

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	CERDRW			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	1	Semester (s) offered		1
Administering Department	Biomedical Engineering	College	College of Engineering	
Module Leader	Rasha ahmad atfah		e-mail	Rasha.atfah@alayen.edu.iq
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	M.Sc.
Module Tutor	Ashjan Abdullah		e-mail	Ashjanabdullah@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.		
	Knowledge	A2 Engineering Drawing A2.1 Understanding the importance of engineering drawing for engineer. A2.2 Understanding the basic principles of engineering drawing and identifying the tools used. Descriptive Statistics A2.3 Understanding the principles of descriptive geometry. A2.4 Understanding orthographic projections (top, front, side views). AutoCAD A2.5 Recognize the principles of drawing with the aid of AutoCAD	
Module Learning Outcomes مخرجات التعلم للمادة الدراسية		A4 A4.1 Applying the orders of Basic Geometrical Shapes A4.2 Drawings Shapes from lectures exercises. A4.3 Drawing Simple 2D Drawings	



			A4.4 Classify Layers using layers properties. A4.5 Applying measuring tools and text modifiers A4.6 Applying all modifiers on shapes.
	Skills	B1	B1.1 Function efficiently as an individual B1.2 Function as a member of multidisciplinary and multicultural teams
		B2	B2.1 Communicate effectively – graphically with a range of audiences using contemporary tools. B2.2 Communicate verbally and in writing with a range of audiences using contemporary tools.
	Ethics	C2	C2.1 Recognize professional and ethical responsibility. C2.2 Adhere and respect diversity.

المحتويات الارشادية

- 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

- ☐ 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, lineweight, and using the Match Properties tool

Annotation Tools

- ☐ Adding and editing text, dimensions, multileaders, and hatching

5

Creating Composite 2D Drawings

- ☐ Assembling complex 2D layouts

Blocks and External References



☐ Creating and inserting blocks, defining attributes, and using XREFs



Course Description	The objective of this course is to provide students with a solid foundation in engineering drawing using 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	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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



Delivery Plan (Weekly Syllabus)			
	Material Covered	LOs	
Week 1	Course Description and Introduction to engineering drawing Instruments and Accessories	A2, B1, B2, C1	
Week 2	Lines, Dimensions, Scale: Explaining and Practicing	A2, B1, B2, C2	
Week 3	Lines, Dimensions, Scale: Further Practicing on different types of lines and their application	A2, B1, B2, C1	
Week 4	Geometrical Shapes and related Calculations: Explaining and Practicing (Basic geometrical shapes)	A2, B1, B2, C1	
Week 5	Geometrical Shapes and related Calculations: Further Practicing on different types of lines and their application (advanced geometrical shapes)	A2, B1, B2, C1	
Week 6	Geometrical Shapes and related Calculations: Further Practicing on different types of geometrical shapes and their application in engineering design drawing	A2, B1, B2, C2	
Week 7	Projections: Theoretical concept	A2, B1, B2, C1	
Week 8	Projection: Shapes and Standards for drawing projections	A2, B1, B2, C1	
Week 9	Projections: application of lines, scales, and shapes in projections	A2, B1, B2, C1	
Week 10	Projections: application of lines, scales, and shapes in projections (practice)	A2, B1, B2, C1	
Week 11	Projection: Application of Cross-section	A2, B1, B2, C1	
Week 12-13	Isometric drawing: Theoretical concept	A4	
Week 14	Isometric drawing: application of lines, shapes, and scales in engineering designs	A4	
Week15	Review for the concepts applied in engineering drawing design	A4	



Delivery Plan (Weekly Lab. Syllabus)		
	Material Covered	LOs
Week 1	Course Description and Introduction to engineering drawing Instruments and Accessories	A4, B1, B2, C1
Week 2	Lines, Dimensions, Scale: Explaining and Practicing	A4, B1, B2, C2
Week 3	Lines, Dimensions, Scale: Further Practicing on different types of lines and their application	A4, B1, B2, C1
Week 4	Geometrical Shapes and related Calculations: Explaining and Practicing (Basic geometrical shapes)	A4, B1, B2, C1
Week 5	Geometrical Shapes and related Calculations: Further Practicing on different types of lines and their application (advanced geometrical shapes)	A4, B1, B2, C1
Week 6	Geometrical Shapes and related Calculations: Further Practicing on different types of geometrical shapes and their application in engineering design drawing	A4, B1, B2, C2
Week 7	Projections: Theoretical concept	A4, B1, B2, C1
Week 8	Projection: Shapes and Standards for drawing projections	A4, B1, B2, C1
Week 9	Projections: application of lines, scales, and shapes in projections	A4, B1, B2, C1
Week 10	Projections: application of lines, scales, and shapes in projections (practice)	A4, B1, B2, C1
Week 11	Projection: Application of Cross-section	A4, B1, B2, C1
Week 12-13	Isometric drawing: Theoretical concept	A4
Week 14	Isometric drawing: application of lines, shapes, and scales in engineering designs	A4
Week 15	Review for the concepts applied in engineering drawing design	A4



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	– Al-Khaffaf, A. A. (1990). Engineering drawing (2nd ed.). University of Technology Press.	No
Websites	https://eng.alayen.edu.iq/colleges/e/42	

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.				

