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	Managing and optimizing existing tech
	systems (e.g., chips, robotics, IoT).	systems (e.g., networks, databases, cloud).
Key Skills	- Circuit design	- Network administration
	- Embedded systems	- Cybersecurity
	- Hardware-software integration	- Cloud computing
	- AI/ML hardware	- Database management
	- Network administration	
	- Cybersecurity	
	- Cloud computing	

	- Database management	
Career Paths	- Embedded Systems Engineer	- Network Administrator
	- Hardware Designer	- IT Consultant
	- Robotics Specialist	- Cloud Architect
	- Chip Developer	- Cybersecurity Analyst
	- Network Administrator	
	- IT Consultant	
	- Cloud Architect	
	- Cybersecurity Analyst	
Tools/Technologies	- Arduino, VHDL, PCB design	- AWS/Azure, SQL
	- C/C++, Python (system-level)	- Firewalls, VPNs
	- Linux Kernel	- DevOps (Docker, Kubernetes)
Math/Physics	Heavy emphasis (calculus, electronics, physics).	Minimal (basic algorithms, statistics).
Best For	Those who want to build technology from	Those who prefer applying tech
	scratch (hardware + low-level software).	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	NPR 600K-2+M/year (hardware/embedded	NPR 500K-1.2M/year (cloud/network
(Nepal)	roles).	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	:1	Semester I				
	Course Code	Subject	Credit	Lastone	Totali	Practical
1	CHM 110	Applied Chemistry		Lecture		
2	PHY 110	Applied Physics	3	3	!	2
3	MTH 110	Calculus I	3	3	1	2
4	ENG 110	Communication Techniques	2	2	2	0
5	CMP 112	Computer Programming	3	3		0
6	MEC 112	Engineering Drawing	2	0	0	2
14/00	THE PARTY OF	Sub-total		13	7	6
Year	:1	Semester II	15	13	1	12
	Course Code	Subject	Credit	1	T	
1	MTH 150	Algebra and Geometry	3	Lecture		Practical
2	MEC 150	Applied Mechanics	4	3	2	0
3	ELE 112			4	2	0
4	CVL 110	Basic Electrical and Electronics Engineering	3	3	2	2
5	CVL 112	Civil Engineering Materials	2	2	0	2
6	GTE 150	Civil Engineering Workshop	1	0	0	3
7	MEC 114	Engineering Geology	3	3	0	2
,	MEC 114	Introduction to Energy Engineering	2	2	1	1
Year	. 11	Sub-total	18	17	7	10
		Semester III				
	Course Code	Subject	Credit	Lecture	Tutorial	Practical
2	ARC 150	Building Technology	2	2	0	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	ī
6	CVL 216	Surveying I	3	3	1	3
1000	The section of	Sub-total Sub-total		16	8	10
Year		Semester IV		10	-	10
S. N.	Course Code	Subject	Credit	Lecture	Tutorial	Practical
1	MGT 250	Engineering Economics	3	3	1 dtoriai	
2	WRE 250	Hydraulics	3	3	2	0
3	MTH 216	Probability and Statistics	2	2	2	2
4	GTE 252	Soil Mechanics	3	3	2	0
_ 5	STR 252	Structural Analysis I	3	3		2
6	CVL 252	Surveying II	3	3	2	1
	ALL PROPERTY.	Sub-total			1	3
Year		Semester V	1/	17	10	8
		Semester V				
	: III Course Code WRE 310	Semester V Subject	Credit	Lecture	Tutorial	Practical
S. N.	Course Code	Semester V Subject Engineering Hydrology	Credit 2	Lecture 2	Tutorial 2	Practical
S. N.	Course Code WRE 310 CVL 318	Semester V Subject Engineering Hydrology Estimating and Valuation	Credit 2	Lecture 2 3	Tutorial 2 2	Practical 1 0
S. N. 1 2	Course Code WRE 310 CVL 318 GTE 310	Semester V Subject Engineering Hydrology Estimating and Valuation Foundation Engineering	Credit 2 3 3	Lecture 2 3	Tutorial 2 2 2	Practical 1 0
S. N. 1 2 3	Course Code WRE 310 CVL 318 GTE 310 STR 314	Semester V Subject Engineering Hydrology Estimating and Valuation Foundation Engineering Structural Analysis II	Credit 2 3 3 3 3	Lecture 2 3 3 3 3	Tutorial 2 2 2 2 2	Practical 1 0 1
S. N. 1 2 3 4	Course Code WRE 310 CVL 318 GTE 310 STR 314 TRP 310	Semester V Subject Engineering Hydrology Estimating and Valuation Foundation Engineering Structural Analysis II Transportation Engineering I	Credit 2 3 3 3 3 3 3	2 3 3 3 3	Tutorial 2 2 2 2 1	Practical 1 0
S. N. 1 2 3 4 5	Course Code WRE 310 CVL 318 GTE 310 STR 314	Semester V Subject Engineering Hydrology Estimating and Valuation Foundation Engineering Structural Analysis II Transportation Engineering I Water Supply Engineering	Credit 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	2 3 3 3 3 3 3	Tutorial 2 2 2 2 2 1 2 2 2 1 2 2 2 1 2	Practical 1 0 1 1 1 1
S. N. 1 2 3 4 5 6	Course Code WRE 310 CVL 318 GTE 310 STR 314 TRP 310 ENV 310	Semester V Subject Engineering Hydrology Estimating and Valuation Foundation Engineering Structural Analysis II Transportation Engineering I Water Supply Engineering Sub-total	Credit 2 3 3 3 3 3 3	2 3 3 3 3	Tutorial 2 2 2 2 1	Practical 1 0 1 1 1
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S. N. 1 2 3 4 5 6 Year S. N.	Course Code WRE 310 CVL 318 GTE 310 STR 314 TRP 310 ENV 310 : III Course Code CVL 350	Semester V Subject Engineering Hydrology Estimating and Valuation Foundation Engineering Structural Analysis II Transportation Engineering I Water Supply Engineering Sub-total Semester VI Subject Project I	Credit 2 3 3 3 3 3 3 17 Credit 1	2 3 3 3 3 3 17 Lecture 0	Tutorial 2 2 2 2 1 2 11 2 Tutorial 0	Practical 1 0 1 1 1 1 5 Practical 2
S. N. 1 2 3 4 5 6 Year S. N. 1	Course Code WRE 310 CVL 318 GTE 310 STR 314 TRP 310 ENV 310 : III Course Code CVL 350 STR 312	Semester V Subject Engineering Hydrology Estimating and Valuation Foundation Engineering Structural Analysis II Transportation Engineering I Water Supply Engineering Sub-total Semester VI Subject Project I Concrete Technology and Masonry Structure	Credit 2 3 3 3 3 3 3 17 Credit 1 3	Lecture 2 3 3 3 3 3 17 Lecture 0 3	Tutorial 2 2 2 2 1 2 2 11 Tutorial 0 2	Practical O 1 1 1 1 5 Practical
S. N. 1 2 3 4 5 6 Year S. N. 1 2 3	Course Code WRE 310 CVL 318 GTE 310 STR 314 TRP 310 ENV 310 : III Course Code CVL 350	Semester V Subject Engineering Hydrology Estimating and Valuation Foundation Engineering Structural Analysis II Transportation Engineering I Water Supply Engineering Sub-total Semester VI Subject Project I Concrete Technology and Masonry Structure Design of Steel and Timber Structure	Credit 2 3 3 3 3 3 17 Credit 1 3 3 3 3	Lecture 2 3 3 3 3 3 17 Lecture 0 3 3 3 3 3 3 3 3 3	Tutorial 2 2 2 2 1 2 1 1 Tutorial 0 2 2 2	Practical 1 0 1 1 1 1 5 Practical 2
S. N. 1 2 3 4 5 6 Year S. N. 1 2 3 4	Course Code WRE 310 CVL 318 GTE 310 STR 314 TRP 310 ENV 310 : III Course Code CVL 350 STR 312 STR 354	Semester V Subject Engineering Hydrology Estimating and Valuation Foundation Engineering Structural Analysis II Transportation Engineering I Water Supply Engineering Sub-total Semester VI Subject Project I Concrete Technology and Masonry Structure Design of Steel and Timber Structure Elective I	Credit 2 3 3 3 3 3 17 Credit 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Lecture 2 3 3 3 3 17 Lecture 0 3 3 3 3 3 3 3 3 3	Tutorial 2 2 2 2 1 2 2 11 Tutorial 0 2	Practical 1 0 1 1 1 1 5 5 Practical 2 2
S. N. 1 2 3 4 5 6 Year S. N. 1 2 3 4 5	Course Code WRE 310 CVL 318 GTE 310 STR 314 TRP 310 ENV 310 ENV 310 Course Code CVL 350 STR 312 STR 354 WRE 352	Semester V Subject Engineering Hydrology Estimating and Valuation Foundation Engineering Structural Analysis II Transportation Engineering I Water Supply Engineering Sub-total Semester VI Subject Project I Concrete Technology and Masonry Structure Design of Steel and Timber Structure Elective I Irrigation and Drainage Engineering	Credit 2 3 3 3 3 3 17 Credit 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Lecture 2 3 3 3 3 3 17 Lecture 0 3 3 3 3 3 3 3 3 3	Tutorial 2 2 2 2 1 2 1 1 Tutorial 0 2 2 2	Practical 1 0 1 1 1 1 5 Practical 2 0
S. N. 1 2 3 4 5 6 Year S. N. 1 2 3 4 5 6	Course Code WRE 310 CVL 318 GTE 310 STR 314 TRP 310 ENV 310 : III Course Code CVL 350 STR 354 WRE 352 ENV 352	Semster V Subject Engineering Hydrology Estimating and Valuation Foundation Engineering Structural Analysis II Transportation Engineering I Water Supply Engineering Sub-total Semester VI Subject Project I Concrete Technology and Masonry Structure Design of Steel and Timber Structure Elective I Irrigation and Drainage Engineering Sanitary Engineering	Credit 2 3 3 3 3 3 17 Credit 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Lecture 2 3 3 3 3 17 Lecture 0 3 3 3 3 3 3 3 3 3	Tutorial 2 2 1 1 2 11 Tutorial 0 2 2 2 0 0	Practical
S. N. 1 2 3 4 5 6 7	Course Code WRE 310 CVL 318 GTE 310 STR 314 TRP 310 ENV 310 : III Course Code CVL 350 STR 354 WRE 352 ENV 352 CVL 316	Semester V Subject Engineering Hydrology Estimating and Valuation Foundation Engineering Structural Analysis II Transportation Engineering I Water Supply Engineering I Sub-total Semester VI Subject Project I Concrete Technology and Masonry Structure Design of Steel and Timber Structure Elective I Irrigation and Drainage Engineering Sanitary Engineering Sunvey Field Project	Credit 2 3 3 3 3 3 17 Credit 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 1 1 1	Lecture 2 3 3 3 3 3 17 Lecture 0 3 3 3 3 3 3 3 3 3	Tutorial 2 2 2 2 1 1 2 11 Tutorial 0 2 2 2 2 0 2 2 2 2 1 1 2 2 1 1 1 1 1 1	Practical 1
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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.