafar
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Biomedical Engineering			
Course Code (according to the bylaw):	<u>MDE 101</u>			
Department/s that participated in the teaching:	<u>Biomedical Engineering</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>	<u>1</u>		<u>3</u>
Course Type:	Elective			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass. Prof. Amal EL Dosoky			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

History of biomedical engineering, examples of biomedical engineers contributions and research fields classification of biomedical engineering, the interrelation between systems and biomedical engineering, examples of physiological systems and medical instruments – General overview about different biomedical devices and hospital departments from point of view of device name, function, and its place in the hospital.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A5, A8, A10		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Supports understanding of how biomedical devices solve physiological problems.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO2	investigate recent innovations in biomedical engineering using appropriate research methods.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	collaboration to create a presentation on a biomedical engineering topic.
		LO4	demonstrate effective communication skills through presentations and reports on biomedical devices, systems, and case studies.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO5	Acquire a knowledge about vital sign and Medical device.
		LO6	explore current trends and new developments in biomedical engineering independently.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√					√	√				√				

Course Schedule:

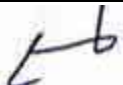
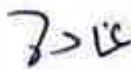
Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Lab / Practical
1	An overview: general idea about the concepts of Biomedical Engineering and its applications in the field.	3	2	1	
2	Introduction to Human anatomy and physiology.	3	2	1	
3	Cardiovascular and Respiratory Systems with Related Devices	3	2	1	
4	Nervous and Muscular Systems with Related Devices	3	2	1	
5	Classification of Biomedical Engineering and Fields Introduction to Bio-signal	3	2	1	
6	Introduction to Bio-Imaging	3	2	1	
7	Revision and Mid Exam				
8	Introduction to Bio-Instrument	3	2	1	
9	Introduction to Bio-mechanics	3	2	1	
10	Hospitals and its Organization	3	2	1	
11	Hospital Departments and Devices – Part 2 and Quiz	3	2	1	
12	Biomedical Engineering: Innovations (future trends) and Opportunities	3	2	1	
13	Student Presentations / Mini-Projects	3	2	1	
14	Student Presentations / Mini-Projects	3	2	1	
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Quiz	11	10	10%
2	Midterm exam	7	20	20 %
3	Final Written Exam	15, 16	40	40 %
4	Assignments / Mini-Projects /Sheets	Across the term and According to the schedule	30	30%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	S.A.BERGER (1996). INT.TO BIOENGINEERING. N.YORK: OXFORD. ANDREW G. WEBB (2018). PRINCIPLES OF BIOMEDICAL. NEW YORK: CAMBRIDGE
	Other References	
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	
	Supplies	
	Electronic Programs	
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Ass. Prof. Amal EL Dosoky	Dr. Ghada Karim
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Monitoring & Quality control systems			
Course Code (according to the bylaw):	MNG 101			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	--	--	1
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr.Radwa A. Ghazalla			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Introduction: history of quality, the dimensions of quality. Quality Control Concepts: quality assurance, total quality management. Control systems: objectives of control systems, quality systems, top management communication. Hazard Analysis: high -quality recommendations, commitment monitoring, follow up Systems, the base line of hazard analysis critical point (HACCP). Sampling and Inspection: Sample size, sampling error, sampling designs and inspection, acceptance sampling plans. Quality Control Tools and Techniques: tools for creating new concepts, tools for organization and analysis of data, tools for determining and solving problems (Control Charts for Variables - Control Charts for Attributes - PRE - control - analysis - flow charts). International Standards Accreditation: Accreditation meaning, ISO requirements and recommendations, Audit program, Certification body. Analyzing Process Capability:

Process capability indices, process performance indices.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A4, A8, A9		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	LO1	Apply appropriate statistical methods to evaluate operational or quality performance according to industry standards.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO2	Optimize the use of graphical data and visual tools to effectively communicate performance outcomes.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	LO3	Compare and evaluate different quality management systems to support continuous improvement and innovation.
		LO4	Apply modern quality theories to optimize resource utilization and enhance organizational effectiveness.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education

✓	✓	✓		✓		✓	✓								✓

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Lab / Practical
1	Introduction, Dimensions, Concepts, Objectives, Characteristics	2	1	1	
2	Leaders of Quality	2	1	1	
3	Quality systems, Costs and measures, Quality assurance	2	1	1	
4	Quality Control Tools	2	1	1	
5	Total Quality Management	2	1	1	
6	Review	2	1	1	
7	Revision and Mid Exam				
8	Hazard Analysis	2	1	1	
9	Hazard Analysis	2	1	1	
10	Sampling and Inspection	2	1	1	
11	Iso Definitions and tools	2	1	1	
12	Analyzing Process Capability	2	1	1	
13	Case study discussion and submission	2	1	1	
14	Review and case study discussion	2	1	1	
15,16	Final Exam.				

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	4	10	10%
2	Exam 2 written (Semester work or quiz)	12	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %

5	Case study	13	10	10%
6	Assignments / Project /Portfolio/ Logbook	9	10	10%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Project Management: a systems approach to planning, scheduling, and controlling. Kerzner, Harold. (2020).
	Other References	Montgomery, D. C., "Introduction to Statistical Quality Control", 8th Edition, Wiley, 2020.
	Electronic Sources (Links must be added)	MIT OpenCourseWare – Quality Control and Process Improvement https://ocw.mit.edu ISO Official Website (Standards & Certification) https://www.iso.org NIST – Process Capability & Quality Metrics https://www.nist.gov/services-resources/software/process-capability-analysis
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data Show
	Supplies	N/A
	Electronic Programs	MS-Teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Radwa A. Ghazalla	Dr. Mohamed Ashraf
Signature	رضوى غزاله	محمد اشرف

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Technical Report Writing			
Course Code (according to the bylaw):	MNG 103			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	2	--	3
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mohamed Elsayed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Essential elements of a technical report: Abstract - Summary - Contents - Objectives - Details of the report including figures, images, video ...etc, - Conclusions - Recommendations - References using a standard format and the different electronic sources. Report Classification: Technical (Requirement specification, Analysis, Design, and Implementation). Administrative (Directed to different operational and management levels). Levels of confidentiality for the different reports. Report Composition: Logical presentation of the report and coordination between its components. Importance of using correct grammar and punctuation. Enhancing

communication effectiveness by the use of different media. Report Implementation: Use of the appropriate software packages including any graphics or multimedia packages.

3. Course Learning Outcomes CLOs:

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A5, A8, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A5.	Practice research techniques and methods of investigation as an inherent part of learning.	LO1	Identify the purpose, characteristics, and structure of technical writing, and distinguish it from general writing.
		LO2	Differentiate between the key components of technical reports, CVs, letters, and technical presentations.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	Apply the principles of technical writing to produce structured technical documents such as reports, CVs, and presentations.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Analyze examples of technical documents through independent research to enhance communication skills and promote lifelong learning.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓	✓			✓	✓			✓				✓	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Practical Lab /
1	Introduction of technical writing	3	1	2	-
2	Some Elements of Technical Reports (cover page, title page, abstract, acknowledgement, dedication and summary)	3	1	2	-
3	Some Elements of Technical Reports (tables of contents, list of figures, list of tables, Nomenclature, Abbreviation and Acronym)	3	1	2	-
4	Some Elements of Technical Reports (Introductory chapters(s), Literature Review, Central chapters,)	3	1	2	-
5	Some Elements of Technical Reports (Microstructure, Conclusions, Tables and Figures, Appendices)	3	1	2	-

6	Some Elements of Technical Reports (References (Harvard method))Bibliography, Plagiarism, Style)	3	1	2	-
7	Punctuation, Layout and Equations.	3	1	2	-
8	Revision and Mid Exam				
9	CV (Curriculum Vitae)	3	1	2	-
10	Letters	3	1	2	-
11	Technical Presentations	3	1	2	-
12	Submitting a technical report from the students and evaluating the report according to the explanation	3	1	2	-
13	Submitting a technical presentation from the students and evaluating the report according to the explanation	3	1	2	-
14	Submitting a technical presentation from the students and evaluating the report according to the explanation	3	1	2	-
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Technical Report (Semester work or quiz)	9	15	15%
2	Technical presentation (Semester work or quiz)	11, 12	15	15%
3	CV & letter	10	10	10%
4	Midterm Exam	8	20	20 %
5	Final Written Exam	15, 16	40	40 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific	The main (essential) reference (must be written in full according to the scientific documentation method)	-The Oracle Corporation, "Corporate citizenship report 2023," Oracle, Redwood Shores, CA, USA, 2023. Accessed: Dec. 5, 2023. [Online]. Available: http://www.oracle.com/us/corporate/citizenship/corporate-citizenship-report-2563684

references, etc.) *		Research and Technical Writing for Science and - Engineering, by Meikang Qiu, Han Qiu, Yi Zeng, 2022.
	Other References	M. Markel, Technical Communication, 11th ed. Boston, MA: Bedford/St. Martin's, 2017.
	Electronic Sources (Links must be added)	Microsoft teams
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data- show and laptop.
	Supplies	White board
	Electronic Programs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Mohamed Elsayed	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Statistics and Probability Theory			
Course Code (according to the bylaw):	MTH 105			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass. Prof. Tarek Nassar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

Probability, conditional probabilities, Bayes' theorem. Tendency and Dispersion Measures: Introduction, different types of data, tendency measures, variability measures, frequency distributions. Random Variables: Discrete random variables, the Hyper - geometric distribution, Binomial distribution, the Poisson distribution, Poisson approximation of binomial probabilities, continuous random variables. Moments: central moments, Skewness measures, kurtosis measures, moment generating function. Sampling Theory and Inferences: the concept Of a sampling distribution, sampling distribution of the mean, central limit theorem, tests of hypothesis and Confidence intervals for the mean, tests of hypothesis and confidence intervals for the difference between two means, tests of hypothesis and confidence intervals for the population proportion, tests of hypothesis and confidence intervals for the difference between two proportions, tests of hypothesis and confidence intervals of sample variance, tests of hypothesis and confidence interval for ratio of sample variances. Simple regression and correlation: Simple linear regression by least square method, validation of the model, correlation coefficient.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, A4, A5, A6)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify and apply the different statistical measurements for analyzing data. Recognize the axioms of the probability	L01	Apply the different statistical measurements for analyzing grouped and ungrouped data.
		L02	Recognize the axioms of the probability to calculate the probability for any event.
A2	Apply techniques for calculate probabilities, expectation, and variance.	L03	Apply several techniques of counting and calculus to calculate probabilities, mean, and variance for random variable.
A4	Represent the data and compute the strength of relation between variables and estimate the regression equation	L04	Represent: box plot, stem&leaf, histogram, frequency polygon, and scatter diagram.
		L05	Compute the relation strength between two variables, and predict one variable by another with the regression equation.
A5	Classify random variables and density function.	L06	Connect between a random variable and density function.
		L07	Apply different type of probability distributions to solve probability problem.
A6	Utilize engineering probability, problems, for safety requirements and apply codes of practice and standards, quality guidelines.	L08	Use the confidence interval method to compute the mean interval.
		L09	Use the test of hypothesis method to predict the mean interval.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√			√		√			√	√			√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Lab / Practical
1	Introduction of statistics - Organized and represent of ungrouped data	4	2	2	
2	Organized and represent of grouped data	4	2	2	
3	Determine the Spearman's and Pearson's coefficient correlation and compute the regression equation	4	2	2	
4	General revision and quiz (1)	4	2	2	
5	Introduction of probability: Sample space and Events – Counting Techniques	4	2	2	
6	Random variables Discrete and continuous and their probability distribution	4	2	2	

7	Mid Exam				
8	Probability distribution: Binomial , Poisson	4	2	2	
9	Probability distribution: normal, standard, student	4	2	2	
10	Relation between distributions	4	2	2	
11	Confidence interval to find the mean interval of the mean population	4	2	2	
12	Hypothesis Testing (The structure of a hypothesis test and testing the mean of population)	4	2	2	
13	General revision and quiz (2)	4	2	2	
14	Sheet and report	4	2	2	
15,16	Final Exam.				

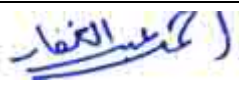
5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Quiz 1 written (Semester work)	4	15	15%
2	Quiz 2 written (Semester work)	13	15	15%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical/Clinical/... Exam		0	
6	Final Oral Exam		0	
7	Assignments / Project /Portfolio/ Logbook	14	0	10%
8	Field training		0	
9	Other (Mention)		0	

6- Learning Resources and Supportive Facilities *

Learning resources	The main (essential) reference (must be written in full according to the scientific documentation method)	Introduction to Probability and Statistics for Engineers and Scientists, By Sheldon M.

(books, scientific references, etc.) *		Ross, 2021 Elsevier, ISN: 978-0-12-824346-6, 6th edition.
	Other References	Probability and Statistics for STEM: A Course in One Semester, By E.N. Barron, J.G. Del Greco, 2022 Springer series, ISN: 978-3-031-02427-6
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	White board
	Supplies	Teaching aids and power point
	Electronic Programs	
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Ass. Prof. Tarek Nassar	Prof. Ahmed Abd El-Gafar
Signature	<i>Ass. Prof. Tarek Nassar</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Electronics Engineering			
Course Code (according to the bylaw):	EEC 102			
Department/s that participated in the teaching:	Electrical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1		3
Course Type:	Elective			
The level to which the course was introduced:	JUNIOR			
Academic Program:	ALL ENGINEERING PROGRAMS			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Eslam Samy El-Mokadem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/11/2025			

2. Course Overview (Brief summary of scientific content):

Revisions on: Semiconductor physics. P-n junction; I-V characteristics, Reverse saturation current depletion layer capacitance, Diffusion capacitance, Diode applications. half-and full-wave rectifier, Peak rectifier, Voltage doublers, Other two-terminal devices; Zener diodes, Metal-semiconductor junction, heterojunction and Ohmic contacts, Schottky barrier diodes, Bipolar Junction transistor (BJT), Static and dynamics characteristics, Field effect transistors, JFET models and biasing, FET application; MOSFET principles of operation, MOSFET as a

resistance. Verification of transistor Characteristics – Verification of different configurations of the transistor amplifiers (common emitter – common base – common collector)- Verification of MOSFET configuration and measuring the different parameters.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A2, A3		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Use the principles of semiconductor materials, PN junction, diode theory and diode equivalent circuit in calculating voltages and currents in circuits.
A2	A2. Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO2	Analyze the performance of half and full wave rectifier circuits from points of Efficiency and ripple factor
		LO3	Construct clipping and clamping circuits using diodes and Zener diodes to use it in wave shaping
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with	LO4	Design voltage regulator circuits using Zener diodes under different conditions.

	consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	LO5	Design power supply circuit
		LO6	Recognize transistor parameters and characteristics to make DC analysis for transistor circuits

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√	√		√	√	√			√		√		√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Lab / Practical
1	Semiconductor Materials	3	2	1	0
2	P.N Junction	3	2	1	0
3	Diode Theory	3	2	1	0
4	Diode circuits application (Half wave rectifiers)	3	2	1	0
5	Diode circuits application (Full wave rectifiers)	3	2	1	0

6	Diode circuits application (Clippers circuits)	3	2	1	0
7	Revision and Mid Exam				
8	diodes characteristics and Zener applications	3	2	1	0
9	Principles of operation for Bipolar junction transistors (BJT)	3	2	1	0
10	Principles of operation for Bipolar junction transistors (BJT)	3	2	1	0
11	BJT common modes	3	2	1	0
12	for operation of Principles JFET transistor	3	2	1	0
13	Principles of operation for MOSFET	3	2	1	0
14	Principles of operation for MOSFET	3	2	1	0
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	10	10%
2	Exam 2 written (Semester work)	10	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
7	Assignments / Project /Portfolio/ Logbook	4,6,11,12	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Microelectronic Circuits-Oxford "Adel Sedra, , 8th-Edition,2020."University Press
	Other References	Electronic-"Robert Boylestad,Louis Nashelsky , ,11th-Edition,2014. "Devices-and-Circuit-Theory
	Electronic Sources (Links must be added)	Available Presentation (handed to students part by part on the Microsoft teams course class .
	Learning Platforms (Links must be added)	EKB - Microsoft office

Supportive facilities & equipment for teaching and learning *	Supplies	White board, Projector and Microsoft teams .
	Skill Labs/ Simulators	Proteus or Multisim.

	Course Coordinator	Program Coordinator
Name	Dr. Eslam Samy EL-Mokadem	Assistant Prof. Taghreed Saied
Signature	<i>Dr. Eslam Samy EL-Mokadem</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Electric Machines			
Course Code (according to the bylaw):	EEC 103			
Department/s that participated in the teaching:	Electrical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1		3
Course Type:	Elective			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	ALL ENGINEERING PROGRAMS			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. Prof. Dr. Taghreed Said			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/11/2025			

2. Course Overview (Brief summary of scientific content):

Elements of Electric Drives, DC motor drives including conventional, brushless and modern permanent magnet motors; AC motor drives including induction and synchronous motors. Magnetic Circuits: Magnetic equivalent circuit, analogy with electric circuits, losses, linear and non-linear magnetic circuits calculations. Transformers: Single phase transformers, principle of operation, equivalent circuit, equivalent parameters determination, three phase transformers, connections of transformers, autotransformers, harmonics, Principles of operation of DC machines.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, A3)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Identify concepts of magnetic circuit analysis and electromechanical energy conversion principles.
		LO2	Recognize operation Principles of electrical transformers and DC machines.
		LO3	Conclude the equivalent circuit parameters of transformers and DC machines.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO4	Illustrate performance curves of transformer and DC machines
		LO5	Select the analysis methods of transformer and DC machines problems.
		LO6	Assess and evaluate the performance characteristics of electrical machines.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	LO7	Apply the acquired knowledge and modern tools to develop modern-day applications out of these machines according to their unique characteristics

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√			√	√	√			√					

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Lab / Practical
1	Magnetic circuit analysis	3	2	1	0
2	Magnetic circuit analysis	3	2	1	0
3	single-phase transformers construction, theory of operation, transformation ratios of voltage and current.	3	2	1	0
4	single-phase transformers equivalent circuit.	3	2	1	0
5	phasor diagram and voltage regulation of single-phase transformer.	3	2	1	0
6	losses, efficiency, and daily efficiency of single-phase transformer.	3	2	1	0
7	Revision and Mid Exam				

8	single-phase transformer tests	3	2	1	0
9	single-phase transformer classification, and applications.	3	2	1	0
10	Electromechanical energy conversion principles.	3	2	1	0
11	DC generators construction, types, and the theory of operation	3	2	1	0
12	DC generators equivalent circuit, EMF equations, Power flow, efficiency and applications.	3	2	1	0
13	DC motors construction, types, EMF and torque equations and the theory of operation.	3	2	1	0
14	DC motor characteristics, starting, types of starters, speed control, braking and testing of all types of DC machines)	3	2	1	0
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Quiz 1 written (Semester work)	4	10	10%
2	Quiz 2 written (Semester work)	10	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical/Clinical/... Exam		0	
6	Final Oral Exam		0	
7	Assignments / Project /Portfolio/ Logbook	During Semester	20	20%
8	Field training		0	
9	Other (Mention)		0	

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific	The main (essential) reference (must be written in full according to the scientific documentation method)	1- Fitzgerald & Kingsley's Electric Machinery, 7th Edition, Stephen Umans, 2014 2- B. L. Theraja and A. K. Theraja " Text Book of Electrical Technology " volume-1, S. CHAND & COMPANY LTD, New Delhi, 2014 .

references, etc.) *		3- U.A. Bakshi and V. U. Bahshi " Electrical Technology", Technical Publications , Pune, India, 2020.
	Other References	
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data Show
	Supplies	White board
	Electronic Programs	
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Assoc. Prof. Dr. Taghreed Said	Assoc. Prof. Dr. Taghreed Said
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Fundamental of Chemical Engineering			
Course Code (according to the bylaw):	CHM 140			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	2	--	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	El Shimaa M. El Zahed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Applications of mass balances in unit operations & in chemical processes & reaction equilibrium, the energy balance, the heat balance (general procedure, net & gross heat balances. Specific heat & heat capacity. Effect of temperature & pressure on heat of reaction.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A9, B1)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Assess energy balance for non-reactive and reactive processes using tabulated data, specific enthalpies, heat of reaction or heat of formation.
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	LO2	Apply flexible and creative thinking for analyzing problems and finding solutions.
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions,	LO3	Estimate degrees of freedom for a chemical process.
		LO4	Apply material and energy balance for different chemical process.

Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design.	LO5	Construct process flow chart depending on the process variables.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√				√	√							√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	How to Draw a simplified process	3	2	1	--
2	Balance on Reactive System, Single Phase and perform degree of freedom analysis.	3	2	1	--
3	Material Balance for reactive and non reactive Systems with Recycle, Bypass, and Purge and perform degree of freedom analysis. (multi unit)	3	2	1	--
4	Material Balance for reactive and non reactive Systems with Recycle, Bypass,	3	2	1	--

	and Purge and perform degree of freedom analysis. (multi unit)				
5	Material Balance for reactive and non reactive Systems with Recycle, Bypass, and Purge and perform degree of freedom analysis. (multi unit)	3	2	1	--
6	Introduction to Energy Balance, Forms of Energy and Energy Balances for Non-Reactive System	3	2	1	--
7	Revision and Mid Exam				
8	Forms of Energy and Energy Balances for Non-Reactive System	3	2	1	--
9	Energy Balance for Reactive System, Heat of Formation, Heat of Combustion And Energy.	3	2	1	--
10	Energy Balances with Chemical Reactions at different temperature (T)	3	2	1	--
11	Energy Balances with Chemical Reactions at different temperature (T)	3	2	1	--
12	Material and Heat Balance for overall flowchart	3	2	1	--
13	Material and Heat Balance for overall flowchart	3	2	1	--
14	Material and Heat Balance for overall flowchart	3	2	1	--
15,16	Final Exam.				

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	3	5	5 %
2	Exam 2 written (Semester work)	6	5	5 %
3	Midterm exam	7	20	20 %
4	Activity	weekly	10	10 %
5	Report, Discussion	11	10	10 %
6	Exam 3 written (Semester work)	12	10	10 %
7	Final Written Exam	15, 16	40	40

6. Learning Resources and Supportive Facilities:

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- R.L. Cerro, B.G. Higgins, S. Whitaker, "Material Balances for Chemical Reacting Systems", 2023. (16903) - K.V.Narayanan , "Stoichiometry and Process Calculations", 2019.(16749) - G.V.Reklaitis & Daniel R. Schneider, "Introduction to Material and Energy Balance", John Wiley & sons, 1984.
	Other References	- Nayef Ghasem, Redhouane Henda, "Principles of Chemical Engineering Processes", 2nd Edition, 2015. - David Mautner Himmelblau, James B. Rigg, "Basic Principles and Calculations in Chemical Engineering", 8th Edition, 2012. - Felder, " Elementry Principles of chemical Process", 2008. - Coulson and Richardson's, "Chemical Engineering", volume 6, 2004.
	Electronic Sources (Links must be added)	Principles of Chemical Engineering Processes Basic Principles and Calculations in Chemical Engineering - David Mautner Himmelblau, James B. Riggs - كتب Google
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	--

	Course Coordinator	Program Coordinator
Name	El Shimaa M. El Zahed	Dr. Noha Fawzy El Hussein
Signature		

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Automatic Control (1)			
Course Code (according to the bylaw):	CHM 151			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	2	--	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	El Shimaa M. El Zahed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Dynamics of simple systems, first order systems, Laplace transformation, second order systems, linearization. Automatic control systems, general configuration of control systems. Closed loop dynamics block diagram. Computer control.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, B1, B3)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Predict control system response through the calculation of the transfer function using Laplace transform, First order, second order, and linearization.
		LO2	Formulate Differential equation in automatic control.
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design.	LO3	Identify fundamentals of a control system.
		LO4	Discuss the importance of control system performance, control configuration and stability.
		LO5	Represent the structure of a control system by Block diagram.

B3	Apply numerical modelling methods and/or computational techniques appropriate to chemical engineering.	LO6	Demonstrate the mathematical model of a specific unit in a process.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√					√								√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introductory Concepts, why process control, Control systems.	3	2	1	-
2	Mathematical modeling of Chemical process.	3	2	1	-
3	Laplace transform.	3	2	1	-
4	Final value theory, initial value theory, Inversion of Laplace transform.	3	2	1	-

5	Differential equations using Laplace transform-Transfer functions and the input- output models.	3	2	1	-
6	Dynamic response of first order.	3	2	1	-
7	Revision and Mid Exam				
8	Response of Second-Order Systems	3	2	1	-
9	Transfer functions and transients response	3	2	1	-
10	Introduction to feedback and feed forward control.	3	2	1	-
11	Block Diagram of a Chemical-process for Control System	3	2	1	-
12	Block diagram reduction	3	2	1	-
13	Stability analysis of feedback system, characteristic equation.	3	2	1	-
14	Routh-Hurwitz criterion for stability	3	2	1	-
15,16	Final Exam.				

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10 %
2	Exam 2 written (Semester work)	6	10	10 %
3	Midterm exam	7	20	20 %
4	Report	9	5	5 %
5	Exam 3 written (Semester work)	12	15	15 %
6	Final Written Exam	15, 16	40	40 %

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific	The main (essential) reference (must be written in full according to the scientific	Stephanopoulos, G., "Chemical process control, an introduction to theory and practice", Englewood Cliffs, New Jerrsy, 2002 .(7743 & 8075)

references, etc.) *	documentation method)	
	Other References	• Prof. Morten Hovd, "Advanced Chemical Process Control", 2023 • Jose A. Romagnoli and Ahmet Palazoglu, "Introduction to Process Control", third Edition, CRC Press, 2020. • Smith, C L, "Process Control for the Process Industries - Part 2: Steady State, 2017.
	Electronic Sources (Links must be added)	https://onlinelibrary.wiley.com/doi/10.1002/9783527842490.fmatter
	Learning Platforms (Links must be added)	EKB https://www.ekb.eg/web/guest/home - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	--

	Course Coordinator	Program Coordinator
Name	El Shima M. El Zahed	Dr. Noha Fawzy El Husseiny
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Heat Transfer (1)			
Course Code (according to the bylaw):	CHM 152			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	2	--	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	El Shimaa M. El Zahed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Fundamentals of heat transfer equipment in chemical engineering field. Heat transfer by conduction, convection, radiation, and heat. Evaporators. Boilers and steam generators.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A10, B1)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Calculate the factors affecting the heat transfer processes in different cases.
		LO2	Determine the empirical correlations and the overall heat transfer coefficient in the heat transfer equipment in chemical engineering processes.
		LO3	Evaluate the impact of finned surfaces for the enhancement of heat transfer.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Explore a new knowledge of the application of heat transfer operations with various apparatus.
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design,	LO5	Apply heat transfer principles to analyze and improve industrial heat exchange processes.

	Instrumentation and Control of Chemical Processes, and Process and Plant Design.		

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√				√	√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction to heat transfer	3	2	1	-
2	Steady state and transient heat transfer: conduction (plane wall - Multilayer plane wall) .	3	2	1	-
3	Steady state and transient heat transfer: conduction (curved surface: Multilayer cylinders,)	3	2	1	-

4	Steady state and transient heat transfer: conduction (curved surface: Multilayer spheres)	3	2	1	-
5	Natural convection and Overall heat transfer coefficient	3	2	1	-
6	Experimental Lab	3	2	-	1
7	Revision and Mid Exam				
8	Steady state and transient heat transfer: forced convection.	3	2	1	-
9	Empirical Correlation(across a cylinder - Flat plate its application)	3	2	1	-
10	Empirical Correlation (A cross tube bundle - Flow inside a duct)	3	2	1	-
11	Empirical Correlation (Equivalent Diameter)	3	2	1	-
12	Heat Transfer from Finned Surfaces	3	2	1	-
13	Experimental Lab	3	2	-	1
14	Steady state and transient heat transfer: Radiation	3	2	1	-
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Thermal Conductivity in metal
2	Heat Transfer in fluidized bed
3	Unsteady state heat transfer

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	10	10 %
2	Midterm exam	7	20	20 %
3	Exam 2 written (Semester work)	10	10	10 %
4	Report , Discussion	12,13	20	20 %

5	Final Written Exam	15, 16	40	40

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Lewis Allison,” Chemical Engineering: Operations and Applications”, 2023. (16902) - Emilia Lioyd , "Handbook of Heat Transfer and Fluid Flow", Cambridge University Press ,U. S.A, 2023 (16905) - F.Kreith, "Principles of Heat Transfer", Cengage Learning, Boston, 2018.(16675)
	Other References	M. N. Ozisik, Helcio R.B. Orlande, “Inverse Heat Transfer Fundamentals and Applications”, 2nd Edition, CRC Press, 2021. - Theodore L. Bergman, Adrienne S. Lavine, Frank P. Incropera, David P. DeWitt, "Fundamentals of Heat and Mass Transfer ", 8 th ed., Wiley, New York, 2018. <u>Holman, J. P. , "Heat Transfer", 10th ed., McGraw –Hill, New York, 2010.</u>
	Electronic Sources (Links must be added)	--
	Learning Platforms (Links must be added)	EKB https://www.ekb.eg/web/guest/home - Microsoft office
	Supportive facilities & equipment for teaching and learning *	
	Devices/Instruments	Data show, laptop
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	Heat Transfer Lab
	Virtual Labs	--
	Other (to be mentioned)	--

	Course Coordinator	Program Coordinator
Name	El Shimaa M. El Zahed	Dr. Noha Fawzy El Husseiny
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Material Technology			
Course Code (according to the bylaw):	CHM 153			
Department/s that participated in the teaching:	Chemical Engineering Department			
Total number of credit hours of the course: (according to the bylaw): 2 credit hrs.	Theoretical	Practical	Other (Tutorial)	Total
	2	-	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Selem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Atomic structure of matter, X-ray diffraction, crystallography, solidification, crystalline imperfection, diffusion, theory of alloys, binary and ternary alloys, iron carbon diagram, TTT diagrams, heat treatments, deformation and strain hardening, mechanical properties of metals, physical properties of materials, corrosion, and wear.

3. Course Learning Outcomes CLOs:

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A2, A7, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO1	Explain the mechanical properties of different materials
		LO2	Analyze the potential outcomes of testing new materials
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	LO3	Outline aspects of materials and material technologies related to chemical engineering applications through effective teamwork.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO4	Explain the imperfections, heat treatment, and solid diffusion on materials' mechanical and physical properties.
		LO5	Examine the material's behavior using different measurements and techniques.
		LO6	Determine the different crystal structures and their relation to material performance

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√						√		√		√			√	√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	Practical / Lab	
1	Introduction to Material Engineering: classification of materials and atomic structure and atomic bonding in solids	3	2	1	-	-
2	Introduction to Material Engineering: classification of materials and atomic structure and atomic bonding in solids	3	2	1	-	-
3	The structure of crystalline solids and crystal system: Crystallographic, points, directions, and planes	3	2	1	-	-
4	The structure of crystalline solids and crystal system: Crystallographic, points, directions, and planes	3	2	1	-	-
5	Linear and planar density X-ray diffraction	3	2	1	-	-

6	Imperfections in solids; point defects, dislocations–linear defects.	3	2	1	-	-
7	Revision and Mid Exam					
8	Imperfections in solids; area defects And bulk or volume defects.	3	2	1	-	-
9	Diffusion; steady state and unsteady state, theory of alloys (binary and ternary alloys), and heat treatments	3	2	1	-	-
10	Diffusion; steady state and unsteady state, theory of alloys (binary and ternary alloys), iron carbon diagram, TTT diagrams, and heat treatments	3	2	1	-	-
11	Mechanical and physical properties of Metals	3	2	1	-	-
12	Mechanical and physical properties of Metals	3	2	1	-	-
13	Mechanical, physical properties of Metals, and corrosion, and wear	3	2	1	-	-
14	Mechanical, physical properties of Metals, and corrosion, and wear	3	2	1	-	-
15,16	Final Exam.					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10%
2	Exam 2 written (Semester work)	12	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Team /Practical work evaluation (semester work)	1-14	10	10%
6	Assignments / Project /activities	1-14	10	10%

6- Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	William F. Smith, "Principles of materials science and engineering "; McGraw-Hill, Third Edition, 1996. <u>William D. Callister, Jr. "Materials science and engineering – An introduction"; John-Wiley, Seventh Edition, 2006.</u> V.S.Korada, "Engineering applications of nanotechnology", Springer, 2017.(16668)
	Other References	Michael F. Ashby, "Materials selection in mechanical design", 5th Edition, Butterworth-Heinemann, 2016. William D. Callister Jr., David G. Rethwisch, "Fundamentals of Materials Science and Engineering: An Integrated Approach, 10th Edition, John Wiley & Sons, 2017. Ashok Kumar Dash, "nano materials and applications", Kalyani Publish, 2024.
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
	Supportive facilities & equipment for teaching and learning *	
	Devices/Instruments	--
	Supplies	-
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha Fawzy El Hussein
Signature	Nora yehia	Noha El Hussein

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

اسم المقرر: (تبعاً لما ورد باللائحة)	مقدمة في تاريخ الحضارات			
كود المقرر: (تبعاً لما ورد باللائحة)	HUM 101			
القسم/الأقسام العلمية التي شاركت في التدريس:	العلوم الأساسية			
إجمالي عدد الساعات المعتمدة للمقرر:	إجمالي	أخرى (تحدد)	عملي	نظري
(تبعاً لما ورد باللائحة)	2			2
نوع المقرر:	اختياري			
المستوى الدراسي الذي قدم فيه المقرر:	SOPHOMORE			
البرنامج الأكاديمي:	العلوم الأساسية			
المعهد:	المعهد التكنولوجي العالي			
اسم منسق المقرر:	أ.م.د. وليد رضوان			
جهة مناقشة واعتماد تقرير المقرر:	مجلس القسم العلمي للبرنامج			
تاريخ اعتماد تقرير المقرر:	7/26/2025			

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

مفهوم الحضارة (الثقافة والحضارة – التاريخ والحضارة) – أصول الحضارة الإنسانية في العصور القديمة (البدايات الحضارية الأولى – الثقافة والحضارة في الشرق القديم، وفي الغرب القديم "اليونان والرومان") – الحضارة والثقافة في العصور الوسطى (المسيحية – الإقطاع – العرب – العصور الإسلامية) – الحضارة في العصور الحديثة (النهضة – الإصلاح الديني – تقدم العلوم – الفلسفة والآداب والفنون).

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		(A2- A5- A7-A9)	
النص	الكود	النص	الكود
يشرح المعلومات والأحداث التي تتعلق بمفهوم الحضارة وأصولها الإنسانية في العصور المختلفة.	LO 1	تطوير وإجراء التجارب العملية المناسبة أو المحاكاة، وتحليل وتفسير وتقييم النتائج، واستخدام التحليلات الإحصائية والحكم الهندسي الموضوعي لاستخلاص النتائج	A 2
يتعرف على أهم المؤثرات التي ساهمت في الحضارة والثقافة في العصور المتعاقبة .	LO 2		
يستنتج مدى التأثير والتأثر بالأحداث التي مرت بها الحضارات ويبين الإنجازات والإخفاقات كل حقبة.	LO 3		
يقيس تطور وتأثير وتأثر الثقافة والحضارة في العصور المختلفة .	LO 4		
يستخدم المنهج التاريخي لتناول الأحداث الحضارية الهامة في كل عصر و مصادر تلك الفترة.	LO 5		
يستقرئ الربط بين تطور الأحداث و الملابس الحضارية التي تتناول تلك العصور ومصادرها.	LO 6		
يستخدم تكنولوجيا المعلومات بما يخدم الممارسة المهنية.	LO 7	ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.	A 5
يظهر مهارات إدارة الوقت بكفاءة.	LO 8		
تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل بحيث يعمل ضمن فريق.	LO 9	العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعدد الثقافات	A 7
القدرة علي قيادة المهنيين والعمل كفريق لانجاز المهام العملية.	LO10	إستخدام التفكير الإبداعي والمبتكر والمرن واكتساب مهارات ريادة الأعمال والقيادة لتوقع المواقف الجديدة والاستجابة لها.	A 9
توخي السلوك الطيب والاقتداء بالقذوة الحسنة.	LO10		

4- طرق التعليم والتعلم للمقرر:

التدريس المباشر		التدريس الغير مباشر										استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات			
المحاضرات	التمارين العملية والتجارب	العصف الذهني	التعلم القائم على المشروعات الجامعية	استراتيجية دراسة الحالة	حل المشكلات	كتابة التقارير / الأبحاث	الحوار والمناقشة	التدريب الميداني	الزيارات الميدانية	التعلم الذاتي	التعلم بالإكتشاف	برامج المحاكاة أو النمذجة	المعامل الافتراضية	التعلم الإلكتروني	النقاء الإصطناعي في التعليم
✓		✓		✓	✓	✓	✓			✓	✓			✓	✓

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة		تدريس نظري
			تدريب		
			تمارين	عملي	
1	تعريف بالمقرر الدراسي ومقدمة عامه.	2	2	0	0
2	مفهوم الحضارة والتاريخ والعلاقة بينهما.	2	2	0	0
3	مفهوم الحضارة والتاريخ والعلاقة بينهما .	2	2	0	0
4	أصول الحضارة الإنسانية فى العصور القديمة.	2	2	0	0
5	الحضارة الإنسانية حيث الثقافة والحضارة فى الشرق القديم .	2	2	0	0
6	أصول الحضارة الإنسانية فى العصور القديمة،من حيث الثقافة و الحضارة فى الغرب القديم ، لا سيما عند اليونان والرومان .	2	2	0	0
7	مراجعة وامتحان منتصف الفصل الدراسي				
8	دور الحركة الوطنية في التصدي للاحتلال. (1)	2	2	0	0
9	دور الحركة الوطنية في التصدي للاحتلال. (2)	2	2	0	0
10	المظاهرات والثورات المناهضة للاحتلال وخاصة ثورة 1919 ونتائجها.	2	2	0	0
11	نذر الحرب العالمية الثانية ومعاهدة 1936 والعدوان الثلاثي.	2	2	0	0
12	الأحداث التي مهدت لثورة 23 يوليو 1952.	2	2	0	0
13	تحليل أهداف ثورة 23 يوليو 1952.	2	2	0	0
14	مراجعة عامة	2	2	0	0

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	5	10	10%
2	امتحان 2 تحريري (أعمال سنة)	9	10	10%
3	امتحان منتصف الفصل الدراسي	7	20	20%
4	امتحان نهائي تحريري	14	40	40%
5	امتحان نهائي عملي	لا يوجد	----	-----
6	امتحان نهائي شفهي	11	10	10%
7	تكاليفات / مشروع / ملف الإنجاز / كتيب الأنشطة	8	10	10%
8	تدريب ميداني	لا يوجد	----	-----
9	أخرى (تذكر)	لا يوجد	----	-----

6- مصادر التعلم والتسهيلات المادية:

المرجع الأساسي للمقرر	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
خالد الشربيني ، مرفت ذكي: مقدمة في تاريخ الحضارات، مذكرة للمعهد التكنولوجي العالي بالعاشر من رمضان، 2019	المراجع الأخرى
1- أحمد عبد الرازق، الحضارة الإسلامية في العصور الوسطى، القاهرة، 2004.	
2- بدر نبيل ملحم: تاريخ الحضارات القديمة، دار الإحصاء العلمي للنشر والتوزيع، 2015.	
3- رالف لينتون، شجرة الحضارة، ترجمة أحمد فخري، (3 أجزاء)، المركز القومي للترجمة 2010	
4- رمسيس رياض، جورج صليب: الحضارات القديمة، مصر والشرق. وكالة الصحافة العربية، 2020	المصادر الإلكترونية (لابد من إضافة الروابط)
1- https://ar.wikipedia.org/wiki	
2- http://www.du.edu.eg/	
3- https://www.youtube.com/	
https://www.ekb.eg/ar/home	المنصة التعليمية (لابد من إضافة الرابط)
(داتا شو) وجهاز كمبيوتر محمول.	الأجهزة
قاعة محاضرات مجهزة	المستلزمات
-----	البرامج الإلكترونية
-----	معامل المهارات/ المحاكيات
-----	المعامل الافتراضية
-----	أخرى (تذكر)
التجهيزات التعليمية المساندة للتعليم والتعلم *	

منسق البرنامج	منسق المقرر	

الإسم	أ.م.د. وليد رضوان	أ.د. أحمد عبد الغفار
التوقيع	وليد رضوان	أحمد عبد الغفار

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

تاريخ مصر الحديث	اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 102	كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية	القسم/الأقسام العلمية التي شاركت في التدريس:
إجمالي	إجمالي عدد الساعات المعتمدة للمقرر:
2	(تبعاً لما ورد باللائحة)
نظري	نوع المقرر:
2	المستوى الدراسي الذي قدم فيه المقرر:
اختياري	البرنامج الأكاديمي:
SOPHOMORE	المعهد:
العلوم الأساسية	اسم منسق المقرر:
المعهد التكنولوجي العالي	جهة مناقشة واعتماد تقرير المقرر:
أ.م.د. وليد رضوان	تاريخ اعتماد تقرير المقرر:
مجلس القسم العلمي للبرنامج	
7/26/2025	

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

مصر تحت الحكم العثماني (1517 – 1798) (الفتح – الحكم والإدارة – الأوضاع الاقتصادية والاجتماعية) – الغزو الفرنسي لمصر وآثاره (1798 – 1801) (الاحتلال – الحكم والإدارة – المقاومة الوطنية – فشل المشروع الاستعماري – نتائج الاحتلال) – نظام محمد علي (1805 – 1848) (الصراع السياسي وتولية محمد علي – بناء الدولة الحديثة – السياسة الخارجية -) – الحركة الوطنية والثورة العربية (خلفاء محمد علي – عصر إسماعيل – الحركة الوطنية والثورة العربية) – مصر في عهد الاحتلال البريطاني (1882- 1914) (سياسة الاحتلال – انبعاث الحركة الوطنية) – مصر في عهد الحماية البريطانية والحرب العالمية الأولى – تأليف الوفد وقيام ثورة 1919 – تصريح 28 فبراير 1922 – دستور 1923 – تطور القضية الوطنية ومعاهدة 1936- مصر خلال الحرب العالمية الثانية) – أزمت مصر السياسية والاجتماعية والطريق إلى ثورة يوليو – الثورة وتغيير النظام السياسي – الجلاء البريطاني 1954 – العدوان الثلاثي 1956.

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		(A2- A3- A9)	
النص	الكود	النص	الكود
استقراء أهداف القوى الاستعمارية وأن الوطن مستهدف.	LO 1	تطوير وإجراء التجارب العملية المناسبة أو المحاكاة، وتحليل وتفسير وتقييم النتائج، واستخدام التحليلات الإحصائية والحكم الهندسي الموضوعي لاستخلاص النتائج	A 2
إدراك أن التاريخ هو المعلم الأول للحكمة ولا بد من دراسته.	LO 2		
معرفة إيجابيات وسلبيات التجارب التي مرت بها مصر.	LO 3		
تعريف دور الشعب في الكفاح الوطني، والإشادة بالحركة الوطنية ودورها في التصدي للاستعمار وظلم الحكام.	LO 4	تطوير وإجراء التجارب العملية المناسبة أو المحاكاة، وتحليل وتفسير وتقييم النتائج، واستخدام التحليلات الإحصائية والحكم الهندسي الموضوعي لاستخلاص النتائج.	A 3
التمييز بين الحكام الإيجابيين والسلبيين وتقييم دور كل منهم.	LO 5		
الاستفادة مما اكتسبه من مهارات في حياته العملية.	LO 6	استخدام التفكير الإبداعي والمبتكر والمرن واكتساب مهارات ريادة الأعمال والقيادة وتوقع المواقف الجديدة والاستجابة لها.	A 9
الموضوعية في الحكم على الأحداث في ضوء الظروف التي أحاطت بها.	LO 7		
القدرة على التحليل والاستنتاج.	LO 8		
القدرة على التوقع وتوظيف مهاراته في الحياة العملية.	LO 9		
توخي السلوك الطيب والاقتداء بالقوة الحسنة.	LO10		

4- طرق التعليم والتعلم للمقرر:

التدريس المباشر		التدريس الغير مباشر										استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات			
المحاضرات	التعلم العملي والتجارب	العصف الذهني	التعلم القائم على المشروعات الجماعية	استراتيجية دراسة الحالة	حل المشكلات	كتابة التقارير / الأبحاث	الحوار والمناقشة	التدريب الميداني	الزيارات الميدانية	التعلم الذاتي	التعلم بالإكتشاف	برامج المحاكاة أو النمذجة	المعامل الافتراضية	التعلم الإلكتروني	النقاء الإصطناعي في التعليم
✓		✓		✓	✓	✓	✓			✓	✓			✓	✓

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس نظري	تدريب
عملية	تمارين			
0	0	2	2	0
0	0	2	2	0
0	0	2	2	0
0	0	2	2	0
0	0	2	2	0
0	0	2	2	0
مراجعة وامتحان منتصف الفصل الدراسي				
0	0	2	2	0
0	0	2	2	0
0	0	2	2	0
0	0	2	2	0
0	0	2	2	0
0	0	2	2	0
0	0	2	2	0
0	0	2	2	0
0	0	2	2	0
0	0	2	2	0
اختبارات الفصل الدراسي النهائية				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	5	10	10%
2	امتحان 2 تحريري (أعمال سنة)	9	10	10%
3	امتحان منتصف الفصل الدراسي	7	20	20%
4	امتحان نهائي تحريري	14	40	40%
5	امتحان نهائي عملي	لا يوجد	----	-----
6	امتحان نهائي شفهي	11	10	10%
7	تكاليفات / مشروع / ملف الإنجاز / كتيب الأنشطة	8	10	10%

6- مصادر التعلم والتسهيلات المادية:

المرجع الأساسي للمقرر	خالد الشرييني ، مرفت ذكي: تاريخ مصر الحديث، مذكرة للمعهد التكنولوجي العالي بالعاشر من رمضان
المراجع الأخرى	1- إسماعيل مرسى: تاريخ مصر الحديث من الحملة الفرنسية حتى خلع فاروق، دار الكتب المصرية، 2020 2- جاد طه: معالم تاريخ مصر الحديث والمعاصر، دار الفكر العربي، 1985. 3- محمد عبد الرحيم مصطفى: تاريخ مصر الحديث.. المطبعة الأميرية.. 2019 4- محمد سهيل طقوش: تاريخ مصر الحديث والمعاصر، دار النفائس، 2019. 5- محمد صبري: تاريخ مصر الحديث من محمد علي إلى اليوم، دار الكتب المصرية، 2008
المصادر الإلكترونية (لابد من إضافة الروابط)	1- https://ar.wikipedia.org/wiki 2- http://www.du.edu.eg/ 3- https://www.youtube.com/
المنصة التعليمية (لابد من إضافة الرابط)	https://www.ekb.eg/ar/home
الأجهزة	(داتا شو) وجهاز كمبيوتر محمول.
المستلزمات	قاعة محاضرات مجهزة
البرامج الإلكترونية	-----
معامل المهارات/ المحاكيات	-----
المعامل الافتراضية	-----
أخرى (تذكر)	-----
مصادر التعلم (الكتب والمراجع العلمية وغيرها) *	
التجهيزات التعليمية المساندة للتعليم والتعلم *	

منسق المقرر	منسق البرنامج	
أ.م.د. وليد رضوان	أ.د. أحمد عبد الغفار	الإسم
		التوقيع

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

الحضارة العربية والإسلامية				اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 103				كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية				القسم/الأقسام العلمية التي شاركت في التدريس:
نظري	عملي	اخرى (تحدد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
اختياري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
العلوم الأساسية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
أ.م.د. وليد رضوان				اسم منسق المقرر:
مجلس القسم العلمي للبرنامج				جهة مناقشة واعتماد تقرير المقرر:
7/26/2025				تاريخ اعتماد تقرير المقرر:

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

أسس الحضارة الإسلامية (القرآن والسنة - الأمة العربية - اللغة - الإطار الجغرافي - الشعوب المفتوحة - التأثيرات الأجنبية) - النظام السياسي (الخلافة - الوزارة - الكتابة - الحجابة) - النظام الإداري (الإدارات المحلية - دواوين الجند والخراج والرسائل والبريد..... إلخ) - النظام المالي (موارد بيت المال - النفقات - السكة) - النظم العسكرية (الجيش: تكوينه وأسلحته وأساليبه - الأسطول) - التعليم والثقافة (العلوم الشرعية "علم الكلام والفقه...." - العلوم العقلية) - الفنون والآثار والعمارة - القضاء والتقاضي - المجتمع الإسلامي (عناصره وأجناسه - الطوائف الدينية والمذهبية - البناء الطبقي: الحكام والفقهاء والعلماء والتجار وأصحاب الحرف والصناعات.... إلخ).

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على أن		(A2- A3- A7)	
النص	الكود	النص	الكود
يستنتج مدى التأثير والتأثر بالأحداث التي مرت بها الحضارة العربية والإسلامية و معرفة مصادر تلك الحقبة الهامة .	LO 1	تطوير وإجراء التجارب العملية المناسبة أو المحاكاة، وتحليل وتفسير وتقييم النتائج، واستخدام التحليلات الإحصائية والحكم الهندسي الموضوعي لاستخلاص النتائج	A 2
يربط بين التأثير والتأثر بأحداث الحضارة العربية والإسلامية و بين إنجازات و إخفاقات كل حقبة.	LO 2		
يربط بين التأثير والتأثر بأحداث الحضارة العربية والإسلامية و بين إنجازات و إخفاقات كل حقبة.	LO 3		
يستخدم المنهج التاريخي لتناول الأحداث الهامة في الحضارة العربية والإسلامية و مصادر تلك الفترة.	LO 4		
يشرح المعلومات والأحداث التي تتعلق بالحضارة العربية والإسلامية .	LO 5	تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة، تلبي الاحتياجات النوعية مع مراعاة الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والأخلاقية وغيرها من الجوانب المتسقة مع النظام والظروف، وضمن مبادئ وسياق التصميم والتنمية المستدامين.	A 3
يتعرف على أهم المؤثرات التي ساهمت في تكوين الحضارة العربية والإسلامية .	LO 6		
يلخص مصادر ومكانة الحضارة العربية والإسلامية.	LO 7		
تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل بحيث يعمل ضمن فريق .	LO 8	العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعددة الثقافات.	A 7
يظهر مهارات إدارة الوقت بكفاءة في مجال أى مهنة ترتبط بالحضارة العربية والإسلامية .	LO 9		
يستخدم تكنولوجيا المعلومات بما يخدم الممارسة المهنية في مجال الحضارة العربية والإسلامية .	LO10		

4- طرق التعليم والتعلم للمقرر:

التدريس المباشر		التدريس الغير مباشر										استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات			
المحاضرات	التعلمين العملية والتجارب	العصف الذهني	التعلم القائم على المشروعات الجماعية	استراتيجية دراسة الحالة	حل المشكلات	كتابة التقارير / الأبحاث	الحوار والمناقشة	التدريب الميداني	الزيارات الميدانية	التعلم الذاتي	التعلم بالإكتشاف	برامج المحاكاة أو النمذجة	المعامل الافتراضية	التعلم الإلكتروني	النقاء الإصطناعي في التعليم
√		√		√	√	√	√			√	√			√	√

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس نظري	تدريب
عملي	تمارين			
0	0	2	2	تعريف بالمقرر الدراسي ومقدمة عامة
0	0	2	2	أسس الحضارة الإسلامية : (القرآن والسنة – الأمة العربية – اللغة – الإطار الجغرافي – الشعوب المفتوحة – التأثيرات الأجنبية).
0	0	2	2	النظام السياسي : (الخلافة – الوزارة – الكتابة – الحجابة).
0	0	2	2	النظام الإداري : (الإدارات المحلية – دواوين الجند والخراج والرسائل والبريد إلخ).
0	0	2	2	النظام المالي : (موارد بيت المال – النفقات – السكة)
0	0	2	2	النظم العسكرية : (الجيش والأسطول : تكوينه وأسلحته وأساليبه)
مراجعة وامتحان منتصف الفصل الدراسي				
0	0	2	2	التعليم والثقافة : (العلوم الشرعية " علم الكلام والفقه " – العلوم العقلية)
0	0	2	2	الفنون والآثار والعمارة.
0	0	2	2	القضاء والتقاضى .
0	0	2	2	المجتمع الإسلامي : (غلصره و أجناسه – الطوائف الدينية والمذهبية)
0	0	2	2	المجتمع الإسلامي، البناء الطبقي : الحكماء والفقهاء والعلماء)
0	0	2	2	التجـر و أصحاب الحرف والصناعات..... إلخ
0	0	2	2	مراجعة عامة
اختبارات الفصل الدراسي النهائية				
16-15				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	5	10	10%
2	امتحان 2 تحريري (أعمال سنة)	9	10	10%
3	امتحان منتصف الفصل الدراسي	7	20	20%
4	امتحان نهائي تحريري	14	40	40%
5	امتحان نهائي عملي	لا يوجد	----	-----
6	امتحان نهائي شفهي	11	10	10%
7	تكليفات / مشروع / ملف الإنجاز / كتيب الأنشطة	8	10	10%
8	تدريب ميداني	لا يوجد	-----	-----
9	أخرى (تذكر)	لا يوجد	-----	-----

6- مصادر التعلم والتسهيلات المادية:

خالد الشريبي ، مرفت ذكي: تاريخ مصر الحديث، مذكرة للمعهد التكنولوجي العالي بالعاشر من رمضان	المرجع الأساسي للمقرر	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
1- أحمد عبد الرازق، الحضارة الإسلامية في العصور الوسطى، القاهرة، 2004 . 2- غيداء عادل: دراسات في الحضارة العربية الإسلامية، المؤسسة العربية للدراسات ونشر، 2020. 3- سعيد عبد الفتاح عاشور وآخران: دراسات في تاريخ الحضار الإسلامية، دار المعرفة الجامعية، 2018. 4- شوقي أبو خليل: الحضارة العربية الإسلامية وموجز عن الحضارات السابقة، دار الفكر المعاصر، 2010	المراجع الأخرى	
1- https://ar.wikipedia.org/wiki 2- http://www.du.edu.eg/ 3- https://www.youtube.com/	المصادر الالكترونية (لا بد من إضافة الروابط)	
https://www.ekb.eg/ar/home	المنصة التعليمية (لا بد من إضافة الرابط)	
(داتا شو) وجهاز كمبيوتر محمول.	الأجهزة	التجهيزات التعليمية المساندة للتعليم والتعلم *
قاعة محاضرات مجهزة	المستلزمات	
-----	البرامج الالكترونية	
-----	معامل المهارات/ المحاكيات	
-----	المعامل الافتراضية	
-----	أخرى (تذكر)	

منسق البرنامج	منسق المقرر	
أ.د. أحمد عبد الغفار	أ.م.د. وليد رضوان	الإسم
		التوقيع

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

التذوق الأدبي				اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 104				كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية				القسم/الأقسام العلمية التي شاركت في التدريس:
نظري	عملي	اخرى (تحدد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
2			2	
اختياري				نوع المقرر:
JUNIOR				المستوى الدراسي الذي قدم فيه المقرر:
العلوم الأساسية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
Prof. Eid Abd El-Baset Eid				اسم منسق المقرر:
مجلس القسم العلمي للبرنامج				جهة مناقشة واعتماد تقرير المقرر:
7/26/2025				تاريخ اعتماد تقرير المقرر:

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

مفهوم النص الإبداعي وأشكال التعبير الوجداني - الأنواع الأدبية الشعرية والنثرية والمسرحية والقصصية - نظريات التلقي وتعدد قراءات الدارس للنص على مستويات الفهم والتذوق والتحليل - أسس التشكيل الجمالي للنص من خلال تحليل : الماهية، الأدوات، الوظائف - أهمية التاريخ للنص والتجربة الأدبية من حيث علاقتها بالمبدع والمرحلة والمجتمع والبيئة - أركان النص الأدبي ومقوماته والنظريات النقدية حول أسس تحليله وتفسيره وتقويمه ونقده - النقد النظري والتطبيقي والنقد التأثري الانطباعي والنقد الموضوعي للنص قديماً وحديثاً - تطبيق إحدى نظريات التلقي واستكشاف أعماق النص على أساس الوعي بالتحليل الجماعي للمفردات والأصوات والتراكيب والجمال وفضاءات تجارب الشعراء - دراسة آليات التذوق الأدبي وأسس تكوينه من خلال تعدد القراءات للظواهر النقدية والإبداعية - الدرس التطبيقي على نصوص منتقاه من الشعر العربي القديم والمعاصر بما يعكس صوراً من ظاهرة الإبداع وظاهرة التلقي ومابينهما من علاقات (يمكن دراسة ظاهرة فن المعارضات الشعرية).

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		A7,A10	
الكود	النص	الكود	النص
LO1	إدراك مفهوم النص الإبداعي وأشكال التعبير الوجداني	A7	العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعدد الثقافات وذات صلة بالتذوق الأدبي
LO2	معرفة الأنواع الأدبية الشعرية والنثرية والمسرحية والقصصية		
LO3	الإلمام بأسس التشكيل الجمالي للنص من خلال تحليل النصوص النثرية		
LO4	دراسة آليات التذوق الأدبي و تطبيقها علي بعض النصوص الشعرية أو النثرية الحديثة.		
LO5	الدرس التطبيقي علي نصوص منتقاه من الشعر العربي القديم والمعاصر		
LO6	تطبيق إحدى نظريات التلقي و إستكشاف أعماق النص علي أساس الوعي بالتحليل الجماعي للمفردات.	A10	اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتي وغيرها مدى الحياة.
LO7	تحليل أسس النصوص التأثيرية و التطبيقية من خلال تعدد القراءات للظواهر النقدية و الإبداعية.		
LO8	تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل بحيث يعمل ضمن فريق.		
LO9	إكتساب مهارات إدارة الوقت بكفاءة.		
LO10	إستخدام تكنولوجيا المعلومات ومواقع الإنترنت لإكتساب مهارات التعليم الذاتي.		

4- طرق التعليم والتعلم للمقرر:

التدريس المباشر		التدريس الغير مباشر										استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات			
المحاضرات	التمارين العملية والتجارب	العصف الذهني	التعلم القائم على المشروعات الجماعية	استراتيجية دراسة الحالة	حل المشكلات	كتابة التقارير / الأبحاث	الحوار والمناقشة	التدريب الميداني	الزيارات الميدانية	التعلم الذاتي	التعلم بالإكتشاف	برامج المحاكاة أو النمذجة	المعامل الافتراضية	التعلم الإلكتروني	النقاء الإصطناعي في التعليم
√		√				√	√			√				√	

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس نظري	تدريب
عملي	تمارين			
0	0	2	2	1
0	0	2	2	2
0	0	2	2	3
0	0	2	2	4
0	0	2	2	5
0	0	2	2	6
مراجعة وامتحان منتصف الفصل الدراسي				
0	0	2	2	8
0	0	2	2	9
0	0	2	2	10
0	0	2	2	11
0	0	2	2	12
0	0	2	2	13
إختبارات الفصل الدراسي النهائية				
				14

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	5	10	10 %
2	امتحان 2 تحريري (أعمال سنة)	12	10	10 %
3	امتحان منتصف الفصل الدراسي	7	20	20 %
4	امتحان نهائي تحريري	14	40	40 %
5	تكاليفات / تقارير	طوال الفصل	20	20 %

6- مصادر التعلم والتسهيلات المادية:

كتاب المقرر ويتم تسليمه للطلاب في بداية الفصل	المرجع الأساسي للمقرر (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
عبد الله التطاوي، تقاطعات الحركة الشرعية بين الموروث والفردى ، الدار المصرية اللبنانية بالقاهرة، الطبعة الثانية. 2020	المراجع الأخرى	
https://ar.wikipedia.org/wiki http://www.du.edu.eg/ https://www.youtube.com/watch?bnCua19ME	المصادر الالكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office	المنصة التعليمية (لابد من إضافة الرابط)	
	الأجهزة	
Data show, White board	المستلزمات	التجهيزات التعليمية
Microsoft Teams	البرامج الالكترونية	المساندة للتعليم والتعلم *
-----	معامل المهارات/ المحاكيات	
-----	المعامل الافتراضية	
-----	أخرى (تذكر)	

منسق البرنامج	منسق المقرر	
أ.د. أحمد عبدالغفار	Prof. Eid Abd El-Baset Eid	الإسم
	Prof. Eid Abd El-Baset Eid	التوقيع

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

التذوق الموسيقي	اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 105	كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية	القسم/الأقسام العلمية التي شاركت في التدريس:
إجمالي	إجمالي عدد الساعات المعتمدة للمقرر:
أخري (تحدد)	(تبعاً لما ورد باللائحة)
عملي	نوع المقرر:
نظري	المستوى الدراسي الذي قدم فيه المقرر:
2	البرنامج الأكاديمي:
اختياري	المعهد:
JUNIOR	اسم منسق المقرر:
العلوم الأساسية	جهة مناقشة واعتماد تقرير المقرر:
المعهد التكنولوجي العالي	تاريخ اعتماد تقرير المقرر:
Prof. Eid Abd El-Baset Eid	
مجلس القسم العلمي للبرنامج	
7/26/2025	

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

الاستماع لمجموعات الآلات الموسيقية الوركستراية وهي مجموعة الآلات الوترية – مجموعة آلات النفخ الخشبي – مجموعة آلات النفخ النحاسي – الآلات الإيقاعية، والتعرف عليها من خلال الصور المرفقة مع الملزمة الخاصة بالمقرر الدراسي – الدراسة النظرية بطريقة مختصرة تشمل جوانب المعرفة الأساسية المطلوب دراستها للعصور الموسيقية المختلفة (عصر الباروك – العصر الكلاسيكي – العصر الرومانتيكي – نبذة عن موسيقى الجاز ونشأتها – نبذة عن الموسيقى العربية وآلاتها المستخدمة) – الأهداف العامة للمقرر: بعد دراسة هذا المقرر يكون الطالب قادراً علي: التعرف بالاستماع علي الآلات الموسيقية المستخدمة في الاوركسترا – دراسة أنواع المعلومات الهامة عن موسيقى الجاز – دراسة الموسيقى العربية وآلاتها – الإلمام الكامل بأنواع الموسيقى المختلفة – المهارات الذهنية: بعد دراسة هذا المقرر يكون الطالب قادراً علي: إدراك ومعرفة أنواع الآلات الموسيقية المختلفة – تمييز أنواع المؤلفات الموسيقية المختلفة (عالمية – عربية) – معرفة تكوين الاوركسترا الغربي والشرقي وفرق الجاز – المهالات العامة: بعد دراسة هذا المقرر يكون الطالب قادراً علي: التواصل بفاعلية من خلال المناقشة والحوار – توظيف المادة العلمية في خدمة الثقافة الموسيقية – الإلمام بثقافات علمية في غير مجال التخصص – الأساليب المستخدمة للتقويم: مناقشات وشرح المحاضرة – اختبارات شفوية وتحريرية – اختبار نهاية الفصل الدراسي

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعا للمصنوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادرا على		A3,A4, A5, A6,A10	
الكود	النص	الكود	النص
LO1	معرفة مجموعة الآلات الوترية	A3	تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة تلبي الاحتياجات النوعية مع مراعاة الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والخالقية وغيرها من الجوانب المتسقة مع النظام والظروف وضمن مبادئ وسياق التصميم والتنمية التطوير المستدامين.
LO2	التعرف علي أصوات مجموعات آلات النفخ الخشبي ومجموعات آلات النفخ النحاسي والتعرف علي الآلات الموسيقية من خلال الصور		

4 طرق التعليم والتعلم للمقرر:

التدريس المباشر		التدريس الغير مباشر										استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات			
المحاضرات	التمارين العملية والتجارب	العصف الذهني	التعلم القائم على المشروعات الجماعية	استراتيجية دراسة الحالة	حل المشكلات	كتابة التقارير / الأبحاث	الحوار والمناقشة	التدريب الميداني	الزيارات الميدانية	التعلم الذاتي	التعلم بالإكتشاف	برامج المحاكاة أو النمذجة	المعامل الافتراضية	التعلم الإلكتروني	النقاء الاصطناعي في التعليم
✓		✓				✓	✓			✓				✓	

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس نظري	تدريب
عملية	تمارين			
1	مقدمة عامة و معرفة مفهوم التذوق الموسيقي	2	2	0
2	الموسيقي كإبداع إنساني	2	2	0
3	أنواع الموسيقي الشرقية والعربية	2	2	0
4	أنواع الآلات الوترية و تمايز نغماتها	2	2	0
5	أنواع آلات النفخ الخشبي والنحاسي	2	2	0
6	التعرف علي الآلات الموسيقية المختلفة من خلال الصور	2	2	0
7	مراجعة وامتحان منتصف الفصل الدراسي			
8	كيفية تكوين الأوركسترا الغربي و الشرقي	2	2	0
9	موسيقي الجاز و نشأتها وآلاتها	2	2	0
10	المقارنة بين أنواع المؤلفات الموسيقية المختلفة (عالمية و عربية)	2	2	0
11	دراسة العصور الموسيقية المختلفة(عصر الباروك- العصر الكلاسيكي- العصر الرومانتيكي)	2	2	0
12	توظيف المادة العلمية في خدمة الثقافة الموسيقية	2	2	0
13	مراجعة عامه	2	2	0
14	إختبارات الفصل الدراسي النهائية			

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	5	10	10 %
2	امتحان 2 تحريري (أعمال سنة)	12	10	10 %
3	امتحان منتصف الفصل الدراسي	7	20	20 %
4	امتحان نهائي تحريري	14	40	40 %
5	تكاليفات / تقارير	طوال الفصل	20	20 %

6- مصادر التعلم والتسهيلات المادية:

مصادر التعلم (الكتب والمراجع العلمية وغيرها) *	المرجع الأساسي للمقرر (لا بد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	كتاب المقرر ويتم تسليمه للطلاب في بداية الفصل
	المراجع الأخرى	عبد الحميد توفيق زكي: تاريخ المصريين: التذوق الموسيقي وتاريخ الموسيقي المصرية، الهيئة المصرية العامة للكتاب 2021.

https://ar.wikipedia.org/wiki http://www.du.edu.eg/ https://www.youtube.com/watch?=bnCua19ME	المصادر الإلكترونية (لا بد من إضافة الروابط)	
EKB - Microsoft office	المنصة التعليمية (لا بد من إضافة الرابط)	
قاعة محاضرات مجهزة	الأجهزة	التجهيزات التعليمية المساندة للتعليم والتعلم *
Data show, White board	المستلزمات	
Microsoft Teams	البرامج الإلكترونية	
-----	معامل المهارات/ المحاكيات	
-----	المعامل الافتراضية	
-----	أخرى (تذكر)	

منسق البرنامج	منسق المقرر	
أ.د. أحمد عبدالغفار	Prof. Eid Abd El-Baset Eid	الإسم
	Prof. Eid Abd El-Baset Eid	التوقيع

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

التراث الأدبي المصري				اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 106				كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية				القسم/الأقسام العلمية التي شاركت في التدريس:
إجمالي	أخرى (تحدد)	عملي	نظري	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
2			2	
اختياري				نوع المقرر:
JUNIOR				المستوى الدراسي الذي قدم فيه المقرر:
العلوم الأساسية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
				اسم منسق المقرر:
مجلس القسم العلمي للبرنامج				جهة مناقشة واعتماد تقرير المقرر:
7/26/2025				تاريخ اعتماد تقرير المقرر:

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

يهدف المقرر إلى تعريف الطالب بالتميز الإقليمي لمصر في العصور القديمة والوسطى والحديثة وأثر عبقرية المكان على الفكر والوعي المصري وتجلياته في التراث الأدبي شعراً ونثراً من خلال الدرس التاريخي والنصي للأدب المصري في مراحلته المختلفة كما يحتوي المقرر على التطورات الأدبية من منظور حضاري وإبداعي - المكتبة التراثية المصرية من منظور تاريخي متجدد - دراسة مفهوم وضعية العصور الوسطى في مصر والفرق بينها وبين العصور الوسطى في أوروبا - التراث الجغرافي المصري وأدب الرحلات في الكتابات المصرية - التأليف الموسوعي في مصر والصياغة الأدبية في فن الموسوعات - الظواهر الأدبية الغالبة على الأدب المصري - مناهج دراسة التراث الأدبي المصري ودلالاته - مدارس التأليف والإبداع في تاريخ الفكر المصري - مجالات الإبداع في الشعر المصري (الطبيعة المصرية - أدب الحروب - الموضوعات الجديدة والبيئة المصرية) - مدارس الكتابة الفنية على المستوى الرسمي وغيرها - تتبع التطبيق على النص والتحليل من خلال أبرز شعراء وكتاب التراث المصري من أمثال ابن نبتة المصري وابن سناء الملك وصولاً إلى أدوار الدكتور محمد كامل حسين والأستاذ أمين الخولي والدكتور جمال حمدان في تناول التراث الأدبي المصري بالتحليل والدراسة المنهجية حول عبقرية المكان.

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		A3,A4, A5, A6,A10	
النص	الكود	النص	الكود
يتعرف على أهمية دراسة التراث الأدبي المصري..	LO1	تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة تلبي الاحتياجات النوعية مع مراعاة الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والأخلاقية وغيرها من الجوانب المتسقة مع النظام والظروف وضمن مبادئ وسياق التصميم والتنمية التطوير المستدامين.	A3
يتعرف على أهم المؤثرات التي ساهمت في تكوين التراث الحضارى.	LO2		
يلخص مصادر ومكانة التراث الحضارى و تأثيره في مقومات بقاء وإستمرار الأمم وفقاً لدورها الريادى والحضارى.	LO3	الاستفادة من التقنيات المعاصرة، والممارسات والمعايير، وإرشادات الجودة، ومتطلبات الصحة والسلامة والقضايا البنينة ومبادئ إدارة المخاطر.	A4
يستنتج الدور الحيوى والرئيسى للتراث الادبى المصرى..	LO4		
يربط بين التأثير والتأثر بين الحضارات القديمة والحديثة.	LO5		
يقارن بين الحضارة العربية الاسلامية والحضارات الحديثة و يربط بين محتوات المنهج والأحداث التي يمر بها عالمنا العربى الإسلامى .	LO6		
يثمن قيمة العلم والمعرفة و يثمن دور العقول العربية الاسلامية التي أبدعت في كافة الميادين.	LO7		
يستخدم تكنولوجيا المعلومات بما يخدم الممارسة المهنية في مجال التراث الحضارى.	LO8	ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.	A5
يظهر مهارات إدارة الوقت بكفاءة في مجال أى مهنة ترتبط بالتراث الحضارى.	LO9	التخطيط والإشراف والرقابة علي تنفيذ المشاريع الهندسية مع مراعاة متطلبات الحرف الأخرى	A6
تعزز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل بحيث يعمل ضمن فريق يظهر مهارات التواصل مع الآخرين، و كذلك قدرات التعلم الذاتى .	LO10	اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتى وغيرها مدى الحياة.	A10

4 طرق التعليم والتعلم للمقرر:

التدريس المباشر		التدريس الغير مباشر										استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات			
المحاضرات	التمارين العملية والتجارب	العصف الذهني	التعلم القائم على المشروعات الجماعية	استراتيجية دراسة الحالة	حل المشكلات	كتابة التقارير / الأبحاث	الحوار والمناقشة	التدريب الميداني	الزيارات الميدانية	التعلم الذاتي	التعلم بالإكتشاف	برامج المحاكاة أو النمذجة	المعامل الافتراضية	التعلم الإلكتروني	النقاء الإصطناعي في التعليم
✓		✓				✓	✓			✓				✓	

الجدول الدراسي المقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة		
			تدريس نظري	تدريب	
				تمارين	عملي
1	تعريف بالمقرر الدراسي ومقدمة عامه	2	2	0	0
2	زعم المتعصبين أن كل الإنجازات العلمية من إبداعات الحضارة الغربية.	2	2	0	0
3	الأرقام من إبداعات العلماء العرب و المسلمين	2	2	0	0
4	قيام الحضارات على العلم والدين	2	2	0	0
5	الحضارة الفرعونية بين الإبداع والتشكيك.	2	2	0	0
6	التراث الحضارى ذاكرة الامم .	2	2	0	0
7	مراجعة وامتحان منتصف الفصل الدراسي				
8	العلم تراث حضارى مشترك .	2	2	0	0
9	لماذا شيد قدماء المصريين أكبر الاهرامات على هضبة صخرية صلبة	2	2	0	0
10	الأندلس الباب الغربى الذى إنتقلت عبره علوم العرب والمسلمين الى اوروبا.	2	2	0	0
11	أهمية دراسة التراث الحضارى	2	2	0	0
12	أهمية دراسة المقررات الثقافية	2	2	0	0
13	مراجعة عامه	2	2	0	0
14	إختبارات الفصل الدراسي النهائية				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	5	10	10 %
2	امتحان 2 تحريري (أعمال سنة)	12	10	10 %
3	امتحان منتصف الفصل الدراسي	7	20	20 %
4	امتحان نهائي تحريري	14	40	40 %
5	تكاليفات / تقارير	طوال الفصل	20	20 %

6- مصادر التعلم والتسهيلات المادية:

كتاب المقرر ويتم تسليمه للطلاب في بداية الفصل	المرجع الأساسي للمقرر	

(لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)		
1- عوض مرسى الغلري، دراست في الألب المصري، الدار الدولية للاستثمارات الثقافية، القاهرة الطبعة الأولى، 2017 2- أحمد عبد الرازق، الحضارة الإسلامية في العصور الوسطى، القاهرة، 2020 . 3- عبد الرحمن بدوي: دور العرب في تكوين الفكر الاوربي. الهيئة المصرية العامة للكتاب 2021	المراجع الأخرى	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
https://ar.wikipedia.org/wiki http://www.du.edu.eg/ https://www.youtube.com/watch?=bnCua19ME	المصادر الالكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office	المنصة التعليمية (لابد من إضافة الرابط)	
قاعة محاضرات مجهزة	الأجهزة	
Data show, White board	المستلزمات	التجهيزات التعليمية
Microsoft Teams	البرامج الالكترونية	المساندة للتعليم والتعلم *
-----	معامل المهارات/ المحاكيات	
-----	المعامل الافتراضية	
-----	أخرى (تذكر)	

منسق البرنامج	منسق المقرر	
أ.د. أحمد عبدالغفار		الإسم
		التوقيع

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

الإتجاهات الفنية المعاصرة				اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 107				كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية				القسم/الأقسام العلمية التي شاركت في التدريس:
نظري	عملي	اخرى (تحدد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
2			2	
اختياري				نوع المقرر:
JUNIOR				المستوى الدراسي الذي قدم فيه المقرر:
البرامج الهندسية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
				اسم منسق المقرر:
مجلس القسم العلمي للبرنامج				جهة مناقشة واعتماد تقرير المقرر:
7/26/2025				تاريخ اعتماد تقرير المقرر:

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

يهدف المقرر إلى: إكساب الطالب القدرة على التذوق الفني - إكساب الطالب مهارة قراءة الأعمال الفنية وذلك من خلال دراسة الفلسفات والاتجاهات المذاهب المعاصرة الحديثة وما بعد الحداثة. ويحتوي المقرر على الموضوعات التالية : التعريف بالفنون القديمة كمدخل للفلسفات الكلاسيكية - مدخل للفنون الكلاسيكية والأصول اليونانية - الكلاسيكية الجديدة (أهم المصورين و المثاليين) - الحداثة وحركة التأثيريين الفرنسيين (صالون الشباب) سيزان، مافيه، مونيه - التكعيبية (بارك، بيكاسو) ، المستقبلية (بوتشيني) البعد الزمني- التجريدي (كاندنسيكي- موندريان) - الاتجاه التعبيري (إدوارد مونخ ، فان جوخ) في ألمانيا الوحشية - التلقائية (بول كيلي- خوان ميرو) - الاتجاهات الحديثة والفن الحر- الاتجاهات الحديثة في الفنون المصرية (الحركة التشكيلية المصرية المعاصرة) - الفنانين المصريين المثاليين (محمود مختار- صبحي جرجس- السجيني - الوشاحي) - المصورين المصريين (محمود سعيد، يوسف كامل، راغب عياد، عبد العزيز درويش) فنانين مصريين عالميين (صلاح عبد الكريم، حامد ندى، ناجي شاكرا) - ما بعد الحداثة وأهم اتجاهاتها.

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		A3,A4, A5, A6,A10	
النص	الكود	النص	الكود
يتعرف على أهمية الفنون الحديثة المعاصرة خاصة (الابداع الرسومي)	LO1	A3	تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة تلبي الاحتياجات النوعية مع مراعاة الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والخالقية وغيرها من الجوانب المتسقة مع النظام والظروف وضمن مبادئ وسياسات التصميم والتنمية التطوير المستدامين.
يتعرف على أهم المؤثرات التي ساهمت في إظهار الأعمال الفنية للرسامين العالميين .	LO2		
يلخص مصادر ومكانة الأعمال الفنية للرسامين في أوروبا القديمة والمعاصرة	LO3	A4	الاستفادة من التقنيات المعاصرة، والممارسات والمعايير، وإرشادات الجودة، ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر.
يستنتج الدور الحيوي والرئيسي للعمل الفني المعاصر	LO4		
يربط بين التأثير والتأثر بين الفنون الرسومية القديمة والحديثة.	LO5		
يقارن بين الأعمال الفنية المصرية المعاصرة و الفنية المصرية القديمة ، و يربط بين الفلسفيات القديمة والمعاصرة في الاعمال الفنية.	LO6		
يثمن قيمة العلم والمعرفة و يثمن دور العقول المصرية التي أبدعت في كافة الميادين.	LO7	A5	ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.
يستخدم تكنولوجيا المعلومات بما يخدم الممارسة المهنية في مجال الفنون.	LO8		
يظهر مهارات إدارة الوقت بكفاءة في مجال أى مهنة ترتبط بالفنون .	LO9	A6	التخطيط والإشراف والرقابة علي تنفيذ المشاريع الهندسية مع مراعاة متطلبات الحرف الأخرى
تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل بحيث يعمل ضمن فريق يظهر مهارات التواصل مع الآخرين، و كذلك قدرات التعلم الذاتي .	LO10	A10	اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتي وغيرها مدى الحياة.

4 طرق التعليم والتعلم للمقرر:

التدريس المباشر		التدريس الغير مباشر										استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات			
المحاضرات	التمارين العملية والتجارب	العصف الذهني	التعلم القائم على المشروعات الجماعية	استراتيجية دراسة الحالة	حل المشكلات	كتابة التقارير / الأبحاث	الحوار والمناقشة	التدريب الميداني	الزيارات الميدانية	التعلم الذاتي	التعلم بالاختشاف	برامج المحاكاة أو النمذجة	المعامل الافتراضية	التعلم الإلكتروني	النقاء الاصطناعي في التعليم
✓		✓				✓	✓			✓				✓	

الجدول الدراسي المقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة		
			تدريس نظري	تدريب	
					تمارين
1	التعريف بالفنون القديمة كمدخل للفلسفات الكلاسيكية	2	2	0	0
2	مدخل للفنون الكلاسيكية والأصول اليونانية	2	2	0	0
3	الكلاسيكية الجديدة (أهم المصورين و المثاليين) الحداثة وحركة التأثيريين الفرنسيين (صالون الشباب) سيزان، مافيه، مونيه	2	2	0	0
4	التكعيبية (بارك، بيكاسو) ، المستقبلية (بوتشيني).	2	2	0	0
5	البعد الزمني- التجريدي (كاندنسيكي- موندريان)	2	2	0	0
6	الاتجاه التعبيري (إدوارد مونخ ، فان جوخ) في ألمانيا الوحشية	2	2	0	0
7	مراجعة وامتحان منتصف الفصل الدراسي				
8	الاتجاهات الحديثة والفن الحر	2	2	0	0
9	الاتجاهات الحديثة في الفنون المصرية (الحركة التشكيلية المصرية المعاصرة)	2	2	0	0
10	الفنانين المصريين المثاليين (محمود مختار- صبحي جرجس- السجيني – الوشاحي)	2	2	0	0
11	المصورين المصريين (محمود سعيد، يوسف كامل، راغب عياد، عبد العزيز درويش) فنانين مصريين عالميين (صلاح عبد الكريم، حامد ندى، ناجي شاکر)	2	2	0	0
12	ما بعد الحداثة وأهم اتجاهاتها	2	2	0	0
13	مراجعة عامه	2	2	0	0
14	إختبارات الفصل الدراسي النهائية				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	5	10	10 %
2	امتحان 2 تحريري (أعمال سنة)	12	10	10 %
3	امتحان منتصف الفصل الدراسي	7	20	20 %
4	امتحان نهائي تحريري	14	40	40 %
5	تكليفات / تقارير	طوال الفصل	20	20 %

6- مصادر التعلم والتسهيلات المادية:

كتاب المقرر ويتم تسليمه للطلاب في بداية الفصل	المرجع الأساسي للمقرر (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
محمود خالد بشايرة ، التربية الفنية وتنمية التفكير-اتجاهات حديثه في التدريس، عالم الكتب الحديث 25 أبريل 2019	المراجع الأخرى	
https://ar.wikipedia.org/wiki http://www.du.edu.eg/ https://www.youtube.com/watch?=bnCua19ME	المصادر الالكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office	المنصة التعليمية (لابد من إضافة الرابط)	
قاعة محاضرات مجهزة	الأجهزة	التجهيزات التعليمية المساندة للتعليم والتعلم *
Data show, White board	المستلزمات	
Microsoft Teams	البرامج الالكترونية	
-----	معامل المهارات/ المحاكيات	
-----	المعامل الافتراضية	
-----	أخرى (تذكر)	

منسق البرنامج	منسق المقرر	
أ.د. أحمد عبدالغفار		الإسم
		التوقيع

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Analysis & Research Skills			
Course Code (according to the bylaw):	HUM 109			
Department/s that participated in the teaching:	<u>BASIC SCIENCE</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Tutorial	Other (specify)	Total
	<u>1</u>	<u>2</u>		<u>3</u>
Course Type:	Elective			
The level to which the course was introduced:	JUNIOR			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:				
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

To Introduce Analysis & Research Skills this include studying the framework for analyzing engineering problems considering technical, economic, environmental, and ethical issues. Phases of problem solving (Understanding the problem and formulating it, Solution plan, implementation plan, Evaluation, and Revision). Role of creativity in the analysis for different alternatives. SWOT (strengths, Weaknesses, Opportunities, and Threats) analysis for different alternatives. Cost – Benefit analysis and Risk analysis. Role

of cooperation and team – work in analyzing large engineering problems. Importance of finding the relevant data, information, and knowledge. Basics Web search methods and how to formulate search engine queries using logical connectives (e.g. AND, OR, NOT). Phrase, title, domain, URL, and link search. Evaluating search results, choosing the appropriate search engine. Importance of evaluating the credibility of the different web sites.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A6,A8, A9, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	LO1	Solving problems related to SWOT analysis, decision making, team work decision.
		LO2	Working in a team group.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	Describe the main concepts of basics Web search methods.
		LO4	Explain the main principle of Role of creativity in the analysis for different alternatives.
		LO5	Elucidate the main principal SWOT analysis for different alternatives.
		LO6	Clarify the main principal Cost – Benefit analysis and Risk analysis.
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	LO7	Evaluating search results, choosing the appropriate search engine.
		LO8	Assess issues of Phases of problem solving (Understanding the problem and formulating it, Solution plan, Implementation plan, Evaluation, and Revision).
A10	Acquire and apply new knowledge and practice self, lifelong and other learning strategies.	LO9	Design the problems of role of cooperation and team – work in analyzing large engineering problems.

		LO10	Perform and explain the gained knowledge orally.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√		√				√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Practical Lab /
1	Basics Web search methods Phrase, title, domain, URL, and link search.	3	1	2	0
2	How to formulate search engine queries using logical connectives (e.g. AND, OR, NOT).	3	1	2	0
3	Evaluating search results, choosing the appropriate search engine.	3	1	2	0
4	Importance of evaluating the credibility of the different web sites.	3	1	2	0
5	Framework for analyzing engineering problems considering technical, economic, environmental, and	3	1	2	0

	ethical issues.				
6	Phases of problem solving (Understanding the problem and formulating it, Solution plan, Implementation plan, Evaluation, and Revision).	3	1	2	0
7	Revision and Mid Exam				
8	Role of creativity in the analysis for different alternatives.	3	1	2	0
9	SWOT (strengths, Weaknesses, Opportunities, and Threats) analysis for different alternatives.	3	1	2	0
10	Cost – Benefit analysis and Risk analysis.	3	1	2	0
11	Role of cooperation and team – work in analyzing large engineering problems.	3	1	2	0
12	Importance of finding the relevant data, information, and knowledge	3	1	2	0
13	Revision	3	1	2	0
14	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10
2	Exam 2 written (Semester work)	11	10	10
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	presentation skills	9,10	10	10
6	Assignments	11	10	10

6- Learning Resources and Supportive Facilities *

Learning resources (books,	The main (essential) reference (must be written in full according to the	HTI; Available Hard copy . Available Presentation (handed to students' part by part)

scientific references, etc.) *	scientific documentation method)	
	Other References	1-G.R.Notess, Tesching Web Search Skills, information Today Inc., 2021. 2-D.Newnan, T.Eshenbach, and J.Lavelle, Engineering Economic Analysis, Oxford University Press, fourteenth edition, 2019. 3-Search skills for researchers “workshop”, Engineering economic analysis by Donald G. Newnan .et., al, 2018. 4-G.R.Notess, Tesching Web Search Skills, information Today Inc., 2021. 5-D.Newnan, T.Eshenbach, and J.Lavelle, Engineering Economic Analysis, Oxford University Press, fourteenth edition, 2019. 6-Murray, R. 2018: How to survive your viva. Maidenhead:Open University Press. 7-Rugg, G. & Petre, M. 2021: The unwritten rules of PhD research. Maidenhead:Open University Press. 8-Tinkler, P. & Jackson, C. 2021: The doctoral examination process: a handbook for students, examiners and supervisors. The Society for Research into Higher Education. Maidenhead:Open University Press.
	Electronic Sources (Links must be added)	http://www.scribd.com/anh_ch%C3%A2u_6/d/62390771-Change-Management-Best-Practice-Guide >
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Notebook and data show
	Supplies	data show equipped lecture room
	Electronic Programs	Microsoft power point

	Course Coordinator	Program Coordinator

Name		PROF. Ahmed Abd El-Gafar
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	French Language			
Course Code (according to the bylaw):	LNG 101			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>			<u>2</u>
Course Type:	Elective			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mai Abouzaid			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	<u>7/26/2025</u>			

2. Course Overview (Brief summary of scientific content):

An elementary French course. Drill in pronunciation, elementary principles of inflection and basic sentence patterns. Reading of easy texts. Review of grammatical patterns. Expansion of conversational and written skills and vocabulary.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A8,A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO1	Have a mix of skills in French Language.
		LO2	Study different grammatical Rules.
		LO3	Enhance students’ abilities in expressing themselves.
		LO4	Apply the principle of grammatical rules in their usage of French.
		LO5	Apply the four skills of language freely.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies..	LO6	Express themselves in French with confidence.
		LO7	Upgrade the capability of usage of the French language in various topics.
		LO8	Gain knowledge of general vocabulary that would help the students in various topics.
		LO9	Enhance the degree of awareness to participate professionally in their life.
		LO10	Work effectively in team of multi-disciplinary or multi-culture.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√		√				√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Lecon 1: La Meteo.	2	2	0	0
2	Lecon 2: Hier et avant heir.	2	2	0	0
3	Lecon 3: Lettre d'une illettree	2	2	0	0
4	Lecon 4: Le recit de vie	2	2	0	0
5	Lecon 5: Comment ecrivez-vous?	2	2	0	0
6	Lecon 6: Dis-moi la verite!	2	2	0	0
7	Revision and Mid Exam				
8	Lecon 7: Quelle bonne odeur!	2	2	0	0
9	Lecon 8: Va plus vite.	2	2	0	0
10	Supplementary Material and Quiz	2	2	0	0
11	Presentations	2	2	0	0
12	Supplementary materials and Quiz	2	2	0	0
13	Revision and Quiz	2	2	0	0
14	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	QUIZ 1 written (Semester work)	4	10	10%

2	QUIZ 2 written (Semester work)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15	40	40 %
5	Assignments (Report & Sheet)	10,12	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Available Presentation (handed to students' part by part).
	Other References	1-En Francais "; HTI; copie papier disponible.2021. 2-Presentation disponible (remis aux etudiants partie par partie).2022 3-Grammaire Francais en usage.2022 4-Vocabulaire Francais utilise.2022
	Electronic Sources (Links must be added)	https://www.ecpi.edu/blog/what-is-business-administration-all-about
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Teaching aids and computers.
	Skill Labs/ Simulators	
	Other (to be mentioned)	Notebook and data show equipped lecture room.

	Course Coordinator	Program Coordinator
Name	Dr. Mai Abouzaid	Prof. Ahmed Abd El-Gafar
Signature	<i>Mai Abouzaid</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	German Language			
Course Code (according to the bylaw):	LNG 102			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>			<u>2</u>
Course Type:	Elective			
The level to which the course was introduced:	JUNIOR			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Hoda Arafa			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

Beginner's course. Development of speaking ability and mastering of German basic structures. Reading and understanding of simple texts. Systematic discussion of grammatical difficulties. Oral practice and reading of more difficult texts. Practice in guided composition

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A8, A9, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A8	Enhance and Develop the students' abilities and awareness for appropriate analysis and interpretation to all the scientific topics written in German words.	LO1	Have a mix of skills in German Language.
		LO2	Mastering basic German sentence structure, verb conjugations, articles, and essential vocabulary for every day communication.
		LO3	Enhance students' abilities in expressing themselves
		LO4	Comprehending longer conversations and texts on familiar topics.
A9	Communicate effectively, verbally and in writing with a range of audiences.	LO5	Apply the four skills of language freely.
		LO6	Develop communicative competence, encompassing listening, speaking, reading and writing skills.
A10	Acquire and apply new knowledge and practice through German language.	LO7	Writing clear, coherent and well-structured essays, reports, and academic papers.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction									Information Technology- Assisted Learning				
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√		√				√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Abschnitt 1: Der Artikel, die Konjugation der Verben.	2	2	0	---
2	Abschnitt 1: Übungen, die Personal-pronomen, Negation, Alltagssituationen	2	2	0	---
3	Abschnitt 2: Der Unterricht, das Nomen, der Akkusativ, das Verb "haben"	2	2	0	---
4	Abschnitt 2: Übungen, die Fragepronomen "Wer, Wen, Was", Alltagssituationen	2	2	0	---
5	Quiz	2	2	0	---
6	Abschnitt 3: Die Zahlen, die Zeit	2	2	0	---
7	Midterm Exam.				
8	Abschnitt 4 : Eine Reise, starke Verben, trennbare und untrennbare Verben	2	2	0	---
9	Abschnitt 4 : Übungen, Wortstellung, Präpositionen, Alltagssituationen	2	2	0	---
10	Abschnitt 5 : Ein Freund kommt, der Dativ ,Verben mit dem Dativ und dem Akkusativ	2	2	0	---
11	Abschnitt 5 : Übungen, die Possessivpronomen	2	2	0	---
12	Zusätzliche Material und Quiz	2	2	0	---
13	Projekt	2	2	0	---
14	Wiederholung und Quiz	2	2	0	---
15	Final Exam.				

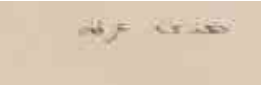
5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	QUIZ 1 written (Semester work)	3	10	10%
2	QUIZ 2 written (Semester work)	9	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15	40	40 %
7	Assignments (Report & Sheet)	12	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Heinz Griesbach-Dora Schulz Deutsche Sprachlehre für Ausländer, 1995
	Other References	1- Friederike Jin & Ute Voß Grammatik aktiv- Deutsch als Fremdsprache 2. Aktualisierte Ausgabe, Aug. 2024 2- PONS Verben & Zeiten Trainieren Deutsch als Fremdsprache, Jan. 2020 3- Stephan Lübke Deutsche Grammatik in kleinen Schritten, Jun 2020 4- Julia Brodt Ein Semester in Hamburg: Roman – Deutsch lernen mit Geschichten über das Leben in Deutschland, Dec. 2024
	Electronic Sources (Links must be added)	Deutsche Welle (DW)
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Teaching aids and computers.
	Skill Labs/ Simulators	Lab Rroom
	Other (to be mentioned)	Notebook and data show equipped lecture room.

	Course Coordinator	Program Coordinator
Name		Prof. Ahmed Abd El-Gafar

Signature	Dr. Hoda Arafa.	
		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Engineering Economics			
Course Code (according to the bylaw):	MNG 102			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1	--	3
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Muhammad Tayssir			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Introduction to Economy: Basic Concepts, Varieties of Market Structure, The Law of Supply and Demand, Elasticity, Different Types of Economy, Accounting Income and Cash Flow, The Objectives of the Firms, Balance Sheet (BS). Introduction To Engineering Economy: Engineering Decision Making, Break - Even Analysis, Production Function, Payback Period Method, Payback Period Method. Time Value of Money: Simple Interest Rate, Compound Interest, Discreet cash flow and Economic Equivalence, Evaluating of the Projects (Present Worth, Annual worth, and Capitalized Cost), Nominal and Effective Interest Rate. Rate - Of Return ROR Computations: Rate of Return calculations using A Present worth PW, Rate of Return Calculation by Using Annual worth EAW, Rate of Return Evaluation for Multiple Alternatives. Depreciation Models: Nature of Depreciation,

Depreciation Conventional Methods, Methods Based on Asset Usage, Switching Between Depreciation Models.

3. Course Learning Outcomes CLOs:

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A2		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Identify concepts of cost and revenue in engineering economic decisions.
		LO2	Explain the concept and purpose of breakeven analysis in evaluating economic viability.
		LO3	Classify cost elements as fixed or variable and justify the classification within project scenarios.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO4	Apply breakeven analysis techniques to assess company profitability in realistic business cases.
		LO5	Analyze project data to evaluate profitability and identify potential financial risks.
		LO6	Apply nominal and effective interest rate formulas to solve engineering economic problems in case studies.
		LO7	Design a proposed project by identifying its cost elements and assessing its economic feasibility.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓			✓	✓	✓								✓

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction	3	2	1	
2	Description and Role in Decision Making	3	2	1	
3	Simple Interest	3	2	1	
4	Cost Concepts and Behavior	3	2	1	
5	Cost Concepts and Behavior	3	2	1	
6	Life-Cycle Product Costing and Pricing	3	2	1	
7	Revision and Mid Exam				
8	Introduction to Use Spreadsheet	3	2	1	
9	Factors: How Time and Interest Affect Money	3	2	1	
10	PW, FW, EUAS / EUAC	3	2	1	
11	Net present value, rate of interest	3	2	1	
12	Payback period, benefit.	3	2	1	

13	Choosing among alternatives	3	2	1	
14	Introduction to Use Spreadsheet	3	2	1	
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	4	10	10 %
2	Exam 2 written (Semester work or quiz)	6	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Project /Portfolio/ Logbook	10,12	20	20 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Engineering economy, le and blank, P.E Anthony, seventh edition,2018 build by Mc Grain
	Other References	• Engineering economy analysis, 9th edition, Donald G newman and Ted G., 2004 published by oxford university, press, Inc. • Jose A. Sepulveda, William E. Souder & Byron S. Gottfried, "Engineering Economics" ,Mc-Graw-Hill Book Company, NW,1984. • H. G. Thuesen, W. J. Fabrycky & G. J. Thuesen, "Engineering Economy", Prentice-Hall,Inc., NJ, 1971. • E. Paul DeGarmo, William G. Sullivan & James A. Bontadelli, "Engineering Economy", Macmillan publishing company,Nw,1990.
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
	Devices/Instruments	Data Show

Supportive facilities & equipment for teaching and learning *	Supplies	N/A
	Electronic Programs	MS-Teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Muhammad Tayssir	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Polymer Chemistry (2)			
Course Code (according to the bylaw):	CHM150			
Department/s that participated in the teaching:	Chemical Engineering Department			
Total number of credit hours of the course: (according to the bylaw) : 3 credit hrs.	Theoretical	Practical	Tutorial	Total
	2	--	2	4
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass. Prof. Soad Abdel Aziz El Metwally			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Properties of polymer solution, viscosity changes, molecular weight of polymers, kinetics of polymerization reaction, molecular properties of polymers, sedimentation of polymer solutions, optical properties of polymer solutions, techniques of determination of different types of molecular weight of polymers, introduction to polymer engineering.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A5, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics	LO1	Calculate the solubility and the molecular weight of polymers using different technics
		LO2	Determine the kinetic parameters of polymerization reactions, mechanical properties of polymers, sedimentation of polymer solutions, and optical properties of polymer solutions
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO3	Analyse the experimental data for polymer molecular weight determination via viscometry, and osmotic pressure
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO4	Recognize recent developments in molecular weight characterization and their impact on polymer performance.
		LO5	Identify modern methods used to study rheological/mechanical properties of polymer solutions.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial	Brain Storming	PPT and Movies	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√	√		√	√				√					

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	Practical Lab /	
1	Introduction to Polymer Engineering and Types of Reaction	4	2	2	--	--
2	Solubility of polymers, solution behavior, solubility parameters.	4	2	2	--	--
3	Molecular mass distribution	4	2	2	--	--
4	Determination of molar mass from colligative Properties measurements (Boiling point , freezing point)	4	2	2	--	--
5	Determination of molar mass from colligative Properties measurements (Osmatic Pressure)	4	2	2	--	--
6	Determination of molar mass from colligative Properties measurements (Vapor Pressure)	4	2	2	--	--
7	Revision and Midterm Exam					
8	Determination of molar by light scattering	4	2	2	--	--
9	Introduction of polymer solutions Rheology	4	2	2	--	--

10	Viscosity of polymer Solutions Optical properties of polymer solutions.	4	2	2	--	--
11	Gel Permeation Chromatography	4	2	2	--	--
12	Sedimentation of polymer solutions.	4	2	2	--	--
13	Turbidity of polymer solutions	4	2	2	--	--
14	kinetics of polymerization reactions	4	2	2	--	--
15,16	Final Exam.					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	10	10 %
2	Exam 2 written (Semester work)	10	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Tutorial and report assessment Presentation / Poster design (Semester Work)	Weekly	20	20 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• Billmeyer, F. W., "Textbook of Polymer Science", J.Wiley, NY, 2000 (7238) • Malcolm P. Stevens, Polymer Chemistry: An Introduction, Oxford University Press, 3rd. Ed.,1999 • Drummond Spinhirne , Polymer science and technology: fundamentals and Applications, intelliz press, USA, 2024 (16914) • Sebastian Koltzenburg, Michael Maskos, Oskar Nuyken "Polymer Chemistry",

		Second Edition, Springer-Verlag GmbH Germany, 2023 S.P. Mohanty, "Experiments in Polymer Chemistry", 2017, Campus Books International (16657)
	Other References	- J.M.G. Cowie, Polymers: Chemistry & Physics of Modern Materials, CRC Press, 2007 - Charles E. Carraher Jr., "Carraher's Polymer Chemistry", 10th Edition, CRC Press, 2017 *
	Electronic Sources (Links must be added)	--
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	Library Usage

*recommended

	Course Coordinator	Program Coordinator
Name	Ass Prof / Soad Abdel Aziz El Metwally	Dr. Noha Fawzy M. El Husseiny
Signature	<i>Soad Abd El. aziz</i>	<i>Noha ElHosseiny</i>

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Field Training (2)			
Course Code (according to the bylaw):	FTR 161			
Department/s that participated in the teaching:	Chemical Engineering Department			
Total number of credit hours of the course: (according to the bylaw): 3 credit hrs.	Theoretical	Practical	Other (specify)	Total
	--	18	--	18
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Selem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Special training on chemical industries such as rubber, corrosion and food industries. Application of unit operations and unit processes in chemical industrials or in laboratories or research institutes.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A5, A6, A8, A10, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO1	Identify the practical applications of unit operations and processes in selected chemical industries (e.g., rubber, corrosion, food).
A6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	LO2	Discuss the observations related to the operational procedures and safety measures in laboratories or industrial training sites.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	Gain the skill of writing preparation of technical reports
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Document technical findings and learning outcomes from the training in a structured scientific report.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO5	Recognize modern technologies used in chemical production or testing within the assigned industr

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
	√	√			√	√	√	√	√	√	√			√	√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	Practical/ Lab	
As scheduled	Overview of Chemical Industries: - Introduction to industrial sectors (rubber, corrosion, food, etc.) - Industrial workflows and main equipment	18	---	---	18	-
	Chemical Industry (Rubber/Food/Corrosion,...etc) Training related to Rubber/Polymer/plastic Industry: - Raw materials and types of rubber/polymer (natural/synthetic) - Polymerization/Vulcanization process and additives - Quality control in rubber production Training related to Corrosion Technology: - Types and causes of corrosion	18	---	---	18	---

	- Corrosion testing methods - Protection techniques (coatings, inhibitors, cathodic protection) Training related to: Food Processing Industry: - Unit operations in food manufacturing (drying, mixing, heat transfer) - Quality assurance in food production - Safety standards and hygiene in food plants					
	Application of Unit Operations - Practical observation of distillation, filtration, drying, mixing, etc.	18	---	---	18	---
	Application of Unit Operations - Equipment handling and process control basics	18	---	---	18	---
	Midterm Report and Oral Exam					
	Industrial Laboratory Techniques - Sampling and analysis	18	---	---	18	---
	Industrial Laboratory Techniques - Instrumental methods (e.g., pH meter, viscometer, spectrophotometer) Introduction to Process Simulation (optional) - Overview of simulation software used in industry (e.g., Aspen Plus)	18	---	---	18	---
	Introduction to Process Simulation (optional) Overview of simulation software used in industry (e.g., Aspen Plus) Technical Reporting & Documentation - How to write a training report - Presentation of industrial findings	18	---	---	18	---
	Final Report and Oral Exam					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Attendance	1-7	10	10%
2	Follow up/presentation/ report preparation/team participation	1-7	20	20%
3	Midterm Report	5	20	20 %
4	Final Report	8	20	20 %
5	Final Oral Exam	9	30	30%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Depending on the Chemical Engineering Training field/ Industry/Technology/ Application, For a technical writing scientific report, all library references appropriate to the field training are available in the different libraries on campus/online
	Other References	-
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	-
	Supplies	-
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha Fawzy El Hussein
Signature	Nora yehia	Noha El Hussein

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Petrochemical Industries			
Course Code (according to the bylaw):	CHM 203			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3 credit hours	Theoretical	Practical (Lab)	TUTORIAL	Total
	2	--	2	4
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof / Maha Hassan Abd-El-Kreem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Various chemicals produced from petroleum including paraffin's, aromatics & cyclo-paraffines.
Thermal & catalytic cracking for the production of olefins & other unsaturated compounds.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3, A10, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO1	Outline process design considerations for the industrial production of petrochemicals, focusing on cost-effectiveness and sustainability.
		LO2	Classify raw materials used in petrochemical industries according to their origin and application.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO3	Apply newly acquired knowledge to suggest a process flowsheet for a petrochemical production route.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer	LO4	Analyze recent technological advancements in petrochemical production and their industrial applications.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓					✓	✓		✓	✓					

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Theoretical teaching (lectures)
				Tutorial	Practical Lab /	
1	Introduction: the different types of petrochemicals and raw material used for production of petrochemicals.	4	2	2	--	--
2	Natural gas as primary raw material for petrochemical industries	4	2	2	--	--
3	Crude oil as primary raw material for petrochemical industries	4	2	2	--	--
4	Hydrocarbons as secondary raw material for petrochemical industries	4	2	2	--	--
5	Industrial production of methanol from syngas, flow sheets and process explanation	4	2	2	--	--
6	Industrial production of formaldehyde from methanol	4	2	2	--	--
7	Revision and Mid Exam					

8	Industrial production of phenol, with flow sheets and process explanation	4	2	2	--	--
9	Industrial production of cumene, with flow sheets and process explanation	4	2	2	--	--
10	Industrial production of styrene, flow sheets and process explanation	4	2	2	--	--
11	Industrial production of acetylene, with Flow sheets and explanation.	4	2	2	--	--
12	Fischer-Tropsch process	4	2	2	--	--
13	Industrial production of ethylbenzene, flow sheets and process description	4	2	2	--	--
14	Industrial production of MTBE, flow sheets and process explanation	4	2	2	--	--
15,16	Final Exam.					

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10%
2	Exam 2 written (Semester work)	12	20	20%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Tutorial/Report assessment/Presentation	Weekly	10	10%

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Uttam Ray Chaudhur, Fundamentals of Petroleum and Petrochemical Engineering, CRC Press, 2011 - G.N.SARKAR, Advanced Petrochemicals, KHANNA PUB., Delhi, 2002 (10800) P. Belov, "Fundamentals of Petroleum Chemicals Technology", Mir Publishers, Moscow ,1970. - M.Gerding, "Fundamentals of Petroleum ", Tulsa, USA ,1986. (1441) - Alain Chauvel, Gilles Lefebvre," Petrochemical Processes", Editions Technip, 1989.(1692) - J.Worstell, "Scaling Chemical Processes: Practical Guides in Chemical Engineering".2016. (16664)
	Other References	Bajus, Martin. Petrochemistry: Petrochemical Processing, Hydrocarbon Technology and Green Engineering. John Wiley & Sons, 2020.
	Electronic Sources (Links must be added)	--
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	-
	Skill Labs/ Simulators	--
	Virtual Labs	-
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Prof / Maha Hassan Ahmed Abd El Kreem	Dr. Noha Fawzy M. El Hussein
Signature	Maha Abdelkreem	Noha ElHoseny

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Computer Applications in Chem. Eng.			
Course Code (according to the bylaw):	CHM 210			
Department/s that participated in the teaching:	Chemical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other	Total
	1	2	-	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Selem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Computer Simulation- Programming and Computer languages- Programming of simple chemical engineering applications – Using of simulator packages (MATLAB) in chemical engineering problem solving.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A10, B2, B3)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Solve numerical chemical engineering problems using computer programs (ex. MATLAB, Excel...etc.).
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO2	Employ different computer simulation languages to chemical engineering case studies/workshops
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO3	Demonstrate proficiency in the fundamentals of computer simulation languages (ex. MATLAB, Excel...etc.). in solving chemical engineering problems and /or plotting data
B3	Apply numerical modelling methods and/or computational techniques appropriate to chemical engineering.	LO4	Solve simultaneous linear and/or non-linear algebraic equations computer simulation languages (ex. MATLAB, Excel...etc.).
		LO5	Apply computer simulation programs (ex. MATLAB, Excel...etc.). numerical functions in solving problems of chemical engineering such as mass balances (with and without recycle), fluid mechanics, thermodynamics and kinetics.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√	√	√	√					√		√		√	√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	/ Practical Lab	
1	Course introduction (course objectives, LOs, ... etc.) Introduction to MATLAB (software layout, basics, ...etc.)	3	1	-	2	
2	Introduction to MATLAB (software layout, basics, ...etc.)	3	1	-	2	
3	Matrix operations in Matlab Polynomial operations Function handle	3	1	-	2	
4	Numerical Solution of a system of Linear Algebraic Equations using different numerical methods with examples.	3	1	-	2	
5	Solution of a system of linear algebraic equations with chemical engineering examples using MATLAB	3	1	-	2	
6	Plotting in MATLAB	3	1	-	2	

7	Revision and Mid Exam					
8	m-files and user-defined function	3	1	-	2	
9	Solution of one and a set of Non-linear Algebraic Equations (Newton's methods and may be others)	3	1	-	2	
10	Solution of one and a set of Non-linear Algebraic Equations (Newton's methods and may be others)	3	1	-	2	
11	Introduction to Excel program ((software layout, basics, ...etc.)	3	1	-	2	
12	Solving chemical engineering examples using the Excel program	3	1	-	2	
13	Solving problems covering different topics	3	1	-	2	
14	Case studies	3	1	-	2	
15,16	Final Exam.					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Classwork (Semester work)	1-14	20	20%
2	Workshops/Case studies (Semester work)	1-14	20	20%
3	Midterm Exam	7	30	30 %
4	Final practical Exam	15, 16	30	30 %

6- Learning Resources and Supportive Facilities

Learning resources (books, scientific references,	The main (essential) reference (must be written in full according to the scientific documentation method)	B. A. Finlayson," Introduction to Chemical Engineering Computing", 2006. - V.S.Korada, “chemical process

etc.) *		modelling and computer simulation”, PHI Learning Private, 2017.
		M.M.MARTIN, “Introduction to software for chemical engineers”, CRC PRESS, 2020.
	Other References	- Pradeep Ahuja, "Introduction to Numerical Methods for Chemical Engineering", 2019. - Kenneth J. Beers, "Numerical Methods for Chemical Engineering: Applications in MATLAB", 1st Edition, 2007. C. Moler, J. Little,” A history of MATLAB”, 2020, https://doi.org/10.1145/3386331 - Akan, Aydin, and Luis F. Chaparro. Signals and systems using Signals and systems using MATLAB, Elsevier, 2024. ISBN: 0443157103,9780443157103
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer laboratory
	Supplies	-
	Electronic Programs	MATLAB, Excel
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha Fawzy El Hussein
Signature	Nora yehia	Noha El Hussein

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Organic Chemical Technology			
Course Code (according to the bylaw):	CHM 211			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2 credit hrs.	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	2	--	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Noha Fawzy Mohamed El Husseiny			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Polymer blending, crushing and processing, method of polymer processing, recycling, effect of processing condition on polymer properties, processing using molds, extrusion, thermoforming.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics	LO1	Identify key chemical reactions involved in industrial organic chemical processes.
		LO2	Evaluate the influence of thermodynamic and kinetic parameters on the efficiency and feasibility of organic compounds production
A4	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	LO3	Design basic production schemes for selected organic compounds considering efficiency, cost, and environmental impact."
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO5	Develop flow diagrams for organic production processes using recent technological approaches
		LO6	Evaluate recent and emerging technologies used in the production of organic compounds

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology- Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√			√		√	√								

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/ Projects/ ...)
				Tutorial	Practical / Lab	
1	Unit processes in organic technology	3	2	1	--	--
2	Unit processes in organic technology	3	2	1	--	--
3	Nitration and factors affecting process	3	2	1	--	--
4	Nitration and factors affecting process	3	2	1	--	--
5	Nitration process	3	2	1	--	--
6	Nitration process	3	2	1	--	--

7	Revision and Mid Exam					
8	Sulfonation process	3	2	1	--	--
9	Sulfonation process	3	2	1	--	--
10	Halogenation process	3	2	1	--	--
11	Halogenation process	3	2	1	--	--
12	Oxidation process	3	2	1	--	--
13	Oxidation process	3	2	1	--	--
14	Oxidation process	3	2	1	--	--
15,16	Final Exam.					

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	10	10%
2	Exam 2 written (Semester work)	10	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Tutorial and presentation	Weekly	10	10%
6	Assignments/Reports/Participation/case study (semester work)	Weekly	10	10%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- R.H.Grubbs, Organic Chemistry Theory Reactivity and Mechanisms in Modern Synthesis, Wiley-VCH , Germa y, 2019 (16776) - Vikas Zaveri , Atext Book of Chemical Engineering Vol.II, ed- tech press, UK, 2022 (16913) P. H.Groggins, " Unit Processes in Organic Synthesis ", Fifth edition, Mc Graw Hill, 1995. H. A. Wittcoff, B. G. Reuben, J. S. Plotkin, Industrial Organic Chemicals, 3rd edition, John Wiley & Sons, 2013 - Speight, J. G., Chemical and Process Design Handbook, MCGRAW-HILL,2002
	Other References	--
	Electronic Sources (Links must be added)	--
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	--
	Supplies	Essential supplies
	Electronic Programs	-
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	--

	Course Coordinator	Program Coordinator
Name	Noha Fawzy M. El Hussein y	Dr. Noha Fawzy M. El Hussein y
Signature		

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Heat Transfer (2)			
Course Code (according to the bylaw):	CHM 212			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	2	--	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	El Shimaa M. El Zahed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Applications of heat transfer to the design of heat exchangers & other heat transfer equipment (including evaporators). Simultaneous mass & heat transfer, humidification, water-cooling & air conditioning.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, B1, B4)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	design in generalDeterm requirements of heat transfer equipment .
		LO2	Estimate the overall heat transfer coefficient, pressure drop, fouling factor and the effectiveness of a heat exchanger.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO3	Design heat exchangers effectively and economically, while understanding the underlying theory and principles of different configurations, and considering sustainability and broader engineering contexts.
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design.	LO4	Investigate the effect of different heat exchanger geometries the heat transfer

B4	Adopt suitable national and international standards and codes to: design, operate, inspect and maintain chemical engineering systems.	LO5	Apply appropriate national and international standards to the design and evaluation of heat transfer equipment.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√		√		√	√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Types of Heat Exchanger	3	2	1	-
2	Types of Heat Exchanger	3	2	1	-
3	Routing of process fluids in heat exchangers.	3	2	1	-
4	Empirical Forced Convection Correlations	3	2	1	-
5	Design of double pipe H.E and shell and tube H.E (physical Properties)	3	2	1	-

6	Fouling factor	3	2	1	-
7	Revision and Mid Exam				
8	Application of Fouling factor	3	2	1	-
9	Calculations of Pressure drop in pipes and annuli	3	2	1	-
10	Application of Pressure drop and Fouling factor	3	2	1	-
11	Design of double pipe H.E and shell and tube H.E (Calculation of Viscosity correction factor)	3	2	1	-
12	Application of Heat Exchanger design (Kern method)	3	2	1	-
13	Application of Heat Exchanger design lab	3	2	-	1
14	Condensation of a Single Component and Application of Condenser in Lab	3	2	-	1
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Various heat Exchanger visualization trainer
2	The condensation process training system

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10 %
2	Midterm exam	7	20	20 %
3	Exam 2 written (Semester work)	11	10	10 %
4	Project, Presentation, Discussion	12,13	20	20 %
5	Final Written Exam	15, 16	40	40

6. Learning Resources and Supportive Facilities:

Learning	The main (essential) reference	• Lewis Allison," Chemical Engineering:

resources (books, scientific references, etc.) *	(must be written in full according to the scientific documentation method)	Operations and Applications",2023 (16902) • F.Kreith, "Principles of Heat Transfer", United state of American, 2018. (16675)
	Other References	• D.Q.Kern , "Process Heat Transfer", International Student Edition, 1965. • <u>Kuppan Thulukkanam, "Heat Exchanger Design HandBook ", second edition, Taylor & Francis ,2013</u> • <u>Holman J.P,"Heat Transfer" MC Graw Hill,2009.</u> • <u>Ramesh K.shah and Dusan P.sekulic "Fundamentals of Heat Exchanger Design", John Wiley & Sons, Inc., Hoboken, New Jersey,2002.</u>
	Electronic Sources (Links must be added)	• https://0810exuy8-1105-y-https-onlinelibrary-wiley-com.mplbci.ekb.eg/doi/10.1002/9781119364825.ch5 • Heat Exchanger Design Handbook
	Learning Platforms (Links must be added)	EKB https://www.ekb.eg/web/guest/home - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	Heat Transfer Lab
	Virtual Labs	--
	Other (to be mentioned)	--

	Course Coordinator	Program Coordinator
Name	El Shimaa M. El Zahed	Dr. Noha Fawzy El Hussein
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Mass Transfer (1)			
Course Code (according to the bylaw):	CHM 213			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2 credit hours	Theoretical (Lecture)	Practical (Lab.)	Other (Tutorial)	Total
	2	-	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Noha Fawzy El Hussein			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the course approval.			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Diffusion and Inter-phase, Staged and Differential contacting schemes gas absorption, liquid extraction, distillation, membrane processes, adsorption, hydrodynamics of staged and differential contact equipment.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, B1)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Describe the mechanisms of mass transfer including Fick's law, types of diffusion, diffusivity, and mass transfer in multi-component mixtures under steady-state conditions, both molecular and convective.
		LO2	Illustrate the principles of equilibrium relations and convective mass transfer theories (film, penetration, surface renewal) between two phases.
		LO3	Determine mass transfer rates, diffusivity, and mass transfer coefficients in two-phase systems using appropriate empirical correlations and available data.
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design	LO4	Apply fundamental engineering principles to perform calculations for sizing Absorption trays and/or packed towers
		LO5	Utilize mass transfer theories and engineering principles to design, operate, and maintain gas-liquid separation equipment, including absorption and desorption units, effectively

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology- Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓				✓	✓	✓			✓				✓	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/ Projects/ ...)
				Tutorial	Practical / Lab	
1	Introduction to mass transfer – mass transfer operations – Diffusion (types and mechanisms).	3	2	1	--	Presentation #1: “Types of mass transfer operations” (3 hours)
2	Prediction of diffusivity in gases/liquid/solids and mixtures properties	3	2	1	--	--
3	Equimolar and Unidirectional - diffusion laws and derivation	3	2	1	--	Assignment #1 (2 hrs)
4	Equimolar diffusion - Unidirectional diffusion problem solving	3	2	1	--	--
5	Mass Transfer between two phases and introduction to Convective mass transfer.	3	2	1	--	Assignment #2 (2 hrs)
6	Mass transfer theories (film theory, penetration theories)	3	2	1	--	--

7	Revision and Mid Exam					
8	Estimation of mass transfer coefficients from dimensional analysis	3	2	1	--	Presentation # 2 (topics as self-learning and presentation skills – 2 hrs)
9	Controlling phase (liquid phase controlling, gas phase controlling) – How to increase/decrease the rate of mass transfer – applications and problems solving.	3	2	1	--	
10	Types of contact in mass transfer (single – cross current and countercurrent)	3	2	1	--	Take-home exam (90 min)
11	Different types of contact principles design, Murphree and overall efficiencies.	3	2	1	--	Problem Solving – 2 hrs
12	Multi stage counter current contact, Absorption, factors affecting mass transfer, factors affecting absorption, absorption equipment, plate column design and introduction to packed towers.	3	2	1	--	Assignment #3 (4 hrs)
13	Factors affecting absorption, absorption equipment, plate column design and introduction to packed towers.	3	2	1	--	
14	Plate to plate calculation , plate column design and introduction to packed towers	3	2	1	--	Practice design problems-extra sheets (5 hrs)
15,16	Final Exam.					

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	10	10%
2	Exam 2 written (Semester work)	10	10	10%
3	Exam 3 written (Semester work)	13	10	10%

4	Midterm exam	7	20	20%
5	Final Written Exam	15, 16	40	40%
6	Assignments / Workshop/class activity	3,5,10,11,12	5	5%
7	Presentations (topics for self-learning) / discussion and participation	2, 7	5	5%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Christie John Geankoplis, A. Allen Hersel Daniel H. Lepek, " Transport Processes and Separation Process Principles", 5th edition, Pearson, 2018. - Raj Chhabra V. Shankar, Coulson and Richardson's Chemical Engineering Volume 1B: Heat and Mass Transfer: Fundamentals and Applications, 7th edition, 2018 - A.M.Lane , Separation Process Essentials, CRC Press, NY, 2020 (16779) - R.C.Sachdeva, Fundamentals of Engineering Heat And Mass Transfer, New Age Techno Press, India, 2017 (16659) - Robert E. Treybal " <u>Mass Transfer Operations</u>", 2nd edition , Mc Graw Hill , Newyork , 1978.
	Other References	- Jaime Benitez,"Principles and Applications of Mass Transfer: The Design of Separation Processes for Chemical and Biochemical Engineering", 4th Edition, John Wiley & Sons, Dec 2022 - Ismail Tosun, "Fundamental Mass Transfer Concepts in Engineering Applications", CRC Press, 2019 (16783)
	Electronic Sources (Links must be added)	--
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	--

learning *	Virtual Labs	--
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Dr. Noha Fawzy M. El Hussein	Dr. Noha Fawzy M. El Hussein
Signature	Noha ElHoseiny	Noha ElHoseiny

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Special Analytical Methods			
Course Code (according to the bylaw):	CHM 214			
Department/s that participated in the teaching:	Chemical Engineering Department			
Total number of credit hours of the course: (according to the bylaw): 3 credit hrs.	Theoretical	Practical	Tutorial	Total
	2	2	0	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass Prof / Soad Abdel Aziz El Metwally			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Atomic & molecular spectrum. Electro analytical methods. Chromatographic methods (gas, liquid & chromatography.) & their applications. NMR.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics	LO1	Determine key parameters of organic compounds using appropriate analytical methods.
		LO2	Interpret structural information of organic compounds based on spectroscopic method of analysis
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions	LO3	Conduct chromatographic experiments to separate components and evaluate physical parameters relevant to industrial chemical processes.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer	LO4	Explore emerging analytical methods used to address industrial and environmental needs

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Practical	Brain Storming	PPT and Movies	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√	√				√			√					

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	Practical / Lab	
1	- General methods of organic compounds. Purification. - Determination of the molecular formula of a compound.	4	2	--	2	
2	Chromatography	4	2	--	2	
3	Chromatography	4	2	--	2	
4	Chromatography	4	2	--	2	
5	UV spectroscopy	4	2	--	2	
6	UV spectroscopy	4	2	--	2	
7	Revision and Mid Exam					

8	Atomic absorption - UV spectroscopy	4	2	--	2	
9	IR spectroscopy	4	2	--	2	
10	IR spectroscopy	4	2	--	2	
11	NMR spectroscopy	4	2	--	2	
12	NMR spectroscopy	4	2	--	2	
13	NMR spectroscopy	4	2	--	2	
14	Electro analytical methods	4	2	--	2	
15,16	Final Exam.					

Experimental Topics

Serial	Experiment
1	Lab. Instruction
2	Purification of organic compound by crystallization.
3	Separation of mixture components using paper chromatography-Part (1)
4	Separation of mixture components using paper chromatography-Part (2)
5	Preparation of deionized water – Part (1)
6	Preparation of deionized water – Part (2)
7	Separation of mixture components using column chromatography – Part (1)
8	Separation of mixture components using column chromatography – Part (2)
9	Choice of suitable eluent of certain mixture to be fine separated
10	Follow up of the reaction using TLC.
11	Determination of λ_{max} of a compound .
12	Determination of unknown concentration of a compound by Calibration curve
13	Stoichiometric Titration – Part (1) – solution preparation
14	Stoichiometric Titration – Part (2)

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10 %
2	Exam 2 written (Semester work)	10	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Lab. Assessment	1-14	15	15 %
6	Reports/Participation	9	5	5%

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Donald. Pavia, Gary M. Lampman, George S. Kriz, James R. Vyan, Introduction to Spectroscopy, 5th edition, Cengage Learning, 2013. O. D. Txagi, M. yadav, Text Book of Spectroscopy, Khanna Pub, Delhi, 2001 (10807) - D.N. Sathyanarayan, Introduction to Magnetic Resonance Spectroscopy ESR, NMR, NQR, 3rd edition, I.K. International Pvt. Ltd., New Delhi, 2020
	Other References	Pradeep Prata Singh, Ambika Singh, Organic Spectroscopy, Viva Book's Private limited, New Delhi, June 2018
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show-Lab Top - Lab instruments – Glassware (pipette, burette, flasks, beakers, etc.) TLC sheets – Materials and chemicals required for experimental work (Silica gel powder- Filter paper - UV lamp)

	Supplies	Essential Supplies
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	Chemicals, indicators and materials necessary for different experiments

	Course Coordinator	Program Coordinator
Name	Ass. Prof. Soad Abd El.aziz El Metwally	Dr. Noha Fawzy M. El Hussein
Signature		

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

مبادئ التفاوض				اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 204				كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية				القسم/الأقسام العلمية التي شاركت في التدريس:
إجمالي	أخرى (تحدد)	عملي	نظري	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
2			2	
اختياري				نوع المقرر:
SENIOR 2				المستوى الدراسي الذي قدم فيه المقرر:
البرامج الهندسية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
د/ سلوى محمد عبد المحسن				اسم منسق المقرر:
مجلس القسم العلمي للبرنامج				جهة مناقشة واعتماد تقرير المقرر:
7/26/2025				تاريخ اعتماد تقرير المقرر:

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

يهدف المقرر إلى تزويد الطالب بالمعرفة الحديثة حول مفهوم وطبيعة المبادئ وخصائص التفاوض الفعال، وكذلك استراتيجياته وتكتيكاته المختلفة، وتنمية مهارات الطالب الخاصة بالإعداد الجيد للتفاوض وممارسته في المجالات المختلفة في منظمات المعاصرة. ويتناول المقرر الموضوعات التالية: مفهوم وخصائص ومبادئ التفاوض – الطبيعة الديناميكية للتفاوض – العلاقات الاعتمادية – أخلاقيات التفاوض – الجوانب النفسية والاجتماعية للتفاوض الجيد – التفاوض التعاوني والتفاوض التنافسي – الإعداد الجيد للتفاوض – استراتيجيات وتكتيكات التفاوض – الجوانب التنظيمية للجلسة التفاوضية – النفوذ والتأثير في التفاوض – استخدام الأسئلة والرد علي الاعتراضات – التعامل مع المواقف الصعبة وحالات فشل التفاوض – أفضل الممارسات في التفاوض (حالات عملية).

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		(A3,A4,A5,A7,A8)	
الكود	النص	الكود	النص
A3	LO1 يفهم أهمية التفاوض	A3	تطبيق عمليات التصميم الهندسي لانتاج حلول فعالة من حيث التكلفة تلبي الاحتياجات المحددة مع مراعات الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والأخلاقية وغيرها من الجوانب حسب الاقتضاء للانضباط وضمن مبادئ وسياقات التصميم والتنمية المستدامين.
	LO2 يتعرف على مبادئ واسس التفاوض		
	LO3 اكتساب مهارات الحوار والنقاش البناء		
A4	LO4 اكتساب مهارات المعرفة من خلال الانترنت	A4	الاستفادة من التقنيات المعاصرة وقواعد الممارسة والمعايير وإرشادات الجودة ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر.
	LO5 اكتساب مهارات التواصل الجيد مع الآخرين		
	LO6 اكتساب مهارات العمل مع فريق		
	LO7 التعاون والتعامل مع الآخرين		
A5	LO8 اكتساب مهارات التواصل الجيد مع الآخرين	A5	ممارسة تقنيات البحث وطرق التحقيق كجزء متأصل من التعلم.
A7	LO9 القدرة علي قيادة المهنيين والعمل كفريق لانجاز المهام العملية	A7	العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعددة الثقافات.
A8	LO10 القدرة علي قيادة المهنيين والعمل كفريق لانجاز المهام العملية	A8	التواصل الفعال -بيانياً ولفظياً وخطياً - مع مجموعة من الجماهير باستخدام الأدوات المعاصرة.

4- طرق التعليم والتعلم للمقرر:

التدريس المباشر		التدريس الغير مباشر										استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات			
المحاضرات		العصف الذهني	التعلم القائم على المشروعات الجماعية	استراتيجية دراسة الحالة	حل المشكلات	كتابة التقارير /الأبحاث	الحوار والمناقشة	التدريب الميداني	الزيارات الميدانية	التعلم الذاتي	التعلم باإكتشاف	برامج المحاكاة أو النمذجة	المعامل الافتراضية	التعلم الالكتروني	النماء الإصطناعي في التعليم
التمارين العملية والتجارب															

√			√		√	√	√			√	√			√	√

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة		تدريس نظري
			تدريب		
			تمارين	عملي	
1	تعريف بالمقرر الدراسي ومقدمة عامه	2	2	0	0
2	أهمية التفاوض واهدافه	2	2	0	0
3	أنواع المفاوضات	2	2	0	0
4	العناصر الأساسية لعملية التفاوض	2	2	0	0
5	مراحل العملية التفاوضية	2	2	0	0
6	إجراءات التفاوض	2	2	0	0
7	مراجعة وامتحان منتصف الفصل الدراسي				
8	مهارات التفاوض	2	2	0	0
9	مباريات التفاوض	2	2	0	0
10	استراتيجيات حل النزاع	2	2	0	0
11	خطوات عملية التفكير التفاوضي	2	2	0	0
12	كيفية التفاوض بفاعلية	2	2	0	0
13	تكتيكات التفاوض	2	2	0	0
14	مراجعة عامة	2	2	0	0
16-15	إختبارات الفصل الدراسي النهائية				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	3	10	10 %
2	امتحان 2 تحريري (أعمال سنة)	10	10	10 %
3	امتحان منتصف الفصل الدراسي	7	20	20 %
4	امتحان نهائي تحريري	15 و 16	40	40 %
5	تكاليفات / مشروع / ملف الإنجاز / كتيب الأنشطة	طوال الفصل	20	20 %

6- مصادر التعلم والتسهيلات المادية:

منسق المقرر	منسق البرنامج	
د/ سلوي محمد عبد المحسن	إ.د/ أحمد عبد الغفار	الإسم
		التوقيع

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

تربية رياضية 3				اسم المقرر: (تبعاً لما ورد باللائحة)
PHE 201				كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية				القسم/الأقسام العلمية التي شاركت في التدريس:
إجمالي	أخرى (تحدد)	عملي	نظري	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
1		1	2	
اجباري				نوع المقرر:
SENIOR 2				المستوى الدراسي الذي قدم فيه المقرر:
البرامج الهندسية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
د خلود فاروق حامد				اسم منسق المقرر:
مجلس القسم العلمي للبرنامج				جهة مناقشة واعتماد تقرير المقرر:
7/26/2025				تاريخ اعتماد تقرير المقرر:

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

الهندسة الرياضية: المعدات الحديثة للتربية البدنية وعلاقتها باختيار الرياضيين، تحليل الحركة والتقييم والقياس الفسيولوجي، المعدات الحديثة وعلاقتها باختيار الرياضيين، معالجة مياه حمامات السباحة، أبعاد الملاعب، الاختلافات الفسيولوجية خلال مزاولة الرياضة وتأثيرها على الملابس الرياضية. مقدمة في علم النفس الرياضي، تعريف علم النفس الرياضي، والدافع، والقلق، والتدريب العقلي، والاسترخاء، التصور العقلي، واستخدام أجهزة الكمبيوتر في قياس الحالة النفسية، العلاقة بين علم النفس الرياضي والهندسة الرياضية

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصنوفة في توصيف البرنامج)		نواتج التعلم للمقرر	
A4_A5_A7_A8_A9		عند الانتهاء من المقرر سيكون الطالب قادراً على	
الكود	النص	الكود	النص
A4	الاستفادة من التقنيات المعاصرة، والممارسات والمعايير، وإرشادات الجودة، ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر.	LO1	التعرف على الكفاءة الهوائية وقدراتها وأنواعها
		LO2	معرفة بعض الاسس الخاصة بالكفاءة الهوائية
		LO3	تنمية المعرفة ببعض المصطلحات الخاصة بالهندسة والرياضة
A5	ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.	LO4	معرفة الاختبارات والمعايير الخاصة بالكفاءة الهوائية
		LO5	التعرف على العمل العضلي اللاهوائي وأنواع القدرات الخاصة به
A7	العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعدد الثقافات	LO6	التعرف على العجز الأكسجيني والدين الأكسجيني وأنواعهما
		LO7	التعرف على الهندسة الرياضية وأهميتها وأهدافها
A8	لتواصل بفعالية ببياناً وشفاهة وكتابة مع مجموعات من الجماهير باستخدام الأدوات العصرية.	LO8	تنمية معرفته بأنواع العضلات والانقباض العضلي
A9	إستخدام التفكير الإبداعي والمبتكر والمرن واكتساب مهارات ريادة الاعمال والقيادة لتوقع المواقف الجديدة والاستجابة لها	LO9	زيادة معرفة الطالب بالأجهزة الرياضية الحديثة واستخداماتها
		LO10	تطوير الأجهزة بما يتناسب مع التقنيات الحديثة

4- طرق التعليم والتعلم للمقرر:

استراتيجيات التعلم بمساعدة تكنو لوجيا المعلومات				التدريس الغير مباشر								التدريس المباشر			
النقاء الإصطناعي في التعليم	التعلم الالكتروني	المعامل الافتراضية	برامج المحاكاة أو النمذجة	التعلم بالاكشاف	التعلم الذاتي	الزيارات الميدانية	التدريب الميداني	الحوار والمناقشة	كتابة التقارير / الأبحاث	حل المشكلات	استراتيجية دراسة الحالة	التعلم القائم على المشروعات الجماعية	العصف الذهني	التمارين العملية والتجارب	المحاضرات
	✓				✓			✓	✓				✓	✓	✓

الجدول الدراسي للمقرر:

رقم الأسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس نظري	تدريب
1	المقدمة ومفهوم عن علم الهندسة الرياضية /هدفها /اهميتها + تدريبات على اللياقة البدنية	2	1	0
2	الكفاءة الهوائية واختباراتها + تدريبات على اللياقة البدنية	2	1	0
3	اسس تنمية الكفاءة الهوائية + تدريبات على اللياقة البدنية	2	1	0
4	الكفاءة اللاهوائية واختباراتها + تدريبات على اللياقة البدنية	2	1	0
5	شروط تنمية التحمل اللاهوائي + تدريبات على اللياقة البدنية	2	1	0
6	علم البيوميكانيك(البيوميكانيك الرياضي بعض المفاهيم والمصطلحات الخاصة بالحركة) + التدريب على اختبارات اللياقة	2	1	0
7	مراجعة وامتحان منتصف الفصل الدراسي			
8	الجهاز الحركي(تركيب العضلة/انواع العضلات)+ تدريبات على اللياقة البدنية	2	1	0
9	الاعتبارات الخاصة باختيار الموقع (المنشأة الرياضية) + تدريبات على اختبارات اللياقة البدنية	2	1	0
10	الاشتراطات العامة لتصميم المنشآت الرياضية + تدريبات على اختبارات اللياقة البدنية	2	1	0
11	التقنيات الحديثة في معالجة المياه + تدريبات على اللياقة البدنية	2	1	0
12	علم النفس الرياضي (الاجهزة الحديثة للتدريب العقلي) + تدريبات على اللياقة البدنية	2	1	0
13	إختبارات الفصل الدراسي النهائية عملي			

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	بحث تقييمي للشق العملي	4	20	20%
2	امتحان منتصف الفصل الدراسي	7	20	20%
3	امتحان نهائي تحريري	13_14	30	30%
4	امتحان نهائي عملي	13	30	30%

6- مصادر التعلم والتسهيلات المادية:

التطور التقني ودوره في المجال الرياضي صبري عمر زكي حسن دار المعرفة 2020م	المرجع الأساسي للمقرر (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
تطبيقات البيوميكانيك في التدريب والاداء صريح عبد الكريم دار دجلة الطبعة الاولى 2019م	المراجع الأخرى	
• https://ar.wikipedia.org/wiki • https://ar.wikipedia.org/wiki	المصادر الالكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office	المنصة التعليمية (لابد من إضافة الرابط)	
قاعة محاضرات مجهزة .	1	التجهيزات التعليمية المساندة للتعليم والتعلم *
المكتبات المركزية والفرعية.	2	
الوسائل التعليمية (داتا شو) وجهاز كمبيوتر محمول.	3	
مذكرة لتدريس المقرر وكشوف متابعة للطلاب	4	

منسق البرنامج	منسق المقرر	
ا.د/ أحمد عبد الغفار	د.خلود فاروق حامد	الإسم
	خلود فاروق حامد	التوقيع

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Refining Engineering			
Course Code (according to the bylaw):	CHM 201			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3 credit hours	Theoretical	Practical (Lab)	TUTORIAL	Total
	2	--	2	4
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof / Maha Hassan Abd-El-Kreem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Introduction - types and origin of petroleum - general review of refining process of crude oil - design of atmospheric, vacuum, pressure columns for petroleum fractionation, including auxiliary furnaces - recent developments in heavy oil processing.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3, A10, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO1	Differentiate between treatment methods of crude oil and its fractions, considering the influencing factors
		LO2	Identify chemical and physical properties related to crude origin and environmental considerations in refining.
		LO3	Describe cracking methods used to upgrade petroleum products (e.g., thermal, catalytic, hydrocracking, isomerization)
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Explore the key factors influencing the upgrading processes of petroleum crude.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer	LO4	Apply design principles to atmospheric and vacuum distillation columns used in modern petroleum refineries
		LO5	Classify recent petroleum treatment processes based on their operational principles and technological advancements

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√		√	√	√	√		√	√					√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Theoretical teaching (lectures)
				Tutorial	Practical Lab /	
1	Introduction to oil refining Oil origin and evaluation, organic and inorganic theories	4	2	2	--	--
2	- Content of petroleum oil - Undesirable components - Physical properties.	4	2	2	--	--
3	Oil exploration, drilling mechanisms, drilling mud	4	2	2	--	--
4	Boiling temperature, density, viscosity and thermal properties of main components in Petroleum	4	2	2	--	--
5	Preparatory separation operations, Flash distillation, principles and purity of products.	4	2	2	--	--
6	- Differential distillation - Operating variables, - Types of heating equipments - Furnaces and its operation.	4	2	2	--	--
7	Revision/Presentation on physical properties /Midterm Exam					

8	Types of plates, classification of refining processes.	4	2	2	--	--
9	Industrial importance of product cuts Cracking of heavy products.	4	2	2	--	--
10	Thermal Cracking processes for heavy oil cuts.	4	2	2	--	--
11	Catalytic cracking processes for heavy oil cuts.	4	2	2	--	--
12	Isomerization various separation processes.	4	2	2	--	--
13	Reforming Various separation processes.	4	2	2	--	--
14	Discuss recent developments in heavy oil processing	4	2	2	--	--
15,16	Final Exam.					

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	5	5%
2	Exam 2 written (Semester work)	11	5	5%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Sheets, Reports	1-14	15	15%
6	Case study	13	10	10%
7	Presentation	12	5	5%

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• T.R.Prajapathi , Properties of Petroleum Fluids, Random Publications, N. DELHI, 2019 (16787) • I.D.Mall, Petroleum Refining Technology, CBS Publishers, N. Delhi, 2017 (16654) • A.Palmer , Introduction to Petroleum Exploration and Engineering, World Scientific, Singapore, 2017 (16658) • J.G.Speight, Rules of Thumb for Petroleum Engineers. Wiley, USA, 2017 (16660) • J.H. Gary, Glenn E.Handwerk, Mark J.Kaiser "Petroleum Refining Technology and Economics", 5th edition, CRC prsess, 2007 • G.N. Sarkar, " Advanced Petroleum Refining", Khanna, Delhi, 1998 (4554) • M.Gerding, "Fundamentals of Petroleum ", Tulsa, USA ,1986. (1441)
	Other References	• W.L.Nelson " Petroleum Refining Engineering", 1958
	Electronic Sources (Links must be added)	--
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Prof / Maha Hassan Ahmed Abd El Kreem	Dr. Noha Fawzy M. El Hussein
Signature	Maha Abdelkreem	Noha ElHoseny

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Natural Gas			
Course Code (according to the bylaw):	CHM 202			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3 credit hours	Theoretical	Practical (Lab)	TUTORIAL	Total
	2	--	2	4
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof / Maha Hassan Abd-El-Kreem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Characteristics of natural gas, natural gas production, natural gas & liquid separation. Hydrates. Dehydration of natural gas. Miscellaneous gas conditioning. Gas processing plants

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3, A10, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO1	Apply thermodynamic theory to predict & explain the properties and PVT behavior of natural gases.
		LO2	Identify design considerations for the natural gas liquefaction process in compliance with industrial regulations.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO3	Explain the principles and operational steps of common unit operations in natural gas processing and their industrial significance.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer	LO4	Present a report/presentation/project/case study on recent technologies used in natural gas production, highlighting their advantages and limitations."

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√				√	√	√			√	√				

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Theoretical teaching (lectures)
				Tutorial	Practical Lab /	
1	Physical behavior & properties; phase behavior; analysis of natural gas systems.	4	2	2	--	--
2	Two phase separation	4	2	2	--	--
3	Three phase separation	4	2	2	--	--
4	Sour gas and Acid gas treatment.	4	2	2	--	--
5	Acid gas removal processes and design – Part I.	4	2	2	--	--
6	Acid gas removal processes and design - Part II.	4	2	2	--	--
7	Revision/Midterm Exam					
8	Natural gas dehydration process and design	4	2	2	--	--
9	Natural gas liquids recovery.	4	2	2	--	--

10	Natural gas transportation & storage	4	2	2	--	--
11	Natural gas liquefaction process	4	2	2	--	--
12	Equipment selection and design for natural gas liquefaction processes	4	2	2	--	--
13	Synthetic natural gas technologies	4	2	2	--	--
14	Recent advances in natural gas technologies	4	2	2	--	--
15,16	Final Exam.					

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10%
2	Tutorials/Participation/assignments	1-14	10	10%
3	Midterm exam	7	20	20 %
4	Reports/Presentation	6, 11	10	10%
5	Exam 2 written (Semester work)	10	10	10%
6	Final Written Exam	15, 16	40	40 %

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	J. Kidnay, William R. Parrish, and Daniel G. McCartney, Fundamentals of Natural Gas Processing, 3rd edition, CRC Press, NY, 2020 <u>A.L.Kohi," Gas Purification", E.A.PUB., NY, 1960 (13041)</u> <u>American Gas Association sponsors, Gas Engineers Handbook, I.PRESS , NY, 1965 (6443)</u> M. Reza Rahimpour, M. Amin Makarem, Maryam Meshksar, Advances in Natural Gas: Formation, Processing, and Applications Natural Gas Sweetening Volume 2, Elsevier, 2024 - Dr. Boyun Guo and Dr. Ali Ghalambor, Natural Gas Engineering Handbook , Gulf Publishing Company, 2005 - S.Mokhatab, Handbook of Natural Gas Transmission and Processing Principles and Practices, Elsevier, NY, 2015 (16651) - Y.T.Shah, Chemical Engergy From Natural And Synthetic Gas, CRC Press, NY, 2017 (16649) ,
	Other References	--
	Electronic Sources (Links must be added)	--
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Prof / Maha Hassan Ahmed Abd El Kreem	Dr. Noha Fawzy M. El Hussein
Signature	Maha Abdelkreem	Noha ElHoseny

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Automatic Control (2)			
Course Code (according to the bylaw):	CHM 221			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	2	2	--	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	El Shimaa M. El Zahed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Process variables & their measurements, temperature, pressure, flow rate, weight, density, viscosity & conductivity. Process analysis & control... Process control of distillation towers, chemical reactors, heat exchange equipment. Control circuits for chem. plants.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3, B1, B3)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO1	Employ the basic terms of a series of controlled systems.
		LO2	Establish a control system by utilizing the degrees of freedom in sustainable chemical process engineering to achieve a cost-effective solution.
B2	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design,	LO3	Design a control strategy for chemical process equipment, process flow diagrams and P&ID.
		LO4	Select appropriate instruments & valves for control process in various applications in chemical plants.

	Instrumentation and Control of Chemical Processes, and Process and Plant Design.		
B3	Apply numerical modelling methods and/or computational techniques appropriate to chemical engineering.	LO5	Specify the controllers performance, appropriate practical application of control systems basics and scale diagrams by using computer program.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√		√				√							√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Lab / Practical
1	Incentive for chemical process control, suppresses the influence of external disturbance, insure the stability of a process and optimize the performance of chemical process.	4	4	-	-

2	Important terms in process automatic control - Types of measurements Hardware of control elements- Process variable & their measurements	4	4	-	-
3	Types of control configurations (Feedback control system). Application in chemical plant.	4	2	-	2
4	Types of control configurations (Feedforward control system). Application in chemical plant	4	2	-	2
5	Ratio control definition & Cascade control system -application in chemical plant	4	2	-	2
6	Degrees of freedom	4	2	-	2
7	Revision and Mid Exam				
8	Degrees of freedom and control of multiple input multiple output systems.	4	2	-	2
9	Chemical Process Diagram (P&ID) + Visio Program	4	2	-	2
10	Automatic controllers (Control action-Control modes- Commercial controllers)	4	2	-	2
11	Final control element (pneumatic control valve) - Construction of pneumatic controllers	4	2	-	2
12	Instrumentation	4	2	-	2
13	Programmable Logic Controller (PLC)	4	2	-	2
14	Design of control systems of multivariable processes and use Visio Program	4	2	-	2
15,16	Final Exam.				

Experiment Topics:

Experiment
Use computer software to Draw Basic Flowchart Diagram.

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	10	10 %
2	Exam 2 written (Semester work)	11	15	15 %
3	Midterm exam	7	20	20 %
4	Mini Project, presentation, Discussion	12,13	15	15 %
5	Final Written Exam	15, 16	40	40 %

6. Learning Resources and Supportive Facilities:

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- A.Brambilla, "Distillation Control & Optimization: Operation Fundamentals through Software Control", McGraw Hill, 2014.(16652) <u>Stephanopoulos, G., "Chemical process control, an introduction to theory and practice", Englewood Cliffs, New Jerrsy, 2002 .(7743 & 8075)</u> <u>Smith, C.A.and Corripio, A. B."Principles and practice of automatic process control", Johm Willy & Sons, 1985.</u>
	Other References	- Prof. Morten Hovd, "Advanced Chemical Process Control",2023 - Jose A. Romagnoli and Ahmet Palazoglu, "Introduction to Process Control",third Edition, CRC Press,2020. - Smith, C L, "Process Control for the Process Industries - Part 2: Steady State, 2017.
	Electronic Sources (Links must be added)	https://onlinelibrary.wiley.com/doi/10.1002/9783527842490.fmatter
	Learning Platforms (Links must be added)	EKB https://www.ekb.eg/web/guest/home - Microsoft office
Supportive	Devices/Instruments	Data show, laptop

facilities & equipment for teaching and learning *	Supplies	Essential Supplies
	Electronic Programs	Visio, Edrawmax
	Skill Labs/ Simulators	Computer Lab
	Virtual Labs	--
	Other (to be mentioned)	--

	Course Coordinator	Program Coordinator
Name	El Shimaa M. El Zahed	Dr. Noha Fawzy El Husseiny
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Paints Technology			
Course Code (according to the bylaw):	CHM 222			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2 credit hrs.	Theoretical	Practical (lab)	Other (Tutorial)	Total
	2	-	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Selem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Paint compositions. Classification of paints. Primers & final coats. Surface preparation. Reactions of paint systems. Paints for corrosion resistance.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A4, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	LO1	Analyze the principle properties of industrial paint formulations in relation to safety, quality, and environmental standards.
		LO2	Explain the fundamentals of paint manufacturing processes, highlighting safety practices and industry regulations
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO3	Select appropriate solvents and additives for advanced paint formulations based on performance and application requirements.
		LO4	Identify modern surface preparation, drying, and curing mechanisms used in the paint industry.
		LO5	Classify various types of paints, primers, and topcoats according to their industrial applications.
		LO6	Calculate paint formulations using current industry practices and performance standards.
		LO7	Recognize recent developments in paint manufacturing processes and technologies.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√				√				√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	/ Practical Lab	
1	Introduction for Paints course.	3	2	1	-	-
2	Introduction to Paints and Coatings. The Functions of Paints. Paints Composition. Thermoplastic' and 'Thermoset.	3	2	1	-	-
3	Solvents of paints. Additives of Paints	3	2	1	-	-
4	Classification of Paints by Physical Type. · Solvent-Based Paints (Oil Paints) · Water-Based Paints.	3	2	1	-	-
5	· High-Solids Paints: (Low VOC paints). · Powder Coatings. · Radiation Curable Coatings.	3	2	1	-	-
6	Classification of Painting Products by Their Functions.	3	2	1	-	-

7	Revision and Mid Exam					
8	Cohesion & Adhesion Importance of Adhesion Fundamentals of Paint Adhesion Adsorption	3	2	1	-	-
9	Wetting Contact Angle & Wettability Chemical Bonding Mechanical Interlocking	3	2	1	-	-
10	Paints Drying & Curing. Curing Mechanism Curing Agent, Its Types and Selection Process Factors Affecting The Curing of Paint	3	2	1	-	-
11	Surface Preparation Methods Application Methods of Painting	3	2	1	-	-
12	Calculations on Paint Formulations	3	2	1	-	-
13	Paints Manufacturing Processes Laboratory Stage Preparing Raw Materials	3	2	1	-	-
14	Tests performed on paints	3	2	1	-	-
15,16	Final Exam.					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	10	10%
2	Exam 2 written (Semester work)	10	10	10%
3	Midterm exam	7	20	20 %
4	Report/assignments/Presentation/Participation	1-14	20	20%
5	Final Written Exam	15, 16	40	40 %

6- Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• "Hand book of surface coating",2012 • Drummond Spinhirne, "Polymer science and technology: fundamentals and Applications", intelliz press, 2024
	Other References	• Arthur A. Tracton, "Coatings technology handbook", CRC Press, 2015 • D.SATAS, "Coatings technology handbook", 2000 (6446) • Alistair R Marrion , "The chemistry and physics of coatings", Alastair Marrion International ,2004
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning	Devices/Instruments	-
	Supplies	-
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha Fawzy El Husseiny
Signature	Nora yehia	Noha ElHoseiny

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Dyes Technology			
Course Code (according to the bylaw):	CHM 223			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2	Theoretical	Practical(lab)	Other (specify)	Total
	2	--	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass Prof / Soad Abdel Aziz El Metwally			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Chemistry of dyes. Azoic dyes. Color formation in dye system. Dyeing processes for natural & synthetic fibers. Laboratory preparations. Industrial preparation of dyes. Properties & testing.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A2, A5, B4)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions	LO1	Conduct practical dyeing experiments on various fabrics using schematic diagrams.
		LO2	Analyze dye characteristics using appropriate analytical instruments
A5	Practice research techniques and methods of investigation as an inherent part of learning	LO3	Evaluate the Eco-friendliness of naturally dyed fabrics
		LO4	Investigate the principles and modern techniques used in dyeing processes.
B4	Adopt suitable national and international standards and codes to: design, operate, inspect and maintain chemical engineering systems	LO5	Classify traditional dyeing methods and their compliance with national and international textile standards.
		LO6	Examine quality control procedures and standards applied to raw materials and dyeing process parameters, including statistical analysis techniques.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓					✓		✓					✓	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	Practical / Lab	
1	Chemistry of dyes and general overview.	3	2	0	1	
2	Fundamentals of color and its importance in industrial applications Color formation in dye system	3	2	0	1	
3	<u>Classification of dyes based on:</u> - Chemical structure (azo, anthraquinone, etc.) - Application method (acid dyes, basic dyes, disperse dyes, etc.)	3	2	0	1	
4	Basic chemical processes involved in dye synthesis Raw materials used and their sources.	3	2	0	1	
5	Unit operations in dye production and quality control aspects. Scientific visit for dyeing factory (optional if available)	3	2	0	1	

6	Laboratory preparations. Industrial preparation of dyes	3	2		1	
7	Revision and Midterm Exam					
8	Azoic and reactive dyes	3	2	0	1	
9	Basic chemical processes involved in dye synthesis. Dyeing processes and method of application/ Dyeing machines	3	2	0	1	
10	Industrial Applications of Dyes Textile dyeing processes: Fibers types & Dyes' interaction and processing.	3	2	0	1	
11	Applications in plastics, paper, inks, leather, and food	3	2	0	1	
12	Quality in dyeing industry and laboratory testing	3	2	0	1	
13	Environmental Impacts of dyes	3	2	0	1	
14	Eco-friendly dyeing solutions for industrial use - Sources of natural dyes: plants, insects, minerals. - Advantages and limitations compared to synthetic dyes. - Recent trends in green chemistry and sustainable	3	2	0	1	
15,16	Final Exam.					

Experimental Topics

Serial Experiment

- 1** Lab-scale synthesis and application of selected dyes
- 2** Preparing of cotton for dyeing
- 3** Using of reactive dye
- 4** The effect of salt and temperature during dyeing
- 5** Analysis and interpretation of experimental data
- 6** Reporting and presenting project findings effectively

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10 %
2	Exam 2 written (Semester work)	10	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Tutorial and report assessment	2,5,9,12	20	20 %

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• Padma Shree Vankar. Natural dyes for textiles : sources, chemistry and applications, Elsevier, 2017 • Ashis Kumar Samanta, Nasser Awwad, Hamed Majdooa Algarni, Chemistry and Technology of Natural and Synthetic Dyes and Pigments, Intech Open, 2020 • <u>Bernand p. Cobman, "Textiles: Fiber to Fabric, 6th edition, Mc Graw-Hill, 1983.(8107)</u> • <u>K Hunger, Stephanopoulos, G. "Industrial Dyes: Chemistry, Properties, Applications", John Wiley-VCH, 2003 (10828)</u>
	Other References	• Shahid Ul Islam, Bhupendra Singh Butola, The Impact and Prospects of Green Chemistry for Textile Technology, Elsevier, 2019
	Electronic Sources (Links must be added)	-

	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Glass ware-Heater-Textile-Dyes-Thermometers
	Supplies	Essential Supplies
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Ass Prof / Soad Abdel Aziz El Metwally	Dr. Noha Fawzy El Hussein
Signature	<i>Soad Abd El Aziz</i>	<i>Noha El Hussein</i>

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Mass Transfer (2)			
Course Code (according to the bylaw):	CHM 224			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2 credit hours	Theoretical (Lecture)	Practical (Lab.)	Other (Tutorial)	Total
	2	-	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Noha Fawzy El Hussein			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the course approval.			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Separation processes models of mass transfer, absorption and desorption, tray and packed, crystallization

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, B1)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Recognize the relative volatility of a binary mixture (ideal/non-ideal/azeotropic), the vapor pressure, partial pressures using suitable relations (Antoine's equation, equilibrium relations) in different mass transfer operations (distillation/ absorption / desorption, etc.).
		LO2	Apply the phenomena of mass transfer in the design of different mass transfer equipment mainly for absorption/stripping/distillation units
		LO3	Calculate bubble and dew point of ideal mixtures
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	LO4	Analyze the impact of operational parameters on the performance or cost-effectiveness of mass transfer equipment.
		LO5	Interpret vapor-liquid equilibrium diagrams relevant to separation processes.
		LO6	Design gas-liquid separation equipment that meet performance, energy, and environmental constraints based on feed composition by graphical or analytical methods.

B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design	LO7	Design basic gas–liquid separation units such as flash distillation, differential distillation, steam distillation, or absorption/stripping towers based on given process conditions.
		LO8	Calculate the number of theoretical stages, minimum number of stages, total reflux, and minimum reflux ratio using analytical or graphical methods for different feeds and columns.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology- Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓				✓	✓	✓			✓				✓	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/ Projects/ ...)
				Tutorial	Practical / Lab	
1	Introduction to mass transfer separation processes - Separation processes models of mass transfer.	3	2	1	--	Revision sheet on Absorption (3 hrs):
2	Absorption and Stripping.	3	2	1	--	--
3	Tray and packed columns	3	2	1	--	Assignment #1 (3 hrs)
4	Introduction to distillation - Vapor – liquid equilibrium relations - Temperature - composition diagram	3	2	1	--	--
5	V-L equilibrium data (calculations and plotting) – Factors affecting equilibrium	3	2	1	--	Take-home exam (2 hrs)
6	Bubble and Dew point calculation for a Binary mixture manually and/or by using Microsoft Excel.	3	2	1	--	Bubble & Dew point calculation home Excel activity (2 hrs)
7	Revision and Mid Exam					
8	Simple Distillation methods (Flash Distillation – Differential Distillation)	3	2	1	--	Presentation # 1- Multi Flash Distillation – steam Distillation (topics as self-learning and presentation skills – 2 hrs)
9	Introduction to fractionation – Tower interiors – Separation principles in continuous V - L contact – column hydrodynamics.	3	2	1	--	Assignment (2) (90 min)
10	Fractional distillation - Plate to plate calculation	3	2	1	--	

11	q- line and factors affecting distillation	3	2	1	--	Problem Solving – 2 hrs
12	Design of plate tower (Analytical and graphical solution)	3	2	1	--	Presentation #2 (compare between plate tower and Packed columns)
13	Minimum reflux and total reflux - Tray column vs Packed column - design parameters - cost effectiveness.	3	2	1	--	Assignment #3 (2 hrs)
14	Plate to plate calculation , plate column design and introduction to packed towers	3	2	1	--	Practice design problems- extra sheets (5 hrs)
15,16	Final Exam.					

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	10	10%
2	Exam 2 written (Semester work)	10	10	10%
3	Exam 2 written (Semester work)	13	10	10%
4	Midterm exam	7	20	20%
5	Final Written Exam	15, 16	40	40%
6	Assignments / Workshop/class activity	1, 3, 5, 9, 13	5	5%
7	Presentations (topics for self-learning) / Activity / Participation / Problem-solving	6, 8, 11, 12, 14	5	5%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Robert E. Treybal " Mass Transfer Operations", 3rd edition , Mc Graw Hill , Newyork , 1980 W. McCabe, J. Smith, P. Harriott, Unit Operations of Chemical Engineering, 7th edition, Mc Graw Hill and Chemical

		Engineering Series, 2005 • Raj Chhabra, V. Shankar, Coulson and Richardson's Chemical Engineering, volume 1b, 7th edition, Elsevier Ltd, 2018 • Jaime Benitez, “ Principles and Applications of Mass Transfer: The Design of Separation Processes for Chemical and Biochemical Engineering”, 4th Edition, John Wiley & Sons, Dec 2023 • Christie John Geankoplis_ A. Allen Hersel_ Daniel H. Lepek, „ Transport Processes and Separation Process Principles“. 5th edition, Prentice Hall, 2018 • K.V. Narayan, B. Lakshmikutty - Mass Transfer Operations_ Theory and Application, 2e, CBS Publishers & Distributors, (2023)
	Other References	• John J. Macketta, Unit Operations Hand-book, Volume 1 Mass Transfer, 1st edition, CRC Press, 1992 • <u>I.Tosun , "Fundamental Mass Transfer Concepts in Engineering Applications"</u>, CRC Press, 2019 • Joel L.Plawsky , "Transport Phenomena Fundamentals", CRC Press, 2020 • Mason Fox, “Chemical Process Engineering: Processing and Plants”, States Academic Press, Sep 2023.
	Electronic Sources (Links must be added)	--
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	Microsoft Excel (computer lab activity)

teaching and learning *	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Dr. Noha Fawzy M. El Hussein	Dr. Noha Fawzy M. El Hussein
Signature	Noha El Hussein	Noha El Hussein

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Inorganic Chemical Technology			
Course Code (according to the bylaw):	CHM 225			
Department/s that participated in the teaching:	Chemical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (Tutorial)	Total
	2	-	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Selem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Introduction, classification of chemical technology, and definitions. Industrial gases. Nitrogen industries. Phosphorous industries, Sulphur industries. Alkali industries. Acid industries.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A4, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying Engineering fundamentals, basic science and mathematics.	LO1	Identify the basic concepts of industrial chemical processes and equipment used for production
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, Environmental issues and risk management principles.	LO2	Recognize the environmental requirements and risks arising from chemical industries
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO3	Draw equipment flow sheet of industrial chemical processes.
		LO4	Define the manufacturing steps to produce a specific product

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√					√	√								

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	/ Practical Lab	
1	- Introduction - Cement: Dry process, Wet process	3	2	1	-	-
2	Risk of industries –Ceramic processing	3	2	1	-	-
3	Ceramics (traditional- modern) Flow sheet - Importance and uses	3	2	1	-	-
4	Ceramics (traditional-modern) Flow sheet - Importance and uses	3	2	1	-	-
5	Ammonia and urea production - Flow sheet - Importance and uses	3	2	1	-	-
6	Sodium carbonate production - Flow sheet - Importance and uses	3	2	1	-	-
7	Revision and Mid Exam					

8	Sodium carbonate production - Flow sheet - Importance and uses	3	2	1	-	-
9	HCl production - Flow sheet - Importance and uses	3	2	1	-	-
10	HCl production - Flow sheet - Importance and uses	3	2	1	-	-
11	Nitric acid production - Flow sheet - Importance and uses	3	2	1	-	-
12	Phosphoric acid production - Flow sheet - Importance and uses	3	2	1	-	-
13	Sulfuric acid production. - Flow sheet - Importance and uses	3	2	1	-	-
14	Sulfuric acid production. - Flow sheet - Importance and uses	3	2	1	-	-
15,16	Final Exam.					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Quiz 1 written (Semester work)	5	15	15%
2	Quiz 2 written (Semester work)	10	15	15%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Presentation	4, 9	10	10%

6- Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method) • Mall I.D. , “Chemical Process Technology” , CBS Publishers & Distributors Pvt. Ltd, 2024 • <u>Austin, G.T., Shreve's Chemical Process Industries, McGraw- Hill Book Co, 5th' Ed., 1984 (1512)</u> • Basics of Inorganic Chemistry", 3G E-LEARNING, 2024

		• J. A. Moulijn, M. Makkee, A. E. Van Diepen, "Chemical Process Technology", 2nd Edition, John Wiley & Sons, Ltd., Publication, 2013. • B. KENT, "Advanced inorganic chemistry", NY Research, 2019.
	Other References	• Navin G. Ashar, Kiran R. Golwalkar (auth.) - A Practical Guide to the Manufacture of Sulfuric Acid, Oleums, and Sulfonating Agents-Springer International Publishing (2013) • M.M.Martin, Industrial Chemical Process Analysis and Design, 2016 • Himanshu J. Patel, "Handbook for Chemical Process Industries", CRC Press, 2024 • D. B. Dhone, Technology Of Inorganic Chemicals, Nirali Prakashan, 2020.
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	-
	Supplies	-
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha Fawzy Elhusseiny
Signature	Nora Yehia	Noha ElHosseiny

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

حقوق الإنسان				اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 205				كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية				القسم/الأقسام العلمية التي شاركت في التدريس:
نظري	عملي	اخرى (تحدد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
1			1	
اختياري				نوع المقرر:
SENIOR 2				المستوى الدراسي الذي قدم فيه المقرر:
البرامج الهندسية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
أ.م.د. وليد رضوان				اسم منسق المقرر:
مجلس القسم العلمي للبرنامج				جهة مناقشة واعتماد تقرير المقرر:
7/26/2025				تاريخ اعتماد تقرير المقرر:

2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

الالام بأهمية حقوق الإنسان والنشأة التاريخية لتلك الحقوق والمدارس الفقهية لتأصل تلك الحقوق وأحكام الاتفاقيات الدولية الخاصة بحقوق الإنسان ، والمنظمات الدولية العالمية والاقليمية القائمة على حماية تلك الحقوق ، وموقف الدستور المصري من حقوق الإنسان ، والحماية القانونية لها على الصعيد الوطني والصعيد الدولي ، بالإضافة الى حقوق الإنسان في الشريعة الإسلامية – الاصول التاريخية الفلسفية لحقوق الإنسان – المصادر الدولية لحقوق الإنسان (العالمية والاقليمية) – المصادر الوطنية لحقوق الإنسان – الاجهزة العالمية القائمة على حماية حقوق لأنسان (أجهزة الامم المتحدة) – الحماية الوطنية لحقوق الإنسان – حقوق الإنسان في الشريعة الإسلامية – عرض لبعض طوائف الإنسان – مراجعة عامة

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		(A3- A8- A10)	
الكود	النص	الكود	النص
LO 1	معرفة الحقوق الأساسية للإنسان والتي لا يحيا بدونها.	A 3	تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة تلبي الإحتياجات النوعية مع مراعاة الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والأخلاقية وغيرها من الجوانب المتسقة مع النظام والظروف وضمن مبادئ وسياسات التصميم والتنمية المستدامين.
LO 2	معرفة ماله من حقوق وما عليه من واجبات.		
LO 3	معرفة دوره في بناء مجتمعه.		
LO 4	المقارنة بين المراحل المختلفة لتطور حقوق الإنسان في الديانات السماوية والنظم الوضعية.		
LO 5	معرفة حقوق المواطنة وحقوق الوطن على المواطن.	A 8	التواصل بفعالية بانيات وشفاهة وكتابة، مع مجموعات من الجماهير باستخدام الأدوات العصرية.
LO 6	معرفة حقوق البيئة وضرورة الحفاظ عليها وعلاقتها بحقوق الإنسان.		
LO 7	معرفة أنواع الفساد ودوره في إهدار حقوق الإنسان.		
LO 8	معرفة دور الشباب في مقاومة الفساد وطرق مقاومته.	A 10	اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتي وغيرها مدى الحياة.
LO 9	الممارسة الصحيحة لما له من حقوق وما عليه من واجبات.		
LO10	تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل في ضوء معرفته لمنظومة الحقوق والواجبات.		

4 طرق التعليم والتعلم للمقرر:

التدريس المباشر		التدريس الغير مباشر										استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات			
المحاضرات	التمارين العملية والتجارب	العصف الذهني	التعلم القائم على المشروعات الجماعية	استراتيجية دراسة الحالة	حل المشكلات	كتابة التقارير / الأبحاث	الحوار والمناقشة	التدريب الميداني	الزيارات الميدانية	التعلم الذاتي	التعلم بالإكتشاف	برامج المحاكاة أو النمذجة	المعامل الافتراضية	التعلم الإلكتروني	النقاء الإصطناعي في التعليم
✓		✓		✓	✓	✓	✓			✓	✓			✓	✓

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس نظري	تدريب
عملية	تمارين			
1	تقديم عن المقرر وتعريف أهميته في حياة الطالب.	1	1	0
2	حقوق نفسك عليك، ما هي؟ وكيف تؤديها؟	1	1	0
3	- تعريف حقوق الإنسان وخصائصها. - أنواع حقوق الإنسان.	1	1	0
4	التطور التاريخي لحقوق الإنسان وحرياته.	1	1	0
5	- حقوق الإنسان في الشرائع السماوية. - إهدار حقوق الإنسان في الولايات المتحدة الأمريكية.	1	1	0
6	حقوق الأبناء على الآباء.	1	1	0
7	مراجعة وامتحان منتصف الفصل الدراسي			
8	- حقوق الأزواج والزوجات وتأسيس أسرة صالحة. - حقوق الآباء على الأبناء.	1	1	0
9	حقوق الوطن.	1	1	0
10	- الانتماء للوطن. - حقوق البيئة.	1	1	0
11	- حقوق اللغة العربية. - الفساد وإهدار حقوق الإنسان. (1)	1	1	0
12	- الفساد وإهدار حقوق الإنسان. (2) - دور الشباب في مكافحة الفساد. (1)	1	1	0
13	دور الشباب في مكافحة الفساد. (2)	1	1	0
14	مراجعة عامة.	1	1	0
16-15	اختبارات الفصل الدراسي النهائية			

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	5	10	10%
2	امتحان 2 تحريري (أعمال سنة)	9	10	10%
3	امتحان منتصف الفصل الدراسي	7	20	20%
4	امتحان نهائي تحريري	14	40	40%
5	امتحان نهائي عملي	لا يوجد	----	-----
6	امتحان نهائي شفهي	11	10	10%
7	تكاليفات / مشروع / ملف الإنجاز / كتيب الأنشطة	8	10	10%

8	تدريب ميداني	لا يوجد	-----
9	أخرى (تذكر)	لا يوجد	-----

6- مصادر التعلم والتسهيلات المادية:

وليد رضوان، حقوق الإنسان، مذكرة للمعهد التكنولوجي العالي بالعاشر من رمضان.	المرجع الأساسي للمقرر	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
1- خديجة النبراوي: موسوعة حقوق الإنسان في الإسلام، دار السلام للطباعة والنشر والتوزيع، القاهرة. 2015 2- محمد الغزالي: حقوق الإنسان بين تعاليم الإسلام وإعلان الأمم المتحدة، القاهرة، دار الكتب الإسلامية، 1984 3- محمد عمارة: الإسلام وحقوق الإنسان، الكويت، سلسلة عالم المعرفة، عدد مايو 1985 4- محي شوقي أحمد: الجوانب الدستورية لحقوق الإنسان (رسالة دكتوراة، جامعة عين شمس، 1986)	المراجع الأخرى	
1- https://ar.wikipedia.org/wiki 2- http://www.du.edu.eg/ 3- https://www.youtube.com/	المصادر الإلكترونية (لا بد من إضافة الروابط)	
https://www.ekb.eg/ar/home	المنصة التعليمية (لا بد من إضافة الرابط)	
(داتا شو) وجهاز كمبيوتر محمول.	الأجهزة	التجهيزات التعليمية المساندة للتعليم والتعلم *
قاعة محاضرات مجهزة	المستلزمات	
-----	البرامج الإلكترونية	
-----	معامل المهارات/ المحاكيات	
-----	المعامل الافتراضية	
-----	أخرى (تذكر)	

منسق المقرر	منسق البرنامج	
أ.م.د. وليد رضوان	أ.د/ أحمد عبد الغفار	الإسم
		التوقيع

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Project Management			
Course Code (according to the bylaw):	MNG 201			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1	--	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Asmaa Ahmed Soliman			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Project management overview, organizational structures, assessing success, planning, learning curves, network scheduling techniques, CPM analysis, precedence networking, resource allocation and constraints, cost management, risk management, project performance measurement and control.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A7, A9 & A10		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO1	Identify the fundamental concepts and phases of project management.
		LO2	Explain the role of organizational strategy in project selection and prioritization.
		LO3	Describe how an organization's mission, vision, and strategy influence project planning.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO4	Develop project network schedules using techniques such as Critical Path Method (CPM) and Program Evaluation Review Technique (PERT).
		LO5	Apply core project management principles to minimize project duration and mitigate risks.
		LO6	Analyze the impact of risk management processes on project outcomes.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO7	Schedule project resources and associated costs using appropriate tools.
		LO8	Recognize the different methods for project resource allocation.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓	-	-	-	✓	-	-	-	-	-	-	-	-	✓

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Practical Lab /
1	Introduction for project management	3	2	1	0
2	Organization strategy and project selection	3	2	1	0
3	Work Breakdown structure (WBS), Organization Breakdown Structure (OBS), Activity & Scope, Planning Process and Time management Project Planning	3	2	1	0
4	Activities Duration, Activities Sequence, Project Networks. Gantt Chart (Bar Chart) and Solved Examples on Bar chart (Gant Chart(	3	2	1	0
5	Activity On Arrow (AOA) and Solved Examples on Activity on Arrow (AOA)	3	2	1	0
6	Activity On Node (AON) and Solved Examples on Activity on Node	3	2	1	0
7	Revision and Mid Exam				
8	Managing Project Risk	3	2	1	0
9	Scheduling Resources and Costs	3	2	1	0

10	Applicable Examples on Scheduling Resources	3	2	1	0
11	Reducing Project Duration	3	2	1	0
12	Cost–Duration Trade-off examples	3	2	1	0
13	Cost–Duration Trade-off examples	3	2	1	0
14	Revision	3	2	1	0
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	3	10	10 %
2	Exam 2 written (Semester work or quiz)	5	10	10 %
3	Exam 3 written (Semester work or quiz)	10	10	10 %
4	Midterm exam	7	20	20 %
5	Final Written Exam	15, 16	40	40 %
6	Assignments / Project /Portfolio/ Logbook	12	10	10 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	1. Ravi V. Industrial Engineering and Management. PHI Learning Pvt. Ltd.; 2015 Aug 31. 2. Baudin, M., & Netland, T. (2022). Introduction to manufacturing: An industrial engineering and management perspective. Routledge.
	Other References	1. Cardona-Meza LS, Olivar-Tost G. Modeling and simulation of project management through the PMBOK® standard using complex networks. Complexity. 2017;2017(1):4791635.
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching	Devices/Instruments	Data show- Dashboard
	Supplies	N/A
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

and learning *		

	Course Coordinator	Program Coordinator
Name	Dr. Asmaa Ahmed Soliman	Dr. Mohamed Ashraf
Signature		

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

اخلاقيات مهنية				اسم المقرر: (تبعاً لما ورد باللائحة)
MNG 203				كود المقرر: (تبعاً لما ورد باللائحة)
الهندسة الطبية				القسم/الأقسام العلمية التي شاركت في التدريس:
إجمالي	أخرى (تحدد)	عملي	نظري	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
1			1	
اجباري				نوع المقرر:
FRESHMAN YEAR				المستوى الدراسي الذي قدم فيه المقرر:
البرامج الهندسية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
ا.م.د/ امل الدسوقي				اسم منسق المقرر:
مجلس القسم العلمي للبرنامج				جهة مناقشة واعتماد تقرير المقرر:
8/12/2025				تاريخ اعتماد تقرير المقرر:

2- الوصف العام للمقرر (ملخص موجز للمحتوي العلمي) :

رؤية عالمية حول علم الهندسة ووظيفة المهندس: لطالما كان علم الهندسة نبزاً أساسياً لأي حضارة. - تُعد مهنة الهندسة من أرقى وأسمى المهن (وظيفة هندسية قائمة على الإبداع والابتكار والتطوير من وحي خيال المهندس - خدمة البشرية جمعاء والسعي إلى الجودة في حياة الإنسان). مسؤولية المهندس على الصعيدين الوطني والدولي: الدور الحيوي للمهندس وفقاً لعقود الهندسة الدولية (فيديك). - مسؤولية المهندس وفقاً للقوانين المصرية. أخلاقيات وآداب المهنة: رؤية عالمية حول قانون نقابة المهندسين رقم 66.

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		A9, A10	
النص	الكود	النص	الكود
يوضح طبيعة وظيفة المهندس كدور مهني يجمع بين الإبداع والمسؤولية الاجتماعية.	LO1	استخدم التفكير الإبداعي والمبتكر والمرن، واكتسب مهارات ريادة الأعمال والقيادة لتوقع المواقف الجديدة والاستجابة لها. استخدم التفكير الإبداعي والمبتكر والمرن، واكتسب مهارات ريادة الأعمال والقيادة لتوقع المواقف الجديدة والاستجابة لها.	A9
يميز بين المسؤوليات المهنية للمهندس في السياق المحلي والدولي، بما في ذلك عقود الفيديو والقوانين المصرية.	LO2	اكتسب وطبق معارف جديدة، ومارس استراتيجيات التعلم الذاتي، والتعلم مدى الحياة، وغيرها.	A10

4 طرق التعليم والتعلم للمقرر:

التدريس المباشر		التدريس الغير مباشر										استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات			
المحاضرات	التمارين العملية والتجارب	العصف الذهني	التعلم القائم على المشروعات الجماعية	استراتيجية دراسة الحالة	حل المشكلات	كتابة التقارير / الأبحاث	الحوار والمناقشة	التدريب الميداني	الزيارات الميدانية	التعلم الذاتي	التعلم بالإنترنت	برامج المحاكاة أو النمذجة	المعامل الافتراضية	التعلم الإلكتروني	النقاء الإصطناعي في التعليم
✓		✓	✓		✓	✓	✓			✓				✓	

الجدول الدراسي للمقرر:

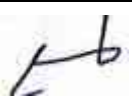
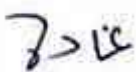
رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس نظري	تدريب
				تمارين
1	رؤية عالمية حول علوم الهندسة ومهنة المهندس.	1	1	0
2	رؤية عالمية حول مهنة المهندس.	1	1	0
3	وظيفة هندسية قائمة على الإبداع والابتكار.	1	1	0
4	وظيفة هندسية قائمة على التطوير.	1	1	0
5	دور المهندس الحيوي في العقود الهندسية الدولية.	1	1	0
6	مسؤولية المهندس في القوانين المصرية.	1	1	0
7	مراجعة وامتحان منتصف الفصل الدراسي			
8	معرفة بالاتحاد الدولي للمهندسين الاستشاريين (فيديك).	1	1	0
9	أخلاقيات وآداب المهنة: رؤية عالمية حول قانون نقابة المهندسين رقم 66 لسنة 1974 - تأكيد.	1	1	0
10	مراجعة واختبار قصير.	1	1	0
11	معرفة بالاتحاد الدولي للمهندسين الاستشاريين (فيديك).	1	1	0
12	أخلاقيات وآداب المهنة: رؤية عالمية حول قانون نقابة المهندسين رقم 66 لسنة 1974 - تأكيد.	1	1	0
13	مناقشة التقارير	1	1	0
14		1	1	0
16-15	إختبارات الفصل الدراسي النهائية			

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية من إجمالي درجة المقرر
1	امتحان 1 تحريري (أعمال سنة)	10	20	20 %
3	امتحان منتصف الفصل الدراسي	7	20	20 %
4	امتحان نهائي تحريري	15 و 16	40	40 %
7	تكليفات / مشروع / ملف الإنجاز /كتيب الانشطة	13 و 14	20	20 %

6- مصادر التعلم والتسهيلات المادية:

Mappes, Thomas A. Biomedical Ethics. 1st ed., Butterworth, 1999	المرجع الأساسي للمقرر (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
السامرائي، مهدي صالح مهدي. أخلاقيات العمل. دار صفاء للنشر والتوزيع، 2021.	المراجع الأخرى	
اخلاقيات العمل - د.مهدي صالح مهدي السامرائي Google Books	المصادر الالكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office	المنصة التعليمية (لابد من إضافة الرابط)	
داتا شوه	الأجهزة	التجهيزات التعليمية المساندة للتعليم والتعلم *
	المستلزمات	
	البرامج الالكترونية	
	معامل المهارات/ المحاكيات	
	المعامل الافتراضية	
	أخرى (تذكر)	

منسق المقرر	منسق البرنامج	
ا.م.د/ امل الدسوقي	د/ غادة كريم	الإسم
		التوقيع

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Applied Electrochemistry and Corrosion			
Course Code (according to the bylaw):	CHM 220			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (Tutorial)	Total
	2	2	1	5
Course Type:	Compulsory			
The level to which the course was introduced: 3	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Selem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Conductivity of solutions, Faraday's law, ionic mobility. Types of cells, electrode potential, pH measurements, electrolysis, electroplating and electrochemical industries. Types of corrosion, forms of corrosion, oxidation of metals, corrosion testing. Methods of protection. Cathodic & anodic protection. Coatings (organic, inorganic & metallic), control of the environment. Corrosion inhibitors. Material selection for corrosion resistance.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, B1, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Calculate the Electrical Potential, Electrical Field, Electrostatic Work, Voltage, Current, Electrochemical Potential, Activation Energy, Electrode and Electrochemical Equilibrium in the cell.
		LO2	Formulate thermodynamics and kinetics equations of Electrochemical cell
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO3	Performing experiments on various corrosion processes, protection methods, and materials selection with practical examples.
		LO4	Evaluate the probability of corrosion occurrence under specific operating conditions in given equipment, the probable corrosion type, the rate of corrosion and the price with regard to safety and environmental considerations.
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design.	LO5	Select the suitable materials, design and operation conditions necessary for the reduction of the likelihood of corrosion in equipment and constructions.
B2	Engage in the recent technological changes and emerging fields relevant to	LO6	Engage in the recent technologies of corrosion protection for sustainable materials use.

	chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.		

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√				√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	/ Practical Lab	
1	Electrolyte Conductance. Electrode potential. Nernst equation and applications. <u>Lab:</u> Safety instructions	5	2	1	2	-
2	Reference electrodes. PH measurements. Experimental aspects. Electrolysis. Decomposition potentials and calculations <u>Lab:</u>	5	2	1	2	-

	Overview of the used laboratory devices and instruments, highlighting their functions, applications					
3	Estimating decomposition potential of some species. Ions separation from a solution purification of metals. Faraday's laws Lab: Experimental quantitative aspects	5	2	1	2	-
4	- Introduction to electroplating and anodizing of metals. - Experimental aspects. - Corrosion and corrosion control - preliminary aspects: electrochemical cells and corrosion Lab: Use electrolysis to separate water into hydrogen and oxygen gas.	5	2	1	2	-
5	Electroplating and anodizing of metals. Experimental aspects. Corrosion and corrosion control (preliminary aspects): electrochemical cells and corrosion part (1) Lab: Use electrolysis to separate water into hydrogen and oxygen gas. Part (2)	5	2	1	2	-
6	Corrosion (continued). Study currents and corrosion. Pourbaix diagram. Polarization phenomenon of potential of electrodes and intending to create it. Lab: Study the variation of cell potential of $\text{Zn} \mid \text{Zn}^{2+} \parallel \text{Cu}^{2+} \mid \text{Cu}$ cell with change in the concentration of electrolytes	5	2	1	2	-

	(CuSO ₄ and ZnSO ₄) at room temperature					
7	Revision and Mid Exam					
8	Corrosion and passivation of metals. Anodic polarization curve. Types of corrosion. Corrosion rate expressions. Corrosion rate measurements. Experiment, Revision Lab: Study the variation of cell potential of $\text{Zn} \mid \text{Zn}^{2+} \parallel \text{Cu}^{2+} \mid \text{Cu}$ cell with change in the concentration of electrolytes (CuSO ₄ and ZnSO ₄) at room temperature	5	2	1	2	-
9	Corrosion rate measurements (continued). Experimental aspects. Forms of corrosion. Corrosion control: metals and alloys selections and design considerations. Experimental aspects. Lab: Metal plate electroplating	5	2	1	2	-
10	Corrosion control (continued): conditioning or modification of environment and use of protective coating (metallic, inorganic and organic coats). Lab: Metal plate electroplating	5	2	1	2	-
11	Corrosion control (continued): use of inhibitors and cathodic protection Lab: Metal plate electroplating	5	2	1	2	-
12	Corrosion control (continued): anodic protection and alloying of metals	5	2	1	2	-

	Lab: Effect of air and moisture on the corrosion of iron					
13	Corrosion control practical applications Lab: Effect of air and moisture on the corrosion of iron	5	2	1	2	-
14	Experimentation and general Revision Lab: Final Practical Exam	5	2	1	2	-
15,16	Final Exam.					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Quiz 1 written (Semester work)	4	10	10%
2	Quiz 2 written (Semester work)	10	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Practical assessment	1-14	10	10%
6	Tutorial/participation/report assessment	5, 8, 12	10	10%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method) • Pierre R. Roberge, "hand book of corrosion engineering", 2000 (6444), 2008 (https://feismo.com/doc-viewer-v2) • Philip A. Schweitzer, P.E, "Encyclopedia of corrosion technology", 2 nd edition, 2004 • Branko N. Popov, "Corrosion

		Engineering: Principles and Solved Problems", Elsevier, 2015 • <u>Tondon O.N, Hand Book of Electroplating Anodizing and Metal Treatment, 6 th Edition, Small Industry Research Institute, Delhi, 1999 (6421)</u>
	Other References	• Pierre R. Roberge, " Corrosion engineering: principles and practice" Txtbk, McGraw-Hill (2016). E-book: • David M. Bastidas, "Corrosion and Protection of Metals", Mdpi AG, 2020 • Theodore L. Brown, et al, "Chemistry the Central Science", Prentice Hall Int. Pearson International, 2010. • <u>Sharma K.K, A Text Book of Physical Chemistry, 7 th Edition, Vikas Publishing, House PVT LTD</u>
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	common glassware , High-impedance digital voltmeter or potentiometer, Thermometer and thermostatic bath
	Supplies	-
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha Fawzy El Hussein
Signature	Nora yehia	Noha El Hussein

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Field Training (3)			
Course Code (according to the bylaw):	FTR 231			
Department/s that participated in the teaching:	Chemical Engineering Department			
Total number of credit hours of the course: (according to the bylaw): 3 credit hrs.	Theoretical	Practical	Other (specify)	Total
	--	18	--	18
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Selem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Special training on chemical industries such as plastics, dies, fibers and paints. Automatic control. Piping and Instruments (P & I) diagrams. Quality control. Utilities (Steam, Water, electricity.).

3. Course Learning Outcomes CLOs:

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A5, A8, A9, A10, B2, B4)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO1	Analyze field data to generate a scientific report and construct process flow diagrams (PFD) and piping and instrumentation diagrams (P&ID)
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO2	Exhibit effective oral and written communication skills when engaging with the training site and department supervisor
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO3	Use creative and flexible thinking, combined with leadership skills, to anticipate challenges and develop effective responses during practical training
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Apply theoretical and practical knowledge to processes in chemical industries such as plastics, dyes, fibers, and paints. etc.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO5	Utilize recent technological advances, with emphasis on AI and data analysis, in field training activities to respond effectively to industrial challenges
B4	Adopt suitable national and international standards and codes to: design, operate, inspect and maintain chemical engineering systems	LO6	Apply international standards in the operation and maintenance of chemical engineering processes, including plastics, dyes, fibers, paints, automatic control systems, P&ID diagrams, quality control, and utilities (steam, water, electricity)

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
		✓			✓	✓	✓	✓	✓	✓	✓	✓		✓	✓

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	/ Practical Lab	
As scheduled	Overview of Chemical Industries: - Introduction to industrial sectors (plastics, dyes, fibers, and paints, etc.) - Identify industrial workflows, main equipment, and their integration within the overall process diagram	18	---	---	18	---

	Chemical Industry (plastics/ dies/ fibers ,...etc.) Training related to plastics, dyes/ fibers/paints Industry: - Raw materials and types of plastics, dies, fibers, and paints, etc. - Detailed process flow sheets to interpret operations and identify key process components	18	---	---	18	---
	Training related to the utilities unit: - Steam boilers, cooling towers, compressed air, etc. - monitoring, instrumentation, and safety requirements.	18	---	---	18	---
	Training related to the Piping, instruments, and quality control - Process P&ID - Quality control in industrial process	18	---	---	18	---
	Midterm Report and Oral Exam					
	Design Principles of Unit Operations - Apply design principles to various process unit operations, considering process requirements. - Implement safety measures and energy efficiency practices in chemical industries	18	-	-	18	-
	Industrial Laboratory Techniques - Demonstrate understanding of quality assurance and control standards in industrial processes.	18	-	-	18	-
	Optimize and analyze Process Through Simulation (optional) - Apply simulation and data	18	-	-	18	-

	analysis software to optimize or analyze process flowsheet or operating conditions (e.g., Aspen Plus, Python)					
	Technical Reporting & Documentation - Document industrial findings in a professional training report supported by appropriate visualizations					
	Final Report and Oral Exam					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Attendance	1-7	10	10%
2	Follow up	1-7	20	20%
3	Midterm Report	5	20	20 %
4	Final Report	8	20	20 %
5	Final Oral Exam	9	30	30%

6- Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Depending on the Chemical Engineering Training field/ Industry/Technology/ Application, For a technical writing scientific report, all library references appropriate to the field training are available in the different libraries on campus/online
	Other References	-
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities &	Devices/Instruments	-
	Supplies	-

equipment for teaching and learning *	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha Fawzy El Husseiny
Signature	Nora Yehia	Noha ElHosseiny

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Automatic Control (2)			
Course Code (according to the bylaw):	CHM 221			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	2	2	--	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	El Shimaa M. El Zahed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Process variables & their measurements, temperature, pressure, flow rate, weight, density, viscosity & conductivity. Process analysis & control... Process control of distillation towers, chemical reactors, heat exchange equipment. Control circuits for chem. plants.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3, B1, B3)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO1	Employ the basic terms of a series of controlled systems.
		LO2	Establish a control system by utilizing the degrees of freedom in sustainable chemical process engineering to achieve a cost-effective solution.
B2	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design,	LO3	Design a control strategy for chemical process equipment, process flow diagrams and P&ID.
		LO4	Select appropriate instruments & valves for control process in various applications in chemical plants.

	Instrumentation and Control of Chemical Processes, and Process and Plant Design.		
B3	Apply numerical modelling methods and/or computational techniques appropriate to chemical engineering.	LO5	Specify the controllers performance, appropriate practical application of control systems basics and scale diagrams by using computer program.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√		√				√							√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Lab / Practical
1	Incentive for chemical process control, suppresses the influence of external disturbance, insure the stability of a process and optimize the performance of chemical process.	4	4	-	-

2	Important terms in process automatic control - Types of measurements Hardware of control elements- Process variable & their measurements	4	4	-	-
3	Types of control configurations (Feedback control system). Application in chemical plant.	4	2	-	2
4	Types of control configurations (Feedforward control system). Application in chemical plant	4	2	-	2
5	Ratio control definition & Cascade control system -application in chemical plant	4	2	-	2
6	Degrees of freedom	4	2	-	2
7	Revision and Mid Exam				
8	Degrees of freedom and control of multiple input multiple output systems.	4	2	-	2
9	Chemical Process Diagram (P&ID) + Visio Program	4	2	-	2
10	Automatic controllers (Control action-Control modes- Commercial controllers)	4	2	-	2
11	Final control element (pneumatic control valve) - Construction of pneumatic controllers	4	2	-	2
12	Instrumentation	4	2	-	2
13	Programmable Logic Controller (PLC)	4	2	-	2
14	Design of control systems of multivariable processes and use Visio Program	4	2	-	2
15,16	Final Exam.				

Experiment Topics:

Experiment
Use computer software to Draw Basic Flowchart Diagram.

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	10	10 %
2	Exam 2 written (Semester work)	11	15	15 %
3	Midterm exam	7	20	20 %
4	Mini Project, presentation, Discussion	12,13	15	15 %
5	Final Written Exam	15, 16	40	40 %

6. Learning Resources and Supportive Facilities:

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- A.Brambilla, "Distillation Control & Optimization: Operation Fundamentals through Software Control", McGraw Hill, 2014.(16652) <u>Stephanopoulos, G., "Chemical process control, an introduction to theory and practice", Englewood Cliffs, New Jerrsy, 2002 .(7743 & 8075)</u> <u>Smith, C.A.and Corripio, A. B."Principles and practice of automatic process control", Johm Willy & Sons, 1985.</u>
	Other References	- Prof. Morten Hovd, "Advanced Chemical Process Control",2023 - Jose A. Romagnoli and Ahmet Palazoglu, "Introduction to Process Control",third Edition, CRC Press,2020. - Smith, C L, "Process Control for the Process Industries - Part 2: Steady State, 2017.
	Electronic Sources (Links must be added)	https://onlinelibrary.wiley.com/doi/10.1002/9783527842490.fmatter
	Learning Platforms (Links must be added)	EKB https://www.ekb.eg/web/guest/home - Microsoft office
Supportive	Devices/Instruments	Data show, laptop

facilities & equipment for teaching and learning *	Supplies	Essential Supplies
	Electronic Programs	Visio, Edrawmax
	Skill Labs/ Simulators	Computer Lab
	Virtual Labs	--
	Other (to be mentioned)	--

	Course Coordinator	Program Coordinator
Name	El Shimaa M. El Zahed	Dr. Noha Fawzy El Husseiny
Signature		

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Conclusion Project			
Course Code (according to the bylaw):	CHM 240			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3 credit hrs.	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	1	2	2	5
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof / Maha Hassan Abd-El-Kreem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

All the students undertake a major project as part of the program. The aim of project is to provide the students in groups an appropriate opportunity to implement the concepts and techniques to a particular design. A dissertation on the project is submitted on which the student is examined orally by a committee of 3 members.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A5, A6, A7, A8, A10, B1, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO1	Survey the literature related to a problem or technology in the chemical engineering domain
		LO2	Collect market data on a particular problem in the specialized discipline.
A6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	LO3	Apply different control techniques/design principles acquired in their courses of study to a single chemical engineering unit and/or a system of chemical engineering equipment used during the graduation project's study and implementation
		LO4	Develop an economical product/procedure/technology/solution for a real-life problem depending on chemical engineering
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO5	Collaborate effectively with team members to achieve shared project objectives.
		LO6	Manage stress, time, and quality constraints while contributing to team-based project tasks.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO7	Deliver a clear and scientifically sound presentation or technical report using appropriate contemporary communication tools..
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO8	Identify appropriate methods, tools, materials, or technologies (including software) required for the implementation of the graduation project

B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design.	LO9	Design the components of a graduation project based on experimental work or computer-aided process simulation.
		LO10	Apply chemical engineering fundamentals and acquired skills to solve a real-world industrial or community problem.
		LO11	Mitigate risks and waste associated with the project implementation.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO12	Develop safe and cost-effective solutions to problems encountered during implementation using computational tools and measurement techniques.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology- Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/
				Tutorial	Practical / Lab	

						Projects/ ...)
1	Discussion with students the method of selecting the graduation project	5	1	2	2	
2	Discussion with students the method of selecting the graduation project	5	1	2	2	
3	Determine the subject of the project Assign references to students to read about the project	5	1	2	2	
4	Determine the subject of the project Assign references to students to read about the project	5	1	2	2	
5	Discussion with students the ways to build the project and set a timetable for project.	5	1	2	2	
6	Discussion with students the ways to build the project and set a timetable for project.	5	1	2	2	
7 – 26	- Theoretical explanation for the building and writing of the project and the preparation of the report - Open discussion with students about what has been accomplished over the previous period - Implementation of the project (and processing requirements)					
27	Showing initial outputs of the project	5	1	2	2	
28	Showing initial outputs of the project	5	1	2	2	
29	Final presentation of the project	5	1	2	2	

30	Presentation to the projects committee for arbitration	5	1	2	2	
31,32	Final Discussion					

An extra semester (8 weeks) could be extended for the students according to their advancement in their projects and the supervisor decision

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Project assessment 1 (Semester work)	10	10	10%
2	Project assessment 2 (Semester work)	18	10	10%
3	Final project report	30	20	20 %
4	Final oral Exam	30	40	40 %
5	Project assessment 3	23	10	10%
6	Project assessment 4	28	10	10%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method) • Mariano Martín Martí, Industrial Chemical Process Analysis and Design, Elsevier, 2016 • McGraw-Hill, Handbook of Chemical Engineering Calculations, Third Edition, 2004 • James G. Speight, Chemical and Process Design Handbook, 2002 • J.M. Coulson and J.F. Richardson, Chemical Engineering, Volume 1, 5th edition, Butterworth-Heinemann • Robert H. Perry, Don W. Green, "Chemical Engineerings' Handbook", ninth edition, 2019

		Kirk Othmer encyclopedia
	Other References	- Nayef Ghasem, Redhouane Henda, Principles of Chemical Engineering Processes: Material and Energy Balances ., CRC Press, 2nd edition, 2014 - Don W. Green, Marylee Z. Southard, „Perry’s Chemical Engineers Handbook“, 9th edition, Mc Graw Hill, 2019 - Christie John Geankoplis, Transport Processes and Separation Process Principles“, 5th edition, Prentice Hall, 2018.
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	ALL Department laboratories, equipment, devices and facilities.
	Supplies	Essential supplies
	Electronic Programs	Computer lab.
	Skill Labs/ Simulators	Department laboratories
	Virtual Labs	--
	Other (to be mentioned)	All materials, kits, available resources

	Course Coordinator	Program Coordinator
Name	Prof / Maha Hassan Ahmed Abd El Kreem	Dr. Noha Fawzy M. El Husseiny
Signature	Maha Abdelkreem	Noha ElHoseiny

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Polymer Processing			
Course Code (according to the bylaw):	CHM 241			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3	Theoretical	Practical (Lab.)	Other (Tutorial)	Total
	2	2	1	5
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Noha Fawzy Mohamed El Hussein			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Polymer blending, crushing and processing, method of polymer processing, recycling, effect of processing condition on polymer properties, processing using molds, extrusion, thermoforming.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A2, A4, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO1	Investigate different polymer process techniques specific to particular polymer products and processes including reactor and vessel design.
		LO2	Apply polymer processing formation methods for different polymers on a laboratory scale
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	LO3	Integrate different concepts related to bulk, solution, suspension, and emulsion polymerization techniques
		LO4	Apply appropriate processing techniques and relevant safety, environmental, and quality standards in the production of thermoplastic and thermoset polymers.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO5	Identify technological applications of gas laws, phase behavior, and chemical kinetics relevant to modern chemical engineering processes.
		LO6	Explore recent technological advancements and modern equipment used in polymer processing techniques (e.g., extrusion, injection molding, 3D printing, electrospinning technique)

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology- Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√					√	√			√	√				

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/ Projects/ ...)
				Tutorial	Practical / Lab	
1	Introduction to polymer production and polymer processing.	5	2	1	2	
2	Industrial methods of polymer production: • Bulk polymerization. • Solution polymerization. • Emulsion polymerization. • Suspension polymerization.	5	2	1	2	
3	Polystyrene: Properties Synthesis, processing conditions, characteristics and applications.	5	2	1	2	

4	Polyvinyl Chloride • Properties • Processing conditions. • Production of polyvinyl chloride powder and pellets.	5	2	1	2	
5	Polyvinyl acetate latex, • Polyvinyl acetate properties • Processing conditions • Detailed flow sheet for the production of polyvinyl acetate latex.	5	2	1	2	
6	Phenol formaldehyde resin Production and applications Preparation of phenol formaldehyde resin in lab.	5	2	1	2	
7	Revision and Mid Exam					
8	• Urea formaldehyde resin: Production and Applications. • Melamine formaldehyde resin: Preparation, properties, and applications • Experimental preparation of urea formaldehyde resin	5	2	1	2	
9	• Synthesis and applications of unsaturated polyester • Processing of polypropylene	5	2	1	2	
10	• Polyethylene glycol Production and applications. • Poly acrylic Acid powder: manufacturing	5	2	1	2	

	process - main uses and applications.					
11	Polyamide • Properties • Processing. • Applications	5	2	1	2	
12	Polyethylene terephthalate • Properties • Conditions • Application	5	2	1	2	
13	• Production of Polyethylene powder and its application. • Comparison between the chemical structure and properties of low density polyethylene and high density polyethylene.	5	2	1	2	
14	• General and main steps in Polymer processing • Polymers properties required in polymer processing • Injection molding, Extrusion, Blow molding, Thermoforming, Rotational molding, Compression molding, Casting	5	2	1	2	
15,16	Final Exam.					

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	5	5%

2	Exam 2 written (Semester work)	10	5	5%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Tutorial and Laboratory assessment	1 - 14	20	20%
6	Assignments/Reports/Participation/Presentation (Semester work)	1 - 14	10	10%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• Drummond Spinhirne, "Polymer Science and Technology: Fundamentals and Applications", Intelliz press, 2024. (16914) • K. Haghi, Chin Hua Chi, Applied Chemistry and Chemical Engineering, Experimental Techniques and Methodical Developments, Volume 4, Apple Academic Press, 2018 • J.Worstell, Scaling Chemical Processes: Practical Guides in Chemical Engineering, 2016 (16664) • A. Barbalata, D. Feldman, "Synthetic Polymers, Technology, Properties, Application", Chapman & Hall, London, 1996 • Charles A. Harper, "Modern plastic hand book", Mc Graw Hill, 2000. • S.P.Mohanty, Experiments in Polymer Chemistry, Campus books, Delhi, 2017 (16657)
	Other References	• Koltzenburg, Sebastian, Michael Maskos, and Oskar Nuyken. Polymer chemistry. Springer Nature, 2023. • Manas Chanda, Plastics technology handbook, Fifth edition, Taylor & Francis Group, LLC, 2018
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office

Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Lab instruments – Glassware for different experiments – water baths - stirrer – thermometers – Balances
	Supplies	Essential supplies
	Electronic Programs	-
	Skill Labs/ Simulators	Department laboratories
	Virtual Labs	-
	Other (to be mentioned)	materials necessary for different experiments

	Course Coordinator	Program Coordinator
Name	Noha Fawzy M. El Hussein	Dr. Noha Fawzy M. El Hussein
Signature		

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Pressure Vessel Design			
Course Code (according to the bylaw):	CHM 242			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2 credit hours	Theoretical (Lecture)	Practical (Lab.)	Other (Tutorial)	Total
	1	-	2	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof / Maha Hassan Ahmed Abd El Kreem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the course approval.			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Introduction, gas principles for designing pressure vessels, design codes, pressure calculations, allowed stresses, materials of construction, fundamentals of pressure vessel design, thin shells, thick shells and flanges. Applications

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3, A9, B1, B4)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO1	Apply mathematical equations in pressure vessels design
		LO2	Demonstrate a comprehensive understanding of design methodology.
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO3	Infer the empirical equations used in designing pressure vessels..
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design	LO4	Design an integrated equipment with supports and opening for vertical & horizontal vessels.

B4	Adopt suitable national and international standards and codes to: design, operate, inspect and maintain chemical engineering systems, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design	LO5	Apply different codes in the design of pressure vessels and make sure that the design is appropriate.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology- Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√	√	√		√	√			√					√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/ Projects/ ...)
				Tutorial	Practical/ Lab	
1	Introduction to design processes, Properties of safe and optimum design.	3	1	2	--	--
2	Design codes, Basic design and detailed design, Units, conversion factors.	3	1	2	--	--

3	Selection of materials of construction, Design of vessels under internal pressure (shells, heads and closures).	3	1	2	--	--
4	Cont.(Design of vessels under internal pressure (shells, heads and closures).	3	1	2	--	--
5	Design of vessels under external pressure (shells, heads) – Part I.	3	1	2	--	--
6	Design of vessels under external pressure (shells, heads) – Part II.	3	1	2	--	--
7	Revision and Mid Exam					
8	Design of vessels under external pressure (shells, heads, pipes and closures).	3	1	2	--	--
9	Design of vessels under external pressure (shells, heads, pipes and closures, support).	3	1	2	--	--
10	Design of openings under internal/external pressure.	3	1	2	--	--
11	Design of tall vertical vessels in internal/coastal regions, under internal/external pressure, weight calculations.	3	1	2	--	--
12	Design of short vertical vessels in internal/coastal regions.	3	1	2	--	--
13	Design of horizontal vessels (under internal/external pressure).	3	1	2	--	--
14	Equipment fabrication and testing, Comprehensive Case study.	3	1	2	--	--
15,16	Final Exam.					

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10%
2	Exam 2 written (Semester work)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15	40	40 %
5	Assignments / Project /Case study/Report/Presentation	1-14	20	20%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- B.C. Bhattacharyya, Introduction to Chemical Equipment Design-Mechanical Aspects, CBS Publishers & Distributors, 1998), e-book 2018 (https://toaz.info/doc-view-3) - A.SHARMA, Chemical Process Equipment: Selection and Design, SCITUS, USA, 2016 (16760) - Dennis R. Moss, Pressure Vessel Design Manual, 4th edition, Elsevier Inc, USA, 2013 - J.Worstell, Scaling Chemical Processes Practical Guides In Chemical Engineering, B.H.Elsevier, NY, 2016 (16664)
	Other References	Carl R. Branan, Rules of Thumb for Chemical Engineers- A Manual of Quick, Accurate Solutions to Everyday Process Engineering Problems, 3rd edition, Gulf Professional Publishing an imprint of Elsevier Science, USA
	Electronic Sources (Links must be added)	https://toaz.info/doc-view-3
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	Microsoft Excel (computer lab activity)
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Prof / Maha Hassan Ahmed Abd El Kreem	Dr. Noha Fawzy M. El Husseiny
Signature	Maha Abdelkreem	Noha ElHosseiny

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Chemical Engineering Laboratory			
Course Code (according to the bylaw):	CHM 243			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2 credit hours	Theoretical (Lecture)	Practical (Lab.)	Other (Tutorial)	Total
	-	4	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Noha Fawzy El Hussein			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the course approval.			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Heat transfer. Fluid mechanics. Heat exchangers. Flow measurements. Distillation.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, A7, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Evaluate physical properties and fluid flow parameters (e.g., viscosity, density, flow rates) using experimental data and appropriate engineering principles.
		LO2	Apply unit conversions and dimensional analysis to interpret laboratory results and support problem solving in chemical engineering experiments.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO3	Select appropriate analytical or graphical methods to solve experimental problems in chemical engineering using critical thinking.
		LO4	Interpret experimental/industrial data and observations using sound engineering judgment
A7	Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	LO5	Collaborate effectively within a multidisciplinary team to manage laboratory tasks, time, and resources.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO6	Conduct experiments for the determination of unknown physical/chemical properties of fluids/systems in the field of chemical engineering.
		LO7	Apply modern laboratory tools and numerical methods such as Excel and curve fitting techniques to analyze experimental data in chemical engineering applications.
		LO8	Demonstrate the use of up-to-date laboratory equipment and software tools in conducting and analyzing experiments.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology- Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
	√				√	√	√			√	√			√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/ Projects/ ...)
				Tutorial	Practical / Lab	
1	Introduction, laboratory tour, data analysis and units conversion.	4	--	--	4	--
2	Units and conversion, cont. Theoretical and numerical evaluations for some physical quantities (density, viscosity, mass diffusivity, overall heat transfer coefficients, thermal conductivity, etc.) - computer lab practice.	4	--	--	4	Extra practice on Units and Dimensions – revision sheet – 1 hr
3	Efflux time calculations principles and tutorials. - Efflux time measurement and lab practice	4	--	--	4	
4	Heat Transfer - Thermal conductivity of metals – new equipment experiment	4	--	--	4	Assignment #1-Efflux time calculation – 2 hrs

5	Adsorption isotherms – concepts Recall the concentration definitions and calculation for lab preparation	4	--	--	4	Presentation #1 Adsorption Isotherms – 2hrs
6	Adsorption Isotherms (cont.) discussion – Experimentation using different adsorbents	4	--	--	4	
7	Revision and Mid Exam					
8	Sedimentation studies and industrial applications.	4	--	--	4	
9	Sedimentation rate experimental measurements.	4	--	--	4	Assignment#2 (sedimentation) – 1hr
10	Measurement of steady state and unsteady state heat transfer coefficients/ Heat capacity of Metals new equipment experiment.	4	--	--	4	Presentation #2 (Classification of fluids – viscosity measurements) – 2hrs
11	Types of fluids - Viscosity determination for Newtonian fluids through capillary tube viscometer and other methods.	4	--	--	4	Assignment #3 (heat transfer – viscosity) – 1.5 hrs
12	Determination of mass diffusivity for liquids and gases through experimental/industrial data.	4	--	--	4	Assignment#4 (diffusivity) – 1 hr
13	Discussion of the different methods of flow measurements techniques based on experimentation – Fluid Mechanics and Piping Systems new experiment trainer.	4	--	--	4	Presentation #3 (Experimental Flow measurements) – 2 hrs
14	Numerical and graphical solution methods with practice in different experiences (revision) – Lab assessment	4	--	--	4	Assignment #5 (Flow through orifice meter) – 1 hr
15,16	Final Exam.					

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	10	10%
2	Exam 2 written (Semester work)	10	10	10%
3	Midterm exam	7	20	20%
4	Final Written Exam	15, 16	25	40%
5	Final Practical Lab Exam	14	15	
6	Laboratory assessments/ Assignments/ Logbook (Semester work)/ Participation / Problem-solving	1-14	10	10%
7	Presentations (topics for self-learning) Discussions	5, 10, 13	10	10%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) references (must be written in full according to the scientific documentation method)	- Laboratory manual. - Coulson and Richardson's, "Chemical Engineering", volume 6, 4th edition, Elsevier Butterworth-Heinemann, 2005 - Don W. Green & Marylee Z. Southard, "Perry's Chemical Engineering Handbook", 9th edition, McGraw Hill, 2019. - C.M. van 't Land Enschede, The Netherlands, Introduction to Chemical Engineering, John Wiley & Sons, Canada, 2024
	Other References	--
	Electronic Sources (Links must be added)	--
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive	Devices/Instruments	Data show, laptop, Lab. Equipment as

facilities & equipment for teaching and learning *		mentioned in the course content
	Supplies	Essential Supplies
	Electronic Programs	Microsoft Excel (computer lab activity)
	Skill Labs/ Simulators	Department laboratories
	Virtual Labs	--
	Other (to be mentioned)	Library Usage - Department Chemical Engineering lab rooms

	Course Coordinator	Program Coordinator
Name	Dr. Noha Fawzy M. El Hussein	Dr. Noha Fawzy M. El Hussein
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Chemical Process Safety			
Course Code (according to the bylaw):	CHM 244			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 2 credit hours	Theoretical (Lecture)	Practical (Lab.)	Other (Tutorial)	Total
	2	-	-	2
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof / Maha Hassan Abd-El-Kreem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the course approval.			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Hazard in chemical process – automatic control used to minimize accidents – Safety in dealing with chemicals

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3, A4, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO1	Design basic safety systems and protective measures for industrial chemical processes, considering cost-effectiveness and sustainability principles.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles	LO2	Evaluate the consequences of poor process safety on operations, environment, and personnel
		LO3	Estimate the different types of hazards associated with a chemical process plant and associated risk control methods.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO4	Explain safety requirements at each stage of the process, from conceptual design through operation, maintenance, and modification.
		LO5	Implement automatic control principles to ensure safe and accident-free chemical processes."

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√			√	√	√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/ Projects/ ...)
				Tutorial	Practical / Lab	
1	Introduction to safety and Safety Programs in chemical process	2	2	--	--	--
2	Process Hazards Checklists Safety Reviews in chemical process	2	2	--	--	--
3	Process Hazards Checklists Safety Reviews in chemical process	2	2	--	--	--
4	Risk assessment in chemical process	2	2	--	--	--
5	Static electricity in chemical process	2	2	--	--	--
6	Static electricity in chemical process	2	2	--	--	--
7	Revision and Mid Exam					
8	Automatic control (Reliefs)	2	2	--	--	--

9	Automatic control (Reliefs)	2	2	--	--	--
10	Flares	2	2	--	--	--
11	fires and explosions	2	2	--	--	--
12	Design to prevent fires and explosions	2	2	--	--	--
13	Design to prevent fires and explosions	2	2	--	--	--
14	Safety in dealing with chemicals	2	2	--	--	--
15,16	Final Exam.					

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	10	10%
2	Exam 2 written (Semester work)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15	40	40 %
5	Assignments / Project /Case study/Report/Presentation	1-14	20	20%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• <u>Daniel A. Crowl & Joseph F. Louvar, "Chemical Process Safety", 4rd edition, Pearson, 2021</u> • Dr Tony Boyle, Health and Safety: Risk Management, 5th edition, Routledge, London and New York, 2019 • S.Jafarinejad, Petroleum Waste Treatment And Pollution Control, B.H.Elsevier, NY, 2017. (16670) • K.B. Schnelle, Air Pollution Control Technology Handbook, CRC Press, NY, 2016 (16667)

		- Alireza Bahadori, Waste Management in the Chemical and Petroleum Industries, 2nd edition, John Wiley & Sons, 2020 - Alireza Bahadori, Pollution Control in Oil, Gas and Chemical Plants, 2nd edition, John Wiley & Sons, 2014
	Other References	
	Electronic Sources (Links must be added)	https://toaz.info/doc-view-3
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	Microsoft Excel (computer lab activity)
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Prof / Maha Hassan Ahmed Abd El Kreem	Dr. Noha Fawzy M. El Husseiny
Signature	Maha Abdelkreem	Noha ElHosseiny

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Selection of Construction Materials			
Course Code (according to the bylaw):	CHM 245			
Department/s that participated in the teaching:	Chemical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (Tutorial)	Total
	2	-	1	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Seleem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Types of materials. Ferrous & non-ferrous, elements of material selection. Factors affecting selection. Polymeric materials.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Formulate the suitable material index based on translation techniques to select the suitable material and process.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO2	Identify the required material properties for various design cases.
		LO3	Select the suitable manufacturing processes to produce cost-effective solutions that meet specified needs.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	LO4	Recognize different material families and manufacturing process using material map charts and process tables produced from CES program

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√		√		√	√							√	√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	/ Practical Lab	
1	-Materials in design - Evolution of various engineering materials families	3	2	1	-	-
2	-The design process -Types of design -Design tools and materials data -Relation between function, material, shape, and processes. -Case studies	3	2	1	-	-
3	-The families of engineering materials -The definitions of each material family's properties	3	2	1	-	-
4	-Exploring material properties -The material property charts -The selection strategy -Attribute limits and material indices	3	2	1	-	-
5	-Exploring material properties -The material property charts -The selection strategy -Attribute limits and material indices	3	2	1	-	-
6	-Exploring material properties -The material property charts -The selection strategy -Attribute limits and material indices	3	2	1	-	-
7	Revision and Mid Exam					
8	-The structural material index -Material index Case studies	3	2	1	-	-
9	-The structural material index -Material index - Case studies	3	2	1	-	-
10	-The structural material index -Material index - Case studies	3	2	1	-	-
11	- Classifying processes - The processes: shaping,	3	2	1	-	-

	joining, and finishing - Systematic process selection - Ranking: process cost - Computer-aided process selection - Process selection case studies					
12	- Classifying processes - The processes: shaping, joining, and finishing - Systematic process selection - Ranking: process cost - Computer-aided process selection - Process selection case studies	3	2	1	-	-
13	-Multiple constraints and objectives - Projects discussions -Case studies	3	2	1	-	-
14	-Projects discussions -Case studies	3	2	1	-	-
15,16	Final Exam.					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Quiz 1 written (Semester work)	4	10	10%
2	Quiz 2 written (Semester work)	12	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Project /Case study/Report	13, 14	20	20%

6- Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- James F.shackelford, "Introduction to material science for engineering", 3rd edition, 1992. - V.S.Korada, "Engineering applications of nanotechnology", Springer, 2017.

	Other References	• William D. Callister, Jr. "Material science and engineering-An introduction", seventh edition, 2007. • V.S. Korada, "Engineering Applications of Nanotechnology". 2017 • Mahmoud M. Farag, Mahmoud M. Farag, Mahmoud M. Farag, "Materials and Process Selection for Engineering Design", 4th Edition, 2020, https://doi.org/10.1201/9781003006091 • Katsuhiko Ariga and Omar Azzaroni, "What is Nanoarchitectonics: Origin and Task", Nanoscience & Nanotechnology Series No. 55 Concepts and Design of Materials Nanoarchitectonics, The Royal Society of Chemistry 2022.
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	-
	Supplies	-
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha Fawzy El Hussein
Signature	Nora yehia	Noha El Hussein

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Environmental Impacts of Projects			
Course Code (according to the bylaw):	MNG 202			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 1	Theoretical	Practical	Other (Tutorial)	Total
	1	-	-	1
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	All Programs			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass Prof / Soad Abdel Aziz El Metwaly			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the course approval.			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Introduction: Availability of natural resources, Natural cycles of some basic elements (carbon, oxygen, nitrogen, sulfur, Phosphorous) Conflicts between developments, Economics and environments. Defining emissions sources, impacts, standards and precautions. Water, air and soil pollution and measurements. Historical development for recognizing the need for environmental impact assessment. Assessing the impacts on health, social, cultural and economic activities. Procedures of the environmental impact assessment: screening, scoping, defining impacts, comparing alternatives, plans for mitigation and alleviation, environmental auditing and public participation. Environmental impact statement and reporting, contents and forms. Examples for assessing the impacts of water resources projects on the environment and impacts of different activities on the water environment

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3, A4, A6)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	LO1	Define the steps of EIA study and its objectives, also the structure of the final EIA report
		LO2	Explain the different types of pollution and environmental component analysis
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles	LO3	Realize the natural cycles of essential elements and the conflicts between development, economics, and the environment
		LO4	Recognize qualitative and quantitative methods of impact analysis.
A6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	LO5	Predict EIA for different projects

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology- Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√				√		√	√								

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/ Projects/ ...)
				Tutorial	Practical / Lab	
1	Course Introduction Natural cycles of some elements	1	1	-	-	
2	Types of pollution and measurements.	1	1	-	-	
3	Emissions sources	1	1	-	-	
4	EIA process	1	1	-	-	
5	Quiz 1- EIA Report	1	1	-	-	
6	EIA Report (continued)	1	1	-	-	
7	Revision and Mid Exam					
8	Impact Identification	1	1	-	-	

9	Impact Identification	1	1	-	-	
10	Review and licensing	1	1	-	-	
11	Quiz 2 - Review and licensing (continued)	1	1	-	-	
12	Monitoring and Auditing	1	1	-	-	
13	Monitoring and Auditing (continued)	1	1	-	-	
14	Case Study	1	1	-	-	
15,16	Final Exam.					

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	According to schedule	15	15%
2	Exam 2 written (Semester work)	According to schedule	15	15%
3	Midterm exam	7	20	20%
4	Final Written Exam	15, 16	40	40%
5	Assignments / Reports /case study	According to schedule	10	10%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	John Glasson, Riki Therivel and Andrew Chadwick, Introduction to Environmental Impact Assessment, 4th edition, 2012.
	Other References	- Thom B. Fischer, "Strategic Environmental Assessment in Transport and Land Use Planning", 1st edition, 2023, - Barbara Carroll, Josh Fothergill, Jo Murphy, and Trevor Turpin, "Environmental Impact Assessment Handbook: A practical guide for planners, developers and communities", Third edition, 2019

		Peter Morris and Riki Therivel, Methods of Environmental Impact Assessment, Third edition, 2009
	Electronic Sources (Links must be added)	--
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Ass. Prof. Soad Abd El.aziz El Metwally	Dr. Noha Fawzy M. El Hussein
Signature	<i>Soad Abdel Aziz Awad</i>	<i>Noha El Hussein</i>

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Microanalysis			
Course Code (according to the bylaw):	CHM 204			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3 credit hours	Theoretical	Practical (Lab)	TUTORIAL	Total
	2	2	--	4
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass Prof / Soad Abdel Aziz El Metwally			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Atomic absorption units-analytical methods. Gravimetric and volumetric methods of analysis

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3, A10, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO1	Apply appropriate analytical methods related to specified needs
		LO2	Select analytical techniques based on efficiency, cost-effectiveness, and suitability for specific engineering problems.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO3	Investigate modern applications of analytical techniques, reflecting continuous learning strategies.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer	LO4	Explain the modern techniques of chemical analysis and the rules for their use.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓					✓	✓			✓	✓				

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Theoretical teaching (lectures)
				Tutorial	Practical Lab /	
1	- Introduction to Analytical Chemistry	4	2	2	--	--
2	Quantitative Analysis Qualitative Analysis	4	2	2	--	--
3	<u>Volumetric Analysis :</u> Theory <u>Types of titrations:</u> a. Acid – base or neutralization methods b. Precipitation methods c. Complexometric methods d. Oxidation – reduction methods	4	2	2	--	--
4	<u>Volumetric analysis.</u> - Methods of Expressing Concentration of solutions - Primary and Secondary Standard Solutions	4	2	2	--	--
5	<u>Quantitative Analysis:</u> <u>Gravimetric analysis:</u>	4	2	2	--	--

	Types of gravimetric analysis. <u>Precipitation gravimetry.</u> Properties of Precipitates and Precipitating Reagents					
6	<u>Precipitation gravimetry:</u> - Particle Size and Filterability of Precipitates - Mechanism of Precipitate Formation	4	2	2	--	--
7	Revision and Mid Exam					
8	<u>Precipitation gravimetry:</u> - Drying and Ignition of Precipitates. - Calculation of results from gravimetric data. - Advantages & disadvantages of Gravimetric Analysis - Applications of gravimetric methods	4	2	2	--	2
9	<u>Instrumental methods of analysis:</u> - Different types - Theory of use. - Limitations of Instrumental methods of analysis	4	2	2	--	2
10	<u>Atomic spectroscopy:</u> (absorption – emission) <u>Atomic absorption spectroscopy:</u> - Principles of AAS- use - Instrumentation - Atomization	4	2	2	--	2
11	<u>Electro thermal atomic absorption</u> (Graphite furnace). <u>Flame atomic absorption spectroscopy:</u> - Basic steps. - Comparison between atomizers.	4	2	2	--	2
12	<u>Gas Chromatography</u> Principles and types of detectors in GC	4	2	2	--	2
13	Interpret qualitative and quantitative analysis of organic compounds using GC-MS	4	2	2	--	2
14	- Determination of wavelength by UV- Visible spectrophotometer - Determination of Calibration Curve of a dye using UV-	4	2	2	--	2

	Visible Spectrophotometer					
15,16	Final Exam.					

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	10	10%
2	Exam 2 written/practical (Semester work)	14	20	20%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Lab assessment	According to schedule	10	10%

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• P.K. Agasyan, Qualitative Chemical Semimicroanalysis, Houghton Mifflin, NY, 1994 (14253) • Douglas A. Skoog, F. James Holler, Stanley R. Crouch, Principles of Instrumental Analysis, 7th Edition, Cengage Learning, 2016 • Brian M. Tissue, Basics of Analytical Chemistry and Chemical Equilibria, John Wiley & Sons, Inc, part III, 2013. • R. A. Day, " Quantitative Analysis", Prentice-Hall, India, 2001 (7951) • D.C.Harris, " Quantitative Chemical Analysis", W. H. Freeman and Company, NY, 2007 • D.C.Harris, " Quantitative Chemical Analysis", W. H. F, NY, 2002 (7727)

	Other References	--
	Electronic Sources (Links must be added)	--
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	Chemicals and materials necessary for different experiments - Laboratory usage - Library Usage

	Course Coordinator	Program Coordinator
Name	Ass Prof / Soad Abdel Aziz El Metwaly	Dr. Noha Fawzy M. El Hussein
Signature	<i>Soad Abd El. aziz</i>	<i>Noha ElHoseiny</i>

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Industrial & Wastewater Treatment			
Course Code (according to the bylaw):	CHM 205			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3 credit hours	Theoretical	Practical (Lab)	TUTORIAL	Total
	2	2	--	4
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof / Maha Hassan AbdelKreem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Water analysis, Water treatment, Clarification, disinfecting, activated sludge process. Chemical and Biological waste treatment.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3, A10, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO1	Explain the different characteristics of industrial water and waste water (chemical, biological, and physical characteristics).
		LO2	Design a basic wastewater treatment system based on industrial water characteristics and environmental regulations, considering cost-effectiveness and sustainability
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO3	Apply innovative approaches to wastewater treatment and analysis to enhance interpretation and evaluation of results
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer	LO4	Utilize models to describe different wastewater treatment processes.
		LO5	Evaluate the performance of an existing wastewater treatment facilities using modern engineering approaches.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√	√	√	√	√	√		√	√					√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Theoretical teaching (lectures)
				Tutorial	Practical Lab /	
1 & 2	<u>Industrial water and waste water characteristics:</u> - Physical characteristics - Chemical characteristics - Biological characteristics	8	4	4	--	--
	- <u>Introduction to water lab.</u> - <u>Determination of the total hardness of water.</u>					
3 & 4	<u>Industrial water and waste water treatment processes:</u> - Pre-treatment, primary treatment - Composition of wastewater - Design of equalization tank - Design of grit chamber	8	4	4	--	--
	- <u>Determination of water alkalinity</u> - <u>Determination of Cl⁻ content in water</u>					
5 & 6	<u>Industrial water and waste water treatment processes:</u> - Characteristics of wastewater	8	4	4	--	--

	- Design of sedimentation tank					
	- Anaerobic Digester - Aerobic Digester					
7	Revision and Mid Exam/Lab assessment					
8	<u>Secondary treatment:</u> - Aeration method - Mass transfer near the biomass - Design of activated sludge reactor - Wastewater Collection and conveyance system	8	4	4	--	
	Determination of water COD					
9 &10 &11	<u>Tertiary treatment</u> - Sludge disposal - Treatment facilities Disinfection - Wastewater Collection and conveyance system	12	6	6	--	
	- Determination of water BOD - Ion exchange - Coagulation and flocculation					
12 &13 &14	Integration of wastewater treatment processes - Water treatment (Softener) - Clarifier - Solid treatment	12	6	6	--	
	- Adsorption - Case Study - Final Lab Assessment					
15,16	Final Exam.					

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	5	5%

2	Exam 2 written (Semester work)	11	5	5%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15	40	40 %
5	Midterm Practical (lab) Exam	8	10	10%
6	Final Practical (lab) Exam	14	10	10%
7	Assignments / Project /Portfolio/ Logbook	1-14	10	10%

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• J.Cotruvo , Drinking Water Quality And Contaminants Guidebook, CRC Press, NY,2019 (16672) • T.E.Jenkins , Introduction To Water Resource Recovery Facility Design, M. Hill, USA, 2015 (16650) • David Hendricks, Fundamentals of Water Treatment Unit Processes, CRC press, 2011 • Metcalf and Eddy, Wastewater Engineering Treatment Disposal Reuse, McGraw-Hill, New Delhi, 2006 (14664). • Grady, C. P. L. Jr., Daigger, G. T., Lim, H. C. Biological Wastewater Treatment. Second Edition, 1999 • Donald W. Sundstrom, Wastewater Treatment , Englewood Cliffs, N.J. : Prentice-Hall , Prentice-Hall, 1979 (link) • Standard Methods for the Examination of Water and Wastewater, American Public Health Association, Water Pollution Control Federation, 1981
	Other References	• Lawrence K. Wang , Handbook of Environmental Engineering, Volume 3, Biological Treatment Processes, 1986

		Pardeep Singh, Pramit Verma, Ravindra Pratap, Wastewater Resource Recovery and Biological Methods, Springer, 2023
	Electronic Sources (Links must be added)	- https://feismo.com/doc-viewer-v2
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	Department Water Lab.
	Virtual Labs	--
	Other (to be mentioned)	Chemicals and materials necessary for different experiments - Laboratory usage - Library Usage

	Course Coordinator	Program Coordinator
Name	Prof / Maha Hassan Ahmed Abd El Kreem	Dr. Noha Fawzy M. El Hussein
Signature	Maha Abdelkreem	Noha ElHoseny

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Polymer additives			
Course Code (according to the bylaw):	CHM 206			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3 credit hours	Theoretical	Practical (Lab)	TUTORIAL	Total
	2	--	2	4
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass Prof / Soad Abdel Aziz El Metwally			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Viscosity improvement, vulcanization of rubber, molecular weight improvement. Surface treatment. Function of plasticizers, effect on mechanical properties of polymers, types of plasticizers, external & internal plasticizers pigments.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3, A10, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO1	Propose suitable polymer additives for specific industrial applications based on performance, cost-effectiveness, and environmental impact.
		LO2	Analyze the role of different polymer additives in modifying polymer properties and enhancing product performance
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO3	Demonstrate the ability to research and integrate recent advancements in polymer additives and plasticizers through independent learning.
B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer	LO4	Explore recent industrial technologies used in the production of polymer additives and plasticizers.
		LO5	Assess the impact of modern polymer additives on the performance of advanced composite materials.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
✓	✓					✓	✓			✓	✓				

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Theoretical teaching (lectures)
				Tutorial	Practical Lab /	
1	- Introduction to polymer additives (List of polymer additives and the role of each one. - Antioxidants: Classes of antioxidants, loss-of-dry and demands on antioxidant..	4	2	2	--	--
2	Surface active additives, Solid Dispersions Stabilization, Defoamers, Foam stabilizers	4	2	2	--	--
3	- Polydimethyl Silxanes - Organic modified PDMS - Effect of adding PDMS	4	2	2	--	--
4	- Effect of sun beam on polymer molecule - Mechanism of polymer degradation by UV of sun - Principles of UV stabilization	4	2	2	--	--
5	- UV Absorbers: (Benzophenone Triazoles, HALS)	4	2	2	--	--

6	Sulphur containing light stabilizers	4	2	2	--	--
7	Revision and Mid Exam					
8	- Rheological modifiers - Viscosity improves - Thixotropy and Thixotropic additives	4	2	2	--	--
9	- Yield stress builders - Ideal rheological curve dryers - Function of dryers and preparation	4	2	2	--	--
10	Types of dryers: (bulk dryers, surface dryers, primary and auxiliary dryers)	4	2	2	--	--
11	Types of dryers: Acidic, alkaline and neutral dryers	4	2	2	--	--
12	Anti-flame additives	4	2	2	--	--
13	Fire retardant additives	4	2	2	--	--
14	Impact of modern polymer additives on the performance of advanced composite materials	4	2	2	--	--
15,16	Final Exam.					

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	15	15%
2	Exam 2 written (Semester work)	11	15	15%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Tutorial/Report assessment/Presentation	Weekly	10	10%

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• Drummond Spinhirne , Polymer science and technology: fundamentals and Applications, intelliz press, USA, 2024 (16914) • <u>AlFred Rudin , " Elements of Polymer Science & Engineering", 2nd edition ,1998. (4755)</u> • S.P. Mohanty, “Experiments in Polymer Chemistry”, CAMPUS BOOKS, Delhi, 2017 (16657) • S.Al-Malaika, Specialty Polymer Additives, B. S., USA, 2001 (6455)
	Other References	• Charles E. Carraher Jr., Carraher's Polymer Chemistry, CRC Press, 8th.Ed. 2010. • Malcolm P. Stevens, Polymer Chemistry: An Introduction, Oxford UniversityPress, 3rd. Ed.,1999. • Charles E. Carraher Jr., Introduction to Polymer Chemistry, CRC Press, 1st. Ed., 2006.
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Ass Prof / Soad Abdel Aziz El Metwally	Dr. Noha Fawzy M. El Hussein
Signature	<i>Soad Abd El. aziz</i>	<i>Noha ElHoseiny</i>

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Unit Operations			
Course Code (according to the bylaw):	CHM 251			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3 credit hours	Theoretical (Lecture)	Practical (Lab.)	Other (Tutorial)	Total
	2	-	2	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Noha Fawzy El Hussein			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the course approval.			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Particle Characteristics, Properties & handling of solids, size reduction, screening. Mills, size classification, fluidization, floatation., Sedimentation and decantation, Filtration, Centrifugation, Separation of droplets from gases, Gas-solid separation

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, B1, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Apply fundamental engineering equations to calculate design parameters and operational factors for unit operations such as transportation, storage, size reduction, sedimentation, and filtration.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	LO2	Propose unit operation solutions considering efficiency, cost, and industrial relevance
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design	LO3	Design basic solid-handling and separation units (e.g., sedimentation tanks, filters, crushers, cyclones, conveyors and screens) considering the relevant chemical engineering principles and operational parameters.

B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer	LO4	Select appropriate emerging technologies and equipment for unit operation systems based on performance efficiency and cost-effectiveness.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology- Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site / Lab. Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√			√	√		√		√					√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/ Projects/ ...)
				Tutorial	Practical / Lab	
1	Properties of particulate solids	4	2	2	--	--
2	Characterization of solid particle (Sphericity and mean diameter).	4	2	2	--	
3	Screening	4	2	2	--	Assignment #1 (3 hrs)

4	Size Reduction	4	2	2	--	--
5	Size reduction machines (crushers and mills) Power consumption in size reduction	4	2	2	--	
6	Storage of Solids	4	2	2	--	
7	Revision and Mid Exam					
8	Transport of solids (conveyors types and design)	4	2	2	--	--
9	Flow Through Packed and Fluidized Beds	4	2	2	--	
10	Flow Through Fluidized Beds	4	2	2	--	
11	Filtration- Constant pressure filtration Continuous filtration.	4	2	2	--	--
12	Mixing and agitation	4	2	2	--	
13	Separation methods including (Centrifugal separation – sedimentation and decantation - Flootation)	4	2	2	--	
14	Separation of droplets from gases, Gas-solid separation.	4	2	2	--	--
15,16	Final Exam.					

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	10	10%
2	Exam 2 written (Semester work)	10	10	10%
3	Midterm exam	7	20	20%
4	Final Written Exam	15, 16	40	40%
5	Projects/ Assignments/Case study/Site visit (Semester work)	9-13	10	10%
6	Class Work practice and participation/Tutorial (Semester work)	1-14	10	10%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Christie J. Geankopolis, " Transport Processes and Unit Operations ",Prentice Hall, USA, 1993 (1594) – 1999 (7413). - Christie John Geankoplis A. Allen Hersel Daniel H. Lepek," Transport Processes and Separation Process Principles", Fifth Edition, Pearson Education, Prentice Hall, 2018 - A.Sharma, Chemical Process Equipment: Selection and Design, Scitus, USA, 2016 (16760) - Don W. Green , Marylee Z. Southard, "Perry “Chemical Engineers’ Handbook,” 9th ed. McGraw-Hill Education, 2019 - Coulson and Richardson’s, "Chemical Engineering Volume 2A: Particulate Systems and Particle Technology“, Sixth Edition, 2019 - Dr. Magdi Abadir’s student handbook "Principle of mechanical unit operations" Cairo University.
	Other References	--
	Electronic Sources (Links must be added)	www.websites.umich.edu/~elements/5e/index.html
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	New Equipment trainer (Heat Transfer in Fluidized Bed)
	Virtual Labs	--
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Dr. Noha Fawzy M. El Hussein	Dr. Noha Fawzy M. El Hussein
Signature	Noha El Hussein	Noha El Hussein

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Chemical Process and Plant Design			
Course Code (according to the bylaw):	CHM 252			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3 credit hours	Theoretical	Practical (Lab)	TUTORIAL	Total
	2	--	2	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof / Maha Hassan Abd-El-Kreem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the approval			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

The engineering design process. The chemical engineering concept as applied to the design process, development of a process. The scale up technique, process licensing, process evaluation, selection of process equipment, manufacture of equipment. Choice of industrial sites, the plant layout. Project engineering & management. Plant starts up.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, A10, B1, B2, B4)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve Complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Define process design and process classification.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	LO2	Estimate a simplified model for economic analysis and process design with the aid of flow diagram
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO3	Apply comparative analysis, and input information
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design.	LO4	Design the process task Separation and task integration for different technologies

B2	Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer	LO5	Locate the most suitable plant site and layout that meet specified needs with consideration for economic, environment, availability of raw materials, and safety.
B4	Adopt suitable national and international standards and codes to design, operate, inspect and maintain Chemical engineering systems.	LO6	Evaluate the process cost, alternatives, location and environmental impacts

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√	√	√	√	√	√	√			√					√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Theoretical teaching (lectures)
				Tutorial	Practical Lab /	
1	Introduction to process, project and plant design.	4	2	2	--	--
2	Flow sheeting	4	2	2	--	--
3	Plant process mass and energy balance simultaneously	4	2	2	--	--
4	Process development, reaction path, and species allocation	4	2	2	--	--

5	Design of process and process equipment	4	2	2	--	--
6	Plant site selection	4	2	2	--	--
7	Revision and Midterm Exam					
8	Plant layout, piping, utilities	4	2	2	--	--
9	Plant economics and cost estimation	4	2	2	--	--
10	Plant economics and cost estimation	4	2	2	--	--
11	Plant economics and cost estimation	4	2	2	--	--
12	Separation task synthesis.	4	2	2	--	--
13	Task integration	4	2	2	--	--
14	Process evaluation (case study)	4	2	2	--	--
15,16	Final Exam.					

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	4	5	5 %
2	Exam 2 written (Semester work)	11	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Project /Case study/Report/Presentation	1-14	25	25 %

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	• K.V.Narayanan , Stoichiometry and Process Calculations, PHI Learning Private, Delhi, 2019 (16749) • M. M. Martin, "Industrial Chemical Process Analysis and Design", Elsevier, India, 2016 (16673) • Lewis Allison, Chemical Engineering : Operations and Application., Cambridge University Press, USA, 2023 (16902) • Bruce C.Gates , Introductory Elements of Analysis and Design in Chemical Engineering, CRC PRESS, USA, 2024 (16916) • <u>Dale F. Rudd, Gary J. Powers, Jeffrey J. Sirola," Process synthesis", Prentice-Hall international series in the physical and chemical engineering sciences, 1973 (13498)</u> • <u>Max S. Peters, Klaus D. Timmerhaus , Plant design and economics for chemical Engineers, Mc Graw Hill, NY, 2003 (10808)</u> • A. Sharma, Chemical Process Equipment: Selection and Design, USA, 2016 (16760)
	Other References	• <u>Vilbrandt and Dryden, Chemical Engineering Plant Design, Mc Graw Hill, 1959</u> • Gavin Towler, Ray Sinnott, Chemical Engineering Design: Principles, Practice and Economics of Plant and Process Design, 3rd edition, Elsevier, 2022
	Electronic Sources (Links must be added)	--

	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	--
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Prof / Maha Hassan Ahmed Abd El Kreem	Dr. Noha Fawzy M. El Hussein
Signature	Maha Abdelkreem	Noha ElHoseiny

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Chemical Engineering Computer Aided Design (CAD)			
Course Code (according to the bylaw):	CHM 253			
Department/s that participated in the teaching:	Chemical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	-
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Selem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Use of computers in optimization of design & operation of equipment used in chemical engineering. Modeling & simulation of different systems.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, B3)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Identify the main input variables required to carry out the simulation process
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	LO2	Define both material and energy streams using computational programs.
		LO3	Construct a process flow sheet using a simulation program depending on the given process description.
B3	Apply numerical modeling methods and/or computational techniques appropriate to chemical engineering.	LO4	Simulate chemical engineering processes using simulation programs; Aspen HYSYS and Aspen-plus.
		LO5	Analyze chemical engineering process simulation results using computer programs.
		LO6	Select suitable operation conditions and unit operations based on knowledge gained from fundamental

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√		√	√	√		√					√		√	√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	/ Practical Lab	
1	-Starting with Aspen HYSYS -Solving equation of state with using Aspen HYSYS	4	2	-	2	-
2	Starting with Aspen HYSYS Solving equation of state with - using Aspen HYSYS	4	2	-	2	-
3	-Simulation basic operation units using Aspen HYSYS; pump, expander, compressor, heat exchanger, and flash drum using Aspen HYSYS	4	2	-	2	-
4	Simulation basic operation - units using Aspen HYSYS; pump, expander, compressor, heat exchanger, and flash drum using Aspen HYSYS	4	2	-	2	-
5	- Simulation reactors using Aspen HYSYS	4	2	-	2	-

6	- Simulation towers using Aspen HYSYS - Practical examples	4	2	-	2	-
7	Revision and Mid Exam					
8	- Simulation towers using Aspen HYSYS - Practical examples	4	2	-	2	-
9	- Practical examples	4	2	-	2	-
10	-Starting with Aspen plus -Solving equation of state with using Aspen plus	4	2	-	2	-
11	- Simulation flow sheet using Aspen plus	4	2	-	2	-
12	- Process analysis using Aspen plus	4	2	-	2	-
13	- Process analysis using Aspen plus	4	2	-	2	-
14	- Practical examples	4	2	-	2	-
15,16	Final Exam.					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Workshops/Quiz (Semester work)	1-14	30	30%
2	Classwork (Semester work)	1-14	10	10%
3	Midterm exam	7	30	30 %
4	Final Practical Exam	15, 16	30	30 %

6- Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- B.A. Finlayson, "introduction to chemical engineering computing", John Wiley & Sons, Inc., 2006. - V.S.KORADA, "chemical process modelling and computer simulation", PHI

		Learning Private, 2017. • M.M.MARTIN, "Introduction to software for chemical engineers", CRC PRESS, 2020. • J.HADARY, "Chemical process design and simulation, Aspen plus and Aspen Hysys Applications", WILEY, 2019.
	Other References	• A.K.Jana, "Chemical Process Modelling and Computer Simulation", PHI Learning Pvt. Ltd, 2018 • M.M.Martin , "Introduction to Software for Chemical Engineers", CRC Press, 2020 • Towler, G. and R. Sinnott, Chemical engineering design: principles, practice and economics of plant and process design. 2021: Butterworth-Heinemann. • Foo, D.C. and R. Elyas, Introduction to process simulation, in Chemical Engineering Process Simulation. 2023, Elsevier. p. 3-28.
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office
	Supportive facilities & equipment for teaching and learning *	
	Devices/Instruments	Computer laboratory
	Supplies	-
	Electronic Programs	Aspen-Hysys and Aspen-Plus
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha Fawzy El Hussein
Signature	Nora Yehia	Noha El Hussein

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Introduction to Accounting			
Course Code (according to the bylaw):	HUM 201			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>			<u>2</u>
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:				
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	<u>7/26/2025</u>			

2. Course Overview (Brief summary of scientific content):

The scientific frame of accounting: accounting concept & objectives, acceptable principles of accounting, accounting branches, types of institutions - financial statement: balance sheet, income statement, ownership proprietary statement, cash flows statement - double entry & analysis of financial transactions: accounting continuous balance of the financial position formula, debit & credit items financial position formula – the accounting cycle: business documents, the journals the ledgers' commercial documents according to the Egyptian laws. Journalizing & recording the commercial transactions of the firm, transactions of the owner of the firm, commercial papers & documents different types of revenues & expenditure. Trail Balance: Trail balance concept & objectives, its balance & imbalance corrections in the imbalance cases. A brief presentations of accounting in the types of companies as partnerships, limited partnerships & corporation.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A6,A8, A9, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	LO1	Design the presentations of accounting in she types of companies as partnerships, limited partnerships & corporation.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO2	Interpret the main concepts of basic financial accounting.
		LO3	Infer the main principle of basic financial statements.
		LO4	Elucidate the principal of balance sheet, income statement, ownership proprietary statement, cash flows statement - double entry & analysis of financial transactions.
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO5	Clarify the accounting continuous balance of the financial position formula, debit & credit items financial position formula.
		LO6	Evaluate the accounting cycle: business documents, the journals the ledgers' commercial documents according to the Egyptian laws.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies..	LO7	Assess the trail balance concept & imbalance corrections in the imbalance cases.
		LO8	Record the commercial transactions of the firm, transactions of the owner of the firm, commercial papers & documents different types of revenues & expenditure.
		LO9	Mange as member in a teamwork .
		LO10	Illustrate the gained knowledge orally.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√		√				√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Basic concepts of financial accounting in individual projects.	2	2	0	0
2	Budget equation.	2	2	0	0
3	Basic financial statements.	2	2	0	0
4	Double cod theory.	2	2	0	0
5	Posting for the ledger	2	2	0	0
6	Inventory adjustments	2	2	0	0
7	Revision and Mid Exam				
8	Journalizing & recording the commercial transactions of the firm, transactions of the owner of the firm, commercial papers &	2	2	0	0

	documents different types of revenues & expenditure				
9	Preparing financial statements (final accounts and budget).	2	2	0	0
10	Trail Balance: Trail balance concept & objectives, its balance & imbalance corrections in the imbalance cases.	2	2	0	0
11	A brief presentation of accounting in the types of companies as partnerships, limited partnerships & corporation	2	2	0	0
12	Supplementary Material and Quiz	2	2	0	0
13	Presentations	2	2	0	0
14	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	QUIZ 1 written (Semester work)	4	10	10%
2	QUIZ 2 written (Semester work)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15	40	40 %
5	Assignments (Report & Sheet)	10,12	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Available Presentation (handed to students' part by part).
	Other References	Mohamed Sabri El Attar, Mansoura Hamed & Ahmed El-Sabagh, Principles of financial Accounting, Cairo University.2020

	Electronic Sources (Links must be added)	• https://www.oreilly.com/library/view/financial-accounting-in/9780470635292/ch03sec3.html • https://www.coursera.org/learn/financial-accounting • https://open.umn.edu/opentextbooks/textbooks/640/
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Teaching aids and computers.
	Skill Labs/ Simulators	
	Other (to be mentioned)	Notebook and data show equipped lecture room.

	Course Coordinator	Program Coordinator
Name		Prof. Ahmed Abd El-Gafar
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	English Literature			
Course Code (according to the bylaw):	HUM 202			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>			<u>2</u>
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mai Abouzaid			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	<u>7/26/2025</u>			

2. Course Overview (Brief summary of scientific content):

Introduction to the forms of literature, short story, novel, drama and poetry. Developing students' critical ability through carefully selected sample literary texts.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A8, A9, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A8	Enhance and Develop the students' abilities and awareness for appropriate analysis and interpretation to all the scientific topics written in English words.	LO1	Enhance students' abilities in reading English Literature
		LO2	Developing reading strategies for different purposes.
		LO3	Study different types and genres of English Literature(poetry, novel, drama and short stories).
		LO4	Work effectively in team of multi-disciplinary or multi-culture.
A9	Communicate effectively, verbally and in writing with a range of audiences.	LO5	Apply the four skills of language freely with particular emphasis on dealing with literary works.
A10	Acquire and apply new knowledge and practice through English language.	LO6	Express themselves in English with confidence, especially while evaluating and criticizing the literary work.
		LO7	Comprehending various texts, including literary and informational materials.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education

√		√				√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction to Literature, Poetry and Short Stories	2	2	0	0
2	The Necklace by Guy de Maupassant	2	2	0	0
3	Nice Girl by Sherwood Anderson	2	2	0	0
4	Anton Chekov's Small Fry.	2	2	0	0
5	Ernest Hemingway's The Old Man at the Bridge	2	2	0	0
6	Vendetta by Guy de Maupassant	2	2	0	0
7	Revision and Mid Exam				
8	Sir Walter Raleigh's poems.	2	2	0	0
9	Shakespeare's Poems	2	2	0	0
10	Christopher Marlowe's Poems	2	2	0	0
11	Supplementary Material and Quiz	2	2	0	0
12	Supplementary Material and Quiz	2	2	0	0
13	Presentations	2	2	0	0
14	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	QUIZ 1 written (Semester work)	4	10	10%
2	QUIZ 2 written (Semester work)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15	40	40 %
5	Assignments (Report & Sheet)	10,12	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	"English Literature"; HTI; Available Hard copy. Available Presentation (handed to students' part by part).
	Other References	1- History of English Literature by Edward Albert. London: Routledge, 2019. 2- Arabic Literature in Translation. Cairo: The American University in Cairo, 2022. 3-The Complete Works of William Shakespeare. London: Canterbury Classics, 2023. 4- The Norton Anthology of World Literature. London: Norton, 2023.
	Electronic Sources (Links must be added)	https://englishworld.com/
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Teaching aids and computers.
	Other (to be mentioned)	Notebook and data show equipped lecture room.

	Course Coordinator	Program Coordinator

Name	Dr. Mai Abouzaid	Prof. Ahmed Abd El-Gafar
Signature	<i>Mai Abouzaid</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Trade Law			
Course Code (according to the bylaw):	<u>HUM 203</u>			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>			<u>2</u>
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:				
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

Kinds of contracts, contract constituents, contract administration, the limitations as imposed by law, disputes, claims, arbitration, the legal variables encountered in business and commercial transactions.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A7,A8,A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO1	Assess issues of the latest knowledge about the concepts, characteristics, and types of contracts, contract constituents
		LO2	Explain the main principle of Role of contracts: concept, attributes, and principles
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	Elucidate the main principal Dynamic nature of contract administration,
		LO4	Clarify the main principal-of limitations as imposed by law,
		LO5	Design the , the legal variables encountered in business
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies..	LO6	Solving problems related to commercial transactions.
		LO7	Evaluating search results, the limitations as imposed by law,
		LO8	Describe the main concepts of the basics of the legal variables encountered in business and commercial transactions.
		LO9	Working in a team group
		LO10	Presentation techniques in performance and dealing with others and outside the organization

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√		√				√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Fundamental of definition concepts, characteristics Trade Law - Dynamic nature and Kinds of contracts	2	2	0	0
2	Continued...	2	2	0	0
3	Concepts and requirement of contract constituents,- concepts and requirement of contract administration	2	2	0	0
4	Continued	2	2	0	0
5	Cooperative and competitive negotiations- how to use the limitations as imposed by law	2	2	0	0
6	Continued...	2	2	0	0
7	Revision and Mid Exam				
8	Good preparation of disputes, claims- the legal variables - the	2	2	0	0

	legal variables encountered in business				
9	Continued...	2	2	0	0
10	Commercial transactions- the legal variables encountered in commercial transactions	2	2	0	0
11	Continued...	2	2	0	0
12	The limitations as imposed by, disputes, claims, arbitration	2	2	0	0
13	Supplementary materials and Quiz	2	2	0	0
14	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	QUIZ 1 written (Semester work)	4	10	10%
2	QUIZ 2 written (Semester work)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15	40	40 %
5	Assignments (Report & Sheet)	10,12	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Available Presentation (handed to students' part by part).
	Other References	محمد عبد الكريم يوسف- "الصياغة القانونية للعقود التجارية, 2021
	Electronic Sources (Links must be added)	https://www.edx.org/learn/business-administration
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Teaching aids and computers.

for teaching and learning *	Skill Labs/ Simulators	
	Other (to be mentioned)	Notebook and data show equipped lecture room.

	Course Coordinator	Program Coordinator
Name		Prof. Ahmed Abd El-Gafar
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Entrepreneurship			
Course Code (according to the bylaw):	Hum 206			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	--	--	2
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr.Moataz Mohamed Abd El-Raouf			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

2. Course Overview (Brief summary of scientific content):

Preparation of students to consider his own small business project: Introduction to entrepreneurship, Definition of different project scales, characteristics of small project, planning of small project, small project organization, small project control, performance evaluation. application course project.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A6,A8,A9,A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	LO.1	Design thinking and process tools to evaluate real-world problems and projects.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO.2	Create presentations and business plans that articulate and apply financial, operational, organizational, market, and sales knowledge.
		LO.3	Mobilize people and resources.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO4.	Elaborate on students to consider their own small business project.
		LO5.	Analyze methodologies to Sell themselves and their ideas.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO6.	Cultivate endurance to foster self-efficacy through improved communication and problem-solving skills

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brainstorming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√		√				√								√	√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Practical Lab /
1	*Definition of Entrepreneurship. *What is meant by: Entrepreneur? * Competencies of entrepreneur.	2	2	-	-
2	*Main processes of Entrepreneurship. *The difference between entrepreneurship projects and small enterprises. *Inspiring Entrepreneurs Story of KINGINE Founders.	2	2	-	-
3	*The role of entrepreneurship and small enterprises in the development of the economy of countries. *Classification of different types of pilot projects.	2	2	-	-
4	*Entrepreneurship between science and talent. *Success story of an entrepreneur (jewellery designer Azza Fahmi).	2	2	-	-
5	Stages of Entrepreneurship Process: *Identify and evaluate the opportunity. *Develop business plans. *Resources required. *Manage the enterprise. Success story of an entrepreneur: Nike	2	2	-	-
6	-Entrepreneurial problems. -Why do so many small projects fail? + Online Quiz	2	2	-	-
7	Revision and Mid Exam				
8	-Success stories of Ingvar Kaber: IKEA Founder. -Definition of: Business incubators including its Importance.	2	2	-	-
9	-Basic services provided by business incubators. -Classification of Business incubators. -Proportions of services provided by business incubators.	2	2	-	-
10	-Examples Global and local Business incubators -success stories of El Araby Group.	2	2	-	-

	+ Online Quiz				
11	Entrepreneurial Project Presentations	2	2	-	-
12	Entrepreneurial Project Presentations	2	2	-	-
13	Entrepreneurial Project Presentations	2	2	-	-
14	Revision	2	2	-	-
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	6	15	15%
2	Exam 2 written (Semester work or quiz)	10	15	15%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
7	Assignments / Project /Portfolio/ Logbook	11,12,13	10	10%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Nieuwenhuizen, C. <i>Basics of entrepreneurship</i>. Juta and Company Ltd. (2004). - Kuratko, D. F. <i>Entrepreneurship: Theory, process, and practice</i>. Cengage learning.(2016)
	Other References	Singh, S. K., and Sanjay Gupta. <i>Entrepreneurship: E-book</i> . SBPD Publications, 2016.
	Electronic Sources (Links must be added)	https://guides.erau.edu/entrepreneurship/websites
	Learning Platforms (Links must be added)	EKB - Microsoft office
	Devices/Instruments	Data-show and Laptop

Supportive facilities & equipment for teaching and learning *	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr.Moataz Mohamed Abd El-Raouf	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Scientific Thinking			
Course Code (according to the bylaw):	<u>HUM 207</u>			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>			<u>2</u>
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr./ Mustafa Muhammad Fadel			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	<u>7/26/2025</u>			

2. Course Overview (Brief summary of scientific content):

The course trains students to think logically and critically and helps them to adapt and integrate in an academic environment. The student is familiarized with methods of researching and accessing information through the library or the Internet and is trained to assess the content and sources of information, reporting, and citing scientific literature, and how to maintain high ethical standards.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A4,A5,A7,A8)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO 1	Identify the main steps of logically and critically scientific thinking.
		LO 2	Formulate the principal methods of researching and accessing
		LO 3	Rationalize the logic scientific thinking and unlogic scientific thinking.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	LO 4	Utilize the principal methods of researching and accessing information through the library.
		LO 5	Evaluate the environmental issues, and risk management principles.
		LO 6	Assess the standard rules of researching and its quality guidelines for health and safety requirements.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO 7	Implement scientific reports depending on the scientific foundations of his study.
		LO 8	Control the time planning and team integration.
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO 9	Transfer the gained knowledge orally, written, and graphically.
		LO 10	Acquire the ability to self-learn in engineering applications related to scientific thinking.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO 1	Obtain the steps of logically and critically scientific thinking.
		LO 2	acquaint the methods of researching and accessing information through the library or the Internet.
		LO 3	assess the content and sources of information, reporting, and citing scientific literature

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√		√		√	√	√	√	√	√	√	√			√	√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	The main steps of logically and critically scientific thinking	2	2	0	0
2	Factors that affect scientific and innovative thinking, such as the surrounding environment.	2	2	0	0
3	The principal methods of researching and accessing information through the library.	2	2	0	0
4	The techniques of researching through the Internet.	2	2	0	0
5	Evaluating the information and results with academic environment research.	2	2	0	0
6	The methods of presentations to show the findings of scientific research	2	2	0	0

7	Revision and Mid Exam				
8	Scientific analysis and linking between variables	2	2	0	0
9	Suggest scientific solutions to practical problems	2	2	0	0
10	levels of thinking and scientific thinking techniques	2	2	0	0
11	Ethical standards of scientific research.	2	2	0	0
12	The impact of innovative thinking on management in organizations and change management	2	2	0	0
13	Final Exam.				

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Available Presentation (handed to students' part by part).
	Other References	• Michael E Gorman; “Scientific and Technological Thinking” 2005 by Lawrence Erlbaum Associates • Richard Paul, Linda Elder: The Miniature Guide to Scientific Thinking; 2023
	Electronic Sources (Links must be added)	• https://www.youtube.com/watch?v=pOb_jKqy_s0&ab_channel=Flippin%27Science • https://study.com/learn/lesson/scientific-thinking-process-examples.html
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	
	Supplies	
	Electronic Programs	
	Skill Labs/ Simulators	x
	Virtual Labs	x
	Other (to be mentioned)	x

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)		10	10 %
2	Exam 2 written (Semester work)		10	10 %
3	Midterm exam		20	20 %
4	Final Written Exam		40	40 %
5	Final Oral Exam		10	10 %
6	Assignments / Project /Portfolio/ Logbook		10	10 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Available Presentation (handed to students' part by part).	
	Other References	• Michael E Gorman; "Scientific and Technological Thinking" 2005 by Lawrence Erlbaum Associates • Richard Paul, Linda Elder: The Miniature Guide to Scientific Thinking; 2023	
	Electronic Sources (Links must be added)	• https://www.youtube.com/watch?v=pOb_jKqy_s0&ab_channel=Flippin%27ScienceVideos • https://study.com/learn/lesson/scientific-thinking-process-examples.html	
	Learning Platforms (Links must be added)	EKB - Microsoft office	
Supportive facilities & equipment for teaching and learning *	Devices/Instruments		
	Supplies		
	Electronic Programs		
	Skill Labs/ Simulators	x	
	Virtual Labs	x	
	Other (to be mentioned)	x	

	Course Coordinator	Program Coordinator
Name	Dr./ Mustafa Muhammad Fadel	Prof. Ahmed Abd El-Gafar

Signature	<i>Mustafa Muhammad Fadel</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Business Administration			
Course Code (according to the bylaw):	HUM 208			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>			<u>2</u>
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	<u>ALL ENGINEERING PROGRAMS</u>			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	<u>Prof. Eid Abd El-Baset Eid</u>			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

2. Course Overview (Brief summary of scientific content):

Nature, scope, importance & characteristics of business administration, development of the managerial thought, business external & internal environments, types of institutions, the managerial process. Functions of management: planning: planning concepts & importance, types of plans, characteristics & contents of the plan, planning stages, budgeting for planning. Organization: organization concepts & importance, characteristics of good & effective organization, types of organization structures, centralization & decentralization, span of supervision, delegation of authority, integration among the different units in the organization. Direction & supervision: Motivation, communications leadership & its different types. Control: concept & importance of control, control steps, objectives, actual performance, the deviation,

reasons of the deviation, the corrective actions, types of control, internal & external control. Decision - Making: Types of administrative decisions, decision -making process & steps, importance of information of decision making. Major functions in different companies: production, marketing, finance, human resources.

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A7,A8,A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO1	Describe the main steps of strategic plans using marketing information
		LO2	Understand the role of information technology systems (IT) in supporting business operations..
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	Elucidate the principal of Functions of management: planning: planning concepts & importance, types of plans, characteristics & contents of the plan, planning stages, budgeting for planning.
		LO4	Explicate the fundamentals of organization work: organization concepts & importance, characteristics of good & effective organization, types of organization structures, centralization & decentralization, span of supervision, delegation of authority, integration among the different units in the organization.
		LO5	Evaluating between Direction & supervision: Motivation, communications leadership & its different types.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies..	LO6	Assess the Control: concept & importance of control, control steps, objectives, actual performance, the deviation, reasons of the deviation, the corrective actions, types of control, internal & external control.
		LO7	Evaluate the decision Making: Types of administrative decisions, decision -making process & steps, importance of information of decision making.
		LO8	Identify the major functions in different companies: production, marketing, finance, human resources.
		LO9	Maintain the high ethical standards of business work.

		LO10	Explain the gained knowledge orally.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√		√				√	√			√				√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	An overview of the administrative process.	2	2	0	0
2	The nature of the projects and their objectives	2	2	0	0
3	An overview of management functions and facility functions.	2	2	0	0
4	Factors affecting the performance of the facility.	2	2	0	0
5	Planning function	2	2	0	0
6	Regulation function	2	2	0	0
7	Revision and Mid Exam				
8	Orientation function	2	2	0	0

9	Control function.	2	2	0	0
10	Management levels and skills required for each level.	2	2	0	0
11	Administrative communication process.	2	2	0	0
12	Supplementary materials and Quiz	2	2	0	0
13	Presentations	2	2	0	0
14	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	QUIZ 1 written (Semester work)	4	10	10%
2	QUIZ 2 written (Semester work)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15	40	40 %
5	Assignments (Report & Sheet)	10,12	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Available Presentation (handed to students' part by part).
	Other References	1-Mohamed Abdallah Abd El Rehim, Fundamental of Management & Organization , Cairo University.2022 2-El Desouky Hamed Abou Zeid, the Scientific Fundamentals of Management , Cairo University.2022
	Electronic Sources (Links must be added)	https://www.ecpi.edu/blog/what-is-business-administration-all-about https://www.edx.org/learn/business-administration
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities &	Devices/Instruments	Notebook and data show equipped lecture room.

equipment for teaching and learning *	Supplies	Teaching aids and computers.
	Skill Labs/ Simulators	
	Other (to be mentioned)	Notebook and data show equipped lecture room.

	Course Coordinator	Program Coordinator
Name	Prof. Eid Abd El-Baset Eid	Prof. Ahmed Abd El-Gafar
Signature	Prof. Eid Abd El-Baset Eid	

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Chemical Reaction Engineering			
Course Code (according to the bylaw):	CHM 250			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 3 credit hours	Theoretical (Lecture)	Practical (Lab.)	Other (Tutorial)	Total
	2	-	2	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Noha Fawzy El Hussein			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the course approval.			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Differential mass balance in reactors. Kinetic models. Homogeneous reactors. Catalytic reactors. Design of ideal reactors, stability and optimum operation.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, A9, B1)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Solve chemical reaction kinetics problems including the determination of reaction rate, reaction order, reaction rate constant, equilibrium conversions and Arrhenius equation's parameters.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	LO2	Evaluate key performance parameters (reaction rate, conversion, residence time, reactor volume, concentrations, and flow rates) for different types of reaction networks and/or reactor configurations under different operating conditions. . .
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO3	Analyze different reactor types and configurations to determine the optimal design for specific industrial problems.
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance,	LO4	Apply principles of mass and/or energy balances for sizing a constant volume isothermal CSTR, PFR, or batch reactors with and without multiple feeds for a single or combined sets of flow reactors.

	Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design	LO5	Design a variable volume gas phase reactor including the use of the rate equation as a function of either partial pressures or concentrations for different modes of operations and with the construction of the stoichiometric table.

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology- Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
√	√				√	√	√			√	√			√	

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other (Tasks/ Assignments/ Projects/ ...)
				Tutorial	Practical / Lab	
1	Revision and explanation of the basics of reaction kinetics (reaction rate, order and rate constant)	4	2	2	--	--
2	Reaction kinetics rate laws, non-isothermal reactions and Arrhenius equation	4	2	2	--	First sheet on kinetics (3 hrs):

3	Introduction to different types of chemical reactors including classification of reactors according to their mode of operation, thermal characteristics and number of phases.	4	2	2	--	Assignment #1 (3 hrs)
4	Introduction to the principles of design of chemical reactors based on mass and heat balances (General mole balance equation, reactor sizing for constant volume flow reactors in general approach.	4	2	2	--	--
5	Applications of the design fundamentals on continuous reactors (Continuous Stirred Tank Reactor (CSTR)	4	2	2	--	Assignment #2 (3 hrs)
6	Applications of the design fundamentals on continuous reactors - Tubular (Plug flow) - PFR reactors	4	2	2	--	Assignment #3 (1 hr)
7	Revision and Mid Exam					
8	Unsteady state operation (Homogeneous, constant volume Batch reactor design).	4	2	2	--	--
9	Different industrial applications and problems including single / combined sets of chemical reactors	4	2	2	--	Presentation # 1- , stability and optimum operation. (consecutive reactions) (4 hrs)
10	Levenspiel plot use for volume of reactor calculation for different reactors configurations and reaction networks.	4	2	2	--	Assignment 4 (90 min)
11	Comparison between single / multiple sets of reactors with different industrial problems with or without using Levenspiel plot	4	2	2	--	--

12	Introduction to the variable volume gas phase reactions and learn how to construct stoichiometric table relating reactants and products in terms of conversion	4	2	2	--	Problem Solving – 2 hrs
13	Design of different types of variable volume / pressure gas phase reactors study of the impact of reactor choice on yield and selectivity of products	4	2	2	--	Presentation #2 Catalytic reactors
14	Sizing Continuous-Flow reactors – Comparing the CSTR and PFR reactor volumes and Reactor Sequencing	4	2	2	--	--
15,16	Final Exam.					

5. Methods of Students' Assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	5	7.5	7.5%
2	Exam 2 written (Semester work)	10	7.5	7.5%
3	Exam 3 written (Semester work)	13	10	10%
4	Midterm exam	7	20	20%
5	Final Written Exam	15, 16	40	40%
6	Assignments	2, 3, 5, 6, 10	5	5%
7	Presentations (topics for self-learning) / Activity / Participation / Problem-solving	9, 12, 13	10	10%

6. Learning Resources and Supportive Facilities: *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	H. Scott Fogler, Elements of Chemical Reaction Engineering, 6th Edition, Prentice Hall, Pearson, USA, 2016 (16761), 2020 - Martin Schmal and José Carlos Pinto, Chemical Reaction Engineering: Parameter Estimation, Exercises and Examples, 2nd edition, CRC Press,

		Cambridge, 2022 (16904). - Levenspiel,O., Chemical Reaction Engineering, 3rd edition, new York, John Wiley & Sons, 1999 - E.Perkins, Chemical Reaction Engineering, Willford Press, 2022, (16788). T. O. Salmi, Chemical Reaction Engineering and Reactor Technology, CRC Press, NY, 2018 (16782) - Alex De Visscher, "Lecture Notes in Chemical Engineering Kinetics and Reactor Design", 1st edition, Create Space Independent Publishing Platform, 2013
	Other References	- The E-Learning copy: www.websites.umich.edu/~elements/5e/index.html, afforded by H.Scott Fogler, Elements of Chemical Engineering, University of Michigan, Copyright 2022. - Tesser R., Santacesaria E. (deceased), "The Chemical Reactor from Laboratory to Industrial Plant", 2nd edition, Springer (2025) - G.M.Panchenkov, Chemical Kinetics and Catalysis, Medtech, India, 2018 (16780)
	Electronic Sources (Links must be added)	www.websites.umich.edu/~elements/5e/index.html
	Learning Platforms (Links must be added)	EKB - Microsoft Office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show, laptop,
	Supplies	Essential Supplies
	Electronic Programs	Microsoft Excel (computer lab activity)
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	Library Usage

	Course Coordinator	Program Coordinator
Name	Dr. Noha Fawzy M. El Hussein	Dr. Noha Fawzy M. El Hussein
Signature	Noha ElHoseny	Noha ElHoseny

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Field Training (4)			
Course Code (according to the bylaw):	FTR 261			
Department/s that participated in the teaching:	Chemical Engineering Department			
Total number of credit hours of the course: (according to the bylaw): 3	Theoretical	Practical	Other (specify)	Total
	--	18	--	18
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Chemical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Nora Yehia Selem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

2. Course Overview (Brief summary of scientific content):

Training on waste disposal, water treatment. Design of chemical units. Chemical technology. Plant design. Site location and plant layout or in petroleum industry (fields or Plants).

3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A5, A8, A9, A10, B1, B2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO1	Analyze factors influencing plant design, site selection, and layout to ensure efficiency, safety, and sustainability
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO2	Develop a scientific report presenting the industrial findings effectively through clear visualization and strong presentation skills
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO3	Exhibit creative and flexible problem-solving, entrepreneurial mindset, and leadership abilities to manage new or unexpected training situations
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Apply integration principles to reduce waste and conserve energy in process flow diagrams
B1	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design.	LO5	Apply waste disposal and energy saving principles to modify designed integrated systems, processes, and components for industrial applications.
		LO6	Utilize problem-solving and professional practices knowledge in responding to process challenges during field training
B2	Engage in the recent technological changes	LO7.	Engage with recent advances in chemical engineering, technology, and

and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.		emerging fields to respond effectively to professional roles and responsibilities

4. Course Teaching and Learning Methods:

Direct Instruction		Indirect Instruction										Information Technology-Assisted Learning			
Lectures	Tutorial / Practical	Brain Storming	Project based learning	Case Study	Problem Base Learning	Reports & Research	Discussion	Field Training	Site Visit	Self-Learning	Discovery Learning	Simulation Programs	Virtual labs	E-Learning	AI in Education
	√	√			√	√	√	√	√	√	√	√		√	√

Course Schedule:

Week No.	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures)	Training		Other
				Tutorial	Practical / Lab	
As scheduled	Overview of Chemical Industries: Introduction to advanced industrial sectors (petroleum, petrochemical, etc.)	18	---	---	18	---
	Overview of Chemical Industries: Identify industrial workflows, main equipment, and their integration within the overall process diagram	18	---	---	18	---

	Chemical Industry (petroleum, petrochemicals, ,...etc.) Training related to heavy-duty industries, the petroleum/ petrochemicals Industry: - Characterize raw materials and evaluate their properties and applications, and related chemical products	18	---	---	18	---
	Chemical Industry (petroleum, petrochemicals, ,...etc.) Training related to heavy-duty industries, the petroleum/ petrochemicals Industry: - Detailed process flow sheets to interpret operations and identify key process components	18	---	---	18	---
	Midterm Report and Oral Exam					
	Training related to heavy-duty industries, the petroleum/ petrochemicals Industry: - Site Selection and Plant Layout in Petroleum Fields and Processing Plants	18	-	-	18	-
	Industrial Laboratory Techniques - Quality assurance and control standards for waste minimization, water treatment, and energy optimization.	18	-	-	18	-
	Technical Reporting & Documentation - Document industrial findings in a professional training report supported by	18	---	---	18	---

	appropriate visualizations - Representation of plant site location and layout through interactive presentations Optimize and analyze Process Through Simulation (optional) Apply simulation and data analysis software to optimize or analyze process flowsheet or operating conditions (e.g., Aspen Plus, Python)					
	Final Report and Oral Exam					

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	1-7	10	10%
2	Exam 2 written (Semester work)	1-7	20	20%
3	Midterm exam	5	20	20 %
4	Final Written Exam	8	20	20 %
5	Final Oral Exam	9	30	30%

6- Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Depending on the Chemical Engineering Training field/ Industry/Technology/ Application, For a technical writing scientific report, all library references appropriate to the field training are available in the different institute libraries(on campus/online)
	Other References	-
	Electronic Sources (Links must be added)	-
	Learning Platforms (Links must be added)	EKB - Microsoft Office

Supportive facilities & equipment for teaching and learning *	Devices/Instruments	-
	Supplies	-
	Electronic Programs	-
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

	Course Coordinator	Program Coordinator
Name	Dr. Nora Yehia Selem	Dr. Noha Fawzy El Husseiny
Signature	Nora yehia	Noha ElHosseiny