Department of Computer Science and Engineering
Scheme of Additional Minor Engineering Degree in Computer Engineering, AI/ML, Cyber Security, IoT

Date:20-06-2025

Academic Requirements: (Min 20 credits)

A) **For Engineering (Mechanical, Civil, ECE, EEE, Bio-Tech and Chemical)**

1. Students can choose courses which were not studied earlier in the previous semester. Further the courses should not be present in the curriculum of the forthcoming semesters.

2. This scheme is effective for the batches starting from 2024-25 Academic year

3. **Specialization in CSE**

i. Computer Engineering ii. AI &ML iii. Cyber Security iv. Internet of Things

ii. Core elective courses are common for all the specializations.

B) **CORE ELECTIVE LIST (Any 3 Courses including mandatory course)- 9 to 12 credits**

SNO	Course Title	Credits
1	Operating Systems(mandatory course)	3
2	Discrete Structures	4
3	Object Oriented Programming(OOPs)	3
4	Computer Organization and Architecture	4
5	Database Management Systems	3
6	Design and Analysis of Algorithms	3
7	Computer Networks	3
8	Artificial Intelligence & Machine Learning	4
9	Software Engineering	3

Core Elective NPTEL Equivalent courses during Jan-25, AY:25-26

SNo	Course Title	No of Weeks/ Credits	NPTEL Link
1	Introduction to operating Systems	8/2	https://onlinecourses.nptel.ac.in/noc24_cs80/preview
2	Discrete Mathematics	12/3	https://onlinecourses.nptel.ac.in/noc25_cs105/preview https://onlinecourses.nptel.ac.in/noc25_cs127/preview
3	Programming in Java	12/3	https://onlinecourses.nptel.ac.in/noc25_cs110/preview
4	The Joy of Computing using Python	12/3	https://onlinecourses.nptel.ac.in/noc25_cs103/preview
5	Computer Architecture and Organization	12/3	https://onlinecourses.nptel.ac.in/noc25_cs154/preview
6	Data Base Management System	8/2	https://onlinecourses.nptel.ac.in/noc25_cs144/preview
7	Design and Analysis of Algorithms	8/2	https://onlinecourses.nptel.ac.in/noc25_cs90/preview
8	Software Engineering	12/3	https://onlinecourses.nptel.ac.in/noc25_cs108/preview
9	Artificial Intelligence: Search Methods for Problem Solving	12/3	https://onlinecourses.nptel.ac.in/noc25_cs88/preview
10	Introduction to Machine Learning	12/3	https://onlinecourses.nptel.ac.in/noc25_cs91/preview

COMPUTER ENGINEERING: (Any THREE Courses or TWO Courses and Project) – 8 to 11 Credits

SNO	Course Title	Credits
1	Programming in Java	3
2	Algorithmic Game Theory	3
3	Machine Learning	3
4	Cloud Computing	3
5	Deep learning	3
6	Natural LanguageProcessing	3
7	Quantum computing	1 to 3

NPTEL Equivalent courses during Jan-25, AY:24-25

SNO	Course Title	No of Weeks/Credits	Nptel link
1.	Programming in Java	12/3	https://onlinecourses.nptel.ac.in/noc25_cs110/preview
2	Introduction to Machine Learning	12/3	https://onlinecourses.nptel.ac.in/noc25_cs91/preview
3	Cloud computing	12/3	https://onlinecourses.nptel.ac.in/noc25_cs107/preview
4	Deep Learning for Computer Vision	12/3	https://onlinecourses.nptel.ac.in/noc25_cs93/preview
4	Introduction to Quantum Computing: Quantum Algorithms and Qiskit(CE)	4/1	https://onlinecourses.nptel.ac.in/noc25_cs95/preview
5	Programming with Generative AI	8/2	https://onlinecourses.nptel.ac.in/noc25_cs137/preview
6	Algorithmic Game Theory	12/3	https://onlinecourses.nptel.ac.in/noc25_cs151/preview
7	Design & Implementation of Human-Computer Interfaces	12/3	https://onlinecourses.nptel.ac.in/noc25_cs135/preview

Above list is tentative and can be suitably updated based on needs of the Industry and availability of relevant course.

AI & ML (Any THREE Courses or TWO Courses and Project) – 8 to 11 Credits

SNO	Course Title	Credits
1	Fundamentals Of Computer Vision	3
2	Natural LanguageProcessing	3
3	Data Science	3
4	Machine Learning	4
5	Deep Learning	4
6	Special Topics onAI	2

\# Above list is tentative and can be suitably updated based on needs of the Industry and availability of relevant course.

NPTEL Equivalent courses during Jan-25, AY:24-25

SNO	Course Title	No of Weeks/Credits	Nptel link
1	Computer Vision	12/3	https://onlinecourses.nptel.ac.in/noc25_cs143/preview
2	Data Science for Engineers	8/2	https://onlinecourses.nptel.ac.in/noc25_cs101/preview
3	Introduction to Machine Learning	12/3	https://onlinecourses.nptel.ac.in/noc25_cs91/preview
4	Deep Learning - IIT Ropar	12/3	https://onlinecourses.nptel.ac.in/noc25_cs106/preview
5	Mobile Virtual Reality and Artificial Intelligence(CE/AI/ML,IOT)	4/1	https://onlinecourses.nptel.ac.in/noc25_cs80/preview

CYBER SECURITY (Any THREE Courses or TWO Courses and Project) – 8 to 11 Credits

SNO	Course Title	Credits
1	Internet of Things	3
2	Cyber Security	3
3	Applied Cryptography	3
4	Computer Graphics and Multimedia	3
5	Special Topics in Cyber Systems	2
6	Special modules in Systems	1

\# Above list is tentative and can be suitably updated based on needs of the Industry and availability of relevantcourse

NPTEL Equivalent courses during Jan-25, AY:25-26

SNO	Course Title	No of Weeks/Credits	Nptel link
1	Cyber Security and Privacy	12/3	https://onlinecourses.nptel.ac.in/noc25_cs116/preview

3	Practical Cyber Security for Cyber Security Practitioners	12/3	https://onlinecourses.nptel.ac.in/noc25_cs120/preview
4	Ethical Hacking	12/3	https://onlinecourses.nptel.ac.in/noc25_cs142/preview
5	Mobile Virtual Reality and Artificial Intelligence(CE/AI/ML,IOT)	4/1	https://onlinecourses.nptel.ac.in/noc25_cs80/preview

INTERNET OF THINGS (Any THREE Courses OR TWO Courses and Project) 8 to 11 Credits

SNO	Course Title	Credits
1	IT 5.0	3
2	Internet of Things	3
3	Special Topics in IOT	3
4	Special modules in Systems	1

#Above list is tentative and can be suitably updated based on needs of the industry and availability of relevantcourse
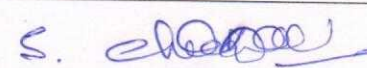
NPTEL Equivalent courses during Jan-25, AY:25-26

SNO	CourseTitle	No of Weeks/ Credits	Nptel link
1	Introduction To Industry 4.0 And Industrial InternetOf Things	12/3	https://onlinecourses.nptel.ac.in/noc25_cs146/preview
2	Introduction To Internet Of Things	12/3	https://onlinecourses.nptel.ac.in/noc25_cs147/preview
3	Mobile Virtual Reality and Artificial Intelligence(CE/AI/ML,IOT)	4/1	https://onlinecourses.nptel.ac.in/noc25_cs80/preview

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