DEPARTMENT OF **COMPUTER SCIENCE**

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FACULTY

Dr. Muhammad Ilyas
Professor

Dr. Saad Razaq
Assistant Professor

Dr. Qaiser Abbas
Assistant Professor **(on leave)**

Dr. Fahad Maqbool
Assistant Professor

Dr. Hussam Ali
Assistant Professor

Aamir Zia
Lecturer

Farooq Javed
Lecturer

Mudassar Ali Zaidi
Lecturer

Muhammad Zohaib Nawaz
Lecturer (on leave)

Muhammad Fahad
Lecturer

Qaisar Farooq
Lecturer (on leave)

Samreen Razzaq
Lecturer

BS in Computer Science

Eligibility: HSSC (Part-I / II) with at least 50% marks with one of the following combinations:

I. Pre-Engineering
II. Pre-Medical (Admitted candidates have to pass 6-credit hours courses of mathematics in first two semesters.)
III. General Science
   a. Math, Stat, Phy b. Math, Stat, Eco
   c. Math, Stat, Comp d. Math, Phy, Comp
   e. Math, Eco, Comp
IV. A-Levels (with of the contribution of I / II / III and equivalence by IBCC) with at least 50% obtained marks

Duration: 4 Years
Semesters: 8
Degree Requirements: 125-149 Credit Hours

Code	Pre-req.	Course Title	C/Hr.
Semester-1			
CMPC-5201		Programming Fundamentals	4(3-3)
URCA-5123		Application of Information & Communication Technologies	3(2-3)
URCQ-5101		Discrete Structures	3(3-0)
URCQ-5102		Calculus and Analytic Geometry	3(3-0)
URCE-5118		Functional English	3(3-0)
BUSB-6101		Introduction to Marketing	3(3-0)
			Total 19(17-6)
Semester-2			
CMPC-5202	CMPC-5201	Object Oriented Programming	4(3-1)
CMPC-5203		Database Systems	4(3-1)
CMPC-5204		Digital Logic Design	3 (2-3)
MATH-5101	URCQ-5102	Multivariable Calculus	3 (3-0)
CMPC-5208		Computer Networks	3 (2-3)
URCQ-5111		Translation of Holy Quran-I	0 (1-0)
			Total 17(15-9)
Semester-3			
CMPC-5205	CMPC-5202	Data Structures	4(3-1)
CMPC-5209	CMPC-5204	Computer Org. & Assembly Language	3(2-1)
CMPC-5207		Artificial Intelligence	3(2-1)
MATH-5102	URCQ-5102	Linear Algebra	3(3-0)
CMPC-5101		Software Engineering	3(3-0)
MATH-5103		Probability & Statistics	3(3-0)
			Total 19(15-9)
Semester-4			
CMPC-5206		Information Security	3(2-1)
CSDC-5101		Theory of Automata	3(3-0)
CSDC-5102	CMPC-5203	Advance Database Management Sys.	3(2-1)
URCI-5105		Islamic Studies/ Ethics	2(2-0)
URCW-5201		Applied Physics	3(2-1)
URCE-5119		Expository Writing	3(3-0)
URCQ-5111		Translation of Holy Quran-II	0(1-0)
			Total 17(15-9)
Semester-5			
CMPC-6201		Operating Systems	3(2-1)
CSDC-6201		HCI & Computer Graphics	3(2-1)

CSDC-6202	CMPC-5204	Computer Architecture	3(2-1)
xxxx-yyyy		Domain Elective 1	3(2-1)
xxxx-yyyy		Domain Elective 2	3(2-1)
URCA-5101		Introduction to Management	2(2-0)
			Total 17(12-5)
Semester-6			
CSDC-6203		Compiler Construction	3(2-1)
ITDC-6204		Parallel & Distributed Computing	3(2-1)
xxxx-yyyy		Domain Elective 3	3(2-1)
xxxx-yyyy		Domain Elective 4	3(2-1)
xxxx-yyyy		Domain Elective 5	3(2-1)
xxxx-yyyy		Domain Elective 6	3(2-1)
URCQ-5111		Translation of Holy Quran-III	0(1-0)
			Total 18(13-5)
Semester-7			
CMPC-6702		Final Year Project - I	2(0-2)
CMPC-6101	CMPC-5205	Analysis of Algorithms	3(3-0)
xxxx-yyyy		Domain Elective 7	3(2-1)
ENGL-6101	URCE-5118	Technical & Business Writing	3(3-0)
URCE-5124		Entrepreneurship	2(2-0)
			Total 15(10-5)
Semester-8			
CMPC-6703	CMPC-6702	Final Year Project - II	4(0-4)
URCI-5122		Ideology and Constitution of Pakistan	2(2-0)
URCS-6101		Professional Practices	2(2-0)
URCC-5125		Civics and Community Engagement	2(2-0)
URCQ-5111		Translation of Holy Quran-IV	1(1-0)
			Total 11(7-4)

BS in Artificial Intelligence

Eligibility: HSSC (Part-I / II) with at least 50% marks with one of the following combinations:

I. Pre-Engineering

II. Pre-Medical (Admitted candidates have to pass 6-credit hours courses of mathematics in first two semesters.)

III. General Science
   a. Mathematics, Statistics, Physics
   b. Mathematics, Statistics, Economics
   c. Mathematics, Statistics, Computer
   d. Mathematics, Physics, Computer
   e. Mathematics, Economics, Computer

IV. A-Levels (with of the contribution of I / II / III and equivalence by IBCC) with at least 50% obtained marks

Duration: 4 Years
Semesters: 8
Degree Requirements: 125-149 Credit Hours

Code	Pre-req.	Course Title	C/Hr.
Semester-1			
CMPC-5201		Programming Fundamentals	4(3-1)
URCS-5123		Application of Information & Communication Technologies	3(2-1)
URCQ-5123		Discrete Structures	3(3-0)
URCQ-5122		Calculus and Analytic Geometry	3(3-0)
URCE-5118		Functional English	3(3-0)
BUSB-6101		Elective Supporting Course (e.g. Introduction to Marketing)	3(3-0)
			Total 19(17-2)
Semester-2			
CMPC-5202	CMPC-5201	Object Oriented Programming	4(3-1)
CMPC-5203		Database Systems	4(3-1)
CMPC-5204		Digital Logic Design	3(2-1)
MATH-5101	URCQ-5102	Multivariable Calculus	3(3-0)
CMPC-5208		Computer Networks	3(2-1)
URCQ-5111		Translation of Holy Quran-I	NC
			Total 17(13-4)
Semester-3			
CMPC-5205	CMPC-5202	Data Structures	4(3-1)
CMPC-5209	CMPC-5204	Computer Organization & Assembly Language	3(2-1)
CMPC-5207		Artificial Intelligence	3(2-1)
MATH-5102	URCQ-5102	Linear Algebra	3(3-0)
CMPC-5101		Software Engineering	3(3-0)
MATH-5103		Probability & Statistics	3(3-0)
			Total 19(16-3)
Semester-4			
CMPC-5206		Information Security	3(2-1)
AIDC-4101		Programming for Artificial Intelligence	3(2-1)
AIDC-4102		Machine Learning	3(2-1)
URCW-5201		Applied Physics	3(2-1)
URCE-5119		Expository Writing	3(3-0)
URCI-5105		Islamic Studies	2(2-0)
URCQ-5111		Translation of Holy Quran-II	Non Credit
			Total 17(13-4)
Semester-5			
CMPC-6201		Operating Systems	3(2-1)
AIDC-5101		Artificial Neural Networks & Deep Learning	3(2-1)
AIDC-5102		Knowledge Representation & Reasoning	3(2-1)
xxxx-yyyy		Domain Elective 1	3(2-1)
xxxx-yyyy		Domain Elective 2	3(3-1)
URCA-5118		Social Science (E.g. Introduction to Management)	2(2-0)
			Total 17(12-5)
Semester-6			
AIDC-6101		Computer Vision	3(2-1)
ITDC-6204		Parallel & Distributed Computing	3(2-1)
xxxx-yyyy		Domain Elective 3	3(2-1)

xxxx-yyyy	Domain Elective 4	3(2-1)
xxxx-yyyy	Domain Elective 5	3(2-1)
xxxx-yyyy	Domain Elective 6	3(2-1)
URCQ-5111	Translation of Holy Quran-III	Non Credit
		Total 18(13-5)

Semester-7

CMPC-6702	Final Year Project – I	2(0-2)
CMPC-6101 CMPC-5202	Analysis of Algorithms	3(3-0)
xxxx-yyyy	Domain Elective 7	3(2-1)
ENGL-6101 URCE-5118	Technical & Business Writing	3(3-0)
URCE-5124	Entrepreneurship	2(2-0)
		Total 13(10-3)

Semester-8

CMPC-6703 CMPC-6702	Final Year Project – II	4(0-4)
URCI-5122	Ideology and Constitution of Pakistan	2(2-0)
URCF-5114	Arts and Humanities	2(2-0)
	(E.g. Professional Practices)	
URCC-5125	Civics and Community Engagement	2(2-0)
URCQ-5111	Translation of Holy Quran-IV	Non Credit
		Total 10(6-4)

BS in Data Science

Eligibility: HSSC (Part-I / II) with at least 50% marks with one of the following combinations:

I. Pre-Engineering

II. Pre-Medical (Admitted candidates have to pass 6-credit hours courses of mathematics in first two semesters.)

III. General Science
   a. Mathematics, Statistics, Physics
   b. Mathematics, Statistics, Economics
   c. Mathematics, Statistics, Computer
   d. Mathematics, Physics, Computer
   e. Mathematics, Economics, Computer

IV. A-Levels (with of the contribution of I / II / III and equivalence by IBCC) with at least 50% obtained marks

Duration: 4 Years
Semesters: 8
Degree Requirements: 125-149 Credit Hours

Code	Pre-req.	Course Title	C/Hr.
Semester-1			
CMPC-5201		Programming Fundamentals	4(3-1)
URCS-5123		Application of Information &	3(2-1)
		Communication Technologies	
URCQ-5101		Discrete Structures	3(3-0)
URCQ-5102		Calculus and Analytic Geometry	3(3-0)
URCE-5118		Functional English	3(3-0)
BUSB-6101		Introduction to Marketing	3(3-0)
URCM-5107		Mathematics I*	Non Credit
			Total 19(17-2)
Semester-2			
CMPC-5202	CMPC-5201	Object Oriented Programming	4(3-1)
CMPC-5203		Database Systems	4(3-1)
CMPC-5204		Digital Logic Design	3(2-1)
MATH-5101		Multivariable Calculus	3(3-0)
CMPC-5208		Computer Networks	3(2-1)
URCM-5108		Mathematics II*	Non Credit
URCQ-5111		Translation of Holy Quran-I	Non Credit
			Total 17(13-4)
Semester-3			
CMPC-5205	CMPC-5202	Data Structures	4(3-1)
CMPC-5209	CMPC-5204	Computer Organization & Assembly	3(2-1)
		Language	
CMPC-5207		Artificial Intelligence	3(2-1)
MATH-5102		Linear Algebra	3(3-0)
CMPC-5101		Software Engineering	3(3-0)
MATH-5103		Probability & Statistics	3(3-0)
			Total 19(16-3)
Semester-4			
CMPC-5206		Information Security	3(2-1)
DSDC-5201		Introduction to Data Science	3(2-1)
DSDC-5202		Advanced Statistics	3(2-1)
URCW-5201		Applied Physics	3(2-1)
URCE-5119	URCE-5118	Expository Writing	3(3-0)
URCI-5105		Islamic Studies	2(2-0)
URCQ-5111		Translation of Holy Quran-II	Non Credit
			Total 17(13-4)
Semester-5			
CMPC-6201		Operating Systems	3(2-1)
DSDC-6201		Data Mining	3(2-1)
DSDC-6202		Data Visualization	3(2-1)
yyyy-xxxx		Domain Elective 1	3(2-1)
yyyy-xxxx		Domain Elective 2	3(2-1)
URCA-5101		Introduction to Management	2(2-0)
			Total 17(12-5)
Semester-6			
DSDC-6203		Data Warehousing & Business	3(2-1)
		Intelligence	
ITDC-6204		Parallel & Distributed Computing	3(2-1)
yyyy-xxxx		Domain Elective 3	3(2-1)
yyyy-xxxx		Domain Elective 4	3(2-1)
yyyy-xxxx		Domain Elective 5	3(2-1)

yyyy-xxxx		Domain Elective 6	3(2-1)
URCQ-5111		Translation of Holy Quran-III	Non Credit
			Total 18(12-6)
Semester-7			
CMPC-6702		Final Year Project - I	2(0-2)
CMPC-6101	CMPC-5205	Analysis of Algorithms	3(3-0)
yyyy-xxxx		Domain Elective 7	3(2-1)
ENGL-6101	URCE-5118	Technical & Business Writing	3(3-0)
URCE-5124		Entrepreneurship	2(2-0)
			Total 13(10-3)
Semester-8			
CMPC-6703	CMPC-6702	Final Year Project - II	4(0-4)
URCI-5122		Ideology and Constitution of Pakistan	2(2-0)
URCF-5118		Professional Practices	2(2-0)
URCC-5125		Civics and Community Engagement	2(2-0)
URCQ-5111		Translation of Holy Quran-IV	Non Credit
			Total 10(6-4)

* Only offered to Pre-Medical Students.

MS Artificial Intelligence

Eligibility: Sixteen years of education including 4-years BSCS/BSIT/ BSSE/BSEE/BSCE/BSAI/BSDS or equivalent (at least 2.50 CGPA out of 4.00) + Departmental Test (at least 50% marks)
Duration: 2-4 Years
Semesters: 4-8
Degree Requirements: 24 C/Hr. Course Work + 6 C/Hr. Thesis

Code	Course Title	C/Hr.
Semester-1		
AICC-7401	Mathematical Foundations of AI	3(3-0)
AICC-7403	Knowledge Representation and Reasoning	3(3-0)
AIEC-wwww	Elective I	3(3-0)
		Total 9(9-0)
Semester-2		
AICC-7402	Advanced Artificial Intelligence	3(3-0)
AICC-7404	Advanced Machine Learning	3(3-0)
AIEC-xxxx	Elective II	3(3-0)
		Total 9(9-0)
Semester-3		
AICC-7405	Thesis-I	3(0-3)
AIEC-yyyy	Elective III	3(3-0)
AIEC-zzzz	Elective IV	3(3-0)
		Total 9(6-3)
Semester-4		
AICC-7406	Thesis-II	3(0-3)
		Total 3(0-3)

MS Computer Science

Eligibility: Sixteen years of education including 4-years BSCS/BSIT/ BSSE/ MSc IT or equivalent (at least 2.50 CGPA out of 4.00) + Departmental Test (at least 50% marks)
Duration: 2-4 Years
Semesters: 4-8
Degree Requirements: 24 C/Hr. Course Work + 6 C/Hr. Thesis

Code	Course Title	C/Hr.
Semester-1		
CSCC-701	Advanced Theory of Computation	3(3-0)
CSCC-702	Advanced Algorithm Analysis	3(3-0)
CSCC-703	Advanced Operating Systems	3(3-0)
		Total 9(9-0)
Semester-2		
CSCC-704	Advanced Computer Architecture	3(3-0)
	Elective I	3(3-0)
	Elective II	3(3-0)
		Total 9(9-0)
Semester-3		
CSCC-700	Thesis-I	3(0-3)
	Elective III	3(3-0)
	Elective IV	3(3-0)
		Total 9(6-3)
Semester-4		
CSCC-700	Thesis-II	3(0-3)
		Total 3(0-3)

PhD Computer Science

Eligibility: Minimum CGPA 3.0 out of 4.0 in the semester system or 1st division in annual system in MPhil/MS/equivalent degree in Computer Science or related disciplines + UOS Entry Test equivalent to HEC HAT General Test (at least 60% marks) OR
HEC/HAT General Test (at least 60% marks)
Duration: 3-8 Years
Semesters: 6-16
Degree Requirements: 18 Credit Hours Course Work + Dissertation

Code	Course Title	C/Hr.

For semester one and two, six courses will be selected from the above list. Semester III to VI will be for research.

CSEC-801	Special Topics in Natural Language Engineering	3(3-0)
CSEC-802	Special Topics in Grammar Engineering	3(3-0)
CSEC-803	Advanced Topics in Formal Methods	3(3-0)
CSEC-804	Special Topics in Cluster & Grid Computing	3(3-0)
CSEC-805	Advanced Topic in Parallel Processing	3(3-0)
CSEC-806	Special Topics in Distributed Computing	3(3-0)
CSEC-807	Special Topics in Open Source Software	3(3-0)
CSEC-808	Advanced Research Methods	3(3-0)
CSEC-809	Evolutionary Computation	3(3-0)
CSEC-810	Special Topics in Machine Learning	3(3-0)
CSEC-811	Special Topics in Artificial Intelligence	3(3-0)
CSEC-812	Advanced Optimization Methods	3(3-0)
CSEC-813	Special Topics in Data Mining	3(3-0)
CSEC-814	Peer-to-Peer Systems	3(3-0)

CSEC-815	Ubiquitous Information Interaction	3(3-0)
CSEC-816	Evolution and Re-Engineering	3(3-0)
CSEC-817	Program Comprehension & Reverse Engineering	3(3-0)
CSEC-818	Software Refactoring	3(3-0)
CSEC-819	Advance Software Architecture	3(3-0)
CSEC-820	Category Theory	3(3-0)
CSEC-821	Concrete Mathematics	3(3-0)
CSEC-822	Number Theory and Cryptography	3(3-0)
CSEC-823	Hamonic Analysis	3(3-0)
CSEC-824	Randomized Algorithms	3(3-0)
CSEC-825	Spectral Graph Theory	3(3-0)
CSEC-826	Wavelets	3(3-0)
CSEC-827	Information Theory I	3(3-0)
CSEC-828	Special Topics in Big Data Analysis	3(3-0)
CSEC-829	Advance Topics in Fog Computing	3(3-0)
CSEC-830	Advance Topics in Cloud Computing	3(3-0)