Department of Computer Sciences

Programs Offered:

Master of Science
in Computer Science

Doctor of Philosophy
in Computer Science

Vision

Computer Science permeates all modern endeavors in Academia, Government, Industry and its role will continue to grow through education and research, the department of computer science will be recognized universally as a promoter of the Centrality of Computing in Society.

Mission

Computer Science and Information Technology has revolutionized education system and industry worldwide to a level that every individual and industrial organization has been reshaped and reorganized to be able to operate in this modern era of Computer Technology of 21st Century. On realizing the need and its importance the foundation of Sarhad University was lead to open center of excellence to provide education in this area, as clear from its name “Sarhad University of Science and Information Technology Peshawar”. The Department of Computer Science and IT was started to provide quality education to the scholars of this area. Prepare student with excellent professional skills for industry and undertake research in this modern technology. All programs of the Computer Science Department will be of International standards, to provide quality education to this remote area.

Master of Science in Computer Science

Minimum Duration : 4 Semesters, 2 Years
Maximum Duration : 8 Semesters, 4 Years
Minimum CGPA required to earn degree 2.50

Program Code	043
Number of Courses	9-12
Credit Hours	32-35

Eligibility

Four years Bachelor's degree program in CS/IT/ Software Engg /Computer System Engineering,

OR Master's (16 years) degree in Computer Science/ IT with first division/ 2.00 CGPA on a scale of 4.00 or 50% marks in annual system.

Applicant needs to pass GAT (General) to be conducted by NTS/ETEA/any Registered Testing Agency or University, with at least 50% cumulative score and to clear departmental interview at the time of Admission.

Program Outcomes:

- Exhibit advanced knowledge of Computer Science fields across fundamental theory, systems, software and applications
- Master and gain in-depth knowledge in at least one specialized area of Computer Science
- Think creatively and critically; to solve challenging and non-trivial problems
- Apply problem-solving skills and computing knowledge to develop solutions for real world problems
- Apprehend how computers and technology can impact the legal, social, ethical, and cultural aspects of the society

SEMESTER ONE

Course Code	Course Title	Cr. Hrs. 9
	Core Course I	3-0
	Elective I	3-0
	Elective II	3-0

SEMESTER TWO

Course Code	Course Title	Cr. Hrs. 9
	Core Course II	3-0
	Elective III	3-0
	Elective IV	3-0

SEMESTER THREE

Course Code	Course Title	Cr. Hrs. 8
RES 581	Research Methodology	2-0
	Elective V	3-0
	Elective VI	3-0

SEMESTER FROU

Course Code	Course Title	Cr. Hrs. 6/9
Plan A: MS with Research Work		
RES 690	Research Thesis	0-6
Plan B: MS with course Work		
	Elective VII	3-0
	Elective VIII	3-0
	Elective IX	3-0

Program Objectives:

Computers are widely used in a great variety of industrial and commercial organizations, and the demand for computer science graduates far exceeds the supply. As a result, there are many exciting avenues for new postgraduates seeking creative and rewarding work with major industries and software houses. The MS CS Program has, therefore, been designed to provide our scholars the opportunity to pursue highly productive careers in industry, academia and research institutes. It enables them to emerge as graduates, having the understanding and vision to creatively apply their knowledge to practical situations. The enhanced lab and practical component of the program gives a competitive edge to our graduates and provides them the credentials to embark upon careers in Software Engineering, Networks & Communication Information Management, Artificial Intelligence, Research or Academia.

Specializations Offered:

Parallel and Distributed Computing

Course Code	Course Title	Cr. Hrs.
CS 665	Parallel Programming for Multicore Systems	3-0
IT619	Grid Computing	3-0
CS 666	Cloud Computing	3-0
CS 667	Mobile Cloud Computing	3-0
CS 668	Distributed Computing	3-0

Computational Intelligence and Machine Vision

Course Code	Course Title	Cr. Hrs.
CS 663	Advanced Artificial Intelligence	3-0
CS 638	Computer Vision	3-0
CS 647	Advanced Computer Graphics	3-0
CS 649	Pattern Recognition	3-0
CS 648	Machine Learning	3-0
CS 568	Natural Language Processing	3-0
CS 617	Digital Image Processing	3-0
CS 621	Digital Signal Processing	3-0
CS 602	Graph Theory	3-0

List of Courses for MS-CS

Core Courses

Course Code	Course Title	Cr. Hrs.
CS561	Advanced Theory and Computation	3-0
CS532	Advanced Algorithms Analysis	3-0

Supporting Courses

Course Code	Course Title	Cr. Hrs.
MA 622	Mathematical Methods for Computing	3-0
MA 632	Advanced Linear Algebra	3-0
MA 522	Advanced Numerical Analysis	3-0
MA 620	Probability and Random Processes	3-0

General Courses

Course Code	Course Title	Cr. Hrs.
CS522	Advanced Computer Architecture	3-0
CS536	Advanced Operating Systems	3-0
CS626	Simulation and Modeling	3-0

Software Engineering

Course Code	Course Title	Cr. Hrs.
SE540	Advance Software Engineering	3-0
SE670	Software Management Quality	3-0
SE526	Software Requirement Engineering	3-0
SE529	Software Quality and Metrics	3-0
SE622	Software Design Patterns	3-0
SE611	Software Estimation	3-0
SE 668	Software Project Management	3-0

Networks and Communication

Course Code	Course Title	Cr. Hrs.
CS664	Advanced Computer Networks	3-0
COM556	Broadband Communication	3-0
COM537	Wireless Communication	3-0
COM670	Network Security and QoS	3-0
CS631	Mobile Adhoc Networks	3-0
CS651	Information Theory and Coding	3-0
COM632	Network Performance Evaluation	3-0

Specializations Offered:

Information Management

Course Code	Course Title	Cr. Hrs.
CS 537	Advance Databases	3-0
CS 541	Data Warehouse	3-0
CS 529	Distributed and Object Databases	3-0
CS 542	Data Mining	3-0
CS 633	Data Grids	3-0
CS 661	Semantic Databases	3-0
CS 641	Spatial and Temporal Database	3-0

Doctor of Philosophy in Computer Science

Minimum Duration : 6 Semesters, 3 Years
Maximum Duration : 16 Semesters, 8 Years
Minimum CGPA required to earn degree 3.00

Program Code	127
Number of Courses	6 + Research Thesis
Credit Hours	54

Program Objectives:

The objective of this program is to prepare exceptionally qualified individuals for research careers in academia and industry. The program is designed for scholars who offer evidence of exceptional scholastic ability, intellectual creativity, and research motivation. The Ph.D. degree is viewed as a certification by the faculty that the student has a solid foundation in computer science and has performed original research in the area. The basis for gaining the degree will be the student's grasp of the subject matter of computer science, competency to plan and conduct research, and ability to express ideas adequately and professionally in oral and written language. The doctoral program emphasizes research, and the SUIT encourages prospective candidates to involve themselves in research under the supervision of a faculty member at the earliest possible opportunity. In addition to research activities in various areas of computer science, there are many opportunities for interdisciplinary and interdepartmental research.

Eligibility

18 years of education (MS / Masters in CS/IT/ Software Engg /Computer System Engineering) with at least 3.00 CGPA on a scale of 4.00 or 60% marks in annual system.

Applicant needs to pass GAT (Subject) to be conducted by NTS/ETEA/any Registered Testing Agency or University, with at least 60% cumulated score and to clear Departmental interview at the time of Admission.

Candidates who have done MS without Research thesis may be considered for admission in the PhD program if they submit a published paper in an HEC recognized journal as a principle author.

Program Outcomes:

After completion of the PhD in Computer Science, scholars will be able to:

- Master broad knowledge in several specialized areas of Computer Science across fundamental theory, software, systems, and applications
- Demonstrate in-depth knowledge in area of research
- Critically analyze published work in their area of research
- Apply critical thinking, problem solving and technical skills to solve problems with minimal guidance, and to carry out independent and original research.
- Effectively communicate ideas and results to peers and to broader technical audiences in the form of conference papers, journal papers, and/or oral presentations

Note for Scholars :

- Course will be selected from the given list of approved courses in consultation with the Research Advisor.
- The Research Advisor may direct the scholar to register for additional courses related to the area of research.
- Scholar needs to be registered in dissertation of Nine (09) credit hours for each semester for minimum of four (04) semesters.
- Scholar will submit his/her research proposal for approval from BOASAR.
- The scholar shall be required to publish a research paper in an HEC recognized journal before the public defense of the PhD dissertation.
- University Rules and Regulations for Post Graduate Degrees will be applicable.

SEMESTER ONE

Course Code	Course Title	Cr. Hrs. 9
	Elective I	3-0
	Elective II	3-0
	Elective III	3-0

SEMESTER TWO

Course Code	Course Title	Cr. Hrs. 9
	Elective IV	3-0
	Elective V	3-0
	Elective VI	3-0

SEMESTER THREE and Onwards : RES 900 Dissertation 0-9

Research Area and Courses

Computer Science General

Course Code	Course Title	Cr. Hrs.
CS714	Systems Development for Computational Science	3-0
CS 716	Special Topics in Computer Science	3-0
CS 814	Emerging Technologies in Computer Science	3-0
RES801	Research Methods for Computer Science (for those research scholars who had not taken research methods course in MS degree program)	3-0

Parallel Computing

Course Code	Course Title	Cr. Hrs.
CS 834	Parallel Algorithms on Multicore Systems	3-0
CS 844	General Purpose Programming on Graphic Processing Units	3-0
CS 823	Grid Computing	3-0
Supporting Courses		
MA 833	Advanced Numerical Analysis	3-0
CS 837	Distributed Computing	3-0

Networks and Communication

Course Code	Course Title	Cr. Hrs.
COM711	Research Topics in Computer Networks	3-0
COM732	Broadband Communication	3-0
COM733	Wireless Communication	3-0
COM834	Network Security and QoS	3-0
COM735	Mobile Adhoc Networks	3-0
COM812	Simulation and Modeling	3-0
Supporting Courses		
MA821	Probability and Random Processes	3-0

Software Engineering

Course Code	Course Title	Cr. Hrs.
SE741	Research Topics in Software Engineering	3-0
SE 742	Software Requirement Engineering	3-0
SE 743	Software Quality Management	3-0
SE 744	Software Design Patterns	3-0
SE 745	Software Estimation	3-0
SE 841	Special Topics in Software Engineering	3-0
SE 715	Software Quality Metrics	3-0
SE 746	Reliable Software Architectures	3-0

Research Area and Courses

Cloud Computing

Course Code	Course Title	Cr. Hrs.
CS 824	Parallel and Distributed Computing	3-0
CS 830	Cluster and Grid Computing	3-0
CS 825	Cloud Computing	3-0
Supporting Courses		
CS 836	Mobile Cloud Computing	3-0
CS 846	Big Data	3-0
CS 854	Internet of Things	3-0

Computational Intelligence and Machine Vision

Course Code	Course Title	Cr. Hrs.
CS 711	Digital Image Processing	3-0
CS 815	Advanced Machine Learning	3-0
CS 861	Advanced Computer Vision	3-0
CS 862	Pattern Recognition	3-0
CS 855	Probabilistic Graphical Models	3-0
CS 871	Medical Image Processing and Analysis	3-0
Supporting Courses		
MA 821	Probability and Random Processes	3-0
CS 754	Digital Signal Processing	3-0