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The Centre of Your Future

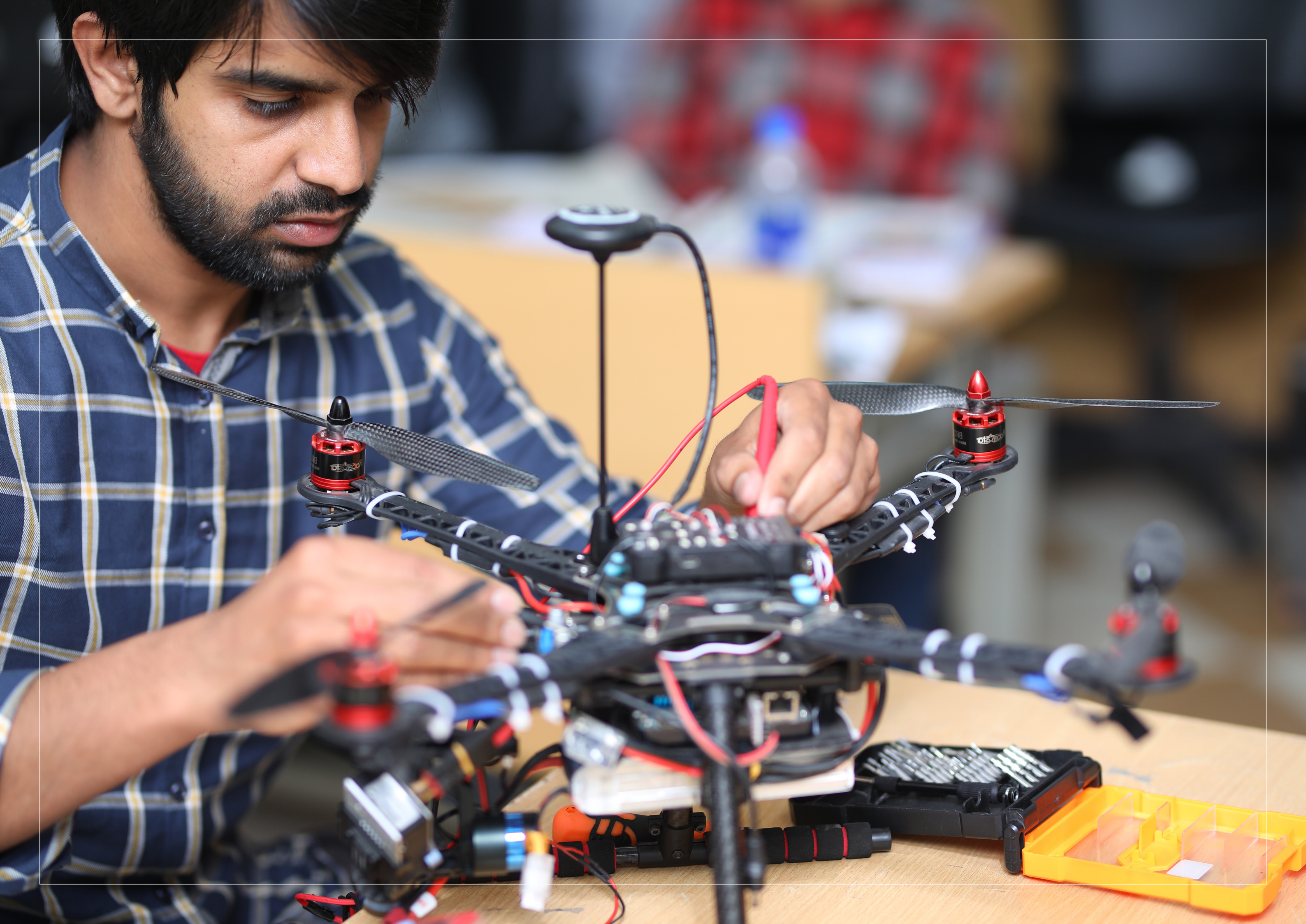
Degree in **Hand** Career in **Reach**

Faculty of

Engineering

2024-25

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BS

Electrical Engineering

Admission Requirements

- Minimum 60% marks in F.Sc. Pre-Engineering/F.Sc. Pre-Medical/ICS with Mathematics, Physics or Equivalent with Physics, Chemistry, and Mathematics. In the case of a foreign qualification, equivalence from IBCC will be required

OR

- A combination of Biology, Physics, and Chemistry is also allowed for admission subject to the successful completion of an Eight-week condensed course in Mathematics. A total of 40% of seats within the allowed intake are available for pre-medical students. A separate admission test after the qualifying mathematics course will be conducted to determine the merit of admission

OR

- Diploma of Associate Engineer Examination in relevant discipline securing at least 60% marks in aggregate
- All applicants are required to pass the PEC-approved test or UCP Admission Test

Degree Requirements

Each candidate for the B.Sc. Electrical Engineering degree is required to successfully earn 131-136 Cr. Hrs. with the minimum CGPA of 2.00 on the scale of 4.00 as per the following detail:

Area	Cr. Hrs.
a) Non-Engineering (General Edu.)	41
b) Engineering Majors	71-74
c) Multidisciplinary Engineering Course (MDEC)	4
d) Flexible Engg/Non-Engg Courses	9-11
e) Industrial Internship	0
f) Design Project	06
Total	131-136

Industrial Internship (EE4000)

Each student is required to complete an 8-week industrial internship training usually after 6 semesters or on the completion of 90 Cr. Hrs. The internship shall be graded as pass/fail.

Community Work (EE3000)

Each student is required to complete 65 hours of community work, usually after the 4th semester which would be a prerequisite for the award of a degree.

Programme Duration

This is a four-year degree programme comprising 8 semesters. There will be a Fall and a Spring semester each year. The summer semester will be utilized for internship or deficiency courses. The maximum duration to complete B.Sc. Electrical Engineering degree is 7 years.

Scheme of Studies

B.Sc. in Electrical Engineering

Semester I (16 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	ICT 101	Applications of ICT	2	Computer Sci (GE)
2	ICTL 101	Applications of ICT Lab	1	Computer Sci (GE)
3	EEMT1013	Applied Mathematics I	3	Natural Sci (GE)
4	EE1112	Applied Physics	2	Natural Sci (GE)
5	EE1111	Applied Physics Lab	1	Natural Sci (GE)
6	ENG 110	Functional English	3	Humanities (GE)
7	PAK 102	Ideology & Constitution of Pakistan	2	Humanities (GE)
8	ENT 102	Fundamentals of Entrepreneurship	2	Management Sci (GE)

Semester II (18 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	EE1813	Linear Circuit Analysis	3	EE Foundation
2	EE1811	Linear Circuit Analysis Lab	1	EE Foundation
3	EE1011	Engineering Drawing	1	EE Foundation
4	ENG211	Expository Writing	3	Humanities (GE)
5	EEMT1023	Applied Mathematics II	3	Natural Sci (GE)
6	ISL110	Islamic Studies	2	Humanities (GE)
7	EECS1213	Computer Programming	3	ACIS*
8	EECS1211	Computer Programming Lab	1	ACIS*
9	EE1021	Electrical Workshop Practice	1	EE Foundation

Semester III (17 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	EECS2223	Data Structures and Algorithms	3	ACIS
2	EECS2221	Data Structures and Algorithms Lab	1	ACIS
3	EE2323	Electronic Devices and Circuits	3	EE Foundation
4	EE2321	Electronic Devices and Circuits Lab	1	EE Foundation
5	EE2823	Electrical Network Analysis	3	EE Foundation
6	EE2821	Electrical Network Analysis Lab	1	EE Foundation
7	EEHU2072	Communication and Presentation Skills	2	Humanities (GE)
8	EEMT2033	Applied Mathematics III	3	Natural Sci (GE)

Semester IV (18 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	EE2333	Digital Logic Design	3	EE Foundation
2	EE2331	Digital Logic Design Lab	1	EE Foundation
3	EE2713	Signals and Systems	3	EE Foundation
4	EE2711	Signals and Systems Lab	1	EE Foundation
5	EE2833	Electrical Machines	3	EE Core Breadth
6	EE2831	Electrical Machines Lab	1	EE Core Breadth
7	EEMT2063	Multivariable Calculus	3	Natural Sci (GE)
8	EEME2043	Thermodynamics	3	MDEC***

Semester V (18 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	EE3343	Microprocessors and Interfacing	3	EE Core Breadth
2	EE3341	Microprocessors and Interfacing Lab	1	EE Core Breadth
3	EE3513	Electromagnetic Field Theory	3	EE Foundation
4	EEMT3043	Complex Variables and Transforms	3	Natural Sci (GE)
5	EE3533	Communication Systems	3	EE Core Breadth
6	EE3531	Communication Systems Lab	1	EE Core Breadth
7	EEPE3843	Power Distribution and Utilization	3	EE Core Breadth
8	EEPE3841	Power Distribution and Utilization Lab	1	EE Core Breadth

Semester VI (17 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	EEXX3xx3	Depth Core Elective I	3	EE Core Depth
2	EEXX3xx1	Depth Core Elective I Lab	1	EE Core Depth
3	EEXX3xx3	Depth Core Elective II	3	EE Core Depth
4	EEXX3xx1	Depth Core Elective II Lab	1	EE Core Depth
5	EE3613	Linear Control Systems	3	EE Core Breadth
6	EE3611	Linear Control Systems Lab	1	EE Core Breadth
7	EEMG3012	Project Management	2	Management Sci (GE)
8	EE3053	Probability and Statistics for Engineers	3	EE Foundation

Semester VII (16 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	EEXX4xx3	Depth Elective III	3	EE Core Depth
2	EEXX4xx1	Depth Elective III Lab	1	EE Core Depth
3	EEXX4xx1	Depth Elective IV	3	EE Core Depth
4	EE4xx3	Flexible Elective I	3	Flexible Engg./non-Engg.
5	EEHU4062	Civic and Community Engagements	2	Humanities
6	EEHU4082	Engineering Economics	2	Management
7	EE4912	Design Project I	2	Design Project

Semester VIII (14 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	EE4xx3	Flexible Elective II	3	Flexible Engg./non-Engg.
2	EE4xx3	Flexible Elective III	3	Flexible Engg./non-Engg.
3	EEXX4xx3	Depth Elective V	3	EE Elective
4	EEME4071	Occupational Health and Safety	1	MDEC***
5	EE4924	Design Project II	4	Design Project



BS

Robotics and Intelligent Systems

Admission Requirements

- At least 50% marks in F.Sc. Pre-Engineering/Pre-Medical/ICS (all combinations)/3 years Diploma recognized by Provincial Board of Technical Education (related to Electrical, Mechanical or CS/IT), A-levels or an equivalent qualification
- The students with pre-medical background will take 4 additional credit hours of mathematics. There will be one additional mathematics course in the first semester (for both fall and spring admissions), while the second additional mathematics course will be offered to all admitted students in the summer semester
- All applicants are required to pass UCP Admission Test

Degree Requirements

Each candidate for the B.Sc. Electrical Engineering degree is required to successfully earn 130-134 Cr. Hrs. with the minimum CGPA of 2.00 on the scale of 4.00 as per the following detail:

Area	Cr. Hrs.
a) General Education	31
b) Major	78
c) Interdisciplinary	14
d) Capstone Project	4
e) Field Experience	3
f) Additional Mathematics*	4
Total	130-134

Scheme of Studies

BS Robotics and Intelligent Systems

Semester I (16/18 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	ICT 101	Applications of ICT	2	General Education
2	ICTL 101	Applications of ICT Lab	1	General Education
3	RME 101	Engineering Mechanics – I	3	Major
4	QR 101	Quantitative Reasoning – I	3	General Education
5	ENG 110	Functional English	3	General Education
6	ENT 102	Entrepreneurship	2	General Education
7	PAK 102	Ideology & Constitution of Pakistan	2	General Education
8	RAD 100	Pre-Calculus*	2	Additional Math course for Pre-Med

Semester II (16/18 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	RCS 111	Fundamental of Programming	2	Interdisciplinary
2	RCS 112	Fundamental of Programming Lab	1	Interdisciplinary
3	REE 101	Basic Electrical Engineering	3	Major
4	REE 102	Basic Electrical Engineering Lab	1	Major
5	RNS 101	Applied Mathematics – I**	2	General Education
6	RME 102	Engineering Mechanics – II	3	Major
7	ENG 211	Expository Writing	3	General Education
8	RME 103	Computer Aided Design	1	Major
9	RAD 101	Elementary Algebra*	2	Additional Math course for Pre-Med

Semester III (16 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	RCS 221	Object Oriented Programming	2	Interdisciplinary
2	RCS 222	Object Oriented Programming Lab	1	Interdisciplinary
3	REE 201	Electronics – I	3	Major
4	REE 202	Electronics – I Lab	1	Major
5	REE 211	Electrical Network Analysis	3	Major
6	REE 212	Electrical Network Analysis Lab	1	Major
7	ISL 201	Islamic Studies/Religious Ed.	2	General Education
8	RNS 201	Applied Mathematics – II**	2	General Education
9	CCE 201	Civics & Community Engagement	1	General Education

Semester IV (17 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	QR 201	Quantitative Reasoning - II	3	General Education
2	REE 220	Robotics Design Lab - I	1	Major
3	REE 221	Digital Logic Design	3	Major
4	REE 222	Digital Logic Design Lab	1	Major
5	REE 233	Introduction to Economics	2	General Education
6	RCS 223	Data Structures & Algorithms	3	Interdisciplinary
7	RCS 224	Data Structures & Algorithms Lab	1	Interdisciplinary
8	RGE 231	Robotics Design and Creativity**	3	Gen. Edu.

Semester V (17 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	RCS 331	Operating Systems	3	Interdisciplinary
2	RCS 332	Operating Systems Lab	1	Interdisciplinary
3	REE 331	Electric Machines	3	Major
4	REE 332	Electric Machines Lab	1	Major
5	REE 333	Electronics - II	3	Major
6	REE 334	Electronics - II Lab	1	Major
7	RME 321	Sensors & Actuators	3	Major
8	RME 322	Sensors & Actuators Lab	1	Major

Semester VI (16 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	REE 351	Feedback Control System	3	Major
2	REE 352	Feedback Control System Lab	1	Major
3	REE 341	Embedded Systems	3	Major
4	REE 342	Embedded Systems Lab	1	Major
5	RME 331	Robotics Machine Design	3	Major
6	REE 3xx	Elective – I	3	Major
7	REE 3xx	Elective – I Lab	1	Major
8	REE 333	Robotics Design Lab – II	1	Major

Semester VII (16 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	REE 401	Field Experience/Internship	3	Field Experience
2	REE 4xx	Elective – II	1	Major
3	REE 4xx	Elective – II Lab	3	Major
4	REE 461	Adaptive Control	3	Major
5	REE 451	Artificial Intelligence	2	Major
6	REE 452	Artificial Intelligence Lab	2	Major
7	REE 442	Robotics Design Lab – III	2	Major
8	REE 4xx	Elective – III	3	Major

Semester VIII (15 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	REE 412	Capstone Project	4	Capstone Project
2	REE 4xx	Elective – IV	3	Major
3	REE 4xx	Elective – IV Lab	1	Major
4	REE 4xx	Elective - V	3	Major
5	REE 4xx	Elective – V Lab	1	Major
6	REE 4xx	Elective VI	3	Major

Community Work (EE3000)

Each student is required to complete 65 hours of community work, usually after the 4th semester which would be a prerequisite for the award of a degree.

Program Duration

This is a four-year degree program comprising 8 semesters. There will be a Fall and a Spring semester each year. The summer semester will be utilized for internship or deficiency courses. The maximum duration to complete BS Robotics and Intelligent Systems degree is 7 years.

M.Sc.

Electrical Engineering

Admission Requirements

- A minimum of 16 years of education leading to BS / BE / B.Sc. in Electrical / Electronics / Telecommunications Engineering or equivalent
- Minimum 2.00/4.00 CGPA or 50% marks in the annual system
- All applicants are required to pass the UCP Admission Test with a 50% score or the GRE/HAT General/equivalent test with a passing score of 50% followed by an interview by the Graduate Admission Committee

Degree Requirements

A student admitted to this program will have to complete the degree requirements by following any one of the options given below:

- 24 Cr. Hrs. course work with 6 Cr. Hrs. Thesis
- Coursework only (10 Courses)

Area	Cr. Hrs.
a) Core Courses	06
b) Specialization Courses	15
c) Elective	03
d) Thesis/Additional Courses	06
Total	30

a) Core Courses

Course Title	Code	Cr. Hrs.
Linear System Theory	EE5553	3
Advanced Probability	EE5573	3

b-i) Specialization Courses

Course Title	Code	Cr. Hrs.
Power Convertors	EE5523	3
Photovoltaic Based Energy Systems	EE5533	3
Electric Power System Stability	EE6913	3
Advanced Power Electronics	EE5643	3
High Voltage Engineering	EE5653	3
Renewable Energy, Technology & System	EE 6943	3
Switch Mode Power Supplies	EE5793	3
Power Systems Analysis & Design	EE5813	3
Nonlinear Systems & Control	EE5763	3
Distributed Control of Multiagent Systems	EE5623	3
Testing & Diagnostics of High Voltage Power Equipment	EE5943	3

b-ii) Electronics and Telecommunication Specialization

Course Title	Code	Cr. Hrs.
Satellite Communication Systems	EE5723	3
High Frequency Systems & Analysis	EE5503	3
Advance Analog & Digital Communication System	EE5583	3
Modern Communication Theory	EE5593	3
Analog & digital Filter Design	EE5613	3
Telecom Networks & Tele-Traffic Engineering	EE5753	3
Advance Antenna Design & Analysis	EE6963	3
Wireless Networks	EE5803	3

c) Elective Courses

A student may choose 3 to 9 Cr. Hrs., depending upon the degree completion option, from the given list or any other course offered by the EE department.

Course Title	Code	Cr. Hrs.
Random Processes in Engineering	EE5573	3
Graph Theory & Network Optimization	EE5213	3
Advanced Digital System & Design	EE5353	3
Advanced Digital Signal Processing	EE6743	3
High Reliability Embedded Systems	EE6733	3
Expert System	EE5663	3
Linear Programming	EE5693	3
Research Thesis	EE6916	6
Thesis Continuation	EE6921	1

d) Research Thesis

Course Title	Code	Cr. Hrs.
Research Thesis	EE6916	6
Thesis Continuation	EE6921	1

Degree Requirement

A student is required to earn a minimum of 2.50/4.00 CGPA on the completion of his/her degree requirements.

Programme Duration

This is nominally a two-year degree programme comprising 4 semesters. There will be a Fall and a Spring semester each year. The maximum duration to complete an MS Electrical Engineering degree is 04 years.

PhDElectricalEngineering

Admission Requirements

- At least 3.00/4.00 CGPA or 60% marks from an annual system in MS or equivalent degree in Electrical Engineering
- All Candidates are required to pass the UCP Admission Test with a 60% score or a test equivalent to GRE/HAT General, conducted by testing bodies accredited by HEC with a passing score of 60% followed by an interview by the Graduate Admission Committee

Degree Requirements

A PhD candidate shall be awarded the degree on successful completion of the following requirements:

- 18 Cr. Hrs. Course Work with minimum CGPA 3.00/4.00
- Comprehensive Examination (written and oral)
- Synopsis Defense
- 30 Cr. Hrs. Research Work
- Publication of at least one research paper in HEC approved W-category journal
- Dissertation Foreign Reviews
- Dissertation Final Defense

Note: PhD scholars are required to comply with the following timeline:

Activity	Preferred Time	Maximum
Course Work	2 Semesters	3 Semesters
Comprehensive Exam	3 Semesters	4 Semesters
Synopsis Qualification	4 Semesters	6 Semesters
Thesis Submission	6 Semesters	14 Semesters (7 Years)



International Outreach and Research Impact

International Collaborations

The Department of Electrical Engineering at the University of Central Punjab is closely working with international collaborators from renowned universities around the globe. Under different capacities, the Department of Electrical Engineering is collaborating with the University of Chicago (USA), the University of Quebec (Canada), Queen Mary University of London (UK), the University of Wuzburg (Germany), Taif University (KSA), Federal University of Lavras (Brazil), Instituto de Telecomunicações Aveiro (Portugal), Chulalongkorn University (Thailand) to name a few.

Alumni Success Stories

Our alumni are working in various top universities such as UC Berkeley, UC Davis, UC Los Angeles, Politecnico di Torino, Karlstad University, ISEA, RWTH University etc. Our alumni are working in one of the best companies in the world such as Google, Morgan Stanley, Tractebel Engie, LESCO, and NESPAK.

Research Publications

The Department of Electrical Engineering is actively involved in Research and Development activities. Since 2018, we have successfully published more than 120 journal papers and 35+ international conferences. It is a matter of great pride for our department that the total impact factor produced by the Electrical Engineering Department is more than 275.

International Grants and Patents

Faculty members and students have successfully secured funding from various national and international bodies/donors such as The Belt and Road Initiative, IGNITE, and Asia Connect to name a few. Faculty members have successfully filled patents in Pakistan and we are hopeful to have international patents soon.

B.Sc. Mechanical Engineering

Admission Requirements

- Minimum 60% marks in F.Sc. Pre-Engineering/F.Sc. Pre-Medical/ICS with Mathematics, Physics or Equivalent with Physics, Chemistry, and Mathematics. In the case of a foreign qualification, equivalence from IBCC will be required

OR

- A Diploma of Associate Engineer (DAE) Examination in Mechanical with any specialization, or Aerospace, Auto & Diesel, Automation, Bio-Medical, or Dies & Mould, Mechatronics, Precision Mechanical and Instruments, Refrigeration and Air Conditioning, or Vacuum or any relevant discipline securing at least 60% marks in aggregate

OR

- A combination of Biology, Physics, and Chemistry is also allowed for admission subject to the successful completion of an Eight-week condensed course in Mathematics. A total of 40% of seats within the allowed intake are available for pre-medical students. A separate admission test after the qualifying mathematics course will be conducted to determine the merit of admission

- All applicants are required to pass the PEC-approved test or UCP Admission Test

Degree Requirements

Each candidate for the B.Sc. Mechanical Engineering degree is required to successfully complete 135 Cr. Hrs. with the minimum CGPA of 2.00 on the scale of 4.00 as per the following detail:

Area	Cr. Hrs.
a) Mechanical Engineering Foundation Courses	29
b) Mechanical Engineering Breadth Courses	30
c) Mechanical Engineering Depth Courses	22
d) Natural Sciences	14
e) Computing Courses	02
f) Inter Departmental Engineering Electives (IDEE)	6
g) Humanities Courses	13
h) Management Sciences	13
i) Mechanical Engineering Elective Courses	04
j) Industrial Internship	00
k) Design Project	06
Total	135

a) Mechanical Engineering Foundation Courses (25 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Engineering Drawing	MEL1011	1
Introduction to Engineering	ME1011	1
Engineering Graphics	MET1211	1
AutoCAD	ME1211	1
Engineering Mechanics-I	ME1513	3
Workshop Technology	ME1312	2
Mechanics of Machines-I	ME2223	3
Fluid Mechanics-I	ME2713	3
Mechanics of Materials-I	ME2523	3
Applied Thermodynamics-I	ME1413	3
Engineering Mechanics-II	ME2532	2
Engineering Mechanics-II Lab	ME2531	1
Engineering Materials	ME1613	3
Manufacturing Processes-I	ME2812	2

b) Mechanical Engineering Breadth Courses (30 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Mechanics of Machines-II	ME2232	2
Machine Design-I	ME2242	2
Mechanics of Materials-II	ME2543	3
Mechanics of Materials-II Lab	ME2541	1
Machine Design-II	ME2253	3
Machine Design-II Lab	ME2251	1
Manufacturing Processes-II	ME3822	2
Manufacturing Processes-II Lab	ME3821	1
Applied Thermodynamics-II	ME2423	3
Applied Thermodynamics-II Lab	ME2421	1
Fluid Mechanics-II	ME3723	3
Fluid Mechanics-II Lab	ME3721	1
Instrumentation & Control	MEEE4033	3
Instrumentation & Control Lab	MEEE4031	1
Heat & Mass Transfer	ME3432	2
Heat & Mass Transfer Lab	ME3431	1

c) Mechanical Engineering Depth Courses (22 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
IC Engines	ME3443	3
IC Engines Lab	ME3441	1
Technical Elective-I	ME3-----	2
Technical Elective-II	ME4---	2
Engineering Maintenance and Failure Analysis	ME4563	3
Finite Element Analysis	ME4262	2
Finite Element Analysis Lab	ME4261	1
Mechanisms & Mechanical Vibrations Lab	ME4551	1
Refrigeration and Air-Conditioning	ME4463	3
Refrigeration and Air-Conditioning Lab	ME4461	1
Power Plants	ME4453	3

d) Natural Sciences Courses (15 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Applied Mathematics I	MEMT1013	3
Applied Physics	ME1113	3
Applied Mathematics II	MEMT1023	3
Applied Mathematics III	MEMT2043	3
Numerical Analysis	MEMT3053	3

e) Computing Courses (02 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Computer System and Programming	MECSL1011	1
Computer System and Programming Lab	MECST1011	1

f) Inter Departmental Engineering Electives (10 Cr Hrs.)

Course Title	Code	Cr. Hrs.
Basic Electrical Engineering	MEEE3012	2
Basic Electrical Engineering Lab	MEEE3011	1
Industrial Electronics	MEEE3022	2
Industrial Electronics Lab	MEEE3021	1

g) Humanities Courses (13 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
English I	ENG101	3
English II	ENG102	3
English III	ENG203	2
English III Lab	ENGL203	1
Islamic Studies	ISL201	2
Pakistan Studies	PAK101	2

h) Management Sciences (13 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Management Elective-I	MEMG3----	2
Entrepreneurship	MEMG3022	2
Metrology and Quality Assurance	MEMG4073	3
Metrology and Quality Assurance Lab	MEMG4071	1
Management Elective -II	MEMG4---	2
Health Safety and Environment	MEMG3042	2
Career Lab	CBL301	1

i) Elective Courses (04 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Renewable Energy Technology	ME3472	2
Gas Dynamics	ME3732	2
CFD	ME3752	2
Mechanical Vibrations	ME4552	2
Introduction to Mechatronics	ME4272	2
Automation and Robotics	ME4282	2
Nuclear Engineering	ME4482	2
Mechanical Engineering Design	ME4292	2

j) Management Elective Courses (04 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Industrial Management and Economics	MEMG3052	2
Total Quality Management	MEMG3082	2
Operations Management	MEMG4092	2
Project Management	MEMG4032	2
Engineering Law	MEG4022	2

k) Industrial Internship (ME4000)

All students shall be required to undergo accumulated industrial internship of 6 weeks in the 3rd/4th years of studies.

Design Project (06 Cr. Hrs.)

After completing 6 semesters of studies, the student will demonstrate their practical skills in the field of mechanical engineering by undertaking a Final Year Project (FYP). The project stands for 6 credit hours and will be completed in 4th year, i.e., 7th and 8th semesters.

Course Title	Code	Cr. Hrs.
Final Year Project-I	ME4912	2
Final Year Project-II	ME4924	4

Community Work (ME3000)

All students shall be compulsorily rendering 65 hours of voluntary social work during the course of studies, which is a prerequisite for the award of a degree.

Programme Duration

The programme is 4-year bachelor with two semesters per academic year. Fall Semester shall be usually commencing in September/October each year whereas Spring Semester shall be staring in February.

Scheme of Studies

B.Sc. in Mechanical Engineering

Semester I (16 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	ENG110	Functional English	3	Humanities
2	MEMT1103	Applied Mathematics-I	3	Natural Sciences
3	ME1112	Applied Physics	2	Natural Sciences
4	ME1121	Applied Physics Lab	1	Natural Sciences
5	ME1231	Engineering Graphics	1	Eng. Foundation
6	ME1230	Engineering Drawing Lab	1	Eng. Foundation
7	ICT101	Applications of Information and Communication Technologies	2	Computer Sciences
8	ICTL101	Applications of Information and Communication Technologies Lab	1	Computer Sciences
9	ISL110/Eth101	Islamic Studies/Ethics (for non-Muslims)	2	Humanities

Semester II (18 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	MEMT1113	Applied Mathematics -II	3	Natural Sciences
2	PAK102	Ideology and Constitution of Pakistan	2	Humanities
3	ME1312	Workshop Technology Lab	2	Eng. Foundation
4	ME1612	Engineering Materials	2	Eng. Foundation
5	ME1512	Engineering Mechanics - I	2	Eng. Foundation
6	MEL1211	CAD Lab	1	Eng. Foundation
7	ME1413	Applied Thermodynamics – I	3	Eng. Foundation
8	MECS1012	Computer Systems and Programming	2	Computer & Information Sciences
9	MECS1011	Computer Systems and Programming Lab	1	Computer and Information Sciences

Semester III (17 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	MEEE2012	Electrical Engineering	2	Multi-Disciplinary Engineering
2	ME2412	Applied Thermodynamics - II	2	Major Based Core (Breadth)
3	ME2411	Applied Thermodynamics - II Lab	1	Major Based Core (Breadth)
4	ME2523	Mechanics of Materials - I	3	Eng. Foundation
5	MEMT2123	Applied Mathematics - III	3	Natural Sciences
6	ME2532	Engineering Mechanics - II	2	Eng. Foundation
7	ME2531	Engineering Mechanics - II Lab	1	Eng. Foundation
8	ME2713	Fluid Mechanics – I	3	Eng. Foundation

Semester IV (16 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	ME2812	Manufacturing Processes	2	Major Based Core (Breadth)
2	ME2222	Mechanics of Machines	2	Eng. Foundation
3	ME37232	Fluid Mechanics – II	2	Major Based Core (Breadth)
4	ME3721	Fluid Mechanics – II Lab	1	Major Based Core (Breadth)
5	ME2543	Mechanics of Materials – II	3	Major Based Core (Breadth)
6	ME2541	Mechanics of Materials – II Lab	1	Major Based Core (Breadth)
7	ME2242	Machine Design – I	2	Major Based Core (Breadth)
8	MECS2042	Numerical Analysis	2	Natural Sciences
9	MECS2041	Numerical Analysis Lab	1	Natural Sciences

Semester V (17 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	ENG211	Expository Writing	3	Humanities
2	MEEE3012	Measurement and Instrumentation	2	Flexible Engg/ Non-Engg Courses
3	ME3252	Machine Design - II	2	Major Based Core (Breadth)
4	ME3251	Machine Design - II Lab	1	Major Based Core (Breadth)
5	ME3822	Computer Aided Manufacturing	2	Major Based Core (Breadth)
6	ME3821	Manufacturing Processes & CAM Lab	1	Major Based Core (Breadth)
7	MEMG3041	Occupational Health & Safety	1	Multi-Disciplinary Engineering
8	MEMT31X2	Mathematics Elective	2	Flexible Engg/ Non-Engg Courses
9	MEEE3022	Industrial Electronics	2	Multi-Disciplinary Engineering
10	MEEE3021	Industrial Electronics Lab	1	Multi-Disciplinary Engineering

Semester Summer (0 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	ME3910	Supervised Internship	0	Mandatory and non-Credit

Semester VI (18 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	ENT102	Entrepreneurship	2	Management Sciences
2	ME3432	Heat & Mass Transfer	2	Major Based Core (Breadth)
3	ME3431	Heat & Mass Transfer Lab	1	Major Based Core (Breadth)
4	ME3262	Finite Element Analysis	2	Major Based Core (Depth)
5	ME3261	Finite Element Analysis Lab	1	Major Based Core (Depth)
6	AH102	Fundamentals of Philosophy/Arts and Humanities Elective	2 2	Humanities Major Based Core (Depth)
7	ME3442	IC Engines	1	Major Based Core (Depth)
8	ME3441	IC Engines Lab	2	Humanities
9	CCE201	Civics & Community Engagement	2	Computer and Information Sciences
10	MECS3072	Applied AI and Machine Learning		
11	MECS3071	Applied AI and Machine Learning Lab	1	Computer and Information Sciences

Semester VII (17 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	MEEE40332	Control Engineering	2	Major Based Core (Breadth)
2	MEEE4031	M&I and Control Lab	1	Flexible Eng./ Non-Eng. Courses
3	SS103	Sociology / Social Sciences Elective	2	Humanities
4	ME----	Technical Elective-I	3/ (2+1)	Major Based Core (Depth)
5	MEMG4362	Project Management	2	Management Sci
6	ME4913	Final Year Project	3	Final Year Design Project (FYDP)/ Capstone
7	ME4463	Refrigeration & Air-conditioning	3	Major Based Core (Depth)
8	ME4461	Refrigeration & Air-conditioning Lab	1	Major Based Core (Depth)

Semester VIII (15 Cr. Hrs.)

S. No	Course Code	Course Title	Cr. Hrs.	Type
1	ME4552	Mechanical Vibrations	2	Major Based Core (Depth)
2	ME4551	Mechanical Vibrations Lab	1	Major Based Core (Depth)
3	MEMG4832	Reverse Engineering and Inspection Techniques	2	Major Based Core (Depth)
4	MEMGL4831	Reverse Engineering and Inspection Techniques Lab	1	Major Based Core (Depth)
5	ME----	Technical Elective-II	3/ (2+1)	Major Based Core (Depth)
6	ME4212	Mechatronics and Robotics Engineering	2	Flexible Eng./ Non-Eng. Courses
7	ME4211	Mechatronics and Robotics Engineering Lab	1	Flexible Eng./ Non-Eng. Courses
8	ME4923	Final Year Projects	3	Final Year Design Project (FYDP)/ Capstone

M.Sc

Mechanical Engineering

Admission Requirements

- A minimum of 16 years of education leading to BS / BE / B.Sc. in Engineering Technology in Mechanical, Industrial, Mechatronics or aeronautical engineering
- Minimum 2.00/4.00 CGPA or 50% marks in the annual system
- All applicants are required to pass the UCP Admission Test with a 50% score or the GRE/HAT General/equivalent test with a passing score of 50% followed by an interview by the Graduate Admission Committee

Degree Requirements

A student admitted in M.Sc. Mechanical Engineering will have to complete the degree requirements by following any one of the options given below:

- 24 Cr. Hrs. course work with 6 Cr. Hrs. Thesis
- Course work only (10 Courses)

Area	Cr. Hrs.
a) Core Courses	06
b) Specialization Courses	15
c) Elective	03
d) Thesis/Project/Additional Courses	06
Total	30

a) Core Courses

Course Title	Code	Cr. Hrs.
Research Methodology	ME5013	3
Modeling and Simulation	ME6023	3



b) Specialization Courses

i) Design and Manufacturing

Course Title	Code	Cr. Hrs.
Advanced Manufacturing Processes	ME5813	3
Mechanics of Fracture and Fatigue	ME5213	3
Advanced Mechanical Vibrations	ME6223	3
Welding and Joining Processes	ME6233	3
Robotics and Control	ME6823	3
Advanced Stress Analysis	ME6243	3

ii) Thermal

Course Title	Code	Cr. Hrs.
Automotive Power Trains	ME5413	3
Advanced Thermodynamics	ME5423	3
CFD for Engineering Applications	ME6713	3
Renewable Energy Systems	ME6433	3
Aerodynamics	ME6723	3
Gas Dynamics	ME6733	3

c) Elective Courses

A student may choose 3 to 9 Cr. Hrs., depending upon the degree completion option, from the given list or any other course offered by the ME department.

Course Title	Code	Cr. Hrs.
Theory of Plates and Shells	ME6253	3
Design of Machine Tools	ME6263	3
Engineering Plasticity	ME6273	3
Mechanics of Composite Materials	ME6283	3
Solar Energy Utilization	ME6443	3
Energy Management	ME6453	3
Advanced Propulsion	ME6463	3
Energy Systems	ME6473	3
Solar Energy Utilization	ME6443	3
Advanced Heat and Mass Transfer	ME6513	3
Boiling and Condensation Heat Transfer	ME6523	3
Industrial Air Conditioning and Refrigeration	ME6533	3
Design of Industrial Boilers and Furnaces	ME6543	3
Fuel Cell Technology	ME6553	3
Turbulent Flow	ME6743	3
Boundary Layer Theory	ME6753	3
Two Phase Flow	ME6763	3
Theory of Granular Flows	ME6573	3
Gradient Optimization Techniques	ME6833	3
Nano Fabrication and Manufacturing	ME6843	3
Quality Engineering and Management	ME6853	3
Product Life Cycle Management	ME6863	3
Productivity Engineering	ME6873	3
Experimental Methods	ME5313	3
Scheduling and Sequencing	ME6883	3
Theory of Metal Cutting	ME6893	3

d) Research Thesis

Course Title	Code	Cr. Hrs.
Research Thesis	ME6916	6
Thesis Continuation	ME6921	1

GPA Requirement

A student is required to earn a minimum of a 2.50/4.00 CGPA on the completion of his/her degree requirements.

Programme Duration

This is nominally a two-year degree programme comprising 4 semesters. There will be a Fall and a Spring semester each year. The maximum duration to complete MS Mechanical Engineering degree is 04 years.

Ph.D

Mechanical Engineering

Admission Requirement

- At least 3.00/4.00 CGPA or 60% marks from an annual system in MS or equivalent degree in Mechanical / Mechatronics / Industrial / Aerospace / Engineering or a relevant engineering discipline (the relevance will be decided by the graduate admission committee)
- All Candidates are required to pass the UCP Admission Test with a 60% score or a test equivalent to GRE/HAT General, conducted by testing bodies accredited by HEC with a passing score of 60% followed by an interview by the Graduate Admission Committee

Programme Duration

The minimum duration for the PhD degree shall be three (03) years and the maximum allowable duration, inclusive of semester breaks, shall be eight (08) years from the date of admission. However, the BASR can relax the upper limit to a maximum of one year.

Degree Requirements

A PhD scholar shall be required to successfully complete the following requirements:

- 18 Cr. Hrs. course work;
- 30 Cr. Hrs. research work;
- comprehensive examination;
- research work synopsis;
- dissertation foreign reviews;
- publication of at least one research paper as first author during his/her doctoral studies in an HEC approved W category (or as per UCP guidelines as communicated time to time in accordance with HEC requirements) research journal for the award of degree, and
- dissertation defense.

A student has to fulfill the residency requirement of at least 02 years at the university. The timeline of various milestones is defined in the table given below.

Activity	Preferred Time (by the end of)	Maximum Time (by the end of)
Course Work	2nd Semester	3 Semesters
Comprehensive Exam	3rd Semester	4 Semesters
Synopsis Qualification	4th Semester	6 Semesters
Thesis Submission	7th Semester	14 Semesters (7 Years)

A PhD scholar shall cease to continue his/her studies if he/she fails to complete 18 Cr. Hrs. coursework within four regular semesters with at least 3.00/4.00 CGPA.

The PhD degree shall be awarded after a minimum of **three (3) years** and not more than eight (8) years after the enrollment of the student; provided that for students who are unable to complete the program within **eight (8) years**, the university may designate a competent authority to determine whether the delay was caused by circumstances beyond the student’s control, and if so, grant an extension in such exceptional circumstances; however, in no event shall the PhD degree be awarded more than **ten (10) years** after the enrolment of the student in the program. The date of notification of the award of the PhD degree subsequent to the PhD defense shall be considered to be the date of the completion of PhD studies.

Scheme of Studies

Ph.D in Mechanical Engineering

Semester I (09 Cr. Hrs.)

Sr. No.	Courses	Cr. Hrs.
1	Course - I	3
2	Course - II	3
3	Course - III	3

Semester II (09 Cr. Hrs.)

Sr. No.	Courses	Cr. Hrs.
1	Course - IV	3
2	Course - V	3
3	Course - VI	3

Semester III (09 Cr. Hrs.)

Sr. No.	Courses	Cr. Hrs.
1	Research Thesis	06
2	Comprehensive Exam	00
3	Synopsis defense	00

Semester IV (30 Cr. Hrs.)

Sr. No.	Courses	Cr. Hrs.
1	Research Thesis	30

A PhD student will have to choose six courses from the following courses after consultation with his thesis supervisor and approval of HoD. If considered necessary by the thesis supervisor and approved by the dean, a PhD candidate might complete not more than 02 courses from another department of the Faculty of Engineering or another faculty of the UCP.

Sr. No.	Course Title	Code	Cr. Hrs.
1	Design Optimization and Analysis Techniques	ME7013	3
2	Project Management	ME7023	3
3	Experimental measurements and data analysis	ME7313	3
4	System Dynamics and Controls	ME7813	3
5	Robotics and Parallel Mechanisms	ME7823	3
6	Turbulence Modelling	ME 7713	3
7	Transport Processes in Energy Systems	ME7723	3
8	Welding & Non-destructive Testing	ME7833	3
9	Advanced Power Plant Systems	ME7413	3
10	Hydrogen and Fuel Cell Engineering	ME7433	3
11	Combustion and Environment	ME7423	3
12	Materials for High Temperature Applications	ME7843	3

List of MSc courses that a PhD candidate can enroll if he has not already studied during his MSc studies is given in the table below:

Sr. No.	Course Title	Code	Cr. Hrs.
1	Modeling and Simulation	ME5013	3
2	Research Methodology	FE5023	3
3	Welding and Joining processes	ME6233	3
4	Mechanics of Fracture and Fatigue	ME5213	3
5	Advanced Mechanical Vibrations	ME6223	3
6	Advanced Stress Analysis	ME6243	3
7	Theory of Plates and Shells	ME6253	3
8	Engineering Plasticity	ME6273	3
9	Mechanics of Composite Materials	ME6283	3
10	Automotive Powertrains	ME5413	3
11	Advanced Thermodynamics	ME5423	3
12	Renewable Energy Systems	ME6433	3
13	Solar Energy Utilization	ME6443	3

Sr. No.	Course Title	Code	Cr. Hrs.
14	Energy Systems	ME6473	3
15	Advanced Heat and Mass Transfer	ME6513	3
16	CFD for Engineering Applications	ME6713	3
17	Aerodynamics	ME6723	3
18	Gas Dynamics	ME6733	3
19	Robotics and Control	ME6823	3
20	Quality Engineering and Management	ME6853	3
21	Selected topics in Mechanical Engineering	ME6903-6993	3
22	Research Thesis	ME7916-7956	6
23	Thesis Continuation	ME7971	0



B.Sc.

Civil Engineering

Admission Requirements

• Minimum 60% marks in F.Sc. Pre-Engineering/F.Sc. Pre-Medical/ICS with Mathematics, Physics or Equivalent with Physics, Chemistry, and Mathematics. In the case of a foreign qualification, equivalence from IBCC will be required

OR

• A combination of Biology, Physics, and Chemistry is also allowed for admission subject to the successful completion of an Eight-week condensed course in Mathematics. A total of 40% of seats within the allowed intake are available for pre-medical students. A separate admission test after the qualifying mathematics course will be conducted to determine the merit of admission

OR

• Diploma of Associate Engineer Examination in relevant discipline securing at least 60% marks in aggregate.

2.3.1. All applicants are required to pass the PEC-approved test or UCP Admission Test

Degree Requirements

Each candidate for the B.Sc. Civil Engineering degree is required to complete successfully 133 Cr. Hrs. with the minimum CGPA of 2.0 on the scale of 4.0 as per the following detail:

Given below is the scheme of studies as per requirements of HEC and Pakistan Engineering Council. In addition to the technical courses, it also includes advanced analytical and computational tools of Computer Science.

Area	Cr. Hrs.
a) Civil Engineering Foundation Courses	28
b) Civil Engineering Breadth Courses	15
c) Civil Engineering Depth Courses	33
d) Natural Sciences	19
e) Computing Courses	02
f) Inter Departmental Engineering Elective (IDEE)	09
g) Humanities Courses	15
h) Management Courses	06
i) Industrial Internship	00
j) Survey Camp	00
k) Design Project	06
Total	133

a) Civil Engineering Foundation Courses (28 Cr. Hrs.)

Sr. No.	Course Title	Code	Cr. Hrs.
1	Strength of Materials I	CE2212	2
2	Strength of Materials I Lab	CE2211	1
3	Theory of Structures I	CE3233	3
4	Theory of Structures I Lab	CE3231	1
5	Civil Engineering Drawing	CE1112	2
6	Civil Engineering Materials	CE1122	2
7	Civil Engineering Materials Lab	CE1121	1
8	Engineering Surveying I	CE1142	2
9	Engineering Surveying I Lab	CE1152	2
10	Civil Engineering Drawing & Estimation	CE2181	1
11	Civil Engineering Drawing & Estimation Lab	CE2182	2
12	Fluid Mechanics-I	CE2412	2
13	Fluid Mechanics-I Lab	CE2411	1
14	Engineering Geology	CE1133	3
15	Soil Mechanics	CE3512	2
16	Soil Mechanics Lab	CE3511	1

b) Civil Engineering Breadth Courses (15 Cr. Hrs.)

Sr. No.	Course Title	Code	Cr. Hrs.
1	Plain and Reinforced Concrete I	CE3262	2
2	Plain and Reinforced Concrete I Lab	CE3261	1
3	Engineering Surveying II	CE2172	2
4	Engineering Surveying II Lab	CE2171	1
5	Fluid Mechanics II	CE3422	2
6	Fluid Mechanics II Lab	CE3421	1
7	Transportation Engineering I	CE4532	2
8	Transportation Engineering I Lab	CE4531	1
9	Environmental Engineering I	CE3612	2
10	Environmental Engineering I Lab	CE3611	1

c) Civil Engineering Depth Courses (33 Cr. Hrs.)

Sr. No.	Course Title	Code	Cr. Hrs.
1	Steel Structures	CE3242	2
2	Steel Structures Lab	CE3241	1
3	Plain and Reinforced Concrete II	CE4272	2
4	Plain and Reinforced Concrete II Lab	CE4271	1
5	Design of Structures	CE4201	1
6	Design of Structures Lab	CE4211	1
7	Structural Engineering	CE4283	3
8	Hydraulics Engineering	CE4442	2
9	Hydraulics Engineering Lab	CE4441	1
10	Irrigation and Drainage Engineering	CE4452	2
11	Irrigation and Drainage Engineering Lab	CE4451	1
12	Geotechnical & Foundation Engineering	CE4522	2
13	Geotechnical & Foundation Engineering Lab	CE4521	1
14	Transportation Engineering II	CE4542	2
15	Transportation Engineering II Lab	CE4541	1
16	Environmental Engineering II	CE4622	2
17	Environmental Engineering II Lab	CE4621	1
18	Strength of Materials II	CE3223	3
19	Strength of Materials II Lab	CE3221	1
20	Theory of Structures II	CE3252	2
21	Theory of Structures II Lab	CE3251	1

d) Natural Sciences Courses (19 Cr. Hrs.)

Sr. No.	Course Title	Code	Cr. Hrs.
1	Applied Mathematics I	CEMT1013	3
2	Applied Mathematics II	CEMT1023	3
3	Applied Mathematics III	CEMT2033	3
4	Engineering Mechanics	CEME2023	3
5	Engineering Mechanics Lab	CEME2021	1
6	Numerical Analysis	CEMT2043	3
7	Probability and Statistics	CEMT3053	3

e) Computing Courses (02 Cr. Hrs.)

Sr. No.	Course Title	Code	Cr. Hrs.
1	Computer Programming	CECS1011	1
2	Computer Programming Lab	CECS1021	1

f) Inter Departmental Engineering Elective (09 Cr. Hrs.)

Sr. No.	Course Title	Code	Cr. Hrs.
1	Basic Electro Mechanical Engineering	CEME1013	3
2	Basic Electro Mechanical Engineering Lab	CEME1011	1
3	Architectural and Town Planning	CE2162	2
4	Entrepreneurship	CEMG2013	3

g) Humanities Courses (15 Cr. Hrs.)

Sr. No.	Course Title	Code	Cr. Hrs.
1	English-I	CEHU1033	3
2	Pakistan Studies	CEHU1023	3
3	Islamic Studies	CEHU1013	3
4	English-II	CEHU2043	3
5	English-III	CEHU3053	3

h) Management Courses (06 Cr. Hrs.)

Sr. No.	Course Title	Code	Cr. Hrs.
1	Construction Engineering and Management	CEMG2313	3
2	Engineering Hydrology	CE3432	2
3	Engineering Hydrology Lab	CE3431	1

i) Survey Camp (CE3000)

Students are required to register, attend and complete a minimum of 2 weeks of Survey Camp following the fourth semester of their degree program.

Course CE2172 is a pre-requisite for Survey Camp. A formal evaluation will be carried out and Pass / Fail grades will be awarded to the students.

k) Design Project (06 Cr. Hrs.)

Sr. No.	Course Title	Code	Cr. Hrs.
1.	Civil Engineering Project I	CE4912	2
2.	Civil Engineering Project II	CE4924	4

Community Work (CE3100)

Each student is required to complete 65 hours of community work, usually after the 4th semester which would be a prerequisite for the award of a degree.

Programme Duration

This is a four years degree program comprising 8 semesters. There will be a Fall and a Spring semester each year. The summer semester will be utilized for internship or deficiency courses. The maximum duration to complete B.Sc. Civil Engineering degree is 07 years.

Scheme of Studies

B.Sc. in Civil Engineering

Semester I (15 Cr. Hrs.)

Sr. No	Course Code	Course Title	Cr. Hrs.	Type
1	CE 1212	Civil Engineering Materials	2	EF
2	CE 1211	Civil Engineering Materials LAB	1	EF
3	CEME1012	Applied Physics & Electro-Mechanical Fundamentals	2	NS
4	CEME 1011	Applied Physics & Electro-Mechanical Fundamentals LAB	1	NS
5	CEHU 1013	English-I (Functional English)	3	HU
6	CEMT 1013	Quantitative Reasoning-I	3	NS
7	CEHU 1032	Ideology and Constitution of Pakistan	2	HU
8	ICT 1042	Applications of ICT	2	CS
9	ICT 1041	Applications of ICT Lab	1	CS

Semester II (18 Cr. Hrs.)

Sr. No	Course Code	Course Title	Cr. Hrs.	Type
1	CE 1112	Engineering Drawing LAB	2	EF
2	CE 1122	Engineering Surveying	2	EF
3	CE 1121	Engineering Surveying LAB	1	EF
4	CEMD 1712	Geology for Engineers	2	MD
5	CEHU 1022/ ISL 110	Islamic Studies/ Ethics	2	HU
6	CE 1132	Engineering Mechanics	2	EF
7	CE 1131	Engineering Mechanics LAB	1	EF
8	CECS 1011	Computer Programming	2	ACIS
9	CECS 1012	Computer Programming LAB	1	ACIS
10	CEMT 1023	Quantitative Reasoning-II	3	NS

Semester III (17 Cr. Hrs.)

Sr. No	Course Code	Course Title	Cr. Hrs.	Type
1	CE 2141	Civil Engg. Drawing & Graphics	1	ACIS
2	CE 2142	Civil Engg. Drawing & Graphics LAB	2	ACIS
3	CE 2151	Advanced Engineering Surveying	1	EB
4	CE 2152	Advanced Engineering Surveying LAB	1	EB
5	CE 2412	Fluid Mechanics	2	EF
6	CE 2411	Fluid Mechanics LAB	1	EF
7	CE 2222	Mechanics of Solids-I	2	EF
8	CE 2221	Mechanics of Solids-I LAB	1	EF
9	CE 2232	Structural Analysis-I	2	EF
10	CE 2231	Structural Analysis-I LAB	1	EF
11	CEMT 2033	Applied Mathematics-I	3	NS

Semester IV (17 Cr. Hrs.)

Sr. No	Course Code	Course Title	Cr. Hrs.	Type
1	CE 2312	Construction Engineering and Cost Estimation	2	FE
2	CE 2322	Construction Engineering and Cost Estimation LAB	2	FE
3	CEHU 2042	Arts and Humanities Elective*	2	HU
4	CEMT 2043	Applied Mathematics-II	3	NS
5	CE2242	Mechanics of Solids-II	2	MB
6	CE2241	Mechanics of Solids-II LAB	1	MB
7	CE 3512	Soil Mechanics	2	EF
8	CE 3511	Soil Mechanics LAB	1	EF
9	CEHU 2052	Social Science Elective**	2	HU
10	CEMD 2720	Survey Camp (NC)	-	MD

Semester V (16 Cr. Hrs.)

Sr. No	Course Code	Course Title	Cr. Hrs.	Type
1	CEMT 3053	Numerical Analysis	3	NS
2	CE 3422	Advanced Fluid Mechanics	2	EB
3	CE 3421	Advanced Fluid Mechanics LAB	1	EB
4	CEHU 3063	Expository Writing	3	HU
5	CE 3522	Geotechnical Engineering	2	MB
6	CE 3521	Geotechnical Engineering LAB	1	MB
7	CE 3253	Reinforced Concrete Design-I	3	EB
8	CE 3251	Reinforced Concrete Design-I LAB	1	EB

Semester VI (17 Cr. Hrs.)

Sr. No	Course Code	Course Title	Cr. Hrs.	Type
1	CE 3262	Reinforced Concrete Design-II	2	MB
2	CE 3261	Reinforced Concrete Design-II LAB	1	MB
3	CE 3612	Environmental Engineering	2	EB
4	CE 3611	Environmental Engineering LAB	1	EB
5	CE 3272	Structural Analysis-II	2	EB
6	CE 3271	Structural Analysis-II LAB	1	EB
7	CE 3432	Engineering Hydrology	2	EB
8	CE 3431	Engineering Hydrology LAB	1	EB
9	CE 3532	Highway & traffic Engineering	2	FE
10	CE 3531	Highway & traffic Engineering LAB	1	FE
11	CEHU 3072	Civics and Community Engagement	2	HU
12	CEMD 3730	Community Service (NC)	-	MD
13	IT3810	Internship (6-8 weeks) mandatory and qualifying (NC)	-	IT

Semester VII (15 Cr. Hrs.)

Sr. No	Course Code	Course Title	Cr. Hrs.	Type
1	CE 4542	Foundation Engineering	2	MB
2	CE 4552	Pavement Analysis & design	2	MB
3	CE 4551	Pavement Analysis & design LAB	1	MB
4	CEMD 4741	Modelling & Simulation	1	MD
5	CEMD 4751	Modelling & Simulation LAB	1	MD
6	CE 4442	Hydraulics Engineering	2	MB
7	CE 4441	Hydraulics Engineering LAB	1	MB
8	CEMG 4311	Project Management	1	MS
9	CEMG 4321	Project Management LAB	1	MS
10	CE 4913	Civil Engineering Projects (FY DP Part-I)	3	FYDP

Semester VIII (15 Cr. Hrs.)

Sr. No	Course Code	Course Title	Cr. Hrs.	Type
1	CE 4452	Irrigation Engineering	2	MB
2	CE 4451	Irrigation Engineering LAB	1	MB
3	CE 4461	Geo-informatics	1	FE
4	CE 4461	Geo-informatics LAB	1	FE
5	CE 4281	Steel Structures	2	FE
6	CE 4291	Steel Structures LAB	1	FE
7	CEMD 4762	Architecture & Town Planning	2	MD
8	CEMD 4771	Occupational Health and safety	1	MD
9	CEMG 4332	Entrepreneurship LAB	1	MS
10	CE 4923	Civil Engineering Projects (FYDP Part-II)	3	FYDP

M.Sc.

Civil Engineering

Admission Requirements

- A minimum of 16 years of education leading to BS / BE / B.Sc. in Civil Engineering or equivalent
- Minimum 2.00/4.00 CGPA or 50% marks in the annual system
- All applicants are required to pass the UCP Admission Test with a 50% score or the GRE/HAT General/equivalent test with a passing score of 50% followed by an interview by the Graduate Admission Committee

Degree Requirements

A student admitted in this programme will have to complete the degree requirements by following any one of the options given below:

- 24 Cr. Hrs. course work with 6 Cr. Hrs. Thesis
- Course work only (10 Courses)

Each candidate for the M.Sc. Civil Engineering degree is required to successfully earn 30 Cr. Hrs. as per the following detail:

Area	Cr. Hrs.
a) Specialization Courses	18
b) Elective	06
c) Thesis/Project/Additional Courses	06
Total	30

a) Specialization Courses

i) Structural Engineering

Sr. No.	Course Title	Code	Cr. Hrs.
1	Advanced Structural Analysis	CED6113	3
2	Structural Dynamics	CED6123	3
3	Advanced Concrete Technology	CED6213	3
4	Theory of Plates and Shells	CED6153	3
5	Conceptual Design of Bridges	CED6253	3
6	Design of Timber Structures	CED6263	3
7	Advanced Reinforce Concrete Design	CED6223	3
8	Finite Element Methods in Engineering	CED6133	3
9	Earthquake Engineering	CED6143	3
10	Pre-stressed Concrete	CED6233	3
11	Steel Structures	CED6243	3
12	Design of Glass Structures	CED6273	3
13	Design for Fire Resistance of Structures	CED6283	3

ii) Hydraulics & Irrigation Engineering

Sr. No.	Course Title	Code	Cr. Hrs.
1	Design of Hydraulic Structures	CED6513	3
2	Irrigation Engineering and Practices	CED6623	3
3	Advanced Fluvial Hydraulics	CED6533	3
4	River Engineering and Flood Management	CED6553	3
5	Computer Aided Design of Hydraulic Structures	CED6573	3
6	Application of RS & GIS	CED6593	3
7	Water Resources Engineering	CED6643	3
8	Ground Water Engineering	CED6673	3
9	Statistical Hydrology	CED6683	3
10	Advanced Open Channel Hydraulics	CED6523	3
11	Applied Hydrology	CED6613	3
12	Sediment Transport	CED6543	3
13	Hydro Power Engineering	CED6563	3
14	Drainage Engineering	CED6583	3
15	Climate Change and Water Resources	CED6633	3
16	Catchment Modeling	CED6653	3
17	Hydrometeorology	CED6663	3
18	Integrated Water Resource Management	CED6693	3

iii) Geotechnical Engineering

Sr. No.	Course Title	Code	Cr. Hrs.
1	Advanced Soil Mechanics	CED6313	3
2	Geotechnical Investigation	CED6323	3
3	Geotechnical Engineering in Professional Practice	CED6353	3
4	Advanced Foundation Engineering	CED6433	3
5	Earth Retaining Structures	CED6443	3
6	Foundation Engineering	CED6413	3
7	Dam Engineering	CED6423	3
8	Soil Improvement Techniques	CED6333	3
9	Soil Dynamics	CED6343	3
10	Soil Erosion & Watershed Management	CED6373	3
11	Rock Engineering	CED6453	3

b) Elective Courses

Elective courses (two courses, 6 Cr. Hrs.) can be taken from any specialization with the approval of academic advisor.

c) Research Thesis

Sr. No.	Course Title	Code	Cr. Hrs.
1.	Research Thesis	CE6916	6
2.	Thesis Continuation	CE6921	1

CGPA Requirement

A student is required to earn a minimum of 2.50/4.00 CGPA on the completion of his/her degree requirements.

Programme Duration

This is nominally a two-year degree programme comprising 4 semesters. There will be a Fall and a Spring semester each year. The maximum duration to complete MSc Civil Engineering degree 04 years.



PhD

Civil Engineering

Admission Requirements

- At least 3.00/4.00 CGPA or 60% marks from an annual system in MS or equivalent degree in a relevant discipline
- All Candidates are required to pass the UCP Admission Test with a 60% score or a test equivalent to GRE/HAT General, conducted by testing bodies accredited by HEC with a passing score of 60% followed by an interview by the Graduate Admission Committee

- Statement of Purpose

As part of the application for admission to PhD programs, applicants shall be required to submit a statement of purpose, which shall form an integral part of the application. The admissions committee shall use the information provided to ascertain the preparedness and interest of the candidate in pursuing doctoral studies, and whether the department has the requisite resources to train and supervise the doctoral candidate in the subspeciality in which the applicant is interested. A statement of purpose shall, at least, include the following:

1. Title of the potential research proposal
2. Clear articulation of the current understanding of the intended field and ideas for potential research
3. Explanation of the intended impact of the proposed research
4. The prospective candidates shall demonstrate passion and enthusiasm for the area of research

- Intradisciplinary Qualifications

The intradisciplinary admission will only be allowed, if:

Candidate has qualification equivalent/relevant to M.Sc. Civil Engineering in

- Agricultural Engineering
- Building & Architectural Engineering
- Transportation Engineering
- Environmental Engineering and Sciences
- Computer Engineering
- Geoinformatics Engineering
- Geological Engineering
- Applied Geology
- Computer Science
- Civil Technology
- Agricultural Technology

- Forestry and Range Management
- Agriculture (with major in water resources management or soil science or Economics or Forestry)
- Marketing and Agribusiness
- Soil and Environmental Sciences
- Water Resources ManagementWater Resources Management & Planning
- Environmental Engineering and Sciences
- Hydrology
- Agricultural and Applied Economics
- Hydrology and Water Resources Management
- Any other degree approved by Academic Council and recognized by the Higher Education having sixteen years education with first division or CGPA of at least 3.0 out of 4.0.
- Forestry and Range Management
- Agriculture (with major in water resources management or soil science or Economics or Forestry)
- Marketing and Agribusiness
- Soil and Environmental Sciences
- Water Resources Management
- Water Resources Management & Planning
- Environmental Engineering and Sciences
- Hydrology
- Agricultural and Applied Economics
- Hydrology and Water Resources Management
- Any other degree approved by Academic Council and recognized by the Higher Education having sixteen years education with first division or CGPA of at least 3.0 out of 4.0

b) The applicant has a strong interest in pursuing a PhD in a different discipline

c) The applicant has passed GRE-Subject/Equivalent Test6 with minimum 50% marks in the discipline of admission and has taken 6-9 CH of deficiency courses of level 7

d) The admission committee is satisfied that the applicant's knowledge of the primary area (level 7) has sufficiently prepared him or her to undertake the course of study of the doctoral program (or, in the opinion of the admissions committee, the preparation can be deemed satisfactory by taking a few additional courses after starting the program)

Curriculum PhD Civil Engineering

A student enrolled in a PhD (Civil engineering) has to complete 06 courses in consultation with his supervisor and program coordinator. A semester-wise breakdown for completion of the PhD degree in 03 years is given below. A PhD candidate will be allowed to register for a maximum of three courses in one semester.

A PhD scholar will not be allowed to register in a course that he has studied during his master’s degree. In case of those students who have previously completed a graduate degree in the same discipline (MS/MPhil or equivalent), the university shall notify a policy (which may vary by discipline) with objective criteria allowing such students to receive credit for prior coursework for not more than 50% of the total credit requirement of the program.

Semester I (09 Cr. Hrs.)

Sr. No.	Courses	Cr. Hrs.
1	Course - I	3
2	Course - II	3
3	Course - III	3

Semester II (09 Cr. Hrs.)

Sr. No.	Courses	Cr. Hrs.
1	Course - IV	3
2	Course - V	3
3	Course - VI	3

Semester III (06 Cr. Hrs.)

Sr. No.	Courses	Cr. Hrs.
1	Research Thesis	06
2	Comprehensive Exam	00
3	Synopsis defense	00

Semester IV (06 Cr. Hrs.)

Sr. No.	Courses	Cr. Hrs.
1	Research Thesis	24

Courses for PhD in Civil Engineering

Sr. No.	Course Title	Code	Cr. Hrs.
1	Structural Fire Engineering	CE7103	3
2	Nano Secrets in Concrete	CE 7113	3
3	Advanced Concrete Technology-II	CE 7123	3
4	Performance Based Seismic Design	CE 8103	3
5	Non-linear Structural Analysis	CE 8113	3
6	Earthquake Seismology & earthquake Hazard	CE 8123	3
7	Geotechnical Site investigation	CE 7203	3
8	Mechanical Properties of soils	CE7213	3
9	DAM & Rock Engineering	CE 7223	3
10	Geotechnical Earthquake Engineering	CE8203	3
11	Unsaturated Soil Mechanics in Engineering Pract	CE 8213	3
12	Soil Strength and Slope Stability	CE 8223	3
13	Hydrological System Modeling	CE 7303	3
14	Urban Hydrology	CE 7313	3
15	Hydrodynamics	CE 7323	3
16	Computational Hydraulics	CE 8303	3
17	Computational Fluid Dynamics	CE 8313	3
18	Advanced Fluid Mechanics	CE 8323	3
19	An Introduction to Intelligent Transportation Systems	CE 7403	3
20	Urban Transportation Planning	CE 7413	3
21	Logistics Systems	CE 7423	3
22	Airport Planning and Design	CE 8403	3
23	Public Transportation Systems	CE 8413	3
24	Transportation Policy, Strategy, and Management	CE 8423	3
25	Environmental Framework on Disaster	CE 7503	3
26	Environmental Impact Assessment	CE 7513	3
27	Waste Water Treatment and Design	CE 7523	3
28	Air and Noise Pollution Control	CE 8503	3
29	Environmental Chemistry and Microbiology	CE 8513	3
30	Sustainable Urban Land use planning and Management	CE 8523	3
31	Construction Project Scheduling	CE7603	3
32	Project Cost Estimate	CE 7613	3
33	Contract Management	CE 7623	3

Sr. No.	Course Title	Code	Cr. Hrs.
34	Sustainable Construction	CE 8603	3
35	Building Information Modeling	CE 8613	3
36	Lean Construction	CE 8623	3
37	Advanced Topics in Civil Engineering	CE8903-8993	3
38	Synopsis Evaluation	CE 7000	0
39	Research Thesis	CE7916-7956	30
40	Thesis Continuation	CE 7971	0
41	Thesis Defense	CE 8000	0

Career prospects of the program

Jobs directly related to PhD Civil Engineering degree include:

• Teaching Jobs	• Research Jobs
• Post-Doctorate	• Consulting Civil Engineer
• Contracting Civil Engineer	• Client Civil Engineer
• Structural Engineer	• Water Engineer
• Geotechnical Engineer	

Scope of the Program

During this time of science and technology, research and development requires highly qualified and trained engineers, especially in the field of Structural, Geotechnical and Water Resource Engineering. It is of paramount importance to gain professional expertise in the field with a special focus on emerging problems in the Construction Industry. The formulation of theories and proposing new and innovative ideas and solutions with the highest level of accuracy, originality and quality would be the hallmark of the scholars of this program.

Degree Requirements

A PhD candidate shall be awarded degree on successful completion of the following requirements:

- 18 Cr. Hrs. Course Work
- 30 Cr. Hrs. Research Work

- Comprehensive Examination
- Research Work Synopsis
- Dissertation Foreign Reviews
- Publication:

1. At least one research article in W category journal or two research articles in X category journals, for Science disciplines
2. The PhD researcher shall be the first author of these publications
3. The research article shall be relevant to the PhD research work of the PhD researcher
4. The article shall be published after approval of the research synopsis
5. The article shall be published in a relevant research journal

- Dissertation Foreign Reviews or as per revised HEC Policy 2023
- Dissertation Final Defense

A student has to fulfil the residency requirement of at least 02 years at the university. The timeline of various milestones is defined in the table given below.

Activity	Preferred Time (by the end of)	Maximum Time (by the end of)
Course Work	2nd Semester	3rd Semester
Comprehensive Exam	3rd Semester	5th Semester
Synopsis Qualification	4th Semester	6th Semester
Thesis Submission	7th Semester	16th Semester

A PhD scholar shall cease to continue his/her studies if he/she fails to complete 18 Cr. Hrs. coursework within four regular semesters with at least 3.00/4.00 CGPA.

The PhD degree shall be awarded after a minimum of three (3) years and not more than eight

(8) years after the enrolment of the student; provided that for students who are unable to complete the program within eight (8) years, the university may designate a competent authority to determine whether the delay was caused by circumstances beyond the student’s control, and if so, grant an extension in such exceptional circumstances; however, in no event shall the PhD degree be awarded more than ten (10) years after the enrolment of the student in the program. The date of notification of the award of the PhD degree after the PhD defense shall be considered to be the date of the completion of PhD.





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080-000-827 | www.ucp.edu.pk

1-Khayaban-e-Jinnah Road, Johar Town, Lahore

