



**Bachelor of Science in Gaming & Multimedia Program  
for Fall-2019 and Onwards**

**Department of Creative Technologies  
Faculty of Computing and Artificial Intelligence  
Air University, Islamabad**

		<b>Gaming &amp; Multimedia – Supporting Courses</b>	
<b>#</b>	<b>Code</b>	<b>Course Title</b>	<b>Lec</b>
1.	GM436	Animation Scripting and Mechanics	3-0-3
2.	GM436L	Animation Scripting and Mechanics Lab	0-1-1
3.	GM335	Virtual Reality Game Development	3-0-3
4.	GM335L	Virtual Reality Game Development Lab	0-1-1
5.	GM320	Storyboarding and Narrative Development	3-0-3
		<b>Total Credit hours</b>	<b>9-2-12</b>

		<b>Gaming &amp; Multimedia – Electives</b>	
<b>#</b>	<b>Code</b>	<b>Course Title</b>	<b>Lec</b>
1.	GM364	Artificial Intelligence for Computer Games	3-0-3
2.	GM302	Object Oriented Game Development	2-0-2
3.	GM302L	Object Oriented Game Development Lab	0-1-1
4.	GM233	Hand-Drawn Character Animation	2-0-2
5.	GM233L	Hand-Drawn Character Animation Lab	0-1-1
6.	GM334	Animation Production	3-0-3
7.	GM416	Figure Drawing	2-0-2
8.	GM416L	Figure Drawing Lab	0-1-1
9.	GM406	Visual Design for Games	2-0-2

10.	GM406L	Visual Design for Games Lab	0-1-1
11.	GM222	Character Design	2-0-2
12.	GM222L	Character Design Lab	0-1-1
13.	GM324	Making Comics	2-0-2
14.	GM324L	Making Comics Lab	0-1-1
15.	GM321	Visual Concept Development	2-0-2
16.	GM321L	Visual Concept Development Lab	0-1-1
17.	GM437	Stop Motion Animation	2-0-2
18.	GM437L	Stop Motion Animation Lab	0-1-1
19.	GM314	3D Texturing and Lighting	3-0-3
20.	GM232	3D Character Animation	2-0-2
21.	GM232L	3D Character Animation Lab	0-1-1
22.	GM344	Creative Studio Methods	2-0-2
23.	GM344L	Creative Studio Methods Lab	0-1-1
24.	GM223	Digital Still Photography	2-0-2
25.	GM223L	Digital Still Photography Lab	0-1-1
26.	GM426	Typography	2-0-2
27.	GM426L	Typography Lab	0-1-1
28.	GM252	Motion Graphics	2-0-2
29.	GM252L	Motion Graphics Lab	0-1-1
30.	GM223	Digital Cinema Production	2-0-2
31.	GM223L	Digital Cinema Production Lab	0-1-1
32.	GM211	Graphic Design Portfolio Development	3-0-3
33.	GM317	Level Design	3-0-3

34.	GM313	Making Deep Games	3-0-3
35.	GM365	Natural language Processing	3-0-3
36.	GM446	Pattern recognition and analysis	3-0-3
37.	GM304	Console Game Development Environments	3-0-3
38.	GM341	Multimedia Sensors Interactive Schemes	3-0-3
39.	GM253	Motion Capture	2-0-2
40.	GM253L	Motion Capture Lab	0-1-1
41.	GM447	3D Rigging	2-0-2
42.	GM447L	3D Rigging Lab	0-1-1
43.	GM351	Game Sensors and Media	2-0-2
44.	GM351L	Game Sensors and Media Lab	0-1-1
45.	GM350	Game Sound Design I	2-0-2
46.	GM350L	Game Sound Design I Lab	0-1-1
47.	GM407	Real-Time Graphics Techniques	2-0-2
48.	GM407L	Real-Time Graphics Techniques Lab	0-1-1
49.	GM263	Distributed Systems	3-0-3
50.	GM262	Mobile Application Development for iOS	2-0-2
51.	GM262L	Mobile Application Development for iOS Lab	0-1-1
52.	GM340	Multimedia Machine Intelligence	3-0-3
53.	GM315	Applied 3D Geometry	3-0-3
54.	GM354	Computer Vision and Digital Media Communications	3-0-3
55.	GM466	Software Testing	2-0-2
56.	GM466L	Software Testing Lab	0-1-1

57.	GM361	Agile Software Development	3-0-3
58.	GM427	Play testing	2-0-2
59.	GM427L	Play testing Lab	0-1-1
60.	GM443	Machine learning for multimedia Systems	3-0-3
61.	GM345	Digital Film Making	3-0-3
62.	GM312	Modeling and Simulation	3-0-3
63.	GM342	Web 2.0, Virtual World Environments	3-0-3
64.	GM467	Research Methods in Gaming	3-0-3
65.	GM210	Fundamentals of Simulation Development	2-0-2
66.	GM210L	Fundamentals of Simulation Development Lab	0-1-1

## 1. List of All courses with their Streams/Clusters

		<b><u>Gaming Mechanics (0)</u></b>
1	GM200	Fundamental of Game Design
<u>2</u>	GM301	Practical Scripting for Games
4	GM302	Game Engine Programming I
<u>5</u>	GM303	Console Game Development Environments
6	GM404	Game Engine Programming II
<u>3</u>	GM405	Object Oriented Game Development
7	GM406	Visual Design for Games
8	GM407	Real-Time Graphics Techniques
		<b><u>2D/3D Graphics Mapping(1)</u></b>
9	GM110	Computer Graphics and Visual Designs
10	GM210	Fundamentals of Simulation Development
10	GM211	Graphic Design Portfolio Development

11	GM312	Modeling and Simulation
12	GM313	Making Deep Games
13	GM314	3D Texturing and Lighting
14	GM315	Applied 3D Geometry
15	GM416	Figure Drawing
16	GM317	Level Design
		<b><u>Creative Arts(2)</u></b>
17	GM320	Storyboarding and Narrative Development
18	GM321	Visual Concept Development
19	GM322	Character Design
20	GM323	Digital Still Photography
21	GM324	Digital Cinema Production
22	GM325	Making Comics
23	GM426	Typography
24	GM427	Playtesting
		<b><u>Animation Reality designs(3)</u></b>
25	GM130	2D and 3D Animation
26	GM231	3D Design and Modelling

27	GM232	3D Character Animation
28	GM233	Hand-Drawn Character Animation
29	GM334	Animation Production
30	GM335	Virtual Reality Game Development
31	GM436	Animation Scripting and Mechanics
32	GM437	Stop Motion Animation
		<b><u>Multimedia Technologies(4)</u></b>
33	GM140	Multimedia Machine Intelligence
34	GM141	Multimedia Sensors Interactive Schemes
35	GM242	Web 2.0, Virtual World Environments
36	GM443	Machine learning for multimedia Systems
37	GM344	Creative Studio Methods
38	GM345	Digital Film Making
39	GM446	Pattern recognition and analysis
40	GM447	3D Rigging
		<b><u>Motion Contents and Media Processing(5)</u></b>
41	GM150	Game Sound Design I
42	GM151	Game Sensors and Media



43	GM252	Motion Graphics
44	GM253	Motion Capture
45	GM354	Computer Vision and Digital Media Communications
		<b><u>General Applications(6)</u></b>
46	GM361	Agile Software Development
47	GM262	Mobile Application Development for iOS
48	GM263	Distributed Systems
49	GM364	Artificial Intelligence for Computer Games
50	GM365	Natural language Processing
51	GM466	Software Testing
52	GM467	Research Methods

## **CURRICULUM DETAILS**

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## Semester I

#	Course Code	Courses	Credit Hrs. (Theory-Lab-Credits)	Pre-Req
1.	HU119	English Comprehension and Composition	3-0-3	-
2.	HU118/H U215	Islamic Studies/Ethics	2-0-2	-
3.	HU115	Pakistan Studies	2-0-2	-
4.	CS180	Introduction to Information & Communication Technologies	2-0-2	-
	CS180L	Introduction to Information & Communication Technologies Lab	0-1-1	
5.	CS111	Programming Fundamentals	3-0-3	-
	CS111L	Programming Fundamentals Lab	0-1-1	
6.	PH104	Physics for Game Developers	3-0-3	-
<b>Credit Hours = 17</b>			<b>15-2-17</b>	

## Semester II

#	Course Code	Courses	Credit Hrs. (Theory-Lab-Credits)	Pre-Requisite
1.	GM110	Computer Graphics and Visual Designs	3-0-3	
	GM110L	Computer Graphics and Visual Designs Lab	0-1-1	
2.	GM130	2D and 3D Animation	2-0-2	-
	GM130L	2D and 3D Animation Lab	0-1-1	
3.	CS112	Object Oriented Programming	3-0-3	CS111/CS111L
	CS112L	Object Oriented Programming Lab	0-1-1	CS111/CS111L

4.	MA110	Calculus & Analytical Geometry	3-0-3	-
5.	HU120	Communication & Presentation Skills	3-0-3	HU 119
<b>Credit Hours = 17</b>			<b>14-3-17</b>	

### Semester III

#	Course Code	Courses	Credit Hrs. (Theory-Lab-Credits)	Pre-Requisite
1.	MA201	Linear Algebra	3-0-3	-
2.	CS214	Data Structure & Algorithm	3-0-3	CS112/ CS112L
	CS214L	Data Structure & Algorithm Lab	0-1-1	CS112/CS112L
3.	MA216	Discrete Structures	3-0-3	-
4.	SE100	Software Engineering	3-0-3	
	SE100L	Software Engineering Lab	0-1-1	
5.	GM200	Fundamental of Game Design	2-0-2	
	GM200L	Fundamental of Game Design Lab	0-1-1	
<b>Credit Hours = 17</b>			<b>14-3-17</b>	

### Semester IV

#	Course Code	Courses	Credit Hrs. (Theory-Lab-Credits)	Pre-Req
1.	CS225	Operating Systems	3-0-3	CS214/CS214L
	CS225L	Operating Systems Lab	0-1-1	CS214/CS214L
2.	GM231	3D Design and Modelling	3-0-3	
	GM231L	3D Design and Modelling Lab	0-1-1	
3.	HU401	Technical & Business Writing	3-0-3	-
4.	GM XXX	Gaming and Multimedia Elective I	2-0-2	
	GM XXXL	Gaming and Multimedia Elective I Lab	0-1-1	
5.	CS230	Database Systems	3-0-3	CS214/CS214L
	CS230L	Database Systems Lab	0-1-1	CS214/CS214L
<b>Credit Hours = 18</b>			<b>14-4-18</b>	

### Semester V

#	Course Code	Courses	Credit Hrs. (Theory-Lab-Credits)	Pre-Req
1.	HUXXX	University Elective I	3-0-3	-
2.	GM320	Storyboarding and Narrative Development	3-0-3	
3.	GM301	Practical Scripting for Games	3-0-3	-
	GM301L	Practical Scripting for Games Lab	0-1-1	
4.	CS360	Computer Networks	3-0-3	-
	CS360L	Computer Networks Lab	0-1-1	

5.	GM XXX	Gaming & Multimedia Elective II	3-0-3	-
	GM XXXL	Gaming & Multimedia Elective II Lab	0-1-1	
<b>Credit Hours = 18</b>			<b>15-3-18</b>	

### Semester VI

#	Course Code	Courses	Credit Hrs. (Theory-Lab-Credits)	Pre-Req
1.	GM302	Game Engine Programming I	2-0-2	CS112/ CS112L
	GM302L	Game Engine Programming I Lab	0-1-1	CS112/ CS112L
2.	GM335	Virtual Reality Game Development	3-0-3	
	GM335L	Virtual Reality Game Development Lab	0-1-1	
3.	GM XXX	Gaming & Multimedia Elective III	3-0-3	-
4.	BAXXX	University Elective II	3-0-3	-
5.	GM497	Final Project-I	0-1-1	-
6.	MAXXX	Trigonometry	3-0-3	-
<b>Credit Hours = 17</b>			<b>14-3-17</b>	

### Semester VII

#	Course Code	Courses	Credit Hrs. (Theory-Lab-Credits)	Pre-Req
1.	GM436	Animation Scripting and Mechanics	3-0-3	-
	GM436L	Animation Scripting and Mechanics Lab	0-1-1	
2.	GM404	Game Engine Programming II	2-0-2	GM302
	GM404L	Game Engine Programming II Lab	0-1-1	GM302 L
3.	GM XXX	Gaming & Multimedia Elective IV	2-0-2	-
	GM XXXL	Gaming & Multimedia Elective IV Lab	0-1-1	
4.	GM498	Final Project – II	0-2-2	GM497
5.	BAXXX	University Elective III	3-0-3	-
<b>Credit Hours = 15</b>			<b>10-5-15</b>	

### Semester VIII

#	Course Code	Courses	Credit Hrs. (Theory-Lab-Credits)	Pre-Req
1.	CY406	Information Security	3-0-3	-
2.	BAXXX	University Elective IV	3-0-3	-
3.	HUXXX	Social Service	1-0-1	-
4.	GM499	Final Project - III	0-3-3	GM498
5.	CS270	Professional Practices	3-0-3	-
6	GM XXX	Gaming & Multimedia Elective V	3-0-3	
<b>Credit Hours = 16</b>			<b>13-3-16</b>	

**Total Credits = 135**