

Bachelor of Science in Computer Engineering Tentative Plan of Studies

The course offering in each semester as given below is not fixed. It may vary depending on the availability of faculty and needs of the student.

Semester – 1

Course Code	Course Title	Credit Hours	Prerequisite(s)
HUM104	Functional English	3(3, 0)	
HUM112	Islamic Studies	2(2, 0)	
MTH104	Calculus and Analytic Geometry	3(3, 0)	
PHY124	Applied Physics	3(2, 1)	
CSC101	Applications of Information and Communication Technologies	3(2, 1)	
MTH211	Discrete Mathematics	3(3, 0)	
Total Credit Hours		17(15, 2)	

Semester – 2

Course Code	Course Title	Credit Hours	Prerequisite(s)
HUM113	Ideology and Constitution of Pakistan	2(2, 0)	
MTH231	Linear Algebra	3(3, 0)	
CPE214	Computer-Aided Engineering Design	1(0, 1)	
CSC103	Programming Fundamentals	4(3, 1)	
CPE122	Linear Circuit Analysis	4(3, 1)	
	Arts and Humanities Elective	2(2, 0)	
Total Credit Hours		16(13, 3)	

Semester – 3

Course Code	Course Title	Credit Hours	Prerequisite(s)
MTH242	Differential Equations	3(3, 0)	MTH104
CSC291	Software Engineering	3(3, 0)	
CSC241	Object Oriented Programming	4(3, 1)	CSC103
CPE241	Digital Logic Design	4(3, 1)	
CPE231	Electronic Devices and Circuits	4(3, 1)	CPE122
Total Credit Hours		18(15, 3)	

Semester – 4

Course Code	Course Title	Credit Hours	Prerequisite(s)
CPE251	Probability Methods in Engineering	3(3, 0)	MTH104
CPE223	Signals and Systems	4(3, 1)	MTH242
CSC211	Data Structures	4(3, 1)	CSC103
CSC270	Database Systems	4(3, 1)	
	Natural Sciences Elective	3(2, 1)/3(3, 0)	
Total Credit Hours		18(14-15, 3-4)	

Semester – 5

Course Code	Course Title	Credit Hours	Prerequisite(s)
ECO290	Fundamentals of Engineering Economics	2(2, 0)	
CPE343	Computer Organization and Architecture	4(3, 1)	CPE241
CPE324	Digital Signal Processing	4(3,1)	CPE223
CSC323	Operating Systems	3(2, 1)	
CPE342	Microprocessor Systems and Interfacing	4(3, 1)	CPE241
Total Credit Hours		17(13, 4)	

Semester – 6

Course Code	Course Title	Credit Hours	Prerequisite(s)
CPE344	Digital System Design	4(3, 1)	CPE241
CPE314	Data Communication and Computer Networks	4(3, 1)	
CPE462	Artificial Intelligence	3(2, 1)	CSC103
HUM120	Expository Writing	3(3, 0)	
	Computer Engineering Depth Elective I	4(3, 1)	
Total Credit Hours		18(14, 4)	

Semester – 7

Course Code	Course Title	Credit Hours	Prerequisite(s)
EGG103	Workplace Safety and Health	1(1,0)	
MGT207	Introduction to Project Management	2(2, 0)	
CPE345	Embedded Systems Workshop	1(0, 1)	CSC103, CPE342
EGG498	Final Year Project (Part I)	3(0, 3)	
	Computer Engineering Depth Elective II	3(3, 0)/4(3, 1) /3(2, 1)	
	Multi-Disciplinary Engineering Elective I	3(3, 0)/3(2, 1)	
HUM117	Pakistan Studies	2(2, 0)	
HUM161	Understanding of Holy Quran - I (Fehm-e-Quran-I)	1(0,1)	
Total Credit Hours		16-17(9-11, 5-7)	

Semester – 8

Course Code	Course Title	Credit Hours	Prerequisite(s) †
HUM208	Civics and Community Engagement	2(2, 0)	
MGT250	Introduction to Entrepreneurship	2(2, 0)	
EGG499	Final Year Project (Part II)	3(0, 3)	EGG498
	Computer Engineering Depth Elective III	3(3, 0)/4(3, 1) /3(2, 1)	
	Multi-Disciplinary Engineering Elective II	3(3, 0)/4(3, 1) /3(2, 1)	
HUM162	Understanding of Holy Quran - II (Fehm-e-Quran-II)	1(0,1)	
Total Credit Hours		14-16(8-10,4-6)	

Computer Engineering Depth Electives (any three courses from the following list with at least one course of 4 credit hours)

#	Course Code	Course Title	Credit Hours ¹	Prerequisite(s) [†]
1.	CPE434	VLSI Design	4(3, 1)	CPE241, CPE231
2.	CPE446	Real Time Embedded Systems	4(3, 1)	CPE342
3.	CPE442	Digital and Mixed Signal System Testing and Testable Design	4(3, 1)	CPE241, CSC211
4.	CPE444	Advanced Digital System Design	4(3, 1)	CPE344
5.	CPE441	Hardware-Software Codesign	4(3, 1)	CPE342
6.	CPE440	Computer Architecture	3(3, 0)	CPE343
7.	CPE325	Control Systems	4(3, 1)	CPE223
8.	CPE415	Digital Image Processing	4(3, 1)	CPE223
9.	CPE472	Speech, Image and Video Processing	3(3, 0)	CPE223
10.	CPE447	Robotics	3(3, 0)	CPE325
11.	CPE461	Neural Networks	4(3, 1)	
12.	CSC354	Machine Learning	3(3, 0)	
13.	CSC232	Information Security	3(2, 1)	
14.	CSC334	Parallel and Distributed Computing	3(2, 1)	CSC323
15.	CSC497	Data Warehousing and Data Mining	3(2, 1)	CSC270
16.	CSC495	Game Development	3(2, 1)	CSC241
17.	CPE445	Internet of Things	3(3, 0)	
18.	DSC293	Data Science Fundamentals	3(2, 1)	
19.	CPE443	FPGA-Based System Design	4(3, 1)	CPE344

i. Multi-Disciplinary Engineering Electives (any two courses from the following list)

#	Course Code	Course Title	Credit Hours ¹	Prerequisite(s) [†]
1.	EEE351	Principles of Communication Systems	4(3, 1)	EEE223 or CPE223
2.	EEE353	Digital Communication Systems	4(3, 1)	EEE351, CPE251
3.	EEE354	Telecommunication Systems Engineering	3(3, 0)	EEE351
4.	EEE456	Broadband Technologies	3(3, 0)	EEE314 or CPE314
5.	EEE464	Wireless Communication Systems	3(3, 0)	EEE351
6.	EEE371	Electric Machines	4(3, 1)	EEE222 or CPE122
7.	EEE488	Renewable and Alternate Energy Systems	3(3,0)	
8.	EEE382	Power Generation	3(3, 0)	
9.	EEE375	Power Distribution and Utilization	4(3, 1)	EEE222 or CPE122
10.	EEE232	Electronics II	4(3, 1)	EEE231 or CPE231

11.	EEE333	Analog Integrated Circuits, Analysis and Design	4(3, 1)	EEE231 or CPE231
12.	EEE489	Power Plant Engineering	3(3, 0)	EEE222 or CPE122
13.	CSC336	Web Technologies	3(2, 1)	CSC241
14.	CSC303	Mobile Application Development	3(2, 1)	CSC241

C. List of Interdisciplinary/Allied Courses (Mandatory Courses)

#	Course Code	Course Title	Credit Hours ¹	Prerequisite(s) [†]
1.		Natural Sciences Elective		
2.	MTH211	Discrete Mathematics	3(3, 0)	
3.	MTH242	Differential Equations	3(3, 0)	MTH104
4.	MGT207	Introduction to Project Management	2(2, 0)	

D. List of Natural Sciences Electives (any one course from the following list)

#	Course Code	Course Title	Credit Hours ¹	Prerequisite(s) [†]
1.	MTH375	Numerical Computations	3(2, 1)	MTH104
2.	MTH105	Multivariable Calculus	3(3, 0)	MTH104
3.	ENV101	Fundamentals of Environmental Sciences	3(3, 0)	
4.	ENV454	Environmental Impact Assessment	3(3, 0)	
5.	MTH374	Optimization	3(3, 0)	MTH104
6.	MTH467	Operations Research	3(3, 0)	MTH104

E. Internship (Mandatory Course)**

#	Course Code	Course Title	Credit Hours ¹	Prerequisite(s) [†]
1.	EGG497	Internship	3(0, 3)	

F. Capstone Project (Mandatory Courses)

#	Course Code	Course Title	Credit Hours ¹	Prerequisite(s) [†]
1.	EGG498	Final Year Project (Part I)*	3(0, 3)	
2.	EGG499	Final Year Project (Part II)	3(0, 3)	EGG498 Final Year Project (Part I)

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