MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	تطبيقات الحاسوب		**Module Delivery**	
Module Type	ELECTIVE		⊠ Theory ☐ Lecture ⊠ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UOMU0103052			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	3	**Semester of Delivery**		5
Administering Department	UOMU0103	**College**	UOMU01	
Module Leader	Ghadeer Haider abbas	**e-mail**	gahdeer.haider@uomus.edu.iq	
Module Leader's Acad. Title	Asst. Lect.	**Module Leader's Qualification**		MSc.
Module Tutor				
Peer Reviewer Name		**e-mail**		
Review Committee Approval	2026-6-10	**Version Number**		1.0

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To understand the basics of computer graphics 2. To understand the methods to sketch 3D model of prosthetics and orthotics 3. To understand how the photos and drawing are represented in the computer 4. To be able to develop 3d models ready for 3d printing 5. To understand how to use SolidWorks 3D modeling application
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To recognize how the photos and drawings are represented in the computer 2. To recognize how the images are acquired with the input devices 3. To recognize how output devices carry the final image to the user 4. To understand how cameras, scanners, printers and TVs work. 5. To understand how transformation matrices work in computer graphics. 6. To recognize the methods of ray tracing and rendering. 7. To understand the shading models in computer graphics. 8. To be able to connect the theoretical part in computer graphics to 3D modeling applications and understand the relation between them. To be able to sketch advanced 3D models in SolidWorks
Indicative Contents المحتويات الإرشادية	**Introduction to Computer Graphics, Introduction to SolidWorks [2hrs]:** We introduce Computer Graphics and discuss the learning outcomes of the subject and we introduce the main subjects in computer graphics. **Math Refresh [2hrs]:** Review of some mathematical concepts that are required in computer graphics such as Sets and Mapping, Logarithms, Quadratic Equatoins, Trigonometric Functions, and Vectors. **Matrices, operations, and matrix inverse [2hrs]:** In this lecture we also introduce the matrices, some unique matrices, mathematical operations on matrices. We also learn how to calculate the

	determinant and inverse of a matrix.
	Raster Images, Raster Devices [4hrs]: In this lecture we introduce raster image and how does it differ from vector images. We also discuss raster input and output devices such as displays, printers, cameras and scanners. Finally, we talk about images, pixels and their geometry plus other subjects. **Images, Pixels, and Geometry, monitor intensities and Gamma, Alpha Compositing [2hrs]** **Transformation Matrices [6hrs]:** In this lecture we introduce transformation matrices, 2D linear transformations such as scaling, shearing, rotation and reflection. We talk about 3D linear transformations, translation and affine transformations. Composition of transformations is also discussed. **Ray tracing [6hrs]:** Methods of ray generation, ray intersection are discussed. Equations to compute viewing rays in orthographic and perspective views are introduced. Algorithms of ray object intersection are discussed for a sphere model. **Shading, light material interactions [2hrs]:** In this lecture we introduce a simple shading model for diffuse reflection, specular reflection/ refraction, and specular highlights. **Solution to some exercises, using 3D printers [2hr]** **SolidWorks Tutorials [2hrs]**
Learning and Teaching Strategies استراتيجيات التعلم والتعليم
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. Labs will be essential to deep understanding of computer graphics and modelling techniques.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	1	10% (10)	8	All
	Assignments	1	10% (10)	Continuous	All
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	Continuous	All
Summative assessment	**Midterm Exam**	2hrs	10% (10)	12	All
	Final Exam	3hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Introduction to Computer Graphics, Introduction to SolidWorks**
Week 2	**Math Refresh**
Week 3	**Matrices, operations, and matrix inverse**
Week 4	**Raster Images, Raster Devices**
Week 5	**Images, Pixels, and Geometry**
Week 6	**Monitor intensities and Gamma, Alpha Compositing**
Week 7	**Transformation Matrices 1: 2D and 3D linear transformations**
Week 8	**Transformation Matrices 2: translation and affine transformations**
Week 9	**Transformation Matrices 3: composition transformations**

Week 10	Ray tracing 1: algorithms
Week 11	Ray tracing 2: computing viewing rays
Week 12	Ray tracing 3: ray object intersection
Week 13	Shading, light material interactions
Week 14	Solution to some exercises, using 3D printers
Week 15	Solidworks Tutorials

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to SolidWorks, Drawing Sketches for Solid Models
Week 2	Editing and Modifying Sketches
Week 3	
Week 4	Adding Relations and Dimensions to Sketches
Week 5	
Week 6	Advanced Dimensioning Techniques and Base Feature Options
Week 7	
Week 8	
Week 9	Creating Reference Geometries
Week 10	
Week 11	Advanced Modeling Tools-I
Week 12	
Week 13	Advanced Modeling Tools-II
Week 14	
Week 15	Assembly Modeling

<table>
<tr><td colspan="3">Learning and Teaching Resources
مصادر التعلم والتدريس</td></tr>
<tr><td></td><td>Text</td><td>Available in the Library?</td></tr>
<tr><td>Required Texts</td><td>1- Fundamentals of Computer Graphics , Shirley and Marschner, Fourth Edition, 2016
SolidWorks 2016, A Tutorial Approach, Third Edition, Sham Tickoo, 2016</td><td>No</td></tr>
<tr><td>Recommended Texts</td><td>-</td><td>No</td></tr>
<tr><td>Websites</td><td></td><td></td></tr>
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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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

 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.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي