**Nepal Engineering College**
**Department of Electronics and Communication Engineering**

## 1. What is Electronics and Communication Engineering?

In today's digital era, Electronics and Communication Engineering (ELX) plays a pivotal role in advancing technology, telecommunications, and automation. This field integrates hardware and software systems to design, develop, and optimize communication networks, embedded systems, IoT devices, and signal processing technologies.

With Nepal's growing demand for digital infrastructure, smart technologies, and connectivity solutions, ELX graduates are essential in driving innovation across industries such as telecommunications, renewable energy, healthcare, and automation.

## 2. How is ELX different from Other Engineering Disciplines?

While Electrical Engineering focuses broadly on power systems and machinery, Electronics and Communication Engineering (ELX) specializes in a range of advanced and rapidly evolving technologies. These include telecommunication systems such as 5G, fiber optics, and satellite communication; embedded systems and the Internet of Things (IoT), encompassing smart devices, automation, and robotics; and digital signal processing, which involves the transmission and processing of audio, video, and data. ELX also covers VLSI and microelectronics, focusing on chip design and semiconductor technology, as well as wireless and networking technologies like Wi-Fi, Bluetooth, and IoT networks. Graduates of ELX programs gain hands-on expertise in both hardware and software, making them versatile professionals capable of working across various sectors including information technology, telecommunications, aerospace, defense, and research.

## 3. What are the opportunities?

Graduates of **Electronics and Communication Engineering** have a wide array of career opportunities across various industries. They can work in telecom companies such as Nepal Telecom, Ncell, and Smart Telecom, where they contribute to the development and maintenance of communication infrastructure. In the field of IT and software development, they are involved in cutting-edge areas like the Internet of Things (IoT), embedded systems, and applications of artificial intelligence and machine learning. Many also find roles in the government and public sector, including organizations like the Nepal Telecommunications Authority (NTA), Nepal Electricity Authority. Career paths also extend to multinational companies such as Huawei, Ericsson, Samsung, and Intel, where they engage in global technology projects. Furthermore, ELX graduates often pursue higher studies and research, both in Nepal and abroad, specializing in fields like AI, robotics, and wireless communication. Notably, many alumni from *nec* have successfully secured positions in Lok Sewa Aayog (Public Service Commission), telecom regulatory bodies, and prominent international tech firms.

**4. How long has it been initiated?**

The Department of Electronics and Communication Engineering at Nepal Engineering College (nec), established in **1998**, has been at the forefront of producing skilled engineers aligned with industry demands. As one of the earliest institutions in Nepal to offer this program, the department has consistently focused on integrating theoretical foundations with practical applications. It boasts state-of-the-art laboratories in areas such as Digital Communication, Digital Signal Processing (DSP), Signal Processing, and the Internet of Things (IoT), providing students with hands-on experience in cutting-edge technologies. The department emphasizes industry collaboration, internships, and project-based learning, ensuring students are well-prepared for real-world challenges. It also encourages research in emerging areas like AI, embedded systems, and Bio-medical. With a team of highly experienced faculty members who have both academic and industry backgrounds, the department continues to uphold its reputation as a leader in electronics and communication engineering education in Nepal.

**For more details, contact**:

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**Curriculum Structure**

| **Semester I** | | | **Semester II** | | |
|---|---|---|---|---|---|
| **S.N.** | **Subject** | **Credit** | **S.N.** | **Subject** | **Credit** |
| **1.** | Applied Physics | 3 | **1.** | Algebra and Geometry | 3 |
| **2.** | Basic Electric Circuits | 3 | **2.** | Communication Techniques | 2 |
| **3.** | Calculus - I | 3 | **3.** | Electronic Devices | 3 |
| **4.** | Computer Programming | 3 | **4.** | Network Theory | 3 |
| **5.** | Electrical Installation Practice and Safety | 2 | **5.** | Object Oriented Programming with JAVA | 3 |
| **6.** | Basic Engineering Drawing | 1 | **6.** | Semiconductor Material | 2 |
| | Engineering Workshop | 1 | | | |
| **Total Credit** | | **16** | **Total Credit** | | **16** |

| **Semester III** | | | **Semester IV** | | |
|---|---|---|---|---|---|
| **S.N.** | **Subject** | **Credit** | **S.N.** | **Subject** | **Credit** |
| **1.** | Calculus - II | 3 | **1.** | Applied Mathematics | 3 |
| **2.** | Data Structure and Algorithms | 3 | **2.** | Computer Graphics | 3 |
| **3.** | Digital Logic | 3 | **3.** | Database Management System | 3 |
| **4.** | Electromagnetic Fields and Waves | 3 | **4.** | Eleectrical Machine and Control | 3 |
| **5.** | Electronic Circuits | 3 | **5.** | Microprocessors | 3 |

| | | | | | |
|---|---|---|---|---|---|
| **6.** | Instrumentation | 3 | **6.** | Numerical Methods | 3 |
| **Total Credit** | | **18** | **Total Credit** | | **18** |

| **Semester V** | | | **Semester VI** | | |
|---|---|---|---|---|---|
| **S.N.** | **Subject** | **Credit** | **S.N.** | **Subject** | **Credit** |
| **1.** | Artificial Intelligence | 3 | **1.** | Analog and Digital Communication | 3 |
| **2.** | Computer Organization and Architecture | 3 | **2.** | Data Communication & Computer Network | 3 |
| **3.** | Engineering Economics | 3 | **3.** | Digital System Design | 2 |
| **4.** | IOT & Sensor Technology | 3 | **4.** | Elective I | 3 |
| **5.** | Research Methodology | 2 | **5.** | Embedded System | 3 |
| **6.** | Signals and System | 3 | **6.** | Probability and Statistics | 3 |
| **Total Credit** | | **17** | **Total Credit** | | **17** |

| **Semester VII** | | | **Semester VIII** | | |
|---|---|---|---|---|---|
| **S.N.** | **Subject** | **Credit** | **S.N.** | **Subject** | **Credit** |
| **1.** | Digital Signal Processing | 3 | **1.** | | Elective III |
| **2.** | Elective II | 3 | **2.** | INT 490 | Internship |
| **3.** | Electromagnetic Propagation & Antenna | 3 | **3.** | PRJ 452 | Major Project |
| **4.** | Engineering Management | 3 | **4.** | | |
| **5.** | Telecommunication and Network Security | 3 | **5.** | | |
| **6.** | Wireless Communication Technology | 3 | **6.** | | |
| **Total Credit** | | **18** | **Total Credit** | | **9** |