MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	**Medical Multimedia**	**Module Delivery**	
Module Type	Core	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MU03024205		
Units	3		
SWL (hr/sem)	200		
Module Level	4	**Semester of Delivery**	2
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Name	**e-mail**	E-mail
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	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	None	**Semester**	

	Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية
Module Aims أهداف المادة الدراسية	1. Understanding Multimedia in Medicine: The aim of this module is to provide students with a comprehensive understanding of multimedia in the context of medicine. 2. Multimedia Tools and Techniques: This module aims to familiarize students with various multimedia tools and techniques used in medical applications. 3. Medical Imaging and Visualization: The objective of this module is to introduce students to the field of medical imaging and visualization using multimedia techniques. 4. Interactive Multimedia Applications in Healthcare: This module aims to explore the role of interactive multimedia applications in healthcare settings. 5. Ethical and Legal Considerations: In this module, students will examine the ethical and legal aspects related to the use of multimedia in medicine. 6. Multimedia Integration in Clinical Practice: The objective of this module is to bridge the gap between multimedia technology and clinical practice. 7. Emerging Trends in Medical Multimedia: This module aims to familiarize students with the latest advancements and emerging trends in the field of medical multimedia. 8. Project-based Learning: As a culmination of the course, students will engage in a project-based learning experience where they apply their knowledge and skills to develop a medical multimedia project.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate a comprehensive understanding of multimedia technology and its applications in the field of medicine. 2. Identify and explain the fundamental concepts, principles, and components of multimedia systems used in medical contexts. 3. Utilize multimedia tools, software platforms, and programming languages effectively to create medical multimedia content. 4. Apply multimedia techniques to process, analyze, and visualize medical imaging data from various modalities. 5. Design and develop interactive multimedia applications for healthcare, considering user interface design principles, human-computer interaction, and usability.

Indicative Contents
 	
المحتويات الإرشادية
	Indicative content includes the following.
	
	1. Introduction to Multimedia in Medicine
	  - Definition and scope of medical multimedia
	  - Historical overview and evolution of medical multimedia technology

- Applications and benefits of multimedia in healthcare

2. Multimedia Technology Fundamentals
   - Multimedia components: text, images, audio, video, and animation
   - Principles of multimedia design and composition
   - Multimedia file formats and compression techniques

3. Multimedia Tools and Software Platforms
   - Introduction to multimedia authoring tools and software platforms
   - Graphics editing software for medical image manipulation
   - Video editing and animation software for medical multimedia creation
   - Programming languages and frameworks for medical multimedia development

4. Medical Imaging Modalities and Techniques
   - Overview of medical imaging modalities: X-ray, MRI, CT scan, ultrasound, etc.
   - Image acquisition, processing, and enhancement techniques
   - Medical image analysis and segmentation methods

5. Medical Image Visualization Techniques
   - Introduction to medical image visualization and display systems
   - 2D and 3D visualization techniques for medical images
   - Volume rendering and 3D reconstruction of medical data

6. Interactive Multimedia Applications in Healthcare
   - Design principles for interactive medical multimedia applications
   - Patient education and health promotion through multimedia
   - Surgical simulation and virtual reality in medical training
   - Telemedicine and remote healthcare applications

7. Ethical and Legal Considerations in Medical Multimedia
   - Patient privacy, data security, and confidentiality in medical multimedia
   - Informed consent and ethical considerations in multimedia use
   - Intellectual property rights and licensing issues in medical multimedia

8. Multimedia Integration in Clinical Practice
   - Role of multimedia in electronic health records and clinical documentation
   - Multimedia-based clinical decision support systems
   - Multimedia applications in medical education and training
   - Communication and collaboration tools for healthcare professionals

	9. Emerging Trends in Medical Multimedia
	- Augmented reality and virtual reality in healthcare
	- Machine learning and AI applications in medical multimedia
	- Wearable technologies and sensor-based multimedia solutions
	- Future directions and innovations in medical multimedia
	10. Project-based Learning
	- Hands-on project development using multimedia tools and techniques
	- Problem-solving and critical thinking in creating a medical multimedia project
	- Project management and documentation skills
	- Presentation and demonstration of the final project
	The indicative contents of this course provide a structured framework for exploring the key topics and concepts related to medical multimedia. They cover technical aspects such as multimedia tools, imaging modalities, and visualization techniques, as well as broader considerations like ethics, legalities, and integration in healthcare settings. The inclusion of project-based learning allows students to apply their knowledge and skills in a practical and creative manner.

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	1. Lectures and Demonstrations: Conduct lectures to introduce the theoretical concepts of medical multimedia and Blender 3D.
	2. Hands-on Blender Workshops: Organize practical workshops where students can gain hands-on experience with Blender 3D. Provide step-by-step instructions for modeling medical objects, creating textures, animating medical processes, and rendering medical scenes. Offer guidance and support during the workshop sessions.
	3. Assignments and Projects: Assign individual or group projects that require students to apply Blender 3D in medical multimedia applications. For example, students can be tasked with creating a 3D model of a human organ, animating a surgical procedure, or designing a virtual reality environment for patient education.
	4. Case Studies and Discussions: Present case studies that showcase real-world applications of Blender 3D in medical multimedia. Engage students in discussions about the challenges, benefits, and ethical considerations of using Blender 3D in healthcare. Encourage critical thinking and analysis of the presented cases.

5. Online Resources and Tutorials: Provide students with access to online resources, tutorials, and documentation related to Blender 3D. Curate a list of recommended websites, forums, and video tutorials that cover topics specific to medical modeling, texturing, animation, and rendering. Encourage students to explore and learn from these resources independently.

6. Virtual Reality and Augmented Reality Demos: Incorporate virtual reality and augmented reality demos using Blender 3D to showcase the immersive and interactive aspects of medical multimedia. Allow students to experience and explore medical scenarios in a virtual environment created with Blender 3D.

7. Assessments: Conduct regular assessments, such as quizzes, exams, and practical assignments, to evaluate students' understanding of both the medical multimedia concepts and their proficiency in using

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Medical Multimedia and Blender 3D
Week 2	Modeling Medical Objects in Blender 3D
Week 3	Animation and Rigging in Blender 3D
Week 4	Medical Visualization and Rendering in Blender 3D
Week 5	Introduction to Virtual Reality and Augmented Reality in Medical Multimedia
Week 6	Ethics, Legalities, and Medical Multimedia
Week 7	Case Studies and Industry Insights
Week 8	Collaborative Project Development
Week 9	Collaborative Project Development (Continued)
Week 10	Presentation and Evaluation of Collaborative Projects
Week 11	Emerging Trends and Future Directions
Week 12	Course Review and Wrap-up
Week 13	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Blender 3D
Week 2	Lab 2: Medical Object Modeling
Week 3	Lab 3: Animation and Rigging
Week 4	Lab 4: Medical Scene Setup and Lighting
Week 5	Lab 5: Advanced Modeling Techniques
Week 6	Lab 6: Particle Systems and Fluid Simulations
Week 7	Lab 7: Virtual Reality and Augmented Reality

<table>
<tr><td colspan="3" align="center">**Learning and Teaching Resources**
مصادر التعلم والتدريس</td></tr>
<tr><td></td><td align="center">**Text**</td><td align="center">**Available in the Library?**</td></tr>
<tr><td>**Required Texts**</td><td>"Medical Multimedia: Concepts, Methodologies, Tools, and Applications" edited by Valentina Emilia Balas, Lakhmi C. Jain, and Branko Kovačević , and "Blender 3D Basics: Second Edition" by Gordon Fisher</td><td align="center">Yes</td></tr>
<tr><td>**Recommended Texts**</td><td>"Multimedia for Medicine, Communication, and Learning" by John G. Webster , and "Blender Foundations: The Essential Guide to Learning Blender 3D" by Roland Hess</td><td align="center">No</td></tr>
<tr><td>**Websites**</td><td></td><td></td></tr>
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	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.