Nepal Engineering College

Department of Electrical and Electronics Engineering

1. What is Electrical and Electronics Engineering?

Electrical and Electronics Engineering (EEE) is a dynamic and essential discipline that forms the backbone of modern infrastructure and technological advancement. This field primarily focuses on the generation, transmission, distribution, power system and utilization of electrical energy, while also integrating key components of electronics for system automation and control.

At Nepal Engineering College (nec), the EEE program is designed to equip students with in-depth knowledge of power systems, electric machines, renewable energy, control systems, and high-voltage engineering, alongside embedded systems and digital electronics.

Given the growing demand for sustainable energy, electrification, and smart grid technology in Nepal and globally, EEE graduates play a pivotal role in driving energy innovation, electrification of rural areas, automation of industries, and modernization of the power sector.

2. How is EEE different from Other Engineering Disciplines?

While Electronics and Communication Engineering focuses more on communication systems and embedded technologies, Electrical and Electronics Engineering concentrates on power engineering and electrical systems.

The core emphasis of EEE lies in:

- Power generation (thermal, hydro, solar, wind)
- Electrical machines and drives
- Power transmission and distribution
- Control systems and automation
- High-voltage systems and protection
- Grid integration of renewable energy
- Electrical design and energy management

The program also includes foundational electronics and computing elements, making EEE graduates versatile for both traditional and modern electrical roles, such as energy system design, smart grid development, and power electronics.

3. What are the opportunities?

EEE graduates from nec can pursue careers in both public and private sectors. Key opportunities include:

Government organizations: Nepal Electricity Authority (NEA), Department of Electricity Development (DoED), and public infrastructure projects

Private utilities and hydropower: Hydropower companies, solar installation firms, and industrial automation sectors

Multinational corporations: Roles in design, automation, energy consulting, and power equipment manufacturing

Higher studies and research: Specializations in power systems, control engineering, energy economics, renewable energy, or electrical drives in Nepal or abroad

Public service: Positions in Lok Sewa Aayog, NEA, NTA, and engineering regulatory bodies

Nec graduates are well-prepared for engineering licensing exams and competitive selection for design, operation, and maintenance roles in energy and industrial sectors.

4. How long has it been initiated?

Traditionally, electrical engineering has been focused on addressing challenges related to large-scale electrical systems, including electricity generation, transmission, and usage, while electronics is centered around low-voltage applications in areas like computers, communication systems, and integrated circuits.

However, advancements in power transmission and the widespread use of electricity across various sectors have created a need to combine these two fields. This has led to the demand for engineers with expertise and skills in both areas Recognizing this need, NEC introduced a Bachelor’s program in Electrical and Electronics Engineering in 2006 A.D.

Graduates of this program are expected to pursue career opportunities in sectors related to electricity generation, transmission, and distribution, as well as alternative/renewable energy, manufacturing, and services

The Department of Electrical and Electronics Engineering at Nepal Engineering College was established with a vision to address Nepal's growing need for qualified electrical engineers. The department focuses on practical, project-based learning with strong theoretical grounding. It houses advanced laboratories in power systems, electrical machines, control systems, and microprocessors, ensuring students gain hands-on exposure to real-world electrical engineering challenges.
With experienced faculty from academic and industrial backgrounds, the department emphasizes research, innovation, and collaboration with industry. Students are encouraged to undertake internships, field visits, and final-year projects in areas such as smart grid development, renewable energy integration, and power electronics.

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Bachelor of Electrical and Electronics Engineering Curriculum Structure (Pokhara University, 2022)

Year I – Semester I

S.N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	PHY 110	Applied Physics	3	3	2	2
2	EEE 130	Basic Electrical Circuits	3	3	1	2
3	MTH 110	Calculus I	3	3	1	0
4	CMP 112	Computer Programming	2	2	0	2
5	ELE 132	Electrical Installation Practice & Safety	2	2	0	2
6	MEC 116	Basic Engineering Drawing	2	0	0	2
7	MEC 136	Engineering Workshop	1	0	0	2
		Sub-total	**16**	**14**	**4**	**14**

Year I – Semester II

S.N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	MTH 150	Algebra and Geometry	3	3	1	0
2	MEC 170	Basic Mechanical Engineering	3	3	1	2
3	ENG 110	Communication Techniques	3	3	0	0
4	ELE 120	Electrical Engineering Material	3	3	1	0
5	ELX 118	Electronic Devices	3	3	0	2
6	ELE 178	Network Theory	3	3	1	2
		Sub-total	**18**	**17**	**4**	**6**

Year II – Semester III

S.N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	MTH 210	Calculus II	3	3	1	0
2	ELX 110	Digital Logic	3	3	1	2
3	ELE 222	Electrical Machine I	3	3	1	2
4	ELX 122	Electromagnetic Fields and Waves	3	3	1	0
5	ELX 123	Electronic Circuits	3	3	1	2
6	ELE 121	Instrumentation	3	3	1	2
		Sub-total	**18**	**18**	**6**	**8**

Year II – Semester IV

S.N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	MTH 250	Applied Mathematics	3	3	1	0
2	ELE 220	Control System	3	3	1	2
3	ELE 272	Electrical Machine II	2	2	1	2
4	ELX 270	Microprocessors	3	3	1	2
5	MTH 252	Numerical Methods	3	3	1	0
6	ELE 274	Transmission and Distribution Systems	3	3	1	2
		Sub-total	**17**	**17**	**6**	**8**

Year III – Semester V

S.N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	ELE 334	Control System Design	3	3	1	2
2	ELE 336	Electrical Machine Design	3	3	1	2
3	MGT 269	Engineering Economics	3	3	1	0
4	ELE 342	Power Electronics	3	3	1	2
5	ELE 340	Power System Analysis	3	3	1	2
6	ELX 359	Signals and System	2	2	1	2
		Sub-total	**17**	**17**	**6**	**10**

Year III – Semester VI

S.N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	MGT 320	Engineering Management	3	3	1	0
2	ELE 337	High Voltage Engineering	3	3	1	0
3	Elective I	Elective I	3	3	1	0
4	MTH 216	Probability and Statistics	3	3	1	0
5	ELE 374	Switch Gear and Protection	3	3	1	2
6	ELE 378	Utilization of Electrical Energy	3	3	2	2
		Sub-total	**18**	**18**	**7**	**4**

Year IV – Semester VII

S.N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	ELX 370	Modern Communication System	3	3	1	0
2	Elective II	Elective II	3	3	1	0
3	ELE 434	Power Plant Technology	3	3	1	0
4	ELE 436	Renewable Energy and Grid Integration	3	3	1	0
5	ELE 338	Research Methodology	2	2	0	0
6	ELE 440	Transmission and Distribution Design	3	3	1	2
		Sub-total	**17**	**17**	**5**	**2**

Year IV – Semester VIII

S.N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	Elective III	Elective III	3	3	0	0
2	INT 488	Internship	3	3	0	6
3	PRJ 452	Major Project	6	0	0	6
		Sub-total	**12**	**6**	**0**	**12**