



# CAPITAL UNIVERSITY OF SCIENCE & TECHNOLOGY ISLAMABAD

Expressway, Kahuta Road, Zone-V, Islamabad  
Phone: +92-51-111-555-666 Fax: +92-51-4486705  
Email: [info@cust.edu.pk](mailto:info@cust.edu.pk) Website: <https://www.cust.edu.pk>

## **PhD Comprehensive Examination** **Faculty of Engineering**

Following is the Department/ Program wise list of the subjects from which the comprehensive examination question papers will be prepared. All engineering students are required to select three (3) courses from the respective list for preparation of the question papers. The selected list is to be sent/ handed over to Graduate Studies Office at the time of registration for comprehensive examination or earlier through email/ personal visit.

### **Electrical Engineering**

<b><u>Control Systems</u></b>		
1	EE5813	Linear System Theory
2	EE5823	Nonlinear Control Systems
3	EE5843	Control Systems Design
4	EE6893	Sliding Mode Control
5	EE6843	Robust Control Systems
6	EE6853	Adaptive Control Systems
<b><u>Signal Processing</u></b>		
1	EE5613	Advanced Digital Signal Processing
2	EE5623	Advanced Digital Image Processing
3	EE6633	Adaptive Signal Processing
4	EE6643	Pattern Recognition
5	EE6673	Radar Signal Processing
6	EE6653	Computer Vision
7	EE6683	Machine Learning
8	EE6363	Advanced Artificial Intelligence
<b><u>Telecommunications</u></b>		
1	EE6703	Advanced Digital Communications
2	EE6733	Cellular and Mobile Communications
3	EE5703	Principles of Digital Communications
4	EE6763	Mobile and Wireless Networks
<b><u>Electronics and Microwaves</u></b>		
1	EE6213	Analog Integrated Electronic Circuits
2	EE6523	Advanced Antenna Theory & Design
3	EE6533	Advanced Microwave Engineering
4	EE6343	Embedded Systems Design
5	EE6313	Advanced Computer Architecture
<b><u>Power Systems</u></b>		
1	EE6153	Smart Grid
2	EE6163	Renewable Energy Systems
3	EE6263	Advanced Power Electronics

## **Civil Engineering**

(a) Specialization Courses			
(i)	Water Resources Engineering & Management	CE 5103	Advanced Open Channel Hydraulics
		CE 5113	Advanced Hydrology
		CE 6123	River Engineering
		CE 6133	Design of Hydraulic Structures
(ii)	Structural Engineering	CE 5303	Dynamics of Structures
		CE 5313	Fiber Reinforced Structures
		CE 6323	Computer Aided Analysis & Design of Structures
		CE 6333	Earthquake Engineering
(b) Elective Courses			
(iii)	Elective Courses	CE 5023	Research Methods in Civil Engineering
		CE 5803	Advanced Construction Management
		CE 5903	Advanced Geo-informatics
		CE 5913	Disaster Risk Assessment & Evaluation
		CE 5813	Project Planning and Control
		CE 5903	Advanced Geo-informatics
		CE 5913	Disaster Risk Assessment & Evaluation
		CE 5153	Drainage & Irrigation Engineering

## **Mechanical Engineering**

Sr#	Course Code	Specializations
<b>Thermal Sciences</b>		
1	ME 5133	Gas Dynamics
2	ME5513	Computational Fluid Dynamics
3	ME5223	Thermal Design of Heat Exchangers
4	ME6113	Environmental and Energy Management
5	ME6123	Thermal Energy Storage
6	ME6113	Environmental and Energy Management
7	ME6503	Fluid Mechanics and Thermodynamics of Turbomachinery
<b>Mechanical Design</b>		
1	ME5703	Research Methodologies for Engineers
2	ME6063	Fracture Mechanics
3	ME5003	Finite Element Methods
4	ME6073	Advanced Mechanical Design
5	ME6093	Mechanics of Composite Materials
6	ME6723	Modelling and Simulation
<b>Manufacturing</b>		
1	ME6713	Applied Machine Learning for Engineers
2	ME5683	Operations Research
3	ME6703	Multiple Criteria Decision-Making Methods
4	ME5653	Manufacturing System Design and Analysis

## **Engineering Management**

<b>Sr#</b>	<b>Course Code</b>	<b>Manufacturing Management</b>
1	EM6413	Research Methods for Social Science
2	EM6333	Production Planning and Controls
3	EM6323	Operation Research
4	EM6133	Quality & Productivity Improvement
5	EM6363	Product Design and Development
6	EM6213	Finance and Accounting for Engineers
7	EM6343	Supply Chain Management
<b>Technology Management</b>		
1	EM6763	Environmental and Energy Management
2	EM6123	Multiple Criteria Decision-Making Methods
3	ME6713	Applied Machine Learning for Engineers
<b>Engineering Project Management</b>		
1	EM6113	Engineering Project Management
2	EM6113	Engineering Management Techniques
3	EM6433	Project Risk Assessment and Decision Analysis
4	EM6483	Project Monitoring and Evaluation
5	MPM6003	Fundamentals of Project Management
<b>Construction Management</b>		
1	CE6863	Construction Contracts for Civil Engineers
2	CE5803	Advanced Construction Management
3	CE5823	Advanced Project Management for Construction Projects
<b>Software Project Management</b>		
1	EM6443	Project Management Information Systems
2	EM6143	Modelling and Simulation