



**Course Syllabus**  
**According to JORDAN National Qualification**  
**Framework (JNQF)**

**Course Name: 3-D Animation Graphics**

**Course Number: 06023256**

### General Course Information:

Course title	3-D Graphics & Animation
Course number	06023256
Credit hours	3
Education type	3 [Face-to-Face]
Prerequisites/corequisites	06022252
Academic Program	Computer science/Computer Multimedia Systems
Program code	602
Faculty	Isra University
Department	Faculty of Information Technology
Level of course	Computer Science
Academic year /semester	3rd year
Awarded qualification	2021/2022- 1st Semester
Other department(s) involved in teaching the course	Bachelor (Bsc)
Language of instruction	None
Date of production/revision	English

### Course Coordinator:

Coordinator's name	Dr. Jamal Zraqou
Office No	4126
Office Phone extension number	2622
Office Hours	10:00-11:00] [11:00-12:00] Sun, Tue, Thur. [8:00-9:00] Mon, Wed
Email	jamal_sam@iu.edu.jo

### Other Instructors:

Instructor name	
Office No	
Office Phone extension number	
Office Hours	
Email	

### Course Description (English/Arabic):

English	<i>Basic concepts of 3D modeling and animation using special software for the production of three-dimensional computer animations and the different approaches to modeling in a 3D environment. Familiarization with both the interface and the production process of 3D animation. Texture mapping, lighting and rendering of simple animations and environments.</i>
Arabic	المفاهيم الأساسية للنمذجة ثلاثية الأبعاد والرسوم المتحركة باستخدام برنامج خاص لإنتاج الرسوم المتحركة ثلاثية الأبعاد بالكمبيوتر والطرق المختلفة للنمذجة في بيئة ثلاثية الأبعاد. التعرف على الواجهات وعملية إنتاج الرسوم المتحركة ثلاثية الأبعاد. رسم الأشكال الصور والإضاءة وتقديم الرسوم المتحركة في بيئة ثلاثية الأبعاد.

### Textbook: Author(s), Title, Publisher, Edition, Year, Book website.

Mastering Autodesk Maya, by Todd Palamar, Autodesk Official Press (1st Edition), 2016.

**References: Author(s), Title, Publisher, Edition, Year, Book website.**

1. 3D Mesh Processing and Character Animation: With Examples Using OpenGL, OpenMesh and Assimp, by Ramakrishnan Mukundan | May 13, 2022.
2. The Complete Guide to Blender Graphics: Computer Modeling & Animation, by John M. Blain | Mar 9, 2022.
3. 3D mit Blender: Modeling – Animation – Rendering (German Edition) German Edition, by Peter Bühler | Jan 10, 2022.
4. Computer Graphics Through OpenGL: From Theory to Experiments, by Sumanta Guha | Dec 13, 2021.
5. Sculpting the Blender Way: Explore Blender's 3D sculpting workflows and latest features such as Face Sets, Mesh Filters, and the Cloth Brush, by Xury Greer | Dec 9, 2021

**Course Educational Objectives (CEOs):**

1.	Learning the Fundamentals principles of 3D graphics animation modelling, animation, texturing, lighting and rendering.
2.	Learning how to model objects in 3D space.
3.	Learning how to animate objects in 3D space.
4.	Learning how to add texture to the objects, light, visual effect and render the scene.
5.	

**Intended Learning Outcomes (ILO's):**

	Subject Intended learning outcomes (ILOs) describe what students are expected to know and be able to do at the end of the course. These outcomes are related to the knowledge, skill and competence that students acquire:	Relationship to CEOs	Contribution to PLOs	Bloom Taxonomy Levels*	Descriptors**
<b>A</b>	<b>Knowledge and Understanding:</b>				
<b>A1</b>	Student will be able to explain the main concepts and features of 3D modeling and animation, and its application to solve problems in real life.	<b>1</b>	<b>b</b>	<b>1</b>	<b>k</b>
<b>A2</b>					
<b>A3</b>					
<b>B</b>	<b>Intellectual skills:</b>				
<b>B1</b>	Develop a 3D model and animation	<b>2</b>	<b>c</b>	<b>3</b>	<b>s</b>
<b>B2</b>					
<b>B3</b>					
<b>C</b>	<b>Subject specific skills:</b>				
<b>C1</b>	Reproduce a model in 3D space	<b>1</b>	<b>c</b>	<b>1</b>	<b>k</b>
<b>C2</b>	Develop a 3D environment including texture and light.	<b>1</b>	<b>f</b>	<b>1</b>	<b>k</b>
<b>C3</b>					

<b>D</b>	<b>Transferable skills:</b>				
<b>D1</b>	Demonstrate a 3D model with visual effects and rendering it.	<b>2</b>	<b>f</b>	<b>2</b>	<b>c</b>
<b>D2</b>					
<b>D3</b>					

**\*Bloom Taxonomy Levels**

Level #	1	2	3	4	5	6
Level Name	Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis

**\*\* Descriptor (National Qualification Framework Descriptors): K : Knowledge, S: Skill, C: Competency.**

**Program Learning Outcome (PLOs):**

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the (CS) program will demonstrate:		Descriptors**		
		K	S	C
1.	Analyse a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.	✓		
2.	<b>Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.</b>		✓	
3.	<b>Communicate effectively in a variety of professional contexts.</b>			✓
4.	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.			✓
5.	Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.			✓
6.	<b>Apply computer science theory and software development fundamentals to produce computing-based solutions. [CS]</b>		✓	

**\*\* Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

**Weekly Schedule (please choose the type of teaching)**

☒ **Face to Face**

☐ **Hybrid (2 Lectures Face – To - Face +1 Lecture Asynchronous)**

☐ **Hybrid (1 Lectures Face – To - Face +1 Lecture Asynchronous)**

☐ **Online (2 Lectures Synchronous +1 lecture Asynchronous)**

Week	First Hour (.....)	Second Hour (.....)	Third Hour (.....)	Ach. ILOs	Ach. PLOs	Descriptors*
1	Introduction What is 3D animation graphics	Introduction What is 3D animation graphics	Applications of 3D animation graphics.	A1	PLO2(B)	

2	Software of 3D animation graphics.	Types of views. Orthographic views.	Types of views. Perspective views.	A1	PLO2(B)	
3	Orthographic projection	Introduction to Autodesk Maya.	Introduction to Autodesk Maya.	A1	PLO2(B)	
4	Working in 3D space	UV coordinate space, views	cameras, dependency graph	A1	PLO2(B)	
5	nodes, attributes	connections, pivots	hierarchies, MEL scripting	A1	PLO2(B)	
6	Modelling in Autodesk Maya.	Types of curves. Ep curves.	Cv curves. Bezier curves.	A2	PLO3(C)	
7	Types of Surfaces. Polygon.	Nurbs surfaces. Sub division surfaces	Nurbs surfaces. Sub division surfaces	A2	PLO3(C)	
8	Polygon modelling, Nurbs	modelling and sub division modelling techniques.	Revolve, loft, planar boundary, extrude, bridge, combine, attach, separate .etc.	A2	PLO3(C)	
9	Modelling of project2 "Jack in the box".	<b>Modelling of project2 "Jack in the box".</b>	Modelling of project2 "Jack in the box".	A2	PLO3(C)	
10	Modelling of project2 "Jack in the box".	<b>Modelling of project2 "Jack in the box".</b>	Modelling of project2 "Jack in the box".	A2	PLO3(C)	
11	Animation and rigging Types of Animation. Key frame animation, reactive animation, path animation, dynamics.	Deformations. Lattices, sculpt objects, clusters.	Character animation. Inverse kinematic, single chain solver, rotate plane solver, IK spline solver. Skinning character. Flexors	B1	PLO3(C)	
12	Animation of project1 "bouncing ball".	Animation of project1 "bouncing ball".	Animation of project1 "bouncing ball".	B1	PLO3(C)	
13	Animation of project1 "bouncing ball".	Animation of project1 "bouncing ball".	Animation of project1 "bouncing ball".	B1	PLO3(C)	
14	Rendering Texturing Overview of Maya material.	Hypershade, Lighting	Cameras Effects Rendering your scene.	C1, D1	PLO3(C), PLO6(F)	
15	Rendering of project1 "bouncing ball".	Rendering of project2 "Jack in the box".	Students project discussion	C1, D1	PLO3(C), PLO6(F)	
16	Students project discussion	<b>Students project discussion</b>	Final Exam			

\* K: Knowledge, S: Skills, C: Competency

## Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Interactive videos
- Practice Labs
- Discussion Forums
- ✓ Quizzes
- Other Interactive online activities
- ✓ Reports

## Course Policies:

### A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

### B- Absences from exams and handing in assignments on time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

### C- Academic Health and safety procedures

### D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

### E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) **30%**
- Midterm **20%**
- Final Exam **50%**

### F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

## Required equipment:

- **PC / Laptop with webcam and mic**
- **Internet Connection**
- **Access to the IU E-Learning Platform at: <https://elearn.iu.edu.jo/>**
- **E-learning plan**
- **Satisfaction questionnaires for online and face-to-face learning**
- **Software for e-learning**
- **Training**

## Assessment Tools implemented in the course:

- ✓ Final Exam
- ✓ Midterm Exam
- ✓ Quizzes
- ✓ Homework
- Practice Labs
- Discussion Forums
- Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching
- Others:.....

## Responsible Persons and their Signatures:

Course Coordinator		Completed Date	/ /
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		Signature	
Received by (Department Head)		Received Date	/ /
		Signature	