Computer Engineering at Nepal Engineering College (*nec*)

1. What is Computer Engineering?

Computer Engineering is a dynamic and interdisciplinary field that merges the principles of electrical, electronics engineering and computer science to design, develop, and optimize both hardware and software systems. Unlike pure computer science, which focuses primarily on algorithms and programming, computer engineering bridges the gap between hardware components (like microprocessors, circuits, and embedded systems) and software applications (such as AI systems, cybersecurity protocols, and network infrastructures).

In Nepal's context, where digital transformation is rapidly accelerating, computer engineers are vital in: Developing customized software solutions for businesses, start-ups, and government agencies.

- Designing and implementing hardware systems, including IoT devices, robotics platforms, and embedded controllers.
- Strengthening cybersecurity frameworks and supporting cloud infrastructure for organizations.
- Driving innovation in artificial intelligence (AI), machine learning (ML), and data science, fields crucial for future technological progress.

2. What Distinguishes Computer Engineering from Related Fields?

Computer Engineering (CE) Vs Information Technology (IT)

Aspect	Computer Engineering (CE)	Information Technology (IT)
Core Focus	Designing and developing hardware + software systems (e.g., chips, robotics, IoT).	Managing and optimizing existing tech systems (e.g., networks, databases, cloud).
Key Skills	- Circuit design - Embedded systems - Hardware-software integration - AI/ML hardware - Network administration - Cybersecurity - Cloud computing	- Network administration - Cybersecurity - Cloud computing - Database management

	- Database management	
Career Paths	- Embedded Systems Engineer - Hardware Designer - Robotics Specialist - Chip Developer - Network Administrator - IT Consultant - Cloud Architect - Cybersecurity Analyst	- Network Administrator - IT Consultant - Cloud Architect - Cybersecurity Analyst
Tools/Technologies	- Arduino, VHDL, PCB design - C/C++, Python (system-level) - Linux Kernel	- AWS/Azure, SQL - Firewalls, VPNs - DevOps (Docker, Kubernetes)
Math/Physics	Heavy emphasis (calculus, electronics, physics).	Minimal (basic algorithms, statistics).
Best For	Those who want to **build technology** from scratch (hardware + low-level software).	Those who prefer **applying tech solutions** to business/organizational problems.
Job Market (Nepal)	Growing in R&D and tech startups.	High demand across all industries (banks, ISPs, corporates).
Salary Range (Nepal)	NPR 600K–2+M/year (hardware/embedded roles).	NPR 500K–1.2M/year (cloud/network roles).

Why Choose Computer Engineering?

- Ideal for students who enjoy both coding and electronics.
- Offers flexibility to work in startups, research labs, or multinational corporations.
- Prepares students to contribute to both hardware innovation and software development.

3. Career Opportunities

Graduates of Computer Engineering at ***nec*** can explore a diverse array of roles in both domestic and international tech sectors:

- Software Developer: Mobile applications, enterprise software, and cloud-based systems.
- Hardware Engineer: Embedded systems, microcontrollers, robotics, and VLSI design.
- Cybersecurity Analyst: Network protection, ethical hacking, and secure systems design.
- AI & Data Scientist: Machine learning modeling, big data analytics, and automation solutions.

- Cloud & Network Engineer: Cloud service deployment (AWS, Azure), data centers, and network management.
- Game & VR Developer: Interactive gaming systems and virtual reality experiences.

Notable Alumni:

- Er. Suresh Kumar Shrestha – CTO at a leading Nepali fintech company.
- Er. Anita Gurung – AI Researcher at a global technology firm.

4. Program Duration & Curriculum

- Duration: 4 years (8 semesters), affiliated with Pokhara University.
- Revised Curriculum (2022):
  Updated to focus on artificial intelligence, cybersecurity, and Internet of Things (IoT) technologies.

Pokhara University
Bachelor of Civil Engineering, 2022

Year	: I	Semester I				
S. N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	CHM 110	Applied Chemistry	2	2	1	2
2	PHY 110	Applied Physics	3	3	1	2
3	MTH 110	Calculus I	3	3	2	0
4	ENG 110	Communication Techniques	2	2	2	0
5	CMP 112	Computer Programming	3	3	1	2
6	MEC 112	Engineering Drawing	2	0	0	6
		Sub-total	15	13	7	12
Year	: I	Semester II				
S. N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	MTH 150	Algebra and Geometry	3	3	2	0
2	MEC 150	Applied Mechanics	4	4	2	0
3	ELE 112	Basic Electrical and Electronics Engineering	3	3	2	2
4	CVL 110	Civil Engineering Materials	2	2	0	2
5	CVL 112	Civil Engineering Workshop	1	0	0	3
6	GTE 150	Engineering Geology	3	3	0	2
7	MEC 114	Introduction to Energy Engineering	2	2	1	1
		Sub-total	18	17	7	10
Year	: II	Semester III				
S. N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	ARC 150	Building Technology	2	2	0	2
2	MTH 210	Calculus II	3	3	2	0
3	WRE 212	Fluid Mechanics	3	3	2	2
4	MTH 252	Numerical Methods	2	2	1	2
5	STR 216	Strength of Materials	3	3	2	1
6	CVL 216	Surveying I	3	3	1	3
		Sub-total	16	16	8	10
Year	: II	Semester IV				
S. N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	MGT 250	Engineering Economics	3	3	1	0
2	WRE 250	Hydraulics	3	3	2	2
3	MTH 216	Probability and Statistics	2	2	2	0
4	GTE 252	Soil Mechanics	3	3	2	2
5	STR 252	Structural Analysis I	3	3	2	1
6	CVL 252	Surveying II	3	3	1	3
		Sub-total	17	17	10	8
Year	: III	Semester V				
S. N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	WRE 310	Engineering Hydrology	2	2	2	1
2	CVL 318	Estimating and Valuation	3	3	2	0
3	GTE 310	Foundation Engineering	3	3	2	1
4	STR 314	Structural Analysis II	3	3	2	1
5	TRP 310	Transportation Engineering I	3	3	1	1
6	ENV 310	Water Supply Engineering	3	3	2	1
		Sub-total	17	17	11	5
Year	: III	Semester VI				
S. N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	CVL 350	Project I	1	0	0	2
2	STR 312	Concrete Technology and Masonry Structure	3	3	2	2
3	STR 354	Design of Steel and Timber Structure	3	3	2	0
4		Elective I	3	3	0	0
5	WRE 352	Irrigation and Drainage Engineering	3	3	2	0
6	ENV 352	Sanitary Engineering	3	3	2	1
7	CVL 316	Survey Field Project	1	0	0	2
8	TRP 352	Transportation Engineering II	3	3	1	1
		Sub-total	20	18	9	8
Year	: IV	Semester VII				
S. N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	CVL 441	Project II	3	0	0	6
2	CVL 412	Construction Project Management	3	3	2	0
3	STR 352	Design of R.C.C. Structures	3	3	2	1
4		Elective II	3	3	0	0
5	CVL 416	Engineering Professional Practice	2	2	0	0
6	WRE 410	Hydropower Engineering	3	3	2	1
		Sub-total	17	14	6	8
Year	: IV	Semester VIII				
S. N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1		Elective III	3	3	0	0
2	INT 484	Internship	6	0	0	12
		Sub-total	9	3	0	12
		Total	129	115	58	73

March 27, 2022

Practicum:

6-month industry internship at top Nepali tech firms such as F1Soft, Leapfrog, NREN or Logpoint to provide hands-on experience and industry exposure.

5. Why Choose *nec's* Computer Engineering Program?

Key Strengths of the Program:

- **Industry**-Aligned Labs: State-of-the-art facilities in robotics, IoT, and cybersecurity.
- **Expert Faculty**: Over 20 full-time professors with rich academic and professional experience.
- **Strong Industry Links**: Partnerships with IT companies in Nepal and abroad to support student placements and internships.
- **Project-Based Learning**: Emphasis on practical projects, hackathons, and technical competitions.

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Conclusion

Computer Engineering at Nepal Engineering College (nec) introduced in **1999**, it's a 4-year/8-semester program with a current intake of **96 seat** equips students with the essential skills and knowledge to lead Nepal's digital revolution. With a curriculum grounded in both theory and practice, access to modern labs, expert guidance, and strong industry connections, ***nec*** fosters innovation, critical thinking, and real-world application of computing technologies.

Whether you're passionate about building intelligent systems, securing digital infrastructures, or innovating the next breakthrough in robotics—***nec's*** Computer Engineering program offers the perfect launchpad.