

# COMSATS University Islamabad

Registrar Secretariat, Academic Unit (PS)

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No. CUI-Reg/Notif- 646/23/ 691

March 8, 2023

## NOTIFICATION


The Academic Council in its 35<sup>th</sup> meeting held on January 17, 2023, on the recommendation of 32<sup>nd</sup> meeting of Board of Advanced Studies and Research (BASAR), approved the following Scheme of Studies of Doctor of Philosophy in Computer Science, effective from Fall 2023;

**Nomenclature: Doctor of Philosophy in Computer Science**

**Abbreviation: PhD (CS)**

	Min No. of Courses	Min No. of Credit Hours
1. Course Work		
i) PhD Courses Work (List Attached)	06	18
2. Research Work		
i) Thesis	-	09

- Note:**
1. The Department may offer elective courses from the elective list (only 600 series and above) of other MS programs being offered in the Department of Computer Science.
  2. The Regulations relating to Graduate Degree Programs approved by the Competent Authority and amended from time to time shall be applicable.

  
**Muhammad Hanif**  
Deputy Registrar

**Encl: (06 pages in total including this page)**

**Distribution:**

1. All Directors, CUI Campuses
2. Dean, Faculty of Information Sciences and Technology, CUI
3. Incharge Academics, Islamabad Campus
4. Chairperson, Department of Computer Science, CUI
5. All HoDs/Incharge of Academics/Examinations Sections, CUI Campuses
6. Internal distribution/Registrar Office, CUI

**CC:**

1. PS to Rector CUI
2. PS to Registrar CUI

**Core Course (Pre-Requisite for Thesis):**

Course Code	Course Title	Credit Hours	Pre-requisite (s)
PCS702	Advanced Research Methods and Techniques	3(3, 0)	-

**PhD Thesis:**

Course Code	Course Title	Credit Hours	Pre-requisite (s)
PCS900	Thesis	9(0, 9)	PCS702

**Elective Courses (any five):**

Following are list of Elective Courses along with area of specialization.

Course Code	Course Title	Credit Hours
<b>Computer Communication and Networks</b>		
PCS709	Advanced Topics in Network Programming	3(3, 0)
PCS714	Advanced Topics in Mobile and Pervasive Computing	3(3, 0)
PCS725	Advanced Topics in Smart Grid Computing	3(3, 0)
PCS736	Advanced Topics in Real Time Systems	3(3, 0)
PCS741	Advanced Topics in Simulation and Modeling	3(3, 0)
PCS752	Advanced Topics in Internet of Things Architecture and Protocols	3(3, 0)
PCS777	Advanced Topics in Computer Networks	3(3, 0)
PCS830	Special Topics in Computer Networks	3(3, 0)
PCS832	Special Topics in Performance Evaluation of Networks	3(3, 0)
PCS835	Special Topics in Ad-Hoc Networks	3(3, 0)
PCS836	Special Topics in Wireless Technologies	3(3, 0)
PCS838	Special Topics in Computer Networking	3(3, 0)
<b>Parallel, Distributed, and Cloud Computing</b>		
PCS711	Advanced Topics in Parallel and Distributed Systems	3(3, 0)
PCS724	Advanced Topics in Fog and Cloud Computing	3(3, 0)
PCS735	Advanced Topics in High Performance Computing	3(3, 0)
PCS740	Advanced Topics in Real-Time Systems	3(3, 0)
PCS811	Special Topics in Parallel Processing	3(3, 0)
PCS839	Special Topics in Distributed Systems	3(3, 0)

PCS860	Special Topics in Fog and Cloud Computing	3(3, 0)
PCS862	Special Topics in High Performance Computing	3(3, 0)
<b>Robotics</b>		
PCS704	Advanced Topics in Robotics	3(3, 0)
PCS715	Advanced Topics in Human Robot Interaction	3(3, 0)
PCS722	Advanced Topics in Simultaneous Localization and Mapping	3(3, 0)
PCS733	Advanced Topics in Robotic Grasping and Fixturing	3(3, 0)
PCS742	Advanced Topics in Rehabilitation and Assistive Robotics	3(3, 0)
PCS741	Advanced Topics in Simulation and Modeling	3(3, 0)
PCS749	Advanced Topics in Digital Image Processing	3(3, 0)
PCS763	Advanced Topics in Agent Based Modeling	3(3, 0)
PCS770	Advanced Topics in Computer Vision and Scene Analysis	3(3, 0)
PCS850	Special Topics in Digital Image Processing	3(3, 0)
PCS865	Special Topics in Robotics	3(3, 0)
PCS869	Special Topics in Computer Vision and Scene Analysis	3(3, 0)
<b>Artificial Intelligence</b>		
PCS701	Advanced Programming in Python	3(3, 0)
PCS707	Advanced Topics in Knowledge Based Systems	3(3, 0)
PCS716	Advanced Topics in Machine Learning	3(3, 0)
PCS729	Advanced Topics in Deep Learning	3(3, 0)
PCS734	Advanced Topics in Reinforcement Learning	3(3, 0)
PCS747	Advanced Topics in Natural Language Processing	3(3, 0)
PCS754	Advanced Topics in Information Retrieval	3(3, 0)
PCS769	Advanced Topics in Pattern Recognition	3(3, 0)
PCS772	Advanced Topics in Soft Computing Techniques	3(3, 0)
PCS780	Advanced Topics in Intelligent Systems Design	3(3, 0)
PCS781	Advanced Topics in Recommendation System	3(3, 0)
PCS805	Special Topics in Natural Language Processing	3(3, 0)
PCS813	Special Topics in Artificial Neural Networks	3(3, 0)
PCS867	Special Topics in Machine Learning	3(3, 0)
PCS868	Special Topics in Artificial Intelligence	3(3, 0)

PCS875	Special Topics in Deep Learning	3(3, 0)
<b>Database, Data warehouse, and Data Science</b>		
PCS717	Advanced Topics in Object Oriented Databases	3(3, 0)
PCS718	Advanced Topics in Web Mining	3(3, 0)
PCS728	Advanced Topics in Stochastic Processes	3(3, 0)
PCS732	Advanced Topics in Distributed Data Processing	3(3, 0)
PCS746	Advanced Topics in Exploratory Data Analysis & Visualization	3(3, 0)
PCS747	Advanced Topics in Natural Language Processing	3(3, 0)
PCS757	Advanced Topics in Big Data Analytics	3(3, 0)
PCS764	Advanced Topics in Text Mining and Analytics	3(3, 0)
PCS771	Advanced Topics in Social Network Analysis and Mining	3(3, 0)
PCS775	Advanced Topics in Graph Analytics for Big Data	3(3, 0)
PCS781	Advanced Topics in Recommendation System	3(3, 0)
PCS784	Advanced Topics in Computational Models for Social Meaning	3(3, 0)
PCS796	Advanced Topics in Time Series Analysis and Prediction	3(3, 0)
PCS807	Special Topics in Data Warehousing	3(3, 0)
PCS814	Special Topics in Distributed Databases	3(3, 0)
PCS825	Special Topics in Object Oriented Databases	3(3, 0)
PCS831	Special Topics in Big Data Analytics	3(3, 0)
PCS837	Special Topics in Social Network Analysis and Mining	3(3, 0)
PCS878	Special Topics in Data Mining	3(3, 0)
<b>Software and System Engineering</b>		
PCS703	Advanced Topics in Agile Software Development Methods	3(3, 0)
PCS713	Advanced Topics in Agent Based Software Engineering	3(3, 0)
PCS727	Advanced Topics in Software Engineering for Intelligent System	3(3, 0)
PCS738	Advanced Topics in Software Architectures for cloud and Big Data	3(3, 0)
PCS743	Advanced Topics in Mining and Analyzing Software Repositories	3(3, 0)
PCS753	Advanced Topics in Software Project Management	3(3, 0)
PCS758	Advanced Topics in Software Estimation and Costing	3(3, 0)
PCS760	Advanced Topics in Requirements Engineering	3(3, 0)

PCS765	Advanced Topics in Software Quality Assurance	3(3, 0)
PCS773	Advanced Topics in Software Engineering Technologies	3(3, 0)
PCS774	Advanced Topics in Object Oriented Software Engineering	3(3, 0)
PCS782	Advanced Topics in Software Reverse Engineering	3(3, 0)
PCS785	Advanced Topics in Software Testing	3(3, 0)
PCS792	Advanced Topics in Component Based Software	3(3, 0)
PCS826	Special Topics in Human Computer Interaction	3(3, 0)
PCS895	Special Topics in Software Engineering	3(3, 0)
<b>Information and Cyber Security</b>		
PCS705	Advanced Topics in Information Security	3(3, 0)
PCS708	Advanced Topics in Information Security Management	3(3, 0)
PCS721	Advanced Topics in Cryptography	3(3, 0)
PCS723	Advanced Topics in Elliptic Curve Cryptography	3(3, 0)
PCS730	Advanced Topics in Quantum Cryptography	3(3, 0)
PCS737	Advanced Topics in Network Security	3(3, 0)
PCS744	Advanced Topics in Cyber Security	3(3, 0)
PCS748	Advanced Topics in Digital Forensics	3(3, 0)
PCS750	Advanced Topics in Privacy Preservation Techniques	3(3, 0)
PCS755	Advanced Topics in Security and Privacy for the Smart Grid	3(3, 0)
PCS756	Advanced Topics in Privacy and Security in IoT	3(3, 0)
PCS761	Advanced Topics in Secure System Design	3(3, 0)
PCS802	Special Topics in Cyber Threat Intelligence	3(3, 0)
PCS803	Special Topics in Distributed Systems Security	3(3, 0)
PCS804	Special Topics in Security in Cloud Environment	3(3, 0)
<b>Multimedia, Virtual and Augmented Reality, Computer Graphics, and Game Design</b>		
PCS706	Advanced Topics in Multimedia Design and Technologies	3(3, 0)
PCS710	Advanced Topics in Game Design and Development	3(3, 0)
PCS719	Advanced Topics in Augmented and Virtual Reality	3(3, 0)
PCS720	Advanced Topics in Computer Graphics	3(3, 0)
PCS731	Advanced Topics in Geometric Modeling	3(3, 0)
PCS739	Advanced Topics in Geo Information Technology	3(3, 0)
PCS806	Special Topics in Multimedia Design and Technologies	3(3, 0)

PCS812	Special Topics in Game Design and Development	3(3, 0)
PCS822	Special Topics in Augmented and Virtual Reality	3(3, 0)
PCS833	Special Topics in Computer Graphics	3(3, 0)
PCS851	Special Topics in Geometric Modeling	3(3, 0)
<b>General Computing</b>		
PCS745	Advanced Topics in Chaos Theory	3(3, 0)
PCS762	Advanced Topics in Randomized Algorithms	3(3, 0)
PCS768	Advanced Topics in Semantic Web	3(3, 0)
PCS801	Special Topics in Mathematical Modeling	3(3, 0)
PCS808	Special Topics in Estimation and Detection Theory	3(3, 0)
PCS809	Special Topics in Chaos Theory	3(3, 0)
PCS823	Special Topics in Semantic Web	3(3, 0)
PCS866	Special Topics in Computer Science I	3(3, 0)
PCS896	Special Topics in Computer Science II	3(3, 0)

**The contents for all the courses would be subject to approval from the Head of Department.**