

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Drawing		Module Delivery
Module Type	BASIC		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CENG122		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester (s) offered	
Administering Department	Petroleum Engineering	College	College of Engineering
Module Leader	Hadi Mostafa Altalab	e-mail	hadi.mustafakazem@alayen.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Mustafa Sadiq Muhammad Hassan	e-mail	ssufe918@gmail.com
Peer Reviewer Name		e-mail	
Review Committee Approval		Version Number	1.0



Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes, Indicative Contents and Brief Description أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر			
Module Aims أهداف المادة الدراسية	This course aims to provide students with the basics and skills of engineering drawing. It includes three components: manual engineering drawing, descriptive geometry, and the use of AutoCAD. The engineering drawing component introduces students to basic concepts such as the drawing tools used, types of drawing paper, and types of lines. Students then learn how to draw basic geometric shapes and how to perform basic geometric operations. At this point, students begin to practice drawing two-dimensional and isometric engineering drawings, as well as adding dimensions. Finally, students learn how to conclude projections for three-dimensional objects. Descriptive geometry component covers the fundamentals of this branch of geometry that allows the representation of three-dimensional (3D) objects in two- dimensions (2D), using precise and standardized drawing techniques. This includes topics such as orthographic projections, representation of points, lines, and Planes, intersections, true length and true shape determination, and auxiliary views. In addition to manual engineering drawing and descriptive geometry, the course also covers AutoCAD fundamentals in order to enable students to use computer software in applying the concepts presented by this course. By doing so, students are given an opportunity to learn and use AutoCAD software to draw 2D and 3D drawings.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Knowledge	A2	A2.1 Recognize the principles of engineering drawing, tools, and types of lines used in drawings. A2.2 Classify engineering drawings into two-dimensional (2D) and three-dimensional (3D) representations. A2.3 Explain projection methods (orthographic, axonometric, perspective) used in engineering drawing. A2.4 Identify projections of points, lines, and planes in descriptive geometry. A2.5 Select appropriate projection methods for representing engineering objects. A2.6 Restate geometric concepts and relationships related to projections and views.

		A3	A3.1 Apply engineering drawing rules and standards in constructing geometric drawings. A3.2 Use AutoCAD software to create, edit, and organize engineering drawings. A3.3 Sketch 2D and 3D engineering objects, including orthographic and isometric views.
		B1	B1.1 Perform engineering drawing tasks independently B1.2 Work effectively as a member of multidisciplinary teams
		B2	B2.1 Communicate engineering concepts graphically using contemporary tools. B2.2 Communicate technical information verbally and in writing.
	Ethics	C2	C2.1 Recognize professional and ethical responsibility. C2.2 Adhere and respect diversity.
		C3	C3.1 Utilize contemporary technologies C3.2 Make use of codes of practice and standards, quality guidelines.
المحتويات الإرشادية	1- Engineering Drawing Introduction to Engineering Drawing: • Principles of Engineering drawing • The tools used in engineering drawing • Types of lines. Preparing Drawing Paper: • Drawing paper setup • Drawing Border and title table • Classwork exercise drawing of simple 2D shape Performing Basic Geometric Operations: • Line segment bisect • Parallel lines drawing • Dividing line segment into equal parts • Angles bisecting • Angles moving • Dividing angle into equal parts • Tangent lines and tangent curves Drawing of Basic Geometrical Shapes: • Triangle drawing • Pentagon drawing using two methods • Hexagon drawing using two methods		

	• Dividing circle into equal parts • Octagon drawing • Ellipse drawing Drawing Simple 2D Drawings: • Classwork exercise drawings Adding Dimensions to Drawings: • Classwork exercise drawing Drawing More Detailed 2D Drawings: • Classwork exercise drawings Drawing Isometric bodies: • Isometric projection • Classwork exercise drawings Deriving and drawing projections of 3D bodies: • Types of projections • First angle projection • Classwork exercise drawings 2- Descriptive Geometry Introduction & Basic Concepts • Importance of Descriptive Geometry • Geometric elements: points, lines, planes • Types of projections: orthographic, axonometric, perspective Projection of Points and Lines • Point location in different quadrants • Line projections in different positions • True length and true inclination of lines Projection of Planes • Plane representation (triangular, rectangular, polygonal) • Finding traces of planes • Inclination of planes Intersections • Line-plane intersection • Plane-plane intersection • Line-line shortest distance Auxiliary Views and True Shape • Using auxiliary planes to reveal true shapes • Solving complex 3D arrangements 3- AutoCAD Introduction to AutoCAD • Overview of AutoCAD's capabilities and common applications in engineering and design AutoCAD User Interface • Toolbars, ribbons, command line, mouse functions, and methods of command issuance Drawing Setup • Units, limits, snap and grid settings, object snaps (OSNAP), and drawing templates Layers and Layer Management • Creating, naming, coloring, and controlling the visibility and behavior of layers Drawing Basic Shapes
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- Using drawing commands: line, circle, rectangle, arc, polygon, ellipse, etc.
- Modifying Drawing Elements**
- Modify commands: move, copy, trim, extend, mirror, offset, scale, rotate
- Object Properties**
- Changing color, layer, linetype, linewidth, and using the Match Properties tool
- Annotation Tools**
- Adding and editing text, dimensions, multileaders, and hatching
- Creating Composite 2D Drawings**
- Assembling complex 2D layouts
- Blocks and External References**
- Creating and inserting blocks, defining attributes, and using XREFs
- Introduction to 3D Drawing**
- 3D workspace, User Coordinate System (UCS), visual styles, and navigation.
- Creating 3D Solids**
- Drawing boxes, cylinders, extruding shapes, and revolving profiles
 - Drawing 3D solid bodies

Course Description	The objective of this course is to provide students with a solid foundation in engineering drawing using manual drawing techniques and AutoCAD software. It aims to develop students' ability to create accurate two-dimensional technical drawings in accordance with international drawing standards. The course focuses on enhancing spatial visualization skills and understanding of geometric constructions and projections. Students will learn to apply AutoCAD tools efficiently for producing professional architectural and engineering drawings. By the end of the course, students will be able to translate design concepts into precise digital drawings suitable for academic and professional use.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Presentation • Interactive learning • Discussions • Brainstorming • Group Solving Problems • Problem-Based Learning - Self-learning

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	1.98
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.01
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time (hr)	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	A2.1, A2.2, A2.5, B1.1, C2.1, C3.2
	Interaction within the class	All	10% (10)	All	A2.1, A2.2, A2.4, B1.2, C2.2, C3.2
	Assignments	6	10% (10)	1,2,3,5,6,8	A2.2, A2.1, A2.4, B2.2, B2.1, C3.1
	Home Work	6	10% (10)	2,3,4,6,8,9	A2.1, A2.4, B1.1, C3.1, C2.1, C3.2
Summative assessment	Midterm Exam	1	10% (10)	7	A2.2, A2.3, A2.5 B1.1
	Final Exam	1	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Theory)

Material Covered

Week	Engineering Drawing	Descriptive Geometry	LOs
Week 1	Introduction, tools, types of lines	Introduction, points, lines, planes	A2.1, A2.4, C2.2
Week 2	Drawing paper, title block	Types of projections	A2.1, A2.3, C2.2
Week 3	Basic geometric constructions	Types of projections (cont.)	B1.2, A2.3, C2.2
Week 4	Angles and constructions	Projection of points	B1.2, A2.4, C2.2
Week 5	Scales and dimensioning	Projection of lines	B1.2, A2.4
Week 6	Orthographic drawing basics	Projection of lines (cont.)	A2.5, A2.4
Week 7	Orthographic drawing practice	Projection of planes	A2.4, A2.5, B2.2, B2.3, C2.1
Week 8	Isometric drawing	Projection of planes (cont.)	B2.2, A2.2
Week 9	Sections and views	True length and inclination	A2.5, A2.6
Week 10	Advanced drawing exercises	Intersections	B1.1, A2.6
Week 11	Complex objects drawing	Development of surfaces	B2.2, A2.6
Week 12	Drawing interpretation	Advanced applications	A2.5, B2.3, C2.2
Week 13	Review and problem solving	Review	A2.2, B2.2, B1.1, C2.1
Week 14	Final review	Final review	A2

Delivery Plan (AutoCAD Laboratory)

المنهاج الاسبوعي للمختبر

AutoCAD Topics (Practical)		LOs
Week 1	Introduction to AutoCAD, overview of capabilities and applications	A3.2, B1.2, C3.1, C3.2
Week 2	AutoCAD interface: toolbars, ribbon, command line, navigation	A3.2, B2.1 C3.1, C3.2
Week 3	Drawing setup: units, limits, grid, snap, OSNAP	A3.1, A3.2, B1.1, B1.2, C3.2
Week 4	Basic drawing commands: line, circle, arc, rectangle	A3.2, A3.3, B1.1, B1.2C3.1, C3.2
Week 5	Using drawing commands: move, copy, rotate, trim, extend	A3.2, A3.3, B1.1, B1.2 C3.1, C3.2
Week 6	Layers and layer management (create, modify, properties)	A3.2, B1.1, B1.2 C3.1, C3.2
Week 7	Object properties: color, linetype, lineweight	A3.2, B1.1, B1.2 C3.1, C3.2
Week 8	Annotation: text, dimensions, dimension styles	A3.1, A3.2, B1.1, B1.2C3.1, C3.2
Week 9	Blocks and inserting blocks	A3.2, B1.1, B1.2 C3.1, C3.2
Week 10	Hatching and basic design elements	A3.2, B1.1, B1.2 C3.1, C3.2
Week 11	Drawing simple engineering components	A3.2, A3.3, B1.1, B1.2 C3.1, C3.2
Week 12	Converting manual drawings to AutoCAD format	A3.2, A3.3, B1.1, B1.2 C3.1, C3.2
Week 13	Layouts and printing (plotting)	A3.3, B1.1, B1.2 B2.2, C3.1, C3.2
Week 14	Final practical project (complete drawing)	A3

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Madsen, D. A., & Madsen, D. P. (2012). Engineering Drawing & Design (5th ed.). Cengage Learning.	Yes
Recommended Texts	Venugopal, K., & Prabhu, V. (2010). Engineering Drawing + AutoCAD (5th ed.). New Age International Pvt. Ltd.	No
Websites	https://eng.alayen.edu.iq//colleges/e/42 Learning AutoCAD 2025	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.