

Department of Computer Science & IT

Vision

To be a nationally and internationally recognized hub of excellence in computing education, research, and innovation, producing globally competitive, ethical, and computing-driven professionals who drive technological advancement, digital transformation, and sustainable societal impact for the betterment and productivity of society at large.

Mission

The Department of Computer Science and IT provides high-quality, outcome-based, and ethical education and research in computing disciplines. To produce graduates with strong theoretical foundations, advanced practical skills, and lifelong learning capabilities. The department fosters innovation, professional conduct, teamwork, and effective communication, preparing graduates to design secure, intelligent, and sustainable solutions addressing industrial, national, and societal challenges.

Programs Offered:

- ◆ Bachelor of Science in Computer Science
- ◆ Bachelor of Science in Software Engineering
- ◆ Bachelor of Science in Data Science
- ◆ Bachelor of Science in Cyber Security
- ◆ Bachelor of Science in Artificial Intelligence

Faculty Members, Department of Computer Science & IT

Main Campus

Prof. Dr. Saeed Mahfooz

Dean, Faculty of Sciences, CS & IT,
Ph.D Distributive Systems,
Liverpool John Moores University, UK

Dr. Muhammad Sohail

Assistant Professor,
Ph.D Computer Science,
KUST, Kohat

Dr. Haroon Ur Rasheed

Associate Professor,
Ph.D Mathematics,
AWKUM

Mr. Asim Ali

Assistant Professor,
MS Computer Science (Software Engg.),
CECOS University, Peshawar

Mr. Maddad Khan

Assistant Professor,
MS Business Information Technology,
Southampton SOLENT University, UK

Mr. Asad Malook

Assistant Professor,
MS Computer Science (Telecom),
University of Peshawar

Engr. Altamash Khan Afridi

Assistant Professor,
MSc Computer Systems Engineering,
UET, Peshawar

Prof. Dr. Jahangir Khan

Head of Department,
Post Doc. Engg. Academia of Serbia
Ph.D Agriculture IT, China Agricultural Uni.

Dr. Muhammad Asif Khan

Assistant Professor,
Ph.D Computer Science,
FAST-NUCES, Islamabad

Dr. Saadat Khan

Assistant Professor,
Ph.D Physics,
Gomal University, DI Khan

Mr. Abu Bakar Nauman

Assistant Professor,
MSc Computer Science,
Bahauddin Zakariya University, Multan

Engr. Mudassir Aman

Assistant Professor, / Coordinator,
MS Electrical Engg.
(Communication & Electronics Engg.),
UET Peshawar.

Mr. Kamran Khan Tatari

Assistant Professor,
MS Software Engineering,
BTH Sweden

Engr. Muhammad Yasir

Assistant Professor,
MS Computer Software Engineering,
UET, Peshawar

Dr. Shahid Latif

Associate Professor
Ph.D Computer Science,
University of Peshawar

Dr. Adam Khan

Assistant Professor,
Ph.D Computer Science,
Sarhad University, Peshawar

Dr. Muhammad Jebran Khan

Assistant Professor,
PhD Applied Sciences,
Lincoln University College, Malaysia

Ms. Zanobia Nisar

Assistant Professor
MS Computer Science,
Islamia College University, Peshawar

Engr. Aiman Rashid

Assistant Professor
MSc Computer System Engineering,
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Assistant Professor,
MS Software Engineering,
Abasyn University Peshawar

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MS Software Engineering,
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Mr. Noor Ul Amin
Lecturer,
MS (Artificial Intelligence),
COMSATS University, Islamabad

Mr. Nasir Khan
Lecturer,
MS Computer Science,
Qurtaba University, Peshawar

Mr. Muhammad Danish Ali
Junior Lecturer,
BS Computer Science,
Agriculture University, Peshawar

Syed Rohan Ali Shah
Lecturer,
MS IT (Computer Networks),
IM Sciences, Peshawar

Mr. Muhammad Fawad
Lecturer,
BS Software Engineering,
Abasyn University Peshawar

Engr. Mobashir Husain
Lecturer,
MS (Computer Software Engg.),
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Mr. Habib Ullah
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Engr. Aamir Shahzad
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Islamabad Campus

Mr. Mehmood Ul Hassan
Head of Department,
MS Computer Science,
Federal Urdu University, Islamabad

Mr. Wajih Ullah
Lecturer (Jr),
BS Physics,
Gomal University D.I Khan

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Assistant Professor,
PhD Computational Intelligence,
University Sains, Malaysia

Ms. Aleeza Ishaq
Junior Lecturer,
BS Computer Science,
University of Haripur

Mr. Asad Khan
Lecturer,
M.Phil Software Engineering,
IIU, Islamabad



Bachelor of Science in Computer Science

Accredited by National Computing Education Accreditation Council (NCEAC)

Program Details:

Program Code	001
Number of Courses	43 Theory + 14 Lab + FYP
Credit Hours	130
Minimum Duration	8 Semesters, 4 Years
Maximum Duration	12 Semesters, 6 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility Criteria:

Intermediate (Pre-Engineering/ Computer Science/* Pre-Medical) with at least 50% Marks or A-Levels with equivalent certificate from IBCC Islamabad or an equivalent certificate from a recognized institution.

**Pre-Medical students must pass deficiency course of Mathematics of 6 Credit Hours with in the first year of their regular studies.*

Depending on university policy, applicants may also be required to pass an entry or aptitude test and appear in an interview or additional screening if required.

Program Educational Objectives:

PEO 1 Computing Foundation: Graduates will possess a strong academic foundation and analytical skills to solve complex computing problems, leveraging comprehensive computer science knowledge.

PEO 2 Professional Growth: Graduates will excel in designing and developing innovative computing solutions using modern tools and technologies, while effectively working both independently and as part of diverse teams.

PEO 3 Societal Responsibility: Graduates will demonstrate effective communication skills, uphold ethical standards and professionalism, contribute positively to society, and engage in life-long learning to adapt to evolving technological advancements.

Graduate Attributes:

GA-1: Academic Education: Completion of an accredited program of study designed to prepare graduates as computing professionals.

GA-2: Knowledge for Solving Computing Problems: Apply knowledge of computing fundamentals, specialization, mathematics, science, and domain knowledge to abstraction and conceptualization of computing models.

GA-3: Problem Analysis: Identify and solve complex computing problems reaching substantiated conclusions using principles of mathematics, computing sciences, and relevant domain disciplines.

GA-4: Design/Development of Solutions: Design and evaluate solutions for complex computing problems; design systems, components, or processes that meet specified needs.

GA-5: Modern Tool Usage: Create, select, or adapt and apply appropriate techniques, resources, and modern computing tools to computing activities while understanding their limitations.

GA-6: Individual and Teamwork: Work effectively as an individual, as a team member, or a leader in multidisciplinary settings.

GA-7: Communication: Communicate effectively (oral, written, and graphical) with a variety of audiences.

GA-8: Project & Time Management: Demonstrate project planning, management, and execution within time, resource, and organizational constraints.

GA-9: Ethics: Understand and commit to professional ethics, responsibilities, and norms of computing practice.

GA-10: Life-long Learning: Recognize the need and have the ability to engage in independent learning and continuous professional development.

Scheme of Studies

1st Semester		
Course Code	Course Title	Cr. Hrs. 18
IT 107T	Applications of ICT	2-0
IT 107L	Applications of ICT Lab	0-1
CS 116T	Programming Fundamentals	3-0
CS 116L	Programming Fundamentals Lab	0-1
ENG 100	Functional English	3-0
GS 108T	Applied Physics Physics (3+0)	2-0
GS108L	Applied Physics Lab	0-1
GE 202	Civics & Community Engagement	2-0
GS123/141	Islamic Studies/Values Ethics (For Non-Muslim)	2-0
QT 101	Understanding of Holy Quran-I (Only for Muslims)	0-1
MR 101	Minority Rights in the Constitution of Pakistan-I (Only for Non-Muslims)	1-0
MA 112	Mathematics I (Mandatory course for Pre-Medical, Non Credit)	3-0

2nd Semester		
Course Code	Course Title	Cr. Hrs.18
CS 125T	Object Oriented Programming (Pre Req. CS 116T)	3-0
CS 125L	Object Oriented Programming Lab (Pre Req. CS 116L)	0-1
CS 123T	Digital Logic Design	3-0
CS 123L	Digital Logic Design Lab	0-1
ENG 116	Expository Writing	3-0
GE 201	Ideology & Constitution of Pakistan	2-0
MKT 201	Media Marketing	2-0
MA 145	Discrete Structures (QR)	3-0
MA 113	Mathematics II (Mandatory course for Pre-Medical, Non Credit)	3-0

3rd Semester		
Course Code	Course Title	Cr. Hrs.18
CS 210T	Data Structures (Pre Req. CS 125T)	3-0
CS 210L	Data Structures Lab (Pre Req. CS 125L)	0-1
MA 209	Elementary Statistics (QR)	3-0
CS 222T	Operating Systems	3-0
CS 222L	Operating Systems Lab	0-1
CS 225T	Database Systems	3-0
CS 225L	Database Systems Lab	0-1
CS 203T	Computer Networks	2-0
CS 203L	Computer Networks Lab	0-1

4th Semester		
Course Code	Course Title	Cr. Hrs.16
MA 101	Calculus & Analytical Geometry	3-0
AI 210T	Artificial Intelligence	2-0
AI 210L	Artificial Intelligence Lab	0-1
SE 201	Software Engineering	3-0
CS 346T	Information Security	2-0
CS 346L	Information Security Lab	0-1
GS 128	Pakistan Studies	2-0
MGT 210	Entrepreneurship	2-0

5th Semester		
Course Code	Course Title	Cr. Hrs.15
CS 340	Theory of Automata	3-0
CS 320T	Computer Organization & Architecture	2-0
CS 320L	Computer Organization & Architecture Lab	0-1
MA 235	Linear Algebra	3-0
	Elective I (Domain Elective)	3-0
	Elective II (Domain Elective)	3-0

6th Semester		
Course Code	Course Title	Cr. Hrs.15
CS 341	Cloud Computing	3-0
CS 241	Design and Analysis of Algorithms	3-0
IT 330	Financial Technology	3-0
	Elective III (Domain Elective)	3-0
	Elective IV (Domain Elective)	3-0

Summer Semester		
Course Code	Course Title	Cr. Hrs.03
RES350	Field Experience*	0-3
* Students may complete their internship at any time during the 4-year degree. However, it is recommended to do it after the 2nd year (i.e., after completing 4 semesters).		

7th Semester		
Course Code	Course Title	Cr. Hrs.15
RES 440	Technical & Research Report Writing	3-0
	Elective V (Domain Elective)	3-0
	Elective VI (Domain Elective)	3-0
RES 491	Project Phase I	0-3
QT 300	Understanding of Holy Quran-II (Only for Muslims)	0-1
MR 300	Minority Rights in the Constitution of Pakistan-II (Only for Non-Muslims)	1-0
GE 319	Professional Practices	2-0

8th Semester		
Course Code	Course Title	Cr. Hrs.12
	Elective VII (Domain Elective)	3-0
	Elective VIII (Domain Elective)	3-0
PC 400	Professional Certification	3-0
RES 492	Project Phase II	0-3

Specializations Offered

Department is offering specializations in the following domains of Computer Science. Enrollments will be allowed provided a reasonable number of applicants show interest. Complete lists of electives can be seen and downloaded from the university website.

Software Engineering**Artificial Intelligence****Computer Engineering****Multimedia and Animation****Human Computer Interaction****Network Infrastructure & Cloud Computing****Health Informatics****Data Science****Cyber Security****Information Technology****Computer Games Development****Robotics****Internet of Things (IoT)****Quantum Computing**



Bachelor of Science in Software Engineering

Accredited by National Computing Education Accreditation Council (NCEAC)

Program Details:

Program Code	002
Number of Courses	45 Theory + 20 Lab + FYP
Credit Hours	137
Minimum Duration	8 Semesters, 4 Years
Maximum Duration	12 Semesters, 6 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility Criteria:

Intermediate (Pre-Engineering/ Computer Science/* Pre-Medical) with at least 50% Marks or A-Levels with equivalent certificate from IBCC Islamabad or an equivalent certificate from a recognized institution.

**Pre-Medical students must pass deficiency course of Mathematics of 6 Credit Hours with in the first year of their regular studies.*

Depending on university policy, applicants may also be required to pass an entry or aptitude test and appear in an interview or additional screening if required.

Program Educational Objectives:

PEO 1 Computing Foundation: Graduates will possess a strong foundation in software engineering principles, analytical skills, and problem-solving for software systems.

PEO 2 Professional Growth: Graduates will design, develop, and deliver secure, scalable, and innovative software products and solutions across computing-driven domains, working effectively individually and in teams.

PEO 3 Societal Responsibility: Graduates will maintain professional ethics, communicate effectively, and engage in lifelong learning while contributing responsibly to industry and society.

Graduate Attributes:

GA-1: Academic Education: Completion of an accredited program of study designed to prepare graduates as computing professionals.

GA-2: Knowledge for Solving Computing Problems: Apply knowledge of computing fundamentals, specialization, mathematics, science, and domain knowledge to abstraction and conceptualization of computing models.

GA-3: Problem Analysis: Identify and solve complex computing problems reaching substantiated conclusions using principles of mathematics, computing sciences, and relevant domain disciplines.

GA-4: Design/Development of Solutions: Design and evaluate solutions for complex computing problems; design systems, components, or processes that meet specified needs.

GA-5: Modern Tool Usage: Create, select, or adapt and apply appropriate techniques, resources, and modern computing tools to computing activities while understanding their limitations.

GA-6: Individual and Teamwork: Work effectively as an individual, as a team member, or a leader in multidisciplinary settings.

GA-7: Communication: Communicate effectively (oral, written, and graphical) with a variety of audiences.

GA-8: Project & Time Management: Demonstrate project planning, management, and execution within time, resource, and organizational constraints.

GA-9: Ethics: Understand and commit to professional ethics, responsibilities, and norms of computing practice.

GA-10: Life-long Learning: Recognize the need and have the ability to engage in independent learning and continuous professional development.

Scheme of Studies

1st Semester

Course Code	Course Title	Cr. Hrs.17
IT 107T	Applications of ICT	2-0
IT 107L	Applications of ICT Lab	0-1
CS 116T	Programming Fundamentals	3-0
CS 116L	Programming Fundamentals Lab	0-1
ENG 100	Functional English	3-0
GE 202	Civics & Community Engagement	2-0
GS 123/141	Islamic Studies/Values Ethics (For Non-Muslim)	2-0
MA 145	Discrete Structures (QR)	3-0

2nd Semester

Course Code	Course Title	Cr. Hrs.18
CS 125T	Object Oriented Programming (Pre Req. CS 116T)	3-0
CS 125L	Object Oriented Programming Lab (Pre Req. CS 116L)	0-1
GS 108T	Applied Physics	2-0
GS 108L	Applied Physics Lab	0-1
CS 124T	Digital Logic Design	2-0
CS 124L	Digital Logic Design Lab	0-1
MA 313	Probability & Statistics	3-0
ENG 116	Expository Writing (Pre Req. ENG 100)	3-0
GE 201	Ideology & Constitution of Pakistan	2-0

3rd Semester

Course Code	Course Title	Cr. Hrs.18
CS 210T	Data Structures (Pre Req. CS 125T)	3-0
CS 210L	Data Structures Lab (Pre Req. CS 125L)	0-1
MA 101	Calculus & Analytical Geometry (QR)	3-0
CS 224T	Operating Systems	2-0
CS 224L	Operating Systems Lab	0-1
CS 225T	Database Systems	3-0
CS 225L	Database Systems Lab	0-1
QT 101	Understanding of Holy Quran-I (only for Muslims)	0-1
MR 101	Minority Rights in the Constitution of Pakistan-I (only for Non-Muslims)	1-0
SE 201	Software Engineering	3-0

4th Semester

Course Code	Course Title	Cr. Hrs.18
CS 203T	Computer Networks	2-0
CS 203L	Computer Networks Lab	0-1
	Elective I (Domain Elective)	3-0
MA 105	Multivariable Calculus (Pre Req. MA 101)	3-0
AI 210T	Artificial Intelligence	2-0
AI 210L	Artificial Intelligence Lab	0-1
	Social Science Elective I	3-0
SE 225T	Software Construction and Development	2-0
SE 225L	Software Construction and Development Lab	0-1

5th Semester

Course Code	Course Title	Cr. Hrs.17
	Elective II (Domain Elective)	3-0
CS 346T	Information Security	2-0
CS 346L	Information Security Lab	0-1
CS 204T	Computer Organization & Assembly Language (Pre Req. CS 124T)	2-0
CS 204L	Computer Organization & Assembly Language Lab (Pre Req. CS 124L)	0-1
SE 227T	Software Requirement Engineering	2-0
SE 227L	Software Requirement Engineering Lab	0-1
	Social Science Elective II	2-0
MA 235	Linear Algebra (Pre Req. MA 101)	3-0

6th Semester

Course Code	Course Title	Cr. Hrs.15
	Elective III (Domain Elective)	3-0
CS 320	Analysis of Algorithms (Pre Req. CS 210T)	3-0
	Elective IV (Domain Elective)	3-0
SE 414	Software Design & Architecture	3-0
SE 323T	Software Quality Engineering	2-0
SE 323L	Software Quality Engineering Lab	0-1

Summer Semester

Course Code	Course Title	Cr. Hrs.03
RES 350	Field Experience*	0-3

* Students may complete their internship at any time during the 4-year degree. However, it is recommended to do it after the 2nd year (i.e., after completing 4 semesters).

7th Semester		
Course Code	Course Title	Cr. Hrs.17
ENG 440	Technical & Business Writing (Pre Req. ENG 116)	3-0
	Elective V (Domain Elective)	3-0
GS 128	Pakistan Studies	2-0
RES 491	Project Phase I	0-3
SE 468T	Software Project Management	2-0
SE 468L	Software Project Management Lab	0-1
CS 423T	Parallel and Distributed Computing	2-0
CS 423L	Parallel and Distributed Computing Lab	0-1

8th Semester		
Course Code	Course Title	Cr. Hrs.14
GE 319	Professional Practices	2-0
MGT 210	Entrepreneurship	2-0
	Elective VI (Domain Elective)	3-0
	Elective VII (Domain Elective)	3-0
QT 300	Understanding of Holy Quran-II (only for Muslims)	0-1
MR 300	Minority Rights in the Constitution of Pakistan-II (only for Non Muslims)	1-0
RES 492	Project Phase II	0-3

The facility for teaching of any of the elective course will be arranged only if reasonable number of students opt for.

Specialization with List of Electives

Full Stack Developer		
Course Code	Course Title	Cr. Hrs.
IT 240	User Interface Designing	2-1
CS 450	Server-Side Scripting	2-1
IT 477	DevOps Tools	2-1
CS 406	Web Engineering	2-1
IT 275	Web Programming	2-1
CS 333	Visual Programming	2-1
CS 455	Mobile Application Development	2-1
CS 334	Multimedia Design & Development	2-1
CS 421	Semantic Web	2-1
CS 403	Systems Programming	2-1

Systems Engineering		
Course Code	Course Title	Cr. Hrs.
SE 312	Formal Methods in SE	3-0
SE 470	Agile Software Development	3-0
SE 450	Software Metrics & Testing	3-0
SE 412	Design Patterns	3-0
SE 472	Automated Software Testing	2-1
SE 512	Software Re Engineering	3-0
SE 370	Applied Software Engineering	2-1
CS 304	Business Process Analysis	3-0
IE 332	Modeling & Simulation	2-1
SE 452	Object Oriented Software Engineering	2-1

Social Science Electives		
Course Code	Course Title	Cr. Hrs.
MKT 227	Principles of Marketing	3-0
MGT 316	E- Governance	3-0
MGT 107	Principles of Management	2-0
SS 301	Logic and Critical Thinking	3-0
MKT 201	Media Marketing	2-0
GS 305/321	Foreign Language (Chinese/Arabic)	3-0
FIN 208	Financial Literacy	2-0



Bachelor of Science in Cyber Security

Accredited by National Computing Education Accreditation Council (NCEAC)

Program Details:

Program Code	229
Number of Courses	42 Theory + 18 Lab + FYP
Credit Hours	134
Minimum Duration	8 Semesters, 4 Years
Maximum Duration	12 Semesters, 6 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility Criteria:

Intermediate (Pre-Engineering/ Computer Science/* Pre-Medical) with at least 50% Marks or A-Levels with equivalent certificate from IBCC Islamabad or an equivalent certificate from a recognized institution.

**Pre-Medical students must pass deficiency course of Mathematics of 6 Credit Hours with in the first year of their regular studies.*

Depending on university policy, applicants may also be required to pass an entry or aptitude test and appear in an interview or additional screening if required.

Program Educational Objectives:

PEO 1 Computing Foundation: Graduates will possess knowledge of cyber security principles, threat analysis, secure systems, and risk management.

PEO 2 Professional Growth: Graduates will design, implement, and manage secure systems using modern cyber security tools and technologies, working independently and in teams.

PEO 3 Societal Responsibility: Graduates will uphold ethical practices, communicate effectively, engage in lifelong learning, and contribute responsibly to organizational, national, and societal security.

Graduate Attributes:

GA-1: Academic Education: Completion of an accredited program of study designed to prepare graduates as computing professionals.

GA-2: Knowledge for Solving Computing Problems: Apply knowledge of computing fundamentals, specialization, mathematics, science, and domain knowledge to abstraction and conceptualization of computing models.

GA-3: Problem Analysis: Identify and solve complex computing problems reaching substantiated conclusions using principles of mathematics, computing sciences, and relevant domain disciplines.

GA-4: Design/Development of Solutions: Design and evaluate solutions for complex computing problems; design systems, components, or processes that meet specified needs.

GA-5: Modern Tool Usage: Create, select, or adapt and apply appropriate techniques, resources, and modern computing tools to computing activities while understanding their limitations.

GA-6: Individual and Teamwork: Work effectively as an individual, as a team member, or a leader in multidisciplinary settings.

GA-7: Communication: Communicate effectively (oral, written, and graphical) with a variety of audiences.

GA-8: Project & Time Management: Demonstrate project planning, management, and execution within time, resource, and organizational constraints.

GA-9: Ethics: Understand and commit to professional ethics, responsibilities, and norms of computing practice.

GA-10: Life-long Learning: Recognize the need and have the ability to engage in independent learning and continuous professional development.

Scheme of Studies

1st Semester		
Course Code	Course Title	Cr. Hrs.18
IT 107T	Applications of ICT	2-0
IT 107L	Applications of ICT Lab	0-1
CS 116T	Programming Fundamentals	3-0
CS 116L	Programming Fundamentals Lab	0-1
ENG 100	Functional English	3-0
GS 108T	Applied Physics	2-0
GS 108L	Applied Physics Lab	0-1
GE 202	Civics & Community Engagement	2-0
QT 101	Understanding of Holy Quran-I (only for Muslim)	0-1
MR 101	Minority Rights in the Constitution of Pakistan-I (only for Non-Muslim)	1-0
GS 123/141	Islamic Studies/Values Ethics (For Non-Muslim)	2-0

2nd Semester		
Course Code	Course Title	Cr. Hrs.17
CS 125T	Object Oriented Programming (Pre Req. CS 116T)	3-0
CS 125L	Object Oriented Programming Lab (Pre Req. CS 116L)	0-1
CS 123T	Digital Logic Design	3-0
CS 123L	Digital Logic Design Lab	0-1
CS 206T	Introduction to Cyber Security	2-0
CS 206L	Introduction to Cyber Security Lab	0-1
ENG 116	Expository Writing	3-0
MA 145	Discrete Structures (QR)	3-0

3rd Semester		
Course Code	Course Title	Cr. Hrs.18
CS 245T	Data Structures & Algorithms (Pre Req. 125T)	3-0
CS 245L	Data Structures & Algorithms Lab (Pre Req. 125L)	0-1
MA 101	Calculus & Analytical Geometry	3-0
CS 222T	Operating Systems	3-0
CS 222L	Operating Systems Lab	0-1
CS 225T	Database Systems	3-0
CS 225L	Database Systems Lab	0-1
MA 209	Elementary Statistics (QR)	3-0

4th Semester		
Course Code	Course Title	Cr. Hrs.16
CS 203T	Computer Networks	2-0
CS 203L	Computer Networks Lab	0-1
GE 201	Ideology & Constitution of Pakistan	2-0
AI 210T	Artificial Intelligence	2-0
AI 210L	Artificial Intelligence Lab	0-1
CYB 201T	Vulnerability Assessment and Penetration Testing	2-0
CYB 201L	Vulnerability Assessment and Penetration Testing Lab	0-1
CYB 205	Cryptography	3-0
GE 319	Professional Practices	2-0

5th Semester		
Course Code	Course Title	Cr. Hrs.16
	Elective I (Domain Elective)	3-0
CS 322T	Network Security	2-0
CS 322L	Network Security Lab	0-1
CS 320T	Computer Organization and Architecture	2-0
CS 320L	Computer Organization and Architecture Lab	0-1
	Social Science Elective	2-0
MGT 210	Entrepreneurship	2-0
IT 330	Financial Technology	3-0

6th Semester		
Course Code	Course Title	Cr. Hrs.18
CYB 301T	Malware Analysis and Reverse Engineering	2-0
CYB 301L	Malware Analysis and Reverse Engineering LAB	0-1
	Elective II (Domain Elective)	3-0
	Elective III (Domain Elective)	3-0
MA 235	Linear Algebra	3-0
CYB 303T	Digital Forensics and Incident Response	2-0
CYB 303L	Digital Forensics and Incident Response Lab	0-1
CYB 305	Information Security Management	3-0

Summer Semester		
Course Code	Course Title	Cr. Hrs.03
RES 350	Field Experience*	0-3

* Students may complete their internship at any time during the 4-year degree. However, it is recommended to do it after the 2nd year (i.e., after completing 4 Sem.)

Bachelor of Science in Cyber Security

7th Semester		
Course Code	Course Title	Cr. Hrs.14
CS 326T	Secure Software Design and Development	2-0
CS 326L	Secure Software Design and Development Lab	0-1
CYB 402T	Cloud and Application Security	2-0
CYB 402L	Cloud and Application Security Lab	0-1
	Elective IV (Domain Elective)	3-0
GS 128	Pakistan Studies	2-0
RES 491	Project Phase I	0-3

8th Semester		
Course Code	Course Title	Cr. Hrs.14
PC 400	Professional Certification	3-0
	Elective V (Domain Elective)	3-0
	Elective VI (Domain Elective)	3-0
QT 300	Understanding of Holy Quran-II (only for Muslims)	0-1
MR 300	Minority Rights in the Constitution of Pakistan-II (only for Non- Muslims)	1-0
RES 492	Project Phase II	0-3

Social Science Electives		
Course Code	Course Title	Cr. Hrs.
MKT 227	Principles of Marketing	3-0
MGT 316	E-Governance	3-0
MGT 107	Principles of Management	2-0
SS 301	Logic and Critical Thinking	3-0
MKT 201	Media Marketing	2-0
GS305/321	Foreign Language (Chinese/Arabic)	3-0
FIN 208	Financial Literacy	2-0

Specializations Offered

Department is offering specializations in the following domains of Computer Science. Enrollments will be allowed provided a reasonable number of applicants show interest. Complete lists of electives can be seen and downloaded from the university website.

Network and Infrastructure Security

Cryptography

Digital Forensics

IoT & Embedded Security

Governance Risk Compliance



Bachelor of Science in Artificial Intelligence

Accredited by National Computing Education Accreditation Council (NCEAC)

Program Details:

Program Code	227
Number of Courses	44 Theory + 20 Lab + FYP
Credit Hours	137
Minimum Duration	8 Semesters, 4 Years
Maximum Duration	12 Semesters, 6 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility Criteria:

Intermediate (Pre-Engineering/ Computer Science/* Pre-Medical) with at least 50% Marks or A-Levels with equivalent certificate from IBCC Islamabad or an equivalent certificate from a recognized institution.

**Pre-Medical students must pass deficiency course of Mathematics of 6 Credit Hours with in the first year of their regular studies.*

Depending on university policy, applicants may also be required to pass an entry or aptitude test and appear in an interview or additional screening if required.

Program Educational Objectives:

PEO 1 Academic Foundation: Graduates will acquire theoretical and practical expertise in Artificial Intelligence, including Artificial General Intelligence, Artificial Super Intelligence, agent-based systems, and emerging AI technologies.

PEO 2 Professional Growth: Graduates will design, implement, and deploy innovative AI solutions, applying advanced tools and technologies while working individually and in multidisciplinary teams.

PEO 3 Societal Responsibility: Graduates will uphold human-centered AI principles, ethical practices, communicate effectively, and contribute positively to society.

Graduate Attributes:

GA-1: Academic Education: Completion of an accredited program of study designed to prepare graduates as computing professionals.

GA-2: Knowledge for Solving Computing Problems: Apply knowledge of computing fundamentals, specialization, mathematics, science, and domain knowledge to abstraction and conceptualization of computing models.

GA-3: Problem Analysis: Identify and solve complex computing problems reaching substantiated conclusions using principles of mathematics, computing sciences, and relevant domain disciplines.

GA-4: Design/Development of Solutions: Design and evaluate solutions for complex computing problems; design systems, components, or processes that meet specified needs.

GA-5: Modern Tool Usage: Create, select, or adapt and apply appropriate techniques, resources, and modern computing tools to computing activities while understanding their limitations.

GA-6: Individual and Teamwork: Work effectively as an individual, as a team member, or a leader in multidisciplinary settings.

GA-7: Communication: Communicate effectively (oral, written, and graphical) with a variety of audiences.

GA-8: Project & Time Management: Demonstrate project planning, management, and execution within time, resource, and organizational constraints.

GA-9: Ethics: Understand and commit to professional ethics, responsibilities, and norms of computing practice.

GA-10: Life-long Learning: Recognize the need and have the ability to engage in independent learning and continuous professional development.

Scheme of Studies

1st Semester

Course Code	Course Title	Cr. Hrs.18
IT 107T	Applications of ICT	2-0
IT 107L	Applications of ICT Lab	0-1
CS 116T	Programming Fundamentals	3-0
CS 116L	Programming Fundamentals Lab	0-1
ENG 100	Functional English	3-0
GS 108T	Applied Physics	2-0
GS 108L	Applied Physics Lab	0-1
GE 202	Civics & Community Engagement	2-0
GS 123/141	Islamic Studies/Values Ethics (For Non-Muslim)	2-0
QT 101	Understanding of Holy Quran-I (only for Muslims)	0-1
MR 101	Minority Rights in the Constitution of Pakistan-I (only for Non-Muslims)	1-0

2nd Semester

Course Code	Course Title	Cr. Hrs.18
CS 125T	Object Oriented Programming (Pre Req. CS 116T)	3-0
CS 125L	Object Oriented Programming Lab (Pre Req. CS 116L)	0-1
CS 124T	Digital Logic Design	2-0
CS 124L	Digital Logic Design Lab	0-1
MA 313	Probability & Statistics	3-0
ENG 116	Expository Writing (Pre Req. ENG 100)	3-0
MA 145	Discrete Structures (QR)	3-0
GS 128	Pakistan Studies	2-0

3rd Semester

Course Code	Course Title	Cr. Hrs.17
CS 210T	Data Structures (Pre Req. CS 125T)	3-0
CS 210L	Data Structures Lab (Pre Req. CS 125L)	0-1
MA 101	Calculus & Analytical Geometry	3-0
CS 324T	Operating Systems	2-0
CS 324L	Operating Systems Lab	0-1
CS 225T	Database Systems	3-0
CS 225L	Database Systems Lab	0-1
CS 208T	Programming for AI	2-0
CS 208L	Programming for AI Lab	0-1

4th Semester

Course Code	Course Title	Cr. Hrs.18
	Elective I (Domain Elective)	3-0
CS 203T	Computer Networks	2-0
CS 203L	Computer Networks Lab	0-1
MA 105	Multivariable Calculus (Pre Req. MA 101)	3-0
AI 210T	Artificial Intelligence	2-0
AI 210L	Artificial Intelligence Lab	0-1
SE 201	Software Engineering	3-0
	Social Science Elective I	3-0

5th Semester

Course Code	Course Title	Cr. Hrs.15
CS 346T	Information Security	2-0
CS 346L	Information Security Lab	0-1
	Elective II (Domain Elective)	3-0
CS 204T	Computer Organization & Assembly Language (Pre Req. CS 124T)	2-0
CS 204L	Computer Organization & Assembly Language Lab (Pre Req. CS 124L)	0-1
	Social Science Elective II	2-0
CS 336T	Knowledge Representation & Reasoning	2-0
CS 336L	Knowledge Representation & Reasoning Lab	0-1
CS 320	Analysis of Algorithms (Pre Req. CS 210T)	3-0

6th Semester

Course Code	Course Title	Cr. Hrs.17
	Elective III (Domain Elective)	3-0
	Elective IV (Domain Elective)	3-0
MA 235	Linear Algebra (Pre Req. MA 101)	3-0
CS 404T	Machine Learning	2-0
CS 404L	Machine Learning Lab	0-1
CS 305T	Computer Vision	2-0
CS 305L	Computer Vision Lab	0-1
GE 201	Ideology & Constitution of Pakistan	2-0

Summer Semester

Course Code	Course Title	Cr. Hrs.03
RES 350	Field Experience*	0-3

* Students may complete their internship at any time during the 4-year degree. However, it is recommended to do it after the 2nd year (i.e., after completing 4 semesters).

7th Semester		
Course Code	Course Title	Cr. Hrs.17
ENG 440	Technical and Business Writing (Pre Req. ENG 116)	3-0
	Elective V (Domain Elective)	3-0
AI 327T	Artificial Neural Networks & Deep Learning	2-0
AI 327L	Artificial Neural Networks & Deep Learning Lab	0-1
CS 423T	Parallel & Distributed Computing	2-0
CS 423L	Parallel & Distributed Computing Lab	0-1
RES 491	Project Phase I	0-3

8th Semester		
Course Code	Course Title	Cr. Hrs.14
GE 319	Professional Practices	2-0
MGT 210	Entrepreneurship	2-0
	Elective VI (Domain Elective)	3-0
	Elective VII (Domain Elective)	3-0
QT 300	Understanding of Holy Quran-II (only for Muslims)	0-1
MR 300	Minority Rights in the Constitution of Pakistan-II (only for Non-Muslims)	0-1
RES 492	Project Phase II	0-3

The facility for teaching of any of the elective course will be arranged only if reasonable number of students opt for.

Specialization with List of Electives

Artificial Intelligence		
Course Code	Course Title	Cr. Hrs.
COM 496	Digital Image Processing	2-1
CS 426	Fuzzy Systems	2-1
CS 432	Reinforcement Learning	2-1
CS 409	Deep Learning	2-1
CS 435	Swarm Intelligence	2-1
CS 325	Agent Based Modeling	2-1
CS 427	Knowledge Based Systems	2-1
CS 460	AI for Games	2-1
CS 461	Virtual Reality	2-1
CS 462	Prompt Engineering	2-1
CS 414T	Robotics & IOT	2-1
CS 421	Natural Language Processing	3-0

Social Science Electives		
Course Code	Course Title	Cr. Hrs.
MKT 227	Principles of Marketing	3-0
MGT 316	E-Governance	3-0
MGT 107	Principles of Management	2-0
SS 301	Logic and Critical Thinking	3-0
MKT 201	Media Marketing	2-0
GS 305/321	Foreign Language (Chinese/Arabic)	3-0
FIN 208	Financial Literacy	2-0



Bachelor of Science in Data Science

Program Details:

Program Code	228
Number of Courses	43 Theory + 20 Lab + FYP
Credit Hours	137
Minimum Duration	8 Semesters, 4 Years
Maximum Duration	12 Semesters, 6 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility Criteria:

Intermediate (Pre-Engineering/ Computer Science/* Pre-Medical) with at least 50% Marks or A-Levels with equivalent certificate from IBCC Islamabad or an equivalent certificate from a recognized institution.

**Pre-Medical students must pass deficiency course of Mathematics of 6 Credit Hours with in the first year of their regular studies.*

Depending on university policy, applicants may also be required to pass an entry or aptitude test and appear in an interview or additional screening if required.

Program Objectives:

PEO 1 Computing Foundation: Graduates will acquire expertise in data science fundamentals, including analytics, machine learning, and data engineering.

PEO 2 Professional Growth: Graduates will design, implement, and deploy intelligent, data-driven solutions using modern tools and technologies, individually and in teams.

PEO 3 Societal Responsibility: Graduates will maintain ethical standards, communicate effectively, engage in lifelong learning, and leverage data insights for organizational and societal benefit.

Graduate Attributes:

GA-1: Academic Education: Completion of an accredited program of study designed to prepare graduates as computing professionals.

GA-2: Knowledge for Solving Computing Problems: Apply knowledge of computing fundamentals, specialization, mathematics, science, and domain knowledge to abstraction and conceptualization of computing models.

GA-3: Problem Analysis: Identify and solve complex computing problems reaching substantiated conclusions using principles of mathematics, computing sciences, and relevant domain disciplines.

GA-4: Design/Development of Solutions: Design and evaluate solutions for complex computing problems; design systems, components, or processes that meet specified needs.

GA-5: Modern Tool Usage: Create, select, or adapt and apply appropriate techniques, resources, and modern computing tools to computing activities while understanding their limitations.

GA-6: Individual and Teamwork: Work effectively as an individual, as a team member, or a leader in multidisciplinary settings.

GA-7: Communication: Communicate effectively (oral, written, and graphical) with a variety of audiences.

GA-8: Project & Time Management: Demonstrate project planning, management, and execution within time, resource, and organizational constraints.

GA-9: Ethics: Understand and commit to professional ethics, responsibilities, and norms of computing practice.

GA-10: Life-long Learning: Recognize the need and have the ability to engage in independent learning and continuous professional development.

Scheme of Studies

1st Semester		
Course Code	Course Title	Cr. Hrs.17
IT 107T	Applications of ICT	2-0
IT 107L	Applications of ICT Lab	0-1
CS 116T	Programming Fundamentals	3-0
CS 116L	Programming Fundamentals Lab	0-1
ENG 100	Functional English	3-0
GE 202	Civics & Community Engagement	2-0
GS 123/141	Islamic Studies/Values Ethics (For Non-Muslim)	2-0
MA 145	Discrete Structure	3-0

2nd Semester		
Course Code	Course Title	Cr. Hrs.18
CS 125T	Object Oriented Programming (Pre Req. CS 116T)	3-0
CS 125L	Object Oriented Programming Lab (Pre Req. CS 116L)	1-0
GS 108T	Applied Physics	2-0
GS 108L	Applied Physics Lab	0-1
CS 124T	Digital Logic Design	2-0
CS 124L	Digital Logic Design Lab	0-1
MA 313	Probability & Statistics	3-0
ENG 116	Expository Writing (Pre Req. ENG 100)	3-0
GE 201	Ideology & Constitution of Pakistan	2-0

3rd Semester		
Course Code	Course Title	Cr. Hrs.18
CS 210T	Data Structures (Pre Req. CS 125T)	3-0
CS 210L	Data Structures Lab (Pre Req. CS 125L)	0-1
MA 101	Calculus & Analytical Geometry	3-0
CS 222T	Operating Systems	2-0
CS 222L	Operating Systems Lab	0-1
IT 212T	Database Systems	3-0
IT 212L	Database Systems Lab	0-1
CS 321T	Introduction to Data Science	2-0
CS 321L	Introduction to Data Science Lab	0-1
QT 101	Understanding of Holy Quran-I (only for Muslims)	0-1
MR 101	Minority Rights in the Constitution of Pakistan-I (only for Non-Muslims)	1-0

4th Semester		
Course Code	Course Title	Cr. Hrs.18
	Elective I (Domain Elective)	3-0
SE 201	Software Engineering	3-0
CS 203T	Computer Networks	2-0
CS 203L	Computer Networks Lab	0-1
MA 105	Multivariable Calculus (Pre Req. MA 101)	3-0
IT 202T	Artificial Intelligence	2-0
IT 202L	Artificial Intelligence Lab	0-1
MA 314T	Advanced Statistics	2-0
MA 314L	Advanced Statistics Lab	0-1

5th Semester		
Course Code	Course Title	Cr. Hrs.15
	Elective II (Domain Elective)	3-0
CS 346T	Information Security	2-0
CS 346L	Information Security Lab	0-1
CS 204T	Computer Organization & Assembly Language (Pre Req. CS 124T)	2-0
CS 204L	Computer Organization & Assembly Language Lab (Pre Req. CS 124L)	0-1
	Social Science Elective I	3-0
CS 307T	Data Visualization	2-0
CS 307L	Data Visualization Lab	0-1

6th Semester		
Course Code	Course Title	Cr. Hrs.18
	Elective III (Domain Elective)	3-0
MA 235	Linear Algebra (Pre Req. MA 101)	3-0
CS 320	Analysis of Algorithms (Pre Req. CS 210T)	3-0
CS 306T	Data Mining	2-0
CS 306L	Data Mining Lab	0-1
	Elective IV (Domain Elective)	3-0
CS 308T	Data Warehousing & Business Intelligence	2-0
CS 308L	Data Warehousing & Business Intelligence Lab	0-1

Summer Semester		
Course Code	Course Title	Cr. Hrs.03
RES 350	Field Experience*	0-3
* Students may complete their internship at any time during the 4-year degree. However, it is recommended to do it after the 2nd year (i.e., after completing 4 semesters).		

7th Semester		
Course Code	Course Title	Cr. Hrs.16
	Social Science Elective II	2-0
ENG 440	Technical & Business Writing (Pre Req. ENG 116)	3-0
GS 128	Pakistan Studies	2-0
	Elective V (Domain Elective)	3-0
CS 423T	Parallel & Distributed Computing	2-0
CS 423L	Parallel & Distributed Computing Lab	1-0
RES 491	Project Phase I	3-0

8th Semester		
Course Code	Course Title	Cr. Hrs.14
GE 319	Professional Practices	2-0
MGT 210	Entrepreneurship	2-0
QT 300	Understanding of Holy Quran-II (only for Muslims)	0-1
MR 300	Minority Rights in the Constitution of Pakistan-II (only for Non-Muslims)	1-0
RES 492	Project Phase II	0-3
	Elective VI (Domain Elective)	3-0
	Elective VII (Domain Elective)	3-0

The facility for teaching of any of the elective course will be arranged only if reasonable number of students opt for.

Specialization with List of Electives

Data Science		
Course Code	Course Title	Cr. Hrs.
CS 303	Big data Analytics	2-1
IE 332	Modeling & Simulation	2-1
CS 304	Business Process Analysis	2-1
Ds310	Platforms & Architectures for Data Science	2-1
CS 341	Cloud Computing Fundamentals	2-1
CS 429	Topics in Data Science	2-1
CS 421	Semantic Web	3-0
CS 413	Enterprise System	3-0
IT 465	Distributed Database	2-1
IT 335	Database Programming	2-1
CS 404	Machine Learning	2-1
AI 327	Artificial Neural Networks & Deep Learning	2-1
CS 339	HCI & Computer Graphics	2-1
DS 310	Platforms & Architectures for Data Science	2-1
CS 340	Theory of Automata	3-0
CS 470	Advanced Database Management Systems	2-1

Social Science Electives		
Course Code	Course Title	Cr. Hrs.
MKT 227	Principles of Marketing	3-0
MGT 316	E-Governance	3-0
MGT 107	Principles of Management	2-0
SS 301	Logic and Critical Thinking	3-0
MKT 201	Media Marketing	2-0
GS305/321	Foreign Language (Chinese/Arabic)	3-0
FIN 208	Financial Literacy	2-0