

Programs in Engineering

Dean's Message

National University of Computer and Emerging Sciences is one of the most prestigious universities in Pakistan. As the Dean of Engineering, I am proud to say that our electrical engineering program is offered at four of our campuses, while the civil engineering program is exclusively available at our Lahore campus. Our engineering programs cater to students at every level, including Bachelor of Science (BS), Master of Science (MS), and Doctorate (PhD) degrees.

Our engineering programs are renowned for their excellence, thanks to our highly qualified faculty members who are dedicated to providing students with the knowledge and skills they need to succeed in their careers. Our faculty members are experts in their fields and have extensive experience working in industry and academia. They bring this wealth of knowledge and experience to the classroom, providing students with a comprehensive education that is relevant to the needs of the industry. At National University of Computer and Emerging Sciences, we also place a strong emphasis on research. Our well-established labs and facilities provide our students with the opportunity to engage in cutting-edge research and contribute to the advancement of their respective fields. We have a strong culture of collaboration with universities and industries around the world, which



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PhD (EE), Graz University of Technology, Austria (2007)

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allows our students and faculty members to exchange ideas, share knowledge and work on projects of mutual interest.

Our engineering programs have been accredited by the Pakistan Engineering Council (PEC) and have achieved Level-II accreditation under the Washington Accord. This recognition is a testament to the quality of our programs and the rigorous standards that we uphold. Our graduates are well-prepared to enter the workforce and make significant contributions to their respective fields. As a result, our alumni are placed around the globe in reputed organizations such as Vodafone, STC, Huawei, Taradata, IBM, Schlumberger, MOL, Volvo, Samsung, Nokia and many others.

We are committed to providing our students with a world-class education that will prepare them for successful careers and help them make a positive impact on society.

Bachelor of Science (Civil Engineering)

Program Vision

To achieve national and international recognition through innovation in civil engineering education, research, and community services.

Program Mission

To develop highly competent graduates with sound engineering knowledge, social responsibility and lifelong learning skills enabling them for successful careers in civil engineering profession.

We achieve this mission through both undergraduate and graduate programs by:

- Providing vibrant teaching and learning environment to deliver high quality engineering education.
- Maintaining state-of-the-art curriculum that emphasizes practical applications and provides opportunities for hands-on experience.
- Developing attitude for lifelong learning and instil ethical and social values in our graduates that helps them acquire professional leadership.
- Identifying contemporary issues in civil engineering profession and developing innovative solutions through research.

Program Educational Objectives (PEOs)

The objectives of the civil engineering program are to produce graduates who will:

- Successfully engage in contemporary civil engineering practice to solve real-world problems.
- Pursue professional growth through continuous learning and experience.
- Maintain high ethical standards in the conduct of professional practice.
- Attain increasing level of responsibility with interpersonal and communication skills.

■ Career Opportunities

A Civil Engineering degree will prepare you for work in the construction industry as well as in relevant business, management, and finance sectors. With a solid grasp of science, mathematics, and engineering knowledge, you will be able to design, create and build sustainable civil infrastructures to serve society.



Eligibility

- At least 60% marks in SSC (Matric) or an equivalent examination, AND
- At least 60% marks in HSSC (Intermediate with Pre-Engineering) or an equivalent examination. Those who have taken HSSC or an equivalent examination and are awaiting the result can also apply.

Selection Criteria

Admission based on NTS-NAT

- Selection is based on marks obtained in NTS NAT IE.
- Cut-off marks to be determined by the University.

Admission based on SAT

A score of 1200 or more only for students who reside abroad.

Admission on the basis of NU Admission Test

Merit List is prepared by assigning the following weights.

- Matric marks 17%
- Intermediate marks 50%
- Score obtained in NU Admission Test 33%

Award of Degree

For the award of BS Civil Engineering degree, a student must have:

- Earned at least 138 credits through respective core and elective courses offered in study plan, AND
- Minimum CGPA of 2.00

Tentative Study Plan-Bachelor of Science (Civil Engineering)

Code	Title	Cr. Hrs	Pre Req
Semester - I			
CV1002	Engineering Drawing	1+2	
CV1001	Civil Engineering Materials	2+1	
EE1002	Basic Electro Mechanical Engineering	3+1	
MT1001	Applied Calculus	3+0	
SS1005	English Language Skills	2+0	
SS1009	Pakistan Studies	1+0	
Total 12+4			
Semester - II			
CV1003	Engineering Surveying	2+1	
MT1006	Differential Equation	3+0	MT1001
NS1004	Engineering Mechanics	3+1	
NS1003	Engineering Geology	2+0	
SS1007	Islamic and Religious Studies	2+0	
CS1003	Computer Programming	1+2	
Total 13+4			
Semester - III			
CL2001	Introduction to Programming in MATLAB	0+1	
CV2002	Fluid Mechanics	3+1	
CV2001	Advanced Engineering Surveying	2+1	CV1003
CV2005	Mechanics of Solids - I	2+1	NS1004
MG2002	Engineering Economics	2+0	
SSxxxx	Social Sciences Elective - I	2+0	
SS2004	Engineering Ethics	1+0	
Total 12+4			
Semester - IV			
CV2006	Structural Analysis - I	3+0	CV2005
CV2004	Civil Engineering Drawing and Graphics	1+2	CV1002
MT2008	Probability and Statistics	2+0	
CV2008	Quantity Surveying & Esti.	2+0	
MT2007	Numerical Analysis	3+0	MT1006
SS2001	Technical Communication Skills	2+0	SS1005
SSxxxx	Social Sciences Elective - II	2+0	
Total 15+2			
Semester - V			
CV3001	Advanced Fluid Mechanics	3+1	CV2002
CV3009	Hydrology and Water Management	3+1	CV2002
CV4002	Architecture and Town Planning	2+0	
CV3002	Plain and Reinforced Concrete - I	3+1	CV2005
CV2003	Soil Mechanics	3+1	
SS2009	Technical Report Writing and Presentation	0+1	
Total 14+5			
Semester - VI			
CV4005	Steel Structures	3+0	CV2005
CV3008	Structural Analysis - II	3+0	CV2006
CV3006	Environment Engineering - I	2+0	CV2002
CV3004	Transportation Planning and Engineering	3+0	CV1003
CV3007	Mechanics of Solid - II	2+1	CV2005
CV4007	Geotechnical and Foundation Engineering	3+1	CV2003
Total 16+2			
Semester - VII			
CV4001	Plain and Reinforced Concrete - II	3+1	CV3006
CV4004	Highway and Traffic Engineering	3+1	
CV4001	Environmental Engineering - II	2+1	CV3006
CV4008	Fundamentals of Dynamics and its Applications	2+0	CV2006
CV4091	Final Year Project - I	0+3	Note 1
NS4001	Geo-Informatics	1+1	
Total 11+7			
Semester - VIII			
MG3007	Construction Engineering and Management	2+1	
CV4010	Design of Structures	2+1	CV3002 CV4005
CV4009	Hydraulic Engineering	2+1	CV2002
CV4011	Irrigation and Drainage Engineering	2+1	CV3009
CV4092	Final Year Project - II	0+3	CV4091
MGxxxx	Manag. Sciences Elective	2+0	
Total 10+7			
Total 138			



Note 1: Requirement to register in Final Year Project I is Min. 130 CH and CGPA 2.00

Domain	Cr. Hrs
Civil Engineering Core	91
Natural Science	8
Social Sciences	13
Other Engineering	4
Mathematics	11
Management Sciences	7
Computer Programming	4
Total	138

Bachelor of Science (Electrical Engineering)

Program Mission

The mission of School of Electrical Engineering is to

- Develop nurturing environment for delivering quality engineering education through discovery and innovation.
- Show commitment and dedication to teaching by developing state of the art curriculum, grounded in scientific, mathematical and technical knowledge that emphasizes practical applications and provides opportunities for hands-on experience.
- Inculcate lifelong learning and instil ethical and social values in our graduates that helps them acquire professional leadership.
- Act as centre of excellence to identify the problems of national industry and to develop innovative solutions.

Program Educational Objectives

- PEO-1: Versatility: Practice electrical engineering in a broad range of industries
- PEO-2: Learning: Pursue advances in engineering education
- PEO-3: Conduct: Conduct themselves in a responsible, professional, and ethical manner.
- PEO-4: Engineering: Employ creative problem solving skills to devise innovative solutions for the complex engineering problems faced by industry, society and environment.

- PEO-5: Leadership: Emerge as team leaders in their domain of expertise and in activities that support service and economic development, nationally and throughout the world.

Career Opportunities

This versatile degree opens careers in different areas of electrical engineering. You could pursue a career in telecom industry, electronics, and power sector or in embedded system design and software programming.

Eligibility

- At least 60% marks in SSC (Matric) or an equivalent examination AND
- At least 60% marks in HSSC (Pre-Engineering) or an equivalent examination

Those who have taken the HSSC or an equivalent examination and are awaiting result can also apply.

Selection Criteria

Admission based on NTS-NAT

- Selection is based on marks obtained in NTS NAT IE.
- Cut-off marks to be determined by the University.

Admission based on SAT

A score of 1200 or more only for students who reside abroad.

Admission on the basis of NU Admission Test

Merit List is prepared by assigning the following weights.

- Matric marks 17%
- Intermediate marks 50%
- Score obtained in NU Admission Test 33%



Award of Degree

For the award of BS (Electrical Engineering) degree, a student must have:

- Passed courses totalling at least 138 credit hours, including all those courses which have been specified as Core courses.
- Obtained a CGPA of at least 2.00

Tentative Study Plan

Bachelor of Science (Electrical Engineering)

Code	Title	Cr. Hrs	Pre Req
Semester - I			
CS 1002	Programming Fundamentals	3+1	
ME 1001	Engineering Drawing	0+1	
MT 1001	Applied Calculus	3+0	
NS 1002	Physics for Engineers	3+1	
SS 1005	English Language Skills	3+0	
SS 1002	Islamic and Religious Studies	3+0	
Total 15+3			

Semester - II			
CS 1004	Object Oriented Programming	3+1	CS 1002
EE 1001	Linear Circuit Analysis	3+1	
EE 1006	Engineering Workshop	0+1	
MT 1004	Linear Algebra	3+0	
MT 1006	Differential Equations	3+0	MT 1001
SS 1003	Pakistan Studies	3+0	
Total 15+3			

Semester - III			
CS 2002	Data Structures and Algorithms	3+1	CS 1002
EE 1004	Electronic Devices & Circuits	3+1	EE 1001
EE 2004	Electrical Network Analysis	3+1	EE 1001
MT 2008	Multi-Variable Calculus	3+0	MT 1006
MT 2003	Complex Variable and Transforms	3+0	MT 1006
Total 15+3			

Semester - IV			
EE 2008	Signals and Systems	3+1	MT 2003
EE 2010	Electro-Mechanical Systems	3+1	NS 1002 EE 2004
EE 1005	Digital Logic Design	3+1	
EE 2011	Probability and Random Processes	3+0	
ME	Inter-Disciplinary Course - I	3+0	
Total 15+3			

Semester - V			
EE 3002	µP Interfacing & Programming	3+1	CS 1004 EE 1005
EE 3005	Electromagnetic Theory	3+0	MT 2003
EE 3003	Analog and Digital Communication	3+1	EE 2008 EE 2011
EE	Breadth Core - I	3+1	
ME	Inter-Disciplinary Course - II	3+0	
Total 15+3			

Semester - VI			
EE 3004	Feedback Control System	3+1	EE 2008
EE xxxx	Breadth Core - II	3+1	
EE xxxx	Depth Elective - I	3+1	
MG 3008	Engineering Economics	3+0	
SS 3001	Communication Skills	3+0	SS 1005
Total 15+3			

Semester - VII			
EE 4091	Final Year Project - I	0+3	Note 1
EE xxxx	Depth Elective - II	3+1	
EE xxxx	Depth Elective - III	3+1	
MG 4015	Engineering Management	3+0	
SS 2007	Technical & Business Writing	3+0	SS 1005
Total 12+5			

Semester - VIII			
EE 4092	Final Year Project - II	0+3	EE 4091
EE xxxx	Depth Elective - IV	3+1	
EE xxxx	Depth Elective - V	3+0	
MG 4011	Entrepreneurship	3.0	
Total 9+4			

Total 138	
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Note

Note 1 Registration in the "Final Year Project - I" is allowed provided the student has earned at least 107 credit hours, and his/her CGPA is equal to or greater than the graduating CGPA (2.0).

Domain	Cr. Hrs
Computing	12
Electrical Engineering	76
Other Engineering	7
Management	9
Mathematics	15
Sciences	4
Social Sciences	15
Total	138



	Computer Engineering		Electronics	
Breadth Core - I	EE 3017 Data Communication and Networks	3+1	EE 2024 Electronic Circuit Design	3+1
Breadth Core - II	CS 2020 Operating Systems	3+1	EE 3024 Power Electronics	3+1
Depth Electives	CS 2013 Fundamentals of Databases	3+1	EE 2020 Instrumentation and Measurement	3+1
	EE 3009 VLSI Design	3+1	EE 3002 Digital Signal Processing	3+1
	EE3020 Digital Design	3+1	EE 3009 VLSI Design	3+1
	EE 3027 Introduction to IOT	3+1	EE 3027 Introduction to IOT	3+0
	EE 4019 Embedded System	3+0	EE 4026 Industrial Process Control	3+1
	EE4021 Computer Architecture	3+1	EE 4028 Digital Control System	3+0
	EE4024 Introduction to Robotics	3+1	EE 4090 Industrial Automation	3+1
	EE 4032 Network Programming			
	EE 4037 Applied Machine Learning			
	Power Systems		Telecommunication	
Breadth Core - I	EE 4030 Power Distribution and Utilization	3+1	EE 2024 Electronic Circuit Design	3+1
Breadth Core - II	EE 4031 Power System Analysis	3+1	EE 3017 Data Communication and Networks	3+1
Depth Electives	EE 3024 Power Electronics	3+1	EE 3008 Microwave Engineering	3+1
	EE 3027 Introduction to IOT	3+1	EE3027 Introduction to IOT	3+1
	EE 4033 Power Generation	3+0	EE 4003 Wireless and Mobile Communication	3+1
	EE 4034 Power System Protection	3+1	EE 4006 Fiber Optic Communication	3+0
	EE 4035 Renewable Energy Systems	3+1	EE 4007 Wave Propagation and Antenna Design	3+1
	EE 4089 Electric Power Transmission	3+1	EE 4016 Telecom Transmission and Switching System	3+1
	EE 4036 Power System Operation and Control	3+1	EE4023 Next Generation Networks	3+1
	EE xxxx Advanced Electrical Machines	3+1	EE 4084 Radio Electronics	3+1

Master of Science (Civil Engineering)

Program Objectives

- To enrich civil engineers with advanced knowledge and skills required to identify and solve diverse range of complex problems in civil engineering and related fields.
- To conduct applied research for rapidly evolving challenges in infrastructure development.
- To pursue life-long learning and continue professional and intellectual development.

Eligibility

- BS Civil Engineering or equivalent degree from a recognized university with at least 60% marks or CGPA of at least 2.0 out of 4.0.

Selection Criteria

- Past Academic Record (Bachelor) 50%
- Score obtained in NU Admission Test/NTS-GAT (General) 50%

Areas of Specializations

MS Civil Engineering program offers courses and research work in the following areas of specializations.

- Structural Engineering
- Hydraulics and Water Resources Engineering
- Geotechnical Engineering
- Transportation Engineering

Tentative Study Plan of Master of Science (Civil Engineering)

Students are required to complete the following courses in a minimum study period of 4 semesters.

MS Civil Engineering	Research-Based Courses		Coursework-Based**	
	Courses	Cr. Hrs.	Courses	Cr. Hrs.
Core Courses	3	9	4	12
Elective Courses	4	12	5	15
CV5032 Research Methodology <i>(Take in Semester-I or II)</i>	1	3	1	3
CV5091MS Thesis – I *	1	3	NA	-
CV5092 MS Thesis – II	1	3	NA	-
Total Cr. Hrs.:	-	30	-	30

* MS Thesis – I registration requires completion of 15 credit hours (including Research Methodology) **AND** a minimum CGPA of 2.50.

** Subjected to the approval of Departmental Graduate Studies Committee (DGSC).

Award of Degree

For the award of MS Civil Engineering degree, a student must complete 30 credit hours as per study plan **AND** attain a minimum CGPA of 2.50.

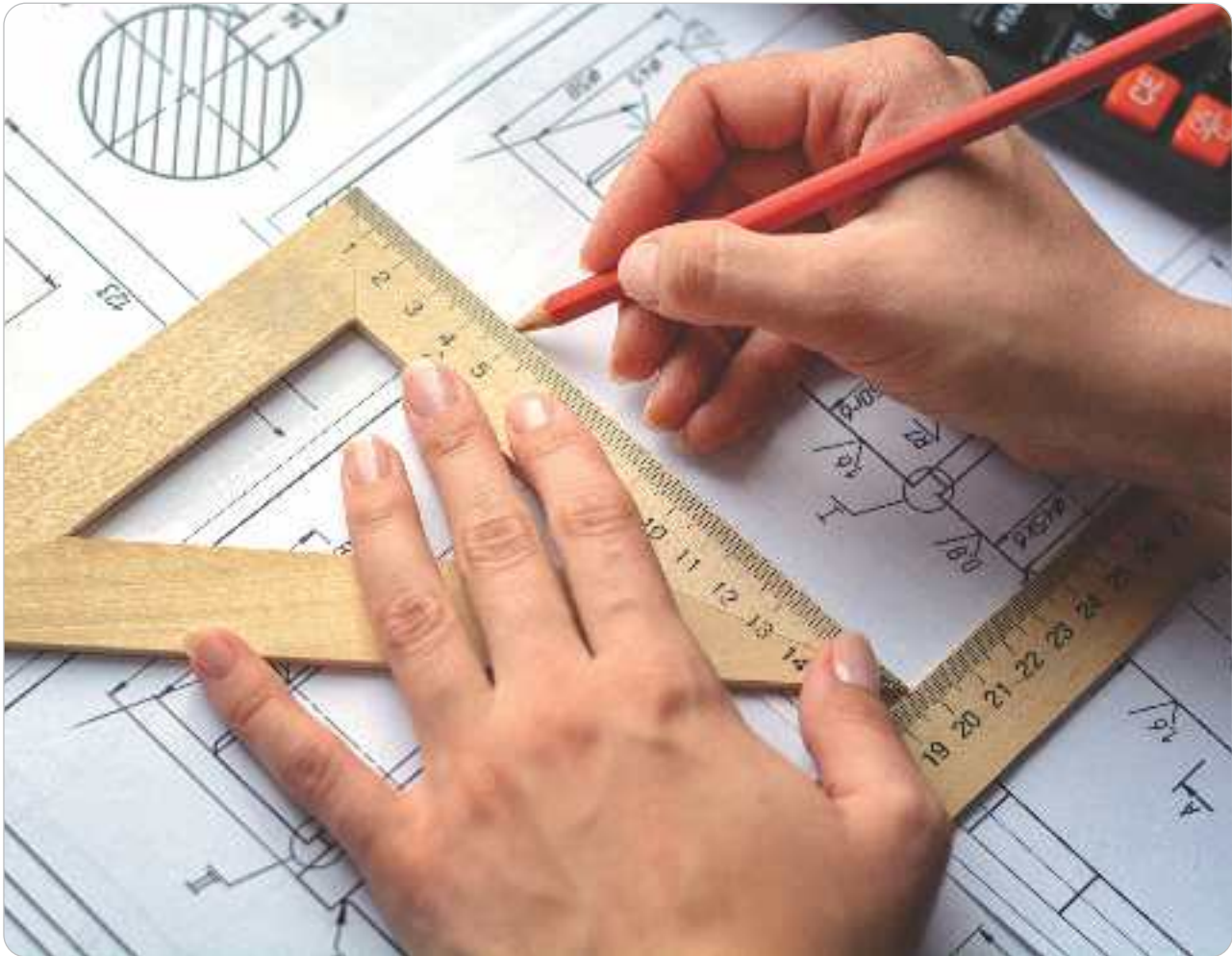


Master of Science (Civil Engineering)

Core Courses

CV 5000 Advanced Structural Analysis	CV 5094 Advanced Soil Mechanics
CV 5001 Probability and Statistical Methods	CV 5099 Optimization Techniques
CV 5003 Foundation Engineering	CV 5012 Forensic Engineering
CV 5011 Finite Element Analysis	CV 5014 Principles and Techniques of Ground Improvement
CV 5014 Transportation Planning	CV 5016 Geotechnical Engineering of Embankment Dams
CV 5015 Hydraulic Structures	CV 5105 Innovative Civil Engineering Material
CV 5017 Pavement Analysis and Design	CV 5109 Earthquake Engineering
CV 5021 Advanced Open Channel Hydraulics	CV 6008 Advanced Engineering Mathematics
CV 5022 Trans-Boundary Water Issues & Water Diplomacy Framework	CV xxxx Repair and Rehabilitation of Structures

Elective Courses: The detailed list of elective courses in each area of specialization is available at the department website. <http://lhr.nu.edu.pk/cv/programsHome/>



Master of Science (Electrical Engineering)

Program Mission

The purpose of the MS program in Electrical Engineering is to attain theoretical and practical depth in one of the areas of interest. The MS (EE) program is structured in such a way as to enhance the student's critical thinking and intuitive abilities using a combination of highly specialized courses and expert supervision. The program aims to produce graduates who will have the abilities and skills to be employed as practicing engineers in fields such as design, research, development, testing, and manufacturing, as well as assuming positions of leadership and responsibility within organizations.

Program Educational Objectives (PEOs)

- Provide students with advanced learning and application in a discipline or sub-discipline of electrical engineering. (Application to be added)
- Teach tools and techniques required for advanced learning, research and application in any discipline or sub-discipline of electrical engineering.
- Enhance skills such areas as problem-solving, mathematical modelling, writing & oral presentation, leadership, interrelation of business with technology and ethics as applied to electrical engineering

Eligibility

- Bachelor Degree in a relevant engineering discipline (Electrical, Telecommunications, or Computer engineering, etc.), recognized by Pakistan Engineering Council (PEC). Minimum CGPA of 2.0 (on a scale of 4.0) or at least 60% marks.

Selection Criteria

- Past Academic Record (Bachelor) 50%
- Score obtained in NU Admission Test/NTS-GAT (General) 50%

Three options: 6-credit hour Thesis or 3 credit hour Project with one additional taught course or MS by course work.

Award of Degree

For the award of MS degree, a student must have:

- Passed courses totalling at least 30 credit hours, including THREE Core courses.
- CGPA of 2.50 or more.

Core Courses (Any THREE of the following courses must be passed)

CS 5024 Advanced Computer Networks	EE 5028 Linear Systems
EE 5106 Advanced Digital Signal Processing	EE 5029 Advanced Power System Modelling and Analysis
EE 5022 Advanced Embedded Systems	EE 5045 Adv. Probability Theory
EE 5023 Analog and Discrete Electronics	EE 5012 Applied Electromagnetics

Tentative Study Plan of MS (Electrical Engineering)

Semester – I	
EE xxxx Core Course – I	3
EE xxxx Core Course – II	3
EE 5011 Research Methodology	3
Total	9

Semester – II	
EE xxxx Core Course – III	3
EE xxxx Elective – I	3
EE xxxx Elective – II	3
Total	9

Semester – III	
EE xxxx Elective – III	3
EE 5091 MS Thesis-I/ Elective IV	3
Total	6

Semester – IV	
EE xxxx Elective – V	3
EE 5092 MS Thesis-II/MS Project/ Elective VI	3
Total	6

Registration in “Thesis – I” is allowed provided the student has earned at least 15 credits, passed the “Research Methodology” course, and CGPA is equal to or more than 2.50.

