SCHEME OF STUDIES
COMPUTER SCIENCE (SPECIALIZATION IN GAMING AND ANIMATION)

Batch 2023 — FIRST YEAR — SEMESTER SYSTEM

	Course Code	Course Title	Th	Pr	T
	Computer Science (Specialisation in Gaming and Animation)			
FALL 2023	CT-175	Programming Fundamentals	3	1	4
	CT-174	Fundamentals of Information Technology	2	1	3
	**EA-104	Functional English	3	0	3
	PH-122	Applied Physics	3	1	4
	*ES-205	Islamic Studies OR	2	0	2
	*ES-209	Ethical Behaviour			
	MT-001	Mathematics-1 (for Pre-Medical)	NC		
SPRING 2024	CS-251	Logic Design & Switching Theory	3	1	4
	CS-162	Discrete Structures	3	0	3
	CT-260	Object Oriented Programming	3	1	4
	MT-171	Differential & Integral Calculus	3	0	3
	*ES-105	Pakistan Studies OR	2	0	2
	*ES-127	Pakistan Studies (for Foreigners)	2	0	2
	MT-002	Mathematics-2 (for Pre-Medical)	NC		

New Specialisation vide Resolution No. SYN-205.6(ii)
* Under Section 28(iv) Offce Order Acad/42(156)16911
** Under Section 28(iv) Offce Order Acad/42(156)16909

Batch 2023 — SECOND YEAR — SEMESTER SYSTEM

	Course Code	Course Title	Th	Pr	T
	Computer Science (Specialisation in Gaming and Animation)			
FALL 2024	CT-159	Data Structure Algorithms & Applications	3	1	4
	MT-227	Differential Equations	3	0	3
	*EA-115	Academic Reading and Writing	3	0	3
	*EA-219	Professional Ethics	2	0	2
	**MT-331	Probability & Statistics	3	0	3
SPRING 2025	CS-252	Computer Architecture & Organisation	3	1	4
	CS-261	Database Management Systems	3	1	4
	*EA-218	Business Communications	2	1	3
	EC-209	Financial & Cost Accounting	3	0	3
	MT-272	Linear Algebra & Geometry	3	0	3
	*EA-200	Community Service	NC		

New Specialisation vide Resolution No. SYN-205.6(ii)
* Under Section 28(iv) Offce Order Acad/42(156)16909
** Changed vide Resolution No.AC-163.5(iv)

Batch 2023 — THIRD YEAR — SEMESTER SYSTEM

	Course Code	Course Title	Th	Pr	T
	Computer Science (Specialisation in Gaming and Animation)			
FALL 2025	*CT-###	Gaming and Animation Elective-I			
	*CT-###	Gaming and Animation Elective-II			
	CT-379	Game Programming	3	1	4
	CT-363	Design & Analysis of Algorithms	3	0	3
	CT-365	Software Engineering	3	0	3
	CT-380	Regulations and Ethics in Gaming Industry	2	0	2
SPRING 2026	*CT-###	Gaming and Animation Elective-III			
	CT-353	Operating Systems	3	1	4
	**CT-376	Computer Communication Networks	3	1	4
	CT-382	Game Design and Development	3	1	4
	**CT-383	Design of AR and VR Applications	1	2	3
	EA/ES	Foreign Language-I	NC		

New Specialisation vide Resolution No. SYN-205.6(ii)
* Changed vide Resolution No.AC-163.5(ii)
Under Section 28(iv) Offce Order Acad/42(156)16909
** Changed Vide Resolution No.AC-165.4(ii)

Batch 2024 — THIRD YEAR — SEMESTER SYSTEM

	Course Code	Course Title	Th	Pr	T
	Computer Science (Specialisation in Gaming and Animation)			
FALL 2026	CT-###	Gaming and Animation Elective-I			
	CT-###	Gaming and Animation Elective-II			
	CT-379	Game Programming	3	1	4
	CT-363	Design & Analysis of Algorithms	3	0	3
	CT-365	Software Engineering	3	0	3
	CT-380	Regulations and Ethics in Gaming Industry	2	0	2
SPRING 2027	CT-###	Gaming and Animation Elective-III			
	CT-353	Operating Systems	3	1	4
	CT-376	Computer Communication Networks	3	1	4
	CT-382	Game Design and Development	3	1	4
	CT-383	Design of AR and VR Applications	1	2	3
	EA/ES	Foreign Language-I	NC		

Batch 2025 — THIRD YEAR — SEMESTER SYSTEM

	Course Code	Course Title	Th	Pr	T
	Computer Science (Specialisation in Gaming and Animation)			
FALL 2027	CT-361	Artificial Intelligence and Expert Systems	3	1	4
	CT-363	Design and Analysis of Algorithms	3	0	3
	CT-379	Game Programming	3	1	4
	CT-###	Gaming and Animation Elective I			
	CT-###	Gaming and Animation Elective II			
SPRING 2028	CT-376	Computer Communication Networks	3	1	4
	CT-382	Game Design and Development	3	1	4
	CT-###	Gaming and Animation Elective III			
	CT-###	Gaming and Animation Elective IV			
	EA/ES	Foreign Language-I	NC		

Changed with vide Resolution No.AC-168.4(vii)

Batch 2023 — FINAL YEAR — SEMESTER SYSTEM

	Course Code	Course Title	Th	Pr	T
	Computer Science (Specialisation in Gaming and Animation)			
FALL 2026	CT-499	Computer Science Project	0	3	3
	*CT-###	Gaming and Animation Elective-IV			
	CT-361	Artificial Intelligence & Expert Systems	3	1	4
	CT-409	Mobile Application Development	2	1	3
	*CT-486	Network & Information Security	3	1	4
	EA/ES	Foreign Language-II	NC		
SPRING 2027	CT-499	Computer Science Project	0	3	3
	*CT-###	Gaming and Animation Elective-V			
	CT-404	Motion Capture and Digital Animation	3	1	4
	CS-428	Parallel & Distributed Computing	3	1	4
	MG-481	Entrepreneurship	3	0	3

New Specialisation vide Resolution No. SYN-205.6(ii)
* Changed Vide Resolution No.AC-163.5(ii)
Under Section 28(iv) Offce Order Acad/42(156)16909

Batch 2024 — FINAL YEAR — SEMESTER SYSTEM

	Course Code	Course Title	Th	Pr	T
	Computer Science (Specialisation in Gaming and Animation)			
FALL 2027	CT-499	Computer Science Project	0	3	3
	CT-###	Gaming and Animation Elective-IV			
	CT-361	Artificial Intelligence & Expert Systems	3	1	4
	CT-409	Mobile Application Development	2	1	3
	CT-486	Network & Information Security	3	1	4
	EA/ES	Foreign Language-II	NC		
SPRING 2028	CT-499	Computer Science Project	0	3	3
	CT-###	Gaming and Animation Elective-V			
	CT-404	Motion Capture and Digital Animation	3	1	4
	CS-428	Parallel & Distributed Computing	3	1	4
	MG-481	Entrepreneurship	3	0	3

Batch 2025 — FINAL YEAR — SEMESTER SYSTEM

	Course Code	Course Title	Th	Pr	T
	Computer Science (Specialisation in Gaming and Animation)			
FALL 2028	CT-380	Regulations and Ethics in Gaming Industry	2	0	2
	CT-409	Mobile Application Development	2	1	3
	CT-486	Network and Information Security	3	1	4
	CT-499	Computer Science Project	0	3	3
	CT-###	Gaming and Animation Elective V			
	EA/ES	Foreign Language-II	NC		
SPRING 2029	CT-404	Motion Capture and Digital Animation	3	1	4
	CT-499	Computer Science Project	0	3	3
	CT-###	Gaming and Animation Elective VI			
	CS-428	Parallel and Distributed Computing	3	1	4
	MG-481	Entrepreneurship	3	0	3

Changed with vide Resolution No.AC-168.4(vii)

Electives (Batch 2023)

Elective-I				
*CT-263	Object Oriented Analysis & Design	2	1	3
*CT-264	Programming for Artificial Intelligence	2	1	3
*CT-368	Fundamentals of Data Science	2	1	3
*CT-266	Fundamentals of Cybersecurity	2	1	3
*CT-267	Fundamentals of Game Development	2	1	3

Elective-II				
CT-384	Graphics Design	2	1	3
**CT-381	Modeling and Animation	1	2	3
CT-364	Theory of Automata and Formal Languages	3	0	3

Elective-III				
CT-385	Art for Games	2	1	3
CT-386	Storyboarding and Previsualization	3	0	3
CT-387	Video Games and Creative Writing	3	0	3

Elective-IV				
CT-401	Web 3D Programming	2	1	3
CT-402	Multicore and GPU Programming	2	1	3
CT-403	Blockchain Technologies	2	1	3
**CT-411	Introduction to Quantum Computing	3	0	3
CT-405	Software Security	2	1	3

Elective-V				
CT-406	Metaverse and its Applications	2	1	3
CT-407	Human Computer Interaction	3	0	3
CT-408	Interactive Games and Audio	2	1	3

* Changed vide Resolution No. EMG-AC-1(A)
** Changed Vide Resolution No.AC-163.5(iv)
*** Changed Vide Resolution No.AC-165.4(iv)

Electives (Batch 2024)

Elective-I				
CT-263	Object Oriented Analysis & Design	2	1	3
CT-264	Programming for Artificial Intelligence	2	1	3
CT-368	Fundamentals of Data Science	2	1	3
CT-266	Fundamentals of Cybersecurity	2	1	3
CT-267	Fundamentals of Game Development	2	1	3

Elective-II				
CT-384	Graphics Design	2	1	3
CT-381	Modeling and Animation	1	2	3
CT-364	Theory of Automata and Formal Languages	3	0	3

Elective-III				
CT-385	Art for Games	2	1	3
CT-386	Storyboarding and Previsualization	3	0	3
CT-387	Video Games and Creative Writing	3	0	3

Elective-IV				
CT-401	Web 3D Programming	2	1	3
CT-402	Multicore and GPU Programming	2	1	3
CT-403	Blockchain Technologies	2	1	3
CT-411	Introduction to Quantum Computing	3	0	3
CT-405	Software Security	2	1	3

Elective-V				
CT-406	Metaverse and its Applications	2	1	3
CT-407	Human Computer Interaction	3	0	3
CT-408	Interactive Games and Audio	2	1	3

Electives (Batch 2025)

Elective-I				
CT-263	Object Oriented Analysis and Design	2	1	3
CT-264	Programming for Artificial Intelligence	2	1	3
CT-266	Fundamentals of Cybersecurity	2	1	3
CT-267	Fundamentals of Game Development	2	1	3
CT-368	Fundamentals of Data Science	2	1	3

Elective-II				
CT-364	Theory of Automata and Formal Languages	3	0	3
CT-381	Modeling and Animation	1	2	3
CT-384	Graphics Design	2	1	3

Elective-III				
CT-385	Art for Games	2	1	3
CT-386	Storyboarding and Previsualization	3	0	3
CT-387	Video Games and Creative Writing	3	0	3

Elective-IV				
CT-383	Design of AR and VR Applications	3	0	3
CT-390	Web Applications and Services	2	1	3

Elective-V				
CT-401	Web 3D Programming	2	1	3
CT-402	Multicore and GPU Programming	2	1	3
CT-403	Blockchain Technologies	2	1	3
CT-405	Software Security	2	1	3
CT-411	Introduction to Quantum Computing	3	0	3

Elective-VI				
CT-406	Metaverse and its Applications	2	1	3
CT-407	Human Computer Interaction	3	0	3
CT-408	Interactive Games and Audio	1	2	3

Changed with vide Resolution No.AC-168.4(vii)

Foreign Language (Batch 2023)

Foreign Language-I		
*EA-220	Chinese Language-I	NC
*EA-231	Turkish Language-I	NC
*EA-224	German Language-I	NC
*EA-226	French Language-I	NC
*ES-222	Arabic Language-I	NC
**EA-233	Japanese Language-I	NC
**EA-235	Russian Language-I	NC

Foreign Language-II		
*EA-221	Chinese Language-II	NC
*EA-232	Turkish Language-II	NC
*EA-225	German Language-II	NC
*EA-227	French Language-II	NC
*ES-223	Arabic Language-II	NC
**EA-234	Japanese Language-II	NC
***EA-236	Russian Language-II	NC

* Under Section 28(iv) Offce Order Acad/42(156)16909
** Changed Vide Resolution No.AC-163.5(ii)
*** Changed Vide Resolution No.AC-165.4(ii)

Foreign Language (Batch 2024)

Foreign Language-I		
EA-220	Chinese Language-I	NC
EA-231	Turkish Language-I	NC
EA-224	German Language-I	NC
EA-226	French Language-I	NC
ES-222	Arabic Language-I	NC
EA-233	Japanese Language-I	NC
EA-235	Russian Language-I	NC

Foreign Language-II		
EA-221	Chinese Language-II	NC
EA-232	Turkish Language-II	NC
EA-225	German Language-II	NC
EA-227	French Language-II	NC
ES-223	Arabic Language-II	NC
EA-234	Japanese Language-II	NC
EA-236	Russian Language-II	NC

Foreign Language (Batch 2025)

Foreign Language-I		
EA-220	Chinese Language-I	NC
EA-231	Turkish Language-I	NC
EA-224	German Language-I	NC
EA-226	French Language-I	NC
ES-222	Arabic Language-I	NC
EA-233	Japanese Language-I	NC
EA-235	Russian Language-I	NC

Foreign Language-II		
EA-221	Chinese Language-II	NC
EA-232	Turkish Language-II	NC
EA-225	German Language-II	NC
EA-227	French Language-II	NC
ES-223	Arabic Language-II	NC
EA-234	Japanese Language-II	NC
EA-236	Russian Language-II	NC