

### Associate Degree in Computing

<b>Structure of AD (Computing)</b>		<b>Category: Courses (Credit Hours)</b>
Total Credit Hours: 72		General Education: 14 (34)
Total Courses: 25		Major courses: 11 (38)
Semesters: 4		Computing Core: 7 (26)
Duration: 2 Years		Specialization Electives: 04 (12)
		Total: 25 (72)

Code	Area	Course Title	Cr Hr	Pre-Reqs	Co-Reqs
<b>Semester - I</b>					
CMC111	Core	Programming Fundamentals	3 + 0	-	CMC111-L
CMC111-L	Core	Programming Fundamentals (Lab)	0 + 1	-	
GER111	GER	Application of Information & Communication Technologies	2 + 0	-	
GER111-L	GER	Application of Information & Communication Technologies (Lab)	0 + 1	-	GER111-L
GERxxx	GER	Natural Science *	2 + 0	-	GERxxx-L
GERxxx-L	GER	Natural Science*	0 + 1	-	
GER121	GER	Functional English	3 + 0	-	
XXXXXX	ELEC	Elective I**	3 + 0	-	
			16 (13+3)		
<b>Semester - II</b>					
CMC112	Core	Object Oriented Programming	3 + 0	CMC111	CMC112-L
CMC112-L	Core	Object Oriented Programming (Lab)	0 + 1	CMC111	
GERxxx	GER	Quantitative Reasoning—I*	3 + 0	-	
GERxxx	GER	Arts & Humanities*	2 + 0	-	
GER241	GER	Pakistan Studies	2 + 0	-	
GEN111*	GER	Understanding of the Holy Quran – I	0 + 1	-	
GER464	GER	Entrepreneurship	2 + 0	-	
XXXXXX	ELEC	Elective II**	3 + 0	-	
			17 (15+2)		
<b>Semester - III</b>					
GER122	GER	Expository Writing	3 + 0	GER121	
CMC251	Core	Data Structures	3 + 0	CMC112	CMC251-L
CMC251-L	Core	Data Structures (Lab)	0 + 1	CMC112	
GEN112*	GER	Understanding of the Holy Quran - II	0 + 1	-	
CMC262	Core	Computer Networks	2 + 0	CMC121	CMC262-L
CMC262-L	Core	Computer Networks (Lab)	0 + 1	CMC121	
CMC331	Core	Database Systems	3 + 0	CMC112	CMC331-L
CMC331-L	Core	Database Systems (Lab)	0 + 1	CMC112	
GERxxx	GER	Quantitative Reasoning—II*	3 + 0	-	
GERxxx	GER	Social Science*	2 + 0	-	
			20 (16+4)		
<b>Semester - IV</b>					
GER443	GER	Civics and Community Engagement	2 + 0	-	

GER142	GER	Ideology and Constitution of Pakistan	2 + 0	-	
XXXXXX	ELEC	Elective III**	3 + 0	-	
GER141	GER	Islamic Studies/Ethics	2 + 0	-	
CMC371	Core	Software Engineering	3 + 0	CMC251	
CMC241	Core	Operating Systems	3 + 0	CMC251	CMC241-L
CMC241-L	Core	Operating Systems (Lab)	0 + 1	CMC251	
XXXXXX	ELEC	Elective IV**	3 + 0	-	
			19 (18+1)		
<b>Total Crd Hrs</b>			<b>72</b>		

\*These courses will be selected from the respective pools

\*\*These courses will be offered from the list of electives based on the specialized stream selected by the student.

\*\* The offering of the 3+0 or 2+1 electives will depend on the availability of the teaching and lab resources

**Note: The proposed elective courses are additional offerings to be incorporated into the existing list of electives, thereby expanding the range of options available to all enrolled students in line with program objectives and industry relevance.**

#### List of Natural Sciences Courses for the AD(Computing) Program

S.No	Course Code	Course Title	Credit Hours
1	GER152	Applied Physics	2 + 1
2	GER124	Biotechnology for Computing	2 + 1

#### List of Arts & Humanities Courses for AD(Computing) Program

S.No	Course Code	Course Title	Credit Hours
1	GEN412	Introduction to Philosophy and Critical Thinking	2 + 0
2	GER123	Communication Skills	2 + 0
3	GEN413	Visual Arts & Design Fundamentals	2 + 0
4	GER126	Design, Creativity & Media	2 + 0

#### List of Quantitative Reasoning - Courses for AD(Computing) Program

S.No	Course Code	Course Title	Credit Hours
1	MS302	Numerical Computing	3 + 0
2	IDS111	Calculus and Analytic Geometry	3 + 0
3	IDS112	Linear Algebra	3 + 0

#### List of Social Sciences Courses for AD(Computing) Program

S.No	Course Code	Course Title	Credit Hours
1	GER261	Introduction to Management	2 + 0
2	GER262	Sociology	2 + 0

#### List of Electives:

**a. Full-Stack Development elective pathway for AD Computing Elective I–IV**

SNo	Course Code	#	Course Title	Credit Hours
1	FDE111	Elective–I	Web Development Fundamentals	2+1
2	FDE121	Elective–II	Frontend Development	2+1
3	FDE211	Elective–III	Backend Development	2+1
4	FDE212	Elective–IV	Cloud Native App Deployment	2+1

**b. Mobile Application Development elective pathway for AD Computing Elective I–IV**

SNo	Course Code	#	Course Title	Credit Hours
1	MAE111	Elective–I	Mobile App Development Fundamentals	2+1
2	MAE121	Elective–II	Mobile UI/UX & State Management	2+1
3	MAE211	Elective–III	Mobile Backend Integration & APIs	2+1
4	MAE212	Elective–IV	Mobile Deployment	2+1

**c. Artificial Intelligence elective pathway for AD Computing Elective I–IV**

SNo	Course Code	#	Course Title	Credit Hours
1	AIE111	Elective–I	Introduction to Artificial Intelligence & Intelligent Systems	2+1
2	AIE121	Elective–II	Python for Data Science, AI	2+1
3	AIE211	Elective–III	Machine Learning Fundamentals	2+1
4	AIE212	Elective–IV	Deep Learning & Applied AI	2+1

**d. Cybersecurity & Digital Forensics elective pathway for AD Computing Elective I–IV**

SNo	Course Code	#	Course Title	Credit Hours
1	CDE111	Elective–I	Fundamentals of Cybersecurity	2+1
2	CDE121	Elective–II	Ethical Hacking	2+1
3	CDE211	Elective–III	Penetration Testing	2+1
4	CED212	Elective–IV	Digital Forensics & Incident Response	2+1