Module Description Form

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**CAD Drawing**			**Module Delivery**	
Module Type	**Basic B**			☐ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOMU0210013**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	UOMU0210		**College**		
Module Leader	Samir Saad Rahim Hussein		**e-mail**	Sameer.Saad.Raheem@uomus.edu.iq	
Module Leader's Acad. Title	Asst. Lect.		**Module Leader's Qualification**	Master degree	
Module Tutor	Mais Mohammed Abdul Jalil		**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	
Module Objectives أهداف المادة الدراسية	1. To present a brief vision of Computer-Aided Design (CAD) and the tools of this term. 2. Highlighting the mathematical modeling principles of line, arc, spline, and other segments. 3. Covering the significant programs utilized in the modeling and comparing these programs. 4. Defining the SOLIDWORK program's tools and modeling outcomes. 5. Explaining global and local coordinate systems in modeling. 6. Explain the objectives of drawing views. 7. Enabling the students to have skills in modeling 2D and 3D. 8. Enabling the students to assemble the parts drawn. 9. Presenting theories of fit and tolerances in a drawing. 10. Presenting theories of bearings, gears, belts-pulleys, and cams.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Control of CAD principles as background programming of each segment, such as line or arc. 2. Controlling the main and sub-tools of the SOLIDWORKS program as a professional designer. 3. Contributing to knowing the methodology of drawing accuracy and technology terms. 4. Presenting the best factual knowledge for using the views and assembly techniques. 5. Create a valid basis for modeling cams, gears, ... etc. 6. Showing the right path to control in putting the dimensions. 7. Training the students to construct sub and major-projects of the designated modeling system.
Indicative Contents المحتويات الإرشادية	The indicative contents of this subject are: Part (A) CAD theories: DDA algorithm for line, Bresenham's algorithm, Spline theories, Matrices of drawing views, and Overlapping and topology problems. (8 hrs) 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) Part (C) Modifies commands in SOLIDWORKS: Trim commands, Convert entities commands, Offsite entities, Mirror, Pattern commands, and Miscellaneous commands. (6 hrs) 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) Part (E) Modify-Features commands: Fillet, Pattern, Rib, Draft, Shell, Wrap, Intersection, and Mirror. (5 hrs)

	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) Part (G) Modify-Surfaces commands: Extend surfaces, Trim and Un-trim commands, knit surface, and Thicken commands. (5 hrs) 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) 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) Part (J) Tolerance Conceptual: Tolerance Methods, Tolerance expression, Plus and minus concept, Limit concept, Chain and baseline, Cases studies. (3 hrs) Part (K) Fit conceptual: Transition, Clearance, and Interference. (3 hrs) Part (L) Bearing, Cams, Gears, and Belts, bolts, Welding conceptual (12 hrs)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	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.

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

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

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

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

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	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
Recommended Texts	Purdue Univ, Prof Sham Tickoo. Solidworks 2016: A Tutorial Approach. United States: CADCIM Technologies, 2016.	Yes
Websites	-	

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: 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.