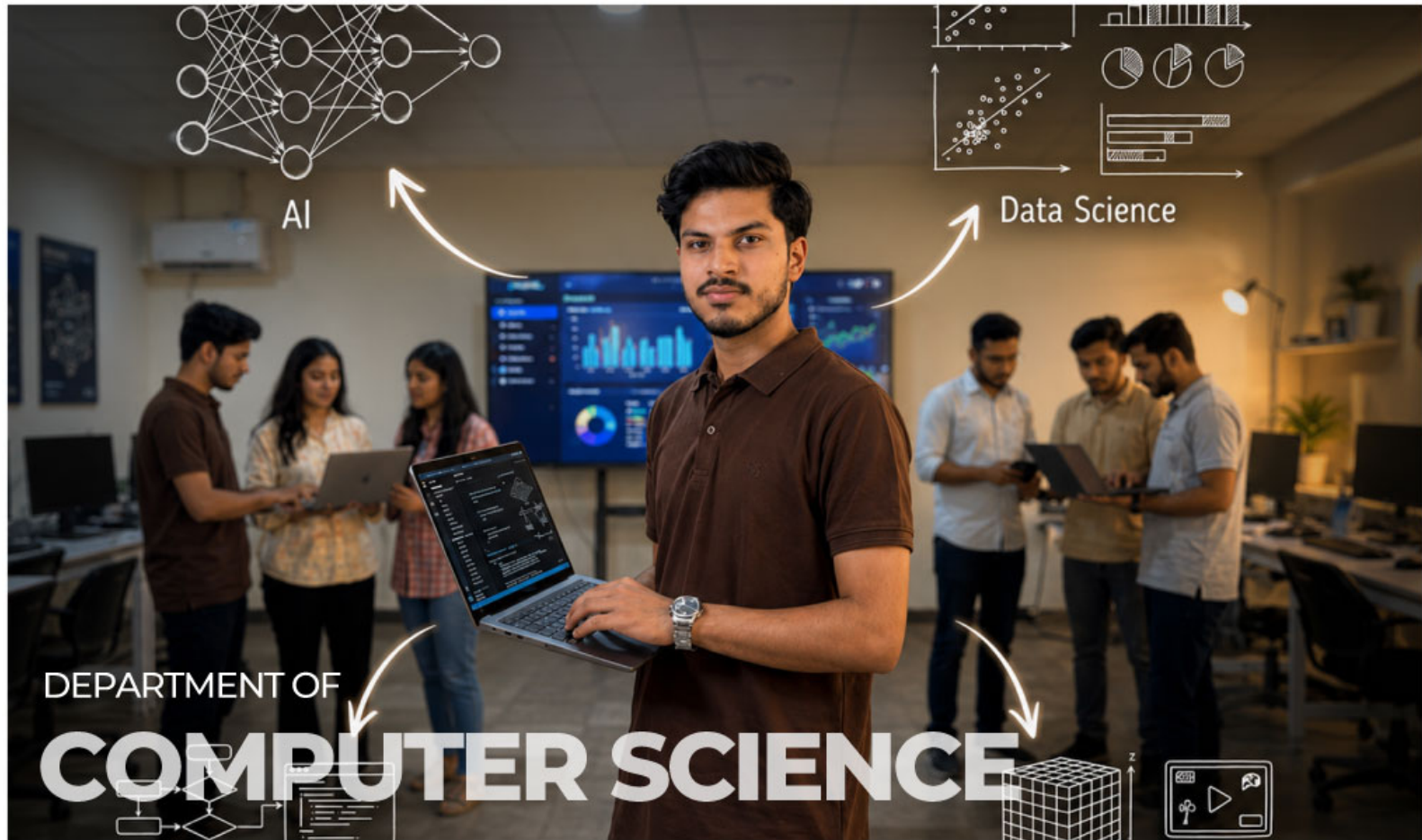




MISSION STATEMENT

To impart computing knowledge, problem-solving techniques, & practical skills to our graduates with a high level of professionalism & ethical values for addressing the challenges of modern society through innovative solutions.



PROGRAMS OFFERED

■ BS Computer Science

- BS CS (General)
- BS CS (Software Engineering)
- BS CS (Data Science)
- BS CS (Artificial Intelligence)
- BS CS (Game Development)
- BS CS (Internet of Things)
- BS CS (Cyber Security)

- MS Computer Science
- MS Software Engineering
- Ph.D Computer Science



HOD'S MESSAGE

The Department of Computer Science at CECOS University is committed to producing computing professionals who possess technical excellence, innovative thinking, and a strong ethical foundation. Our programs are designed to equip students with the skills necessary to address modern challenges in technology and society. With an emphasis on lifelong learning, teamwork, and industry relevance, we empower our students to excel in their careers and make meaningful contributions to the digital world. Join us as we shape the future of computing through excellence and innovation.

Dr. Ghassan Husnain

PhD Intelligent Transportation System, UET, Peshawar



FACULTY OF COMPUTER SCIENCE

Dr. Ghassan Husnain

Professor, Head of Department
PhD Intelligent Transportation System
UET, Peshawar

Dr. Maryam Mahsal Khan

Professor
PhD Computer Science
University of Newcastle, Australia

Dr. Fahad Masood

Professor
PhD Numerical Computing
Quaid-e-Azam University, Islamabad

Dr. Abdul Waheed

Associate Professor
PhD Computer Science
Hazara University, KPK

Dr. Mansoor Qadir

Associate Professor
PhD Computer Science
Iqra National University, Peshawar

Dr. Mian Muaz Razaq

Assistant Professor
PhD Computer Science and Engineering
Kyungpook National University, South Korea

Dr. Nazir Jan

Assistant Professor
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Miss Mona Khalid

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MS HRM
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Gomal University, D.I. Khan

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Mr. Rahmat Shah

Lecturer/Manager IT
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Lecturer
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Mr. Kashif Aman

Lecturer
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Bahria University Islamabad

Mr. Muhammad Yahya

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Mr. Saifullah Khan

Lecturer
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Glasgow Caledonian University, UK

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Mr. Sikander Azam

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Abasyn University, Peshawar

Ms. Faryal Ishfaq

Lecturer
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GIKI Swabi

Mr. Saeed Ullah

Lecturer
MS Computer Science
Abdul Wali Khan University

FACULTY OF COMPUTER SCIENCE

Mr. Ahmad Mustafa

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UET Peshawar

Mr. Sami ur Rehman

Lecturer
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UET Peshawar

Mr. Syed Iqtidar Ali Shah

Lecturer
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UET Taxila

Ms. Maham Javed

Lecturer
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Emerging Sciences

Mr. Tauseeq ur Rehman

Program Manager
MS Computer Science
CECOS University, Peshawar

Mr. Waqas Siddiqui

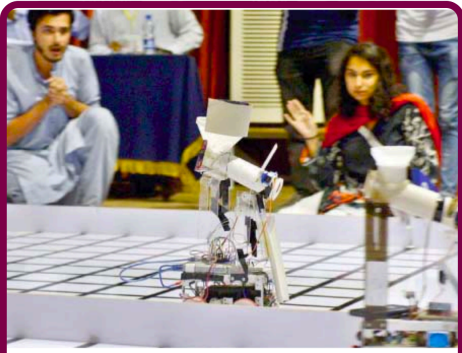
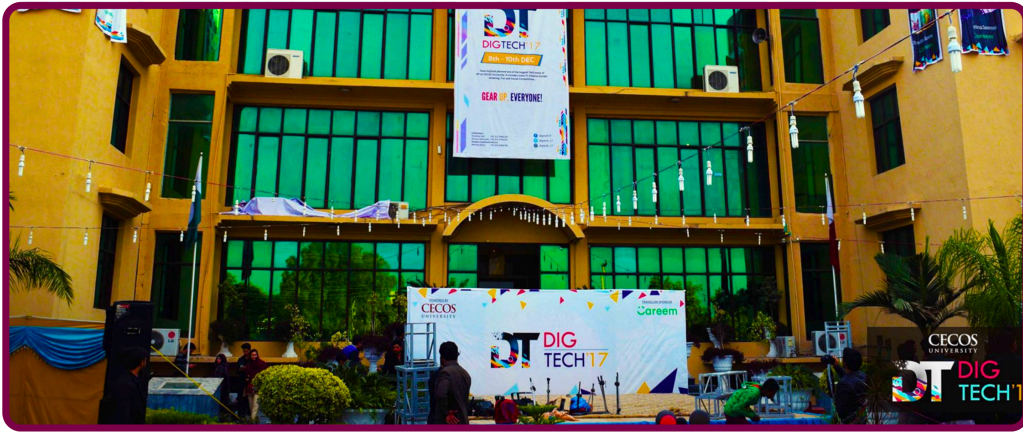
Program Manager
MS Management Sciences
Abasyn University, Peshawar

Mr. Insaf Gul

Office Assistant
Master of Computer Science (MCS)
Abasyn University, Peshawar

Mr. Ali Safdar

Office Assistant
MS Economics
IM Sciences, Peshawar



DIG TECH

A Signature Event organized by the Department of Computer Science. Dig Tech is Biggest Tech Event of KPK held every year at CECOS



Curriculum of BS Computer Science

Semester-I

Course Code	Course Title	Credit Hours
CS-110	Applications of Information & Communication Technologies	2+1
ENG-101	Functional English	3+0
	Quantitative Reasoning- I	3+0
NS-101	Applied Physics (Natural Science)	3+0
CS-111	Discrete Structures	3+0
CS-112	Programming Fundamentals	3+1
MATH-103	***MATH I (Pre-Medical Students Only)	3+0
Total Credit Hours		17+2

Semester-II

Course Code	Course Title	Credit Hours
CS-113	Object Oriented Programming	3+1
CS-115	Digital Logic Design	3+1
SS-101/SS-111	Islamic Studies/ Ethics (For Non-Muslims)	2+0
SS-102	Pakistan Studies	2+0
	Quantitative Reasoning- II	0+0
	Arts & Humanities	2+0
SS-113	Understanding of Holy Quran - I	3+0
MATH-104	***MATH II (Pre-Medical Students Only)	3+0
Total Credit Hours		15+3

Semester-III

Course Code	Course Title	Credit Hours
CS-114	Database Systems	3+1
CS-216	Data Structures	3+1
CS-222	Operating Systems	3+1
MATH-106	Calculus & Analytical Geometry	3+0
SS-114	Understanding of Holy Quran - II	0+1
ENG-102	Expository Writing	3+0
Total Credit Hours		15+4

Semester-IV

Course Code	Course Title	Credit Hours
CS-220	Software Engineering	3+0
CS-221	Computer Organization & Assembly Language	2+1
CS-223	Analysis of Algorithms	3+0
SS-204	Civics and Community Engagement	2+0
SS-203	Ideology and Constitution of Pakistan	2+0
MGT-246	Introduction to Entrepreneurship	2+0
MATH-107	Linear Algebra	3+0
Total Credit Hours		17+1

Semester-V

Course Code	Course Title	Credit Hours
CS-218	Artificial Intelligence	2+1
CS-2xx	Theory of Automata	3+0
MGT-121	Introduction to Marketing (Social Science)	2+0
MATH-211	Probability & Statistics	3+0
	Elective- I	(3+0/ 2+1)
	Elective- II	(3+0/ 2+1)
Total Credit Hours		17

Semester-VI

Course Code	Course Title	Credit Hours
	Cloud Computing	2+1
CS-317	Computer Networks	2+1
CS-319	Information Security	3+0
	Elective- III	(3+0/ 2+1)
	Elective- IV	(3+0/ 2+1)
Total Credit Hours		15

Semester-VII

Course Code	Course Title	Credit Hours
	Elective- V	(3+0/ 2+1)
	Elective- VI	(3+0/ 2+1)
	Elective- VII	(3+0/ 2+1)
CS-424	Final Year Project - I	3+0
	Professional Certification	3+0
Total Credit Hours		15

Semester-VIII

Course Code	Course Title	Credit Hours
	Elective- VIII	(3+0/ 2+1)
CS-425	Final Year Project - II	3+0
	Field Experience	3+0
Total Credit Hours		9

Total Credit Hours = 134

Fact File **Duration:** Four Years
Eligibility: Minimum 50% marks in Intermediate or equivalent.
 Passing aptitude test of CECOS.

Non-credited but mandatory courses	
MATH I and II (For Pre Medical Students)	Pass/Fail

Category		Courses	Credit Hours
General Education Courses (GER)		15	34
Major	Computer Science Core Courses	14	48
	Specialization Electives	8	24
	Professional Certification		3
Interdisciplinary/ Allied Courses (IDS)		4	12
Field Experience/Internship			3
Capstone Project / FYP			6
Total Credits			130

Social Science

Subject Name	Credit Hours
Principles of Management	2
Introduction to Marketing	2
Organizational Behavior	2
Entrepreneurship	2
Business Research Method	2
Management Information System	2
Project Management	2

Arts and Humanities

Course Code	Subject Name	Credit Hours
SS-202	Philosophy of Science	2
SS-103	Introduction to History	2
SS-104	Introduction to Philosophy	2

A	Program Prefix
CS	Computer Science
AI	Artificial Intelligence
SE	Software Engineering
CSY	Cyber Security
DS	Data Science
CGD	Computer Games Development
IOT	Internet of Things (IoT)

SPECIALIZATIONS

1. COMPUTER SCIENCE - (GENERAL)

SR NO	COURSES	Credit Hour	SR NO	COURSES	Credit Hour
1	Software Requirement Engineering	3+0/2+1	24	Data Mining	3+0/2+1
2	Software Project Management	3+0/2+1	25	Programming for AI	3+0/2+1
3	Software Quality and Testing	3+0/2+1	26	Network Security	3+0/2+1
4	DevOps Principles and Practices	3+0/2+1	27	Game Design Principles	3+0/2+1
5	Software Re-Engineering	3+0/2+1	28	Graphic Design and Illustration Art	3+0/2+1
6	Software Design and Architecture	3+0/2+1	29	Game Programming	3+0/2+1
7	Parallel and Distributed Computing	3+0/2+1	30	Game Engine Architecture	3+0/2+1
8	Software Construction and Development	3+0/2+1	31	Reinforcement Learning	3+0/2+1
9	Human Computer Interaction	3+0/2+1	32	Stochastic Processes	3+0/2+1
10	Formal Methods and Design	3+0/2+1	33	Cloud Security	3+0/2+1
11	Cross-platform Application Development	3+0/2+1	34	Embedded Systems Security	3+0/2+1
12	Advanced Topics in Software Engineering	3+0/2+1	35	Cyber Threat Intelligence	3+0/2+1
13	Machine Learning	3+0/2+1	36	Artificial intelligence for Cyber Security	3+0/2+1
14	Internet of Things and It's Applications	3+0/2+1	37	IoT Security	3+0/2+1
15	Green Software Engineering	3+0/2+1	38	Open-Source Intelligence Techniques	3+0/2+1
16	Introduction to Data Science	3+0/2+1	39	Game Design Research Methods	3+0/2+1
17	Computational Statistics	3+0/2+1	40	Game Testing	3+0/2+1
18	Big Data Analytics	3+0/2+1	41	Quantum Security	3+0/2+1
19	Deep Learning	3+0/2+1	42	Emerging Applications of IoT	3+0/2+1
20	Natural Language Processing	3+0/2+1	43	Quantum Computing	3+0/2+1
21	Data Ethics & Security	3+0/2+1	44	IoT Communication and Networks	3+0/2+1
22	Computer Vision	3+0/2+1	45	Web3 Gaming	3+0/2+1
23	Generative AI	3+0/2+1	46	Wireless and Mobile Security	3+0/2+1

SPECIALIZATIONS

2. SOFTWARE ENGINEERING			3. DATA SCIENCE		
SR NO	COURSES	Credit Hour	SR NO	COURSES	Credit Hour
1	Software Requirement Engineering	3+0	1	Introduction to Data Science	3+0
2	Software Project Management	3+0	2	Computational Statistics	3+0
3	Software Quality and Testing	2+1	3	Data Engineering	3+0
4	DevOps Principles and Practices	2+1/3+0	4	Data Visualization	3+0
5	Software Re-Engineering	2+1/3+0	5	Business Intelligence	3+0
6	Software Design and Architecture	3+0	6	Tools and Techniques in Data Science	3+0
7	Parallel and Distributed Computing	2+1/3+0	7	Big Data Analytics	3+0
8	Software Construction and Development	2+1/3+0	8	Machine Learning	3+0
9	Human Computer Interaction	2+1/3+0	9	Deep Learning	3+0
10	Formal Methods and Design	3+0	10	Natural Language Processing	3+0
11	Cross-platform Application Development	3+0	11	Data Ethics & Security	3+0
12	Advanced Topics in Software Engineering	2+1/3+0	12	Computer Vision	3+0
13	Machine Learning	2+1	13	Information Retrieval	3+0
14	Internet of Things and It's Applications	2+1	14	Generative AI	3+0
15	Green Software Engineering	3+0	15	Data Mining	3+0

SPECIALIZATIONS

4. ARTIFICIAL INTELLIGENCE			5. GAME DEVELOPMENT		
SR NO	COURSES	Credit Hour	SR NO	COURSES	Credit Hour
1	Programming for AI	3+0	1	Game Design Principles	3 (2+1)
2	Machine Learning	3+0	2	Graphic Design and Illustration Art	3 (2+1)
3	Deep Learning	3+0	3	Game Programming	3 (2+1)
4	Knowledge representation and Reasoning	3+0	4	Game Engine Architecture	3 (2+1)
5	Generative AI	3+0	5	3D Design and Modelling	3 (2+1)
6	Computer Vision	3+0	6	3D Animation and Visual Effects Production	3 (2+1)
7	Natural Language Processing	3+0	7	UI/UX Design and Development	3 (2+1)
8	Data Mining	3+0	8	Story Boarding and Narrative Development	3 (2+1)
9	Reinforcement Learning	3+0	9	Virtual & Augmented Reality for Games	3 (2+1)
10	Optimization Techniques	3+0	10	Simulation & Digital Twins in Games	3 (2+1)
11	Stochastic Processes	3+0	11	Web3 Gaming	3 (2+1)
12	Machine learning Operations (MLOps)	3+0	12	Sound Design for Games	3 (2+1)
13	Agentic AI	3+0	13	LiveOps And Monetization for Games	3 (2+1)
14	Speech Processing	3+0	14	Game Design Research Methods	3 (2+1)
15	Evolutionary Computing & Swarm Intelligence	3+0	15	Game Testing	3 (2+1)

SPECIALIZATIONS

6. INTERNET OF THINGS (IOT)

SR NO	COURSES	Credit Hour
1	Microcontroller Architecture & System Design	3+1
2	Embedded Programming	3+1
3	Sensors, Transducers, and Interfacing	2+1
4	Real-Time Operating Systems	2+1
5	IoT Communication and Networks	2+1
6	IoT Application Layer Protocol	3+0
7	Edge AI	3+0
8	Machine Learning	3+0
9	IoT Cloud	3+0
10	IIOT	3+0
11	Generative AI	3+0
12	IoT Data Analytics and Visualization	2+1
13	IoT Security	3+0
14	Wireless & 5G for IoT	3+0
15	Emerging Applications of IoT	2+1

7. CYBER SECURITY

SR NO	COURSES	Credit Hour
1	Information Assurance	3+0
2	Network Security	2+1
3	Secure Software Design and Development	2+1
4	Digital Forensics and Incident Response	2+1
5	Applied Cryptography	2+1
6	Vulnerability Assessment & Penetration Testing	2+1
7	Ethics in Cyber Security	2+1
8	Cloud Security	2+1
9	Embedded Systems Security	2+1
10	Cyber Threat Intelligence	2+1
11	Artificial intelligence for Cyber Security	2+1
12	IoT Security	2+1
13	Open-Source Intelligence Techniques	2+1
14	Usable Security and Privacy	2+1
15	Malware Analysis & Reverse Engineering	2+1
16	Security Orchestration, Automation, and Response	2+1
17	Cyber Security Policy and Governance	3+0
18	Security Analytics and DevSecOps	2+1
19	Quantum Security	2+1
20	Blockchain and Web 3 Security	2+1
21	Wireless and Mobile Security	2+1

MAJOR COURSE

SR NO	COURSES	Credit Hour
CS-112	Programming Fundamentals	3
CS-112L	Programming Fundamentals (LAB)	1
CS-113	Object Oriented Programming	3
CS-113L	Object Oriented Programming (LAB)	1
CS-214	Database Systems	3
CS-214L	Database Systems (LAB)	1
CS-115	Digital Logic Design	3
CS-115L	Digital Logic Design (LAB)	1
CS-216	Data Structures	3
CS-216L	Data Structures (LAB)	1
CS-317	Information Security	2
CS-317L	Information Security (LAB)	1
CS-318	Information Security	3
CS-319	Artificial Intelligence	2
CS-319L	Artificial Intelligence (LAB)	1

SR NO	COURSES	Credit Hour
CS-320	Artificial Intelligence	3
CS-321	Computer Networks	2
CS-321L	Computer Networks (LAB)	1
CS-322	Computer Networks	3
CS-223	Software Engineering	3
CS-224	Computer Organization & Architecture	2
CS-224L	Computer Organization & Architecture (LAB)	1
CS-225	Operating Systems	3
CS-225L	Operating Systems (LAB)	1
CS-226	Design and Analysis of Algorithms	3
CS-327	Theory of Automata	3
CS-328	Cloud Computing	2
CS-328L	Cloud Computing (LAB)	1
CS-329	Cloud Computing	3

MS COMPUTER SCIENCE

Minimum 2.0 CGPA or 16-years equivalent degree from HEC recognized institution / University with any of the following BS degrees.

ELIGIBILITY CRITERIA

Applicants with Undergraduate Degrees Accredited by NCEAC:

Admission is allowed without any conditions.

Applicants with Undergraduate Degrees with Intradisciplinary Qualifications:

These include degrees such as Computer Systems Engineering, Computer Engineering, Software Engineering, Electrical Engineering, Telecommunication Engineering, Telecommunications, Telecommunication Systems, and other related/relevant fields. Admission is permitted; however, students will be required to clear any deficient courses as determined by the Departmental Graduate Student Committee (DGSC).

Applicants with Foreign Degrees:

The HEC Equivalence Certificate will be used to determine whether the degree aligns with an NCEAC or Non-NCEAC accredited program. Admission decisions and the need for deficient course clearance will be based on this determination.

MS SOFTWARE ENGINEERING

Minimum 2.0 CGPA or 16-years equivalent degree from HEC recognized institution / University with any of the following BS degrees.

ELIGIBILITY CRITERIA

Applicants with Undergraduate Degrees Accredited by NCEAC:

Admission is allowed without any conditions.

Applicants with Undergraduate Degrees with Intradisciplinary Qualifications:

These include degrees such as Computer Systems Engineering, Computer Engineering, Software Engineering, Electrical Engineering, Telecommunication Engineering, Telecommunications, Telecommunication Systems, and other related/relevant fields. Admission is permitted; however, students will be required to clear any deficient courses as determined by the Departmental Graduate Student Committee (DGSC).

Applicants with Foreign Degrees:

The HEC Equivalence Certificate will be used to determine whether the degree aligns with an NCEAC or Non-NCEAC accredited program. Admission decisions and the need for deficient course clearance will be based on this determination.

PHD ADMISSION REQUIREMENTS - PHD COMPUTER SCIENCE

Basic Academic Qualification:

Having M.Phil/ M.S/Equivalent degree in any of the following relevant fields from HEC recognized university with a minimum CGPA of 3.0 out of 4.0 in the semester system or first division in the annual examination system. In the case of foreign institutions, HEC equivalence certificate must be provided.

- MS in Computer Science, Software Engineering, Information Technology, Artificial Intelligence, Data Science, or Cybersecurity: Admission is permitted without any additional requirements.
- MS in Computer Systems Engineering: Admission is allowed, as the program aligns with UNESCO ISCED-F sub-discipline 0613 (Computer Science)
- MS in Computer/ Electrical/ Telecommunication Engineering: Admission is allowed if the applicant's undergraduate degree (BS in any Computing disciplines). Admission is allowed.
- Applicants with Foreign Degrees: An HEC Equivalence Certificate will be used to evaluate whether the foreign qualification corresponds to an NCEAC-accredited or non-NCEAC program. Admission eligibility and any requirement for clearing deficient courses will be determined based on this assessment.

MS COMPUTER SCIENCE

CURRICULUM FOR MS COMPUTER SCIENCE PROGRAM

CORE COURSES

Course Code	Subject	Credit Hours
CS-702	Advanced Automata Theory	3
CS-703	Advanced Analysis of Algorithms	3
CS-704	Advnced Operating Systems	3
CS-705	Advanced Computer Architecture	3
SS-113	Understanding of Holy Quran - I	0+1
SS-114	Understanding of Holy Quran - II	0+1

MANDATORY ELECTIVE COURSES

Course Code	Subject	Credit Hours
CS-701	Research Methodology	3

SOFTWARE ENGINEERING ELECTIVE COURSES

Course Code	Subject	Credit Hours
SE-702	Advanced Requirement Engineering	3
SE-703	Advanced Software System Architecture	3
SE-704	Software Testing and Quality Assurance	3
SE-710	Software Measurement and Metrics	3
SE-711	Component-Based Software Engineering	3
SE-712	Advanced Formal Methods	3
SE-713	Agile Software Development Methods	3
SE-714	Empirical Software Engineering	3
SE-715	Advanced Software Project Management	3
SE-716	Software Risk Management	3
SE-717	Reliability Engineering	3
SE-718	Design Oriented Programming	3
SE-719	Software Process Improvement	3

SOFTWARE ENGINEERING ELECTIVE COURSES

Course Code	Subject	Credit Hours
SE-720	Safety-Critical Systems	3
SE-721	Global Software Development	3
SE-722	DevOps Practices	3
SE-723	Semantic Web and Ontology Engineering	3
SE-724	Data Science for Software Engineers	3
SE-725	Software Performance Engineering	3
SE-726	Special topics of AI in SE	3
SE-727	AI for Secured Software System	3
SE-728	Intelligent Forensic Systems	3
SE-729	Design of Secure Intelligent System	3
SE-730	Topics in Intelligent Software Systems	3

FACT FILE ELIGIBILITY

- Minimum 16-year education in relevant field with minimum 2.0 CGPA or 60% marks from University / DAI recognized by HEC and accredited by relevant Accreditation body.
- Qualifying GAT-General Test of CECOS University or any other approved testing body (NTS/ETEA)

ARTIFICIAL INTELLIGENCE ELECTIVE COURSES

Course Code	Subject	Credit Hours
CS-750	Machine Learning	3
CS-751	Computer Vision	3
CS-752	Knowledge Representation & Reasoning	3
CS-753	Artificial Neural Networks & Deep Learning	3
CS-754	Artificial Intelligence	3
CS-755	Programming for AI	3
CS-756	Natural Language Processing	3
CS-757	Digital Image and Signal Processing	3
CS-758	Reinforcement Learning	3
CS-759	Data Science	3

ARTIFICIAL INTELLIGENCE ELECTIVE COURSES

Course Code	Subject	Credit Hours
CS-760	AI Ethics and Responsible AI	3
CS-761	AI for Cybersecurity	3
CS-762	AI in Wireless Networks	3
CS-763	AI for Digital Forensics	3
CS-764	Cryptography for Intelligent Systems	3

COMPUTER NETWORKS ELECTIVE COURSES

Course Code	Subject	Credit Hours
CS-730	Advanced Computer Networks	3
CS-731	Advanced Network Security	3
CS-732	Topics in Wireless Sensor Networks	3
CS-733	Advanced Internet of Things	3
CS-734	Network Performance and Evaluation	3
CS-735	Software Defined Networks	3
CS-736	Emerging Topics in Computer Networks	3
CS-737	Topics in Distributed Computing	3
CS-738	Topics in Cloud Computing	3
CS-739	Topics in Blockchain Technologies	3
CS-740	Social Network Analysis	3
CS-741	Cyber Physical Systems	3
CS-742	Cognitive Networks	3
CS-743	Topics in Intelligent Network Systems	3
CS-744	Secure Intelligent Networks	3
CS-745	Heterogeneous Secure Networks	3

*Not limited to the list above, the University may add more courses

THESIS RESEARCH

Course Code	Subject	Credit Hours
CSD-699	Master's Thesis Research	6

MS SOFTWARE ENGINEERING

CURRICULUM FOR MS SOFTWARE ENGINEERING PROGRAM

Course Code	Subject	Credit Hours
CS-801	Advanced Research Methods	Non-Credits
SS-113	Understanding of Holy Quran - I	0+1
SS-114	Understanding of Holy Quran - II	0+1

CORE COURSES

Course Code	Subject	Credit Hours
SE-702	Advanced Requirement Engineering	3
SE-703	Advanced Software System Architecture	3
SE-704	Software Testing and Quality Assurance	3
SS-113	Understanding of Holy Quran - I	0+1
SS-114	Understanding of Holy Quran - II	0+1

MANDATORY ELECTIVE COURSE(S)

Course Code	Subject	Credit Hours
SE-701	Research Methodology	3

THESIS RESEARCH

Course Code	Subject	Credit Hours
CSE-699	Master's Thesis Research	6

FACT FILE ELIGIBILITY

- Minimum 16-year education in relevant field with minimum 2.0 CGPA or 60% marks from University / DAI recognized by HEC and accredited by relevant Accreditation body.
- Qualifying GAT-General Test of CECOS University or any other approved testing body (NTS/ETEA)
- Registration with relevant accreditation body.

DOMAIN ELECTIVE COURSES

Course Code	Subject	Credit Hours
SE-710	Software Measurement and Metrics	3
SE-711	Component-Based Software Engineering	3
SE-712	Advanced Formal Methods	3
SE-713	Agile Software Development Methods	3
SE-714	Empirical Software Engineering	3
SE-715	Advanced Software Project Management	3
SE-716	Software Risk Management	3
SE-717	Reliability Engineering	3
SE-718	Design Oriented Programming	3
SE-719	Software Process Improvement	3
SE-720	Safety-Critical Systems	3
SE-721	Global Software Development	3
SE-722	DevOps Practices	3
SE-723	Semantic Web and Ontology Engineering	3
SE-724	Data Science for Software Engineers	3
SE-725	Software Performance Engineering	3
SE-726	Special Topics of AI in SE	3
SE-727	AI for Secured Software Systems	3
SE-728	Intelligent Forensic Systems	3
SE-729	Design of Secure Intelligent System	3
SE-730	Topics in Intelligent Software Systems	3

PhD COMPUTER SCIENCE

Curriculum for PhD Computer Science Program

Course Code	Subject	Credit Hours
CS-801	Advanced Research Methods	Non-Credits
SS-601	Understanding of Holy Quran - I	0+1
SS-602	Understanding of Holy Quran - II	0+1

ELECTIVE COURSES

Course Code	Subject	Credit Hours
CS-810	Advanced Topics in Automata Theory	3
CS-811	Advanced Topics in Analysis of Algorithms	3
CS-812	Advanced Operating Systems	3
CS-813	Advanced Computer Architecture	3
CS-814	Advanced Computer Networks	3
CS-815	Advanced Network Security	3
CS-816	Advanced Wireless Sensor Networks	3
CS-817	Advanced Internet of Things	3
CS-818	Advanced Network Performance and Evaluation	3
CS-819	Advanced Software-Defined Networks	3
CS-820	Advanced Emerging Topics in Computer Networks	3
CS-821	Special Topics in Distributed Computing	3
CS-822	Advanced Cloud Computing	3
CS-823	Emerging Topics in Blockchain Technologies	3
CS-824	Advanced Social Network Analysis	3
CS-825	Advanced Cyber Physical Systems	3
CS-826	Advanced Cognitive Networks	3
CS-830	Advanced Requirement Engineering	3
CS-831	Advanced Software System Architecture	3
CS-832	Advanced Software Testing and Quality Assurance	3
CS-833	Advanced Software Measurement and Metrics	3
CS-834	Advanced Component-Based Software Engineering	3
CS-835	Advanced Topics in Formal Methods	3
CS-836	Advanced Agile Software Development Methods	3
CS-837	Advanced Empirical Software Engineering	3
CS-838	Special Topics in Software Project Management	3
CS-839	Advanced Software Risk Management	3
CS-840	Advanced Reliability Engineering	

ELECTIVE COURSES

Course Code	Subject	Credit Hours
CS-841	Advanced Design Oriented Programming	3
CS-842	Advanced Software Process Improvement	3
CS-843	Advanced Safety-Critical Systems	3
CS-844	Advanced Global Software Development	3
CS-845	Advanced DevOps Practices	3
CS-846	Advanced Semantic Web and Ontology Engineering	3
CS-847	Advanced Data Science for Software Engineers	3
CS-848	Advanced Software Performance Engineering	3
CS-850	Advanced Machine Learning	3
CS-851	Advanced Computer Vision	3
CS-852	Advanced Knowledge Representation & Reasoning	3
CS-853	Special Topics in Artificial Neural Networks & Deep Learning	3
CS-854	Latest Trends in Artificial Intelligence	3
CS-855	Advanced Topics in Programming for AI	3
CS-856	Advanced in Natural Language Processing	3
CS-857	Advanced in Digital Image and Signal Processing	3
CS-858	Advanced in Reinforcement Learning	3
CS-859	Advanced Topics in Data Science	3
CS-860	Special Topics in AI Ethics and Responsible AI	3
CS-861	Special Topics in AI	3
CS-862	Advanced AI for Cybersecurity	3
CS-863	Advanced AI in Wireless Networks	3
CS-864	Advanced AI for Digital Forensics	3
CS-865	Advanced Cryptography for Intelligent Systems	3
CS-866	Special Topics in Intelligent Network Systems	3

THESIS RESEARCH

Course Code	Subject	Credit Hours
CSD-899	PhD Thesis Research	36