

# Module Description Form

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>CAD Drawing</b>		Module Delivery
Module Type	Basic B		<input type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>UOMU0210013</b>		
ECTS Credits	6		
SWL (hr/sem)	<b>150</b>		
Module Level	1	Semester of Delivery	
Administering Department		College	
Module Leader	Mohammed Abdulridha Abbas	e-mail	mohd.a.abbas@atu.edu.iq
Module Leader's Acad. Title	Senior lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None		Semester
Co-requisites module			Semester

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. To present a brief vision of Computer-Aided Design (CAD) and the tools of this term.</li> <li>2. Highlighting the mathematical modeling principles of line, arc, spline, and other segments.</li> <li>3. Covering the significant programs utilized in the modeling and comparing these programs.</li> <li>4. Defining the SOLIDWORK program's tools and modeling outcomes.</li> <li>5. Explaining global and local coordinate systems in modeling.</li> <li>6. Explain the objectives of drawing views.</li> <li>7. Enabling the students to have skills in modeling 2D and 3D.</li> <li>8. Enabling the students to assemble the parts drawn.</li> <li>9. Presenting theories of fit and tolerances in a drawing.</li> <li>10. Presenting theories of bearings, gears, belts-pulleys, and cams.</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Control of CAD principles as background programming of each segment, such as line or arc.</li> <li>2. Controlling the main and sub-tools of the SOLIDWORKS program as a professional designer.</li> <li>3. Contributing to knowing the methodology of drawing accuracy and technology terms.</li> <li>4. Presenting the best factual knowledge for using the views and assembly techniques.</li> <li>5. Create a valid basis for modeling cams, gears, ... etc.</li> <li>6. Showing the right path to control in putting the dimensions.</li> <li>7. Training the students to construct sub and major-projects of the designated modeling system.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>The indicative contents of this subject are:</p> <p>Part (A) CAD theories:                  DDA algorithm for line, Bresenham's algorithm, Spline theories, Matrices of drawing views, and Overlapping and topology problems. (8 hrs)</p> <p>Part (B) Introduction to modeling system in SOLIDWORKS:                  Drawing planes, Preparing sheet drawings, Line commands, circle commands, Arc commands, Rectangle commands, straight slot commands, Ellipse commands, Spline commands, and 3D sketch planes. (12 hrs)</p> <p>Part (C) Modifies commands in SOLIDWORKS:                  Trim commands, Convert entities commands, Offsite entities, Mirror, Pattern commands, and Miscellaneous commands. (6 hrs)</p> <p>Part (D) Main-Features commands:                  References Geometry commands, Curves, Extruded, Revolved, Swept, loft, Cut extruded, Hole wizard commands, Cut revolved, Cut loft, and Cut swept. (13 hrs)</p> <p>Part (E) Modify-Features commands:                  Fillet, Pattern, Rib, Draft, Shell, Wrap, Intersection, and Mirror. (5 hrs)</p>

	<p>Part (F) Surfaces commands: Extruded surface, Revolved surface, Swept surface, Loft surface, Boundary surface, Filled surface, Planar surface, Offset surface, Ruled surface, Flatten surface, and Fillet commands. (9 hrs)</p> <p>Part (G) Modify-Surfaces commands: Extend surfaces, Trim and Un-trim commands, knit surface, and Thicken commands. (5 hrs)</p> <p>Part (H) Assembly commands: Edit component, Insert components, Mate, Pattern, Smart features, Miscellaneous commands, Show and hidden components, Assembly features, Bill of Materials, and Exploded. (8 hrs)</p> <p>Part (I) Drawing sheet commands: Sheet size, 3D standard view, Model view, Projected view, Auxiliary, Section view, Detail view, Break commands, and Annotations commands. (6 hrs)</p> <p>Part (J) Tolerance Conceptual: Tolerance Methods, Tolerance expression, Plus and minus concept, Limit concept, Chain and baseline, Cases studies. (3 hrs)</p> <p>Part (K) Fit conceptual: Transition, Clearance, and Interference. (3 hrs)</p> <p>Part (L) Bearing, Cams, Gears, and Belts, bolts, Welding conceptual (12 hrs)</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>The strategy of this subject is to study the principles of computer-aided design (CAD) by employing one of the popular programs. The tools of SOLIDWORKS program contribute to developing the users' skills in 2D and 3D drawing. Besides, this program utilizes the assembly and sheet representation for sketched parts with annotation technologies. Furthermore, this program boosts the modeling of belts, coupling, gears, and cams. Consequently, prepare the students in the aeronautical field in the advanced modeling of airplanes.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	93	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	4 and 12	
	<b>Assignments</b>	2	10% (10)	3 to 12	
	<b>Projects / Lab.</b>	2	10% (10)	6 and 11	
	<b>Report</b>	1	10% (10)	0	
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	
	<b>Final Exam</b>	3hr	50% (50)	15	
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	CAD theories.
<b>Week 2</b>	CAD theories, Introduction to modeling system in SOLIDWORKS.
<b>Week 3</b>	Introduction to modeling system in SOLIDWORKS
<b>Week 4</b>	Introduction to modeling system in SOLIDWORKS, 2D Modifies commands in SOLIDWORKS.
<b>Week 5</b>	2D Modifies commands in SOLIDWORKS, Main-Features commands.
<b>Week 6</b>	Main-Features commands.
<b>Week 7</b>	Main-Features commands, Mid-Term Exam.
<b>Week 8</b>	Modify-Features commands, Surfaces commands.
<b>Week 9</b>	Surfaces commands.
<b>Week 10</b>	Surfaces commands, Modify-Surfaces commands.
<b>Week 11</b>	Assembly commands.
<b>Week 12</b>	Assembly commands, Drawing sheet commands.

<b>Week 13</b>	Feet and clearance commands
<b>Week 14</b>	Modeling of Bearing, Cams, and Gears.
<b>Week 15</b>	Modeling of Belts, Bolts, and Welding.
<b>Week 16</b>	Final Exam.

<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	DDA Algorithm for line, Bresenham Algorithm for arc, HC-Spline.
<b>Week 2</b>	Bezier spline, Preparing sheet and plane for drawing by SOLIDWORK program.
<b>Week 3</b>	2D drawing tools.
<b>Week 4</b>	2D drawing tools, 2D modify tools.
<b>Week 5</b>	3D drawing tools.
<b>Week 6</b>	3D drawing tools.
<b>Week 7</b>	3D drawing tools, Mid-Test.
<b>Week 8</b>	3D Modify-Features tools.
<b>Week 9</b>	Surfaces tools.
<b>Week 10</b>	Surfaces tools, Modify-Surfaces tools.
<b>Week 11</b>	Modify-Surfaces tools, Assembly tools.
<b>Week 12</b>	Assembly tools, Drawing Sheet tools.
<b>Week 13</b>	Feet and clearance tools.
<b>Week 14</b>	Bearing, Cams, and Gears tools
<b>Week 15</b>	Belts, Bolts, and Welding tools
<b>Week 16</b>	Final test.

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Radhakrishnan, P., Subramanyan, S. and Raju, V., 2008. CAD/CAM/CIM. New Age International. Bethune, James D. Engineering Design and Graphics with SolidWorks 2016. United States: Pearson, 2016.	Yes
<b>Recommended Texts</b>	Purdue Univ, Prof Sham Tickoo. Solidworks 2016: A Tutorial Approach. United States: CADCIM Technologies, 2016.	Yes
<b>Websites</b>	-	

## Grading Scheme

### مخطط الدرجات

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

**Note:** Marks 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.