

Syllabus Outline for Computer Science & Engineering with Specialization in Artificial Intelligence & Machine Learning



AIML_B.Tech_Syllabus_Outline_2023-2024

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
University of Engineering & Management, Jaipur



PREAMBLE

Education plays an enormously significant role in the building of a nation. There are quite a large number of educational institutions, engaged in imparting education in our country. Majority of them have entered recently into semester system to match with international educational pattern. However, our present education system is churning out youth who have to compete locally, regionally, nationally as well as globally. The present alarming situation necessitates transformation and/or redesigning of system, not only by introducing innovations but developing “learner-centric approach.

Majority of Indian higher education institutions have been following marks or percentage-based evaluation system, which obstructs the flexibility for the students to study the subjects/courses of their choice and their mobility to different institutions. There is need to allow the flexibility in education system, so that students depending upon their interests can choose inter-disciplinary, intra-disciplinary and skill-based courses. This can only be possible when choice based credit system (CBCS), an internationally acknowledged system, is adopted. The choice based credit system not only offers opportunities and avenues to learn core subjects but also explore additional avenues of learning beyond the core subjects for holistic development of an individual. The CBCS will undoubtedly facilitate benchmarking of our courses with best international academic practices.

Advantages of the choice based credit system:

- Shift in focus from the teacher-centric to student-centric education.
- Student may undertake as many credits as they can cope with (without repeating all courses in a given semester if they fail in one/more courses).
- CBCS allows students to choose inter-disciplinary, intra-disciplinary courses, skill-oriented papers (even from other disciplines according to their learning needs, interests and aptitude) and more flexibility for students.
- CBCS makes education broad-based and at par with global standards. One can take credits by combining unique combinations.
- CBCS offers flexibility for students to study at different times and at different institutions to complete one course (ease mobility of students). Credits earned at one institution can be transferred to another institution.

CHOICE BASED CREDIT SYSTEM

The Indian Higher Education Institutions have been moving from the conventional annual system to semester system. Currently many of the institutions have already introduced the Choice Based Credit System. The semester system accelerates the teaching-learning process and enables vertical and horizontal mobility in learning. The credit based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The Choice Based Credit System provides a ‘cafeteria’ type approach in which the students can take courses of their choice, learn at their own pace, undergo additional courses to acquire more than the required credits and adopt an interdisciplinary approach to learning.



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

It has been a necessity to align higher education with the emerging needs of the economy so as to ensure that the graduates of higher education system have adequate knowledge and skills for employment and entrepreneurship since last few years. The higher education system has to incorporate the requirements of various industries in its curriculum, in an innovative and flexible manner while developing a well-groomed graduate. CSE department aims to encourage research and innovation in the field of Machine Learning, Cyber security, Artificial Intelligence and other allied areas such as Computational Theory, Cloud Computing, Blockchain Technology, Data Science, Big Data Analytics and many more. The objective of the Computer Science & Engineering Programme with Specialization in Artificial Intelligence & Machine Learning is to prepare students to undertake careers involving innovative technologies, develop a problem solving capability, or to opt for advanced studies for research oriented careers.

In order to give due importance to practical applications as well as theoretical aspects of CSE, the curriculum for the Computer Science & Engineering Programme with Specialization in Artificial Intelligence & Machine Learning covers most of the foundational aspects as well as develops engineering skills for problem solving.

JOB OPORTUNITIES

Booming IT sector in India has plenty of jobs for fresh computer science graduates. Candidates with a high percentage of mark and good communication skills as well as sound computer knowledge do not face problem in getting a job. Computer engineers can get jobs in non-IT companies like universities, research, private and public industries, government departments, business organizations, commercial organizations and the manufacturing sector, etc. Besides the Computer Engineers have plenty of options to work in IT companies in departments such as design, development, assembly, manufacture, and maintenance, etc. Software Developers: Software developers are professionals who are concerned with facets of the software development process which involves activities such as design and coding, computer programming, project management, etc.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 01: High Quality Engineering Design and Development Work: Graduates of the program will engage in the effective practice of computer science and engineering to identify and solve important problems in a diverse range of application areas.

PEO 02: Real Life Problem Solving: To educate students with proficiency in core areas of Computer science & Engineering and related engineering so as to comprehend engineering trade-offs, analyze, design, and synthesize data and technical concepts to create novel products and solutions for the real life problems.

PEO 03: Leadership: Graduates of the program will engage in successful careers in industry, academia and attain positions of importance where they have impact on their business, profession and community.

PEO 04: Lifelong Learning: Graduates of the program will adapt to contemporary technologies, tools and methodologies to remain at the frontier of computer science and engineering practice with the ability to respond to the need of a challenging environment.

PROGRAM OUTCOME (PO)

PO	Summary	Description
PO1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem analysis	Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	Design /development of solutions	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Conduct investigations of complex problems	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities

		relevant to the professional engineering practice.
PO7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Project management and finance	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-Long Learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAM SPECIFIC OUTCOMES (PSO)

PSO1: The student will learn the fundamental and theoretical aspects of computer science related subjects to analyze the complex real world problems and in turn design an intelligent solution to it.

PSO2: The ability to lead and work in a team with good communication, project management, domain knowledge and expertise for enhancing research capability to transform innovative ideas into reality and documentation skills.

TYPES OF COURSES

1. Courses are the subjects that comprise the Computer Science & Engineering Programme with Specialization in Artificial Intelligence & Machine Learning.
2. A course may be designed to comprise lectures, tutorials, laboratory work, fieldwork, outreach activities, project work, vocational training, viva, seminars, term papers, assignments, presentations, self-study etc. or a combination of some of these components.
3. The learning outcomes of each course will be defined before the start of a semester.
4. Following are the course types:
 - i. **Professional Core Course (PCC):** This is a course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of B.Tech in Computer Science & Engineering with Specialization in Artificial Intelligence & Machine Learning.
 - ii. **Elective Course:** An elective course is a course, which can be chosen from a pool of courses. It is intended to support the discipline of study by providing an expanded scope, enabling exposure to another discipline/domain and nurturing a student's proficiency and skill. An elective may be of following types:
 - a) **Discipline Elective Courses (DE):** It is an elective course that adds proficiency to the students in the discipline.
 - b) **Open Elective Courses (OE):** It is an open elective course taken from other engineering disciplines and enhances the generic proficiency and interdisciplinary perspective of students.
 - c) **Specialization Elective Courses (SEC):** This is a course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of B.Tech in Computer Science & Engineering with Specialization in Artificial Intelligence & Machine Learning.
 - iii. **Obligatory Courses:**
 - a) **Mandatory Courses (MC):** It can be taken from among a pool of foundation courses, which aim at value-based education. They may provide hands-on training to improve competencies and skills or provide education on human, societal, environmental and national values.
 - b) **Internship/Project/Training/Research Paper/ (INT):** Course designed to acquire special/advanced knowledge, such as Internship, supplement study/support study to a project work, and a candidate studies such a course on his own with an advisory support by a teacher/faculty member is called project/dissertation/research Paper.



- c) **Humanities, Social Sciences & Management (HSM):** It is an elective course taken from non-engineering disciplines (humanities, social sciences and management) that broadens the perspective of an engineering student.
 - d) **Basic Science Courses (BSC):** It is based upon content that leads to fundamental knowledge enhancement in sciences, and basic engineering principles.
 - e) **Engineering Science Courses (ESC):** It is based upon content that leads to fundamental knowledge enhancement in basic Engineering Principles.
 - f) **NPTEL (NPT):** National Programme on Technology Enhanced Learning/Massive Open Online Courses (MOOCs) courses are based on the respective year's offered courses.
 - g) **General Studies Courses (GSC):** "Essential Studies for Professionals Skill & Skill Development for Professionals" courses designed to encourage and enrich the students for the technical and professional exams.
 - h) **Extra-Curricular Activities (ECR):** A student has to do the following things to achieve the MAR points: The student should engage herself / himself in activities outside the curriculum. Join different types of Clubs of NSCBIP, write something for the wall magazine, remain active in outer society, participate in Tech Fests activities, etc.
5. Each credit course contributes certain credits to the programme. A course can be offered either as a full course (4 credits) or as a half course (2 credits). A full course is conducted with 3 hours of lectures and either 1 hour of tutorial or 2 hours of practical work per week. A half course is conducted with 2 hours of lectures. There are also some exceptional electives with 3 credits and 1 credit.

Definition of Credit:

1 Hr. Lecture (L) per week	1 Credit
1 Hr. Tutorial (T) per week	1 Credit
1 Hr. Practical (P) per week Or 2 Hr. Practical (Lab)/week	0.5 Credits Or 1 Credit

6. A project work/dissertation is considered as a special course involving application of the knowledge gained during the course of study in exploring, analyzing and solving complex problems in real life applications. A candidate completes such a course with an advisory support by a faculty member.
7. **Mandatory Courses** may be offered. They do not carry credits but aim at expanding knowledge or bridging deficiency in knowledge or skill.
8. A course may have pre-requisite course(s) that are given in the Semester-wise Course Allocation scheme.
9. A student can opt for a course only if he/she has successfully passed its pre- requisite(s).
10. A student has to register for all courses before the start of a semester.
11. **Program codes:** The codes for various undergraduate programmes are as follows:
 - i. Civil Engineering: CE
 - ii. Computer Science & Engineering: CS
(Specialization in Artificial Intelligence & Machine Learning (CS-AIML))
 - iii. Electronics and Communication Engineering: EC

Syllabus Outline for Computer Science & Engineering with
Specialization in Artificial Intelligence & Machine Learning

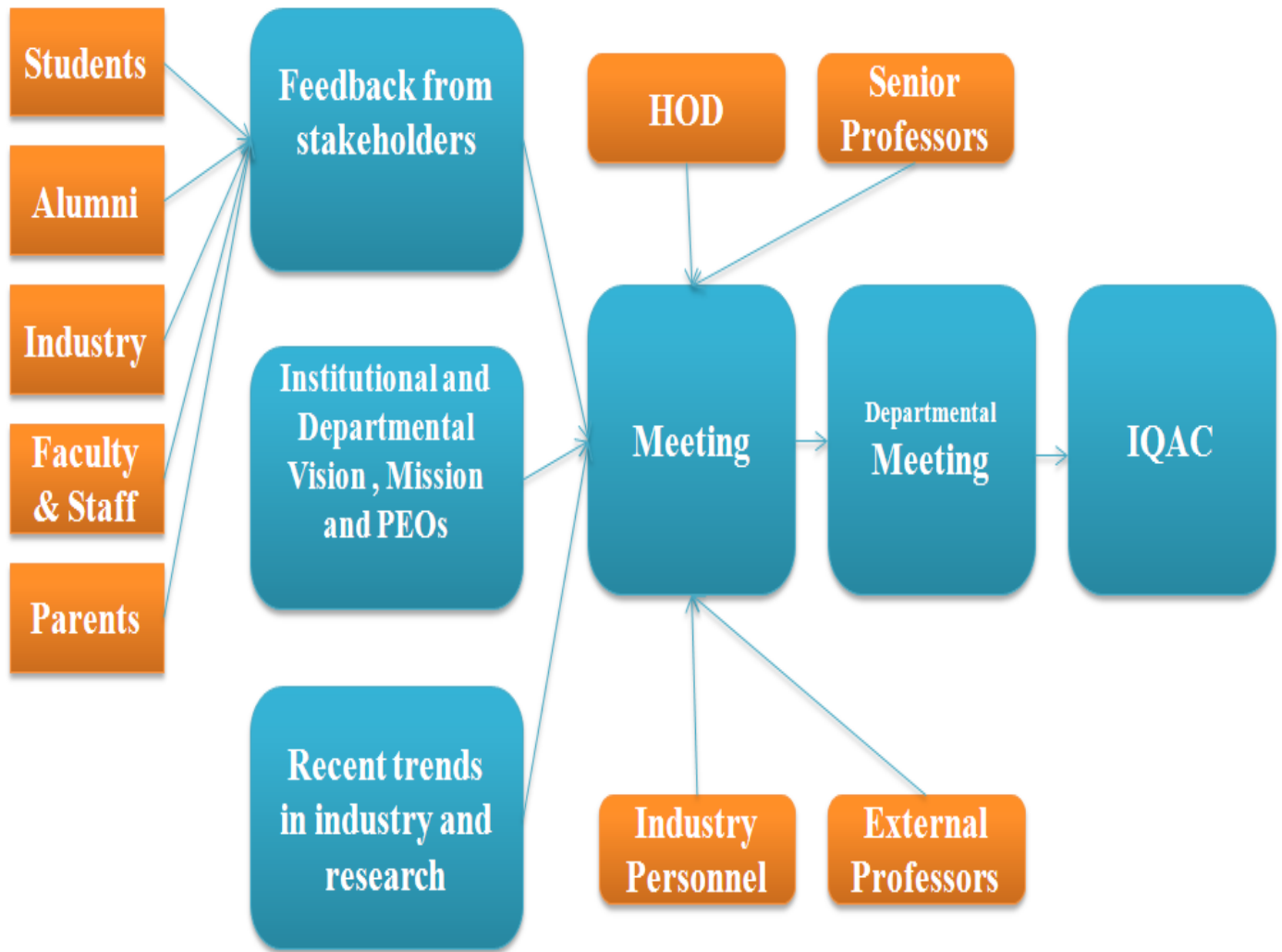


- iv. Electrical Engineering: EE
 - v. Mechanical Engineering: ME
12. **Departmental Course Codes:** The codes for departmental core courses and discipline-specific electives are specific to each discipline. The first two characters are derived from departmental codes listed above. The third character is 'C' for core courses and 'D' for discipline-specific courses and 'INT' for Dissertation/Project/Training/Internship. This is followed by a digit sequence number:
- i. CSCyyy: Core Course
 - ii. CSDyyy: Discipline Elective Courses
 - iii. AIMLyyy: Specialization Elective Courses
 - iv. XXXyyy: Open Elective Courses (Depends on the respective Dept.)
 - v. INTyyy: Project/Training/Internship/ Dissertation
13. **Common Elective Course Codes:** All disciplines will follow a common code as shown below. The 3-digit sequence number 'yyy' is taken from the respective tables of different types of courses.
- i. HSMyyy: Humanities, Social Sciences & Management Course
 - ii. BSCyyy: Basic Science Course
 - iii. MCyyy: Mandatory Course
 - iv. GSCyyy: General Studies Courses
 - v. ECRyyy: Mandatory Additional Requirements
- Here, yyy will be followed by a sequence of digit.
14. **General Electives:** A student may take a course under the category of General Elective (GE) offered by any other Department of the Institute under the categories of Core Course (CC) and Discipline Specific Electives (DE). However, such options shall be offered to a student as per prescribed guidelines of the Institute.
15. The opting of a course by the student will depend upon the requisites for that course and with the consent of the course advisor.

PROCESS FOR DESIGNING THE PROGRAM CURRICULUM

The process for designing the program curriculum involves consideration of the following aspects:

- i) Feedback from stakeholders
- ii) Institutional and Departmental Vision, Mission and PEOs
- iii) Recent trends in industry and research





SCHEME – SEMESTER WISE COURSE ALLOCATION

First Semester Syllabus

Sl No.	Type	Subject Code	Topic	L	T	P	S	Credit Points
THEORY								
1.	BSC	BSCCH102	Chemistry	3	1	0	0	4
2.	BSC	BSCM103	Mathematics-I	3	1	0	0	4
3.	BSC	ESCEE101	Basic Electrical Engineering	3	1	0	0	4
4.	ESC	ESCME102	Engineering Mechanics I	1	1	0	0	2
5.	ESC	HSMC101	English	2	1	0	0	2
6.	HSSM	ESP101	Essential Studies for Professionals – I	2	0	0	0	0.5
PRACTICAL								
7.	BSC	BSCCH192	Chemistry Laboratory	0	0	3	0	1.5
8.	ESC	ESCEE191	Basic Electrical Engineering Laboratory	0	0	2	0	1
9.	ESC	ESCME193	Workshop/ Manufacturing Practices	1	0	4	0	3
10.	HSM	HSMC191	Language Laboratory	0	0	2	0	1
SESSIONAL								
11.	HSSM	SDP181	Skill Development for Professionals – I	0	0	0	2	0.5
MANDATORY INDUSTRY AND VALUE-ADDED COURSES (IVC)								
12.	IVC	IVC181	Design Thinking & Innovation- Basic	0	0	0	1	0
13.	IVC	IVC182	Economics, Finance and Entrepreneurship Skills - Foundation	0	0	0	1	0
14.	IVC	IVC183	Introduction to AI and Data Science using Python	0	0	0	1	0
15.	MCC	MCC181B	Co-Curricular Subjects	0	0	0	0	0
TOTAL				15	4	11	5	23.5/35

#Students will undergo a mandatory Induction Program



Second Semester Syllabus

Sl No.	Type	Subject Code	Topic	L	T	P	S	Credit Points
THEORY								
1.	BSC	BSCPH201	Physics	3	1	0	0	4
2.	BSC	BSCM203	Mathematics – II	3	1	0	0	4
3.	BSC	BSCBE204	Biology for Engineers	2	1	0	0	3
4.	ESC	ESCCS201	Programming for Problem Solving	2	1	0	0	3
5.	ESC	ESCME202	Engineering Mechanics II	1	1	0	0	2
6.	HSSM	ESP201	Essential Studies for Professionals – II	2	0	0	0	0.5
PRACTICAL								
7.	BSC	BSCPH291	Physics Laboratory	0	0	3	0	1.5
8.	ESC	ESCCS291	Programming for Problem Solving Laboratory	0	0	4	0	2
9.	ESC	ESCME292	Engineering Graphics & Design	1	0	4	0	3
SESSIONAL								
10.	HSSM	SDP281	Skill Development for Professionals – II	0	0	0	1	0.5
MANDATORY INDUSTRY AND VALUE-ADDED COURSES (IVC)								
11.	IVC	IVC281	Design Thinking & Innovation-Intermediate	0	0	0	1	0
12.	IVC	IVC282	Economics, Finance and Entrepreneurship Skills – Intermediate	0	0	0	1	0
13.	IVC	IVC283	Electronics-Fundamentals & Principles	0	0	0	1	0
14.	MCC	MCC281A	Co-Curricular Subjects	0	0		1	0
TOTAL				14	5	11	5	23.5/35



Third Semester Syllabus

Sl No.	Type	Subject Code	Topic	L	T	P	S	Credit Points
THEORY								
1.	ESC	ESC301	Analog Electronic Circuits	3	0	0	0	3
2.	ESC	ESC302	Digital Electronics	3	0	0	0	3
3.	PCC	PCCCS301	Data structure & Algorithms	3	0	0	0	3
4.	PCC	PCCCS372	IT Workshop (MATLAB)	3	0	0	0	3
5.	BSC	BSM301	Mathematics- III	3	0	0	0	3
6.	HSSM	HSMCS301	Humanities-I (Principles of Management)	3	0	0	0	3
7.	HSSM	ESP301	Essential Studies for Professionals - III	2	0	0	0	0.5
PRACTICAL								
8.	ESC	ESC391	Analog Electronic Circuits Laboratory	0	0	4	0	2
9.	PCC	PCCCS391	Data structure & Algorithms Laboratory	0	0	4	0	2
10.	ESC	ESC392	Digital Electronics Laboratory	0	0	4	0	2
SESSIONAL								
11.	HSSM	SDP381	Skill Development for Professionals - III	0	0	0	2	0.5
12.	PROJ	PRJCS381	Innovative Project – I	0	0	0	0	1
MANDATORY REQUIREMENTS								
13.	MAR	MAR	Mandatory Additional Requirements (Score)	0	0	0	0	0
14.	MOOCs	MOOCs	Massive Open Online Course (Credit)	0	0	0	0	0
15.	IFC	IFC	Industry and Foreign Certification (Count)	0	0	0	0	0
TOTAL				20	0	12	2	26/36



Fourth Semester Syllabus

Sl No.	Type	Subject Code	Topic	L	T	P	S	Credit Points
THEORY								
1.	PCC	PCCCS401	Discrete Mathematics	3	1	0	0	4
2.	PCC	PCCCS402	Computer Organization & Architecture	3	0	0	0	3
3.	PCC	PCCCS403	Software Engineering with Agile Programming	2	0	0	0	2
4.	PCC	PCCCS404	Design & Analysis of Algorithms	3	0	0	0	3
5.	PCC	PCCCS405	Advanced Programming (OOP)	3	0	0	0	3
6.	HSSM	HSMCS401	Management I (Finance & Accounting)	3	0	0	0	3
7.	MC	MCCCS401	Environmental Sciences	-	-	-	-	0
8.	HSSM	ESP401	Essential Studies for Professionals- IV	2	0	0	0	0.5
PRACTICAL								
9.	PCC	PCCCS492	Computer Organization & Architecture Lab	0	0	4	0	2
10.	PCC	PCCCS493	Software Engineering with Agile Programming Lab	0	0	2	0	1
11.	PCC	PCCCS494	Design & Analysis of Algorithms Lab	0	0	4	0	2
12.	PCC	PCCCS495	Advanced Programming (OOP) Lab	0	0	2	0	1
SESSIONAL								
13.	HSSM	SDP481	Skill Development for Professionals - IV	0	0	0	2	0.5
14.	PROJ	PRJCS481	Innovative Project – II	0	0	0	0	1
15.	MAR	MAR	Mandatory Additional Requirements (MAR)-IV	0	0	0	0	0
16.	MOOCs	MOOCs	Massive Open Online Course	0	0	0	0	0
17.	IFC	IFC	Industry and Foreign Certification	0	0	0	0	0
TOTAL				19	1	12	2	26/34

Fifth Semester Syllabus

Sl No.	Type	Subject Code	Topic	L	T	P	S	Credit Points
THEORY								
1.	ESC	ESC501	Signals & Systems	3	0	0	0	3
2.	PCC	PCCCS501	Database Management Systems	3	0	0	0	3
3.	PCC	PCCCS502	Theory of Computations	3	0	0	0	3
4.	PCC	PCCCS503	Operating Systems	3	0	0	0	3
5.	PCC	PCCCS504	Software Engineering	3	0	0	0	3
6.	PCC	PCCCS575	Neural Network & Deep Learning	3	0	0	0	3
7.	HSSM	ESP(CS)501	Essential Studies for Professionals – V (CS)	2	0	0	0	0.5
8.	MCC	MCC571	Constitution of India	1	0	0	0	1
PRACTICAL								
9.	PCC	PCCCS591	Database Management Systems Lab	0	0	4	0	2
10.	PCC	PCCCS593	Operating Systems Lab	0	0	4	0	2
11.	PCC	PCCCS594	Software Engineering Lab	0	0	4	0	2
SESSIONAL								
12.	HSSM	SDP581	Skill Development for Professionals - V	0	0	0	2	0.5
13.	PROJ	PRJCS581	Innovative Project – III	0	0	0	0	1
14.	PCC	PCCCS581	Quantum Computing	0	0	0	2	1
MANDATORY REQUIREMENTS								
15.	MAR	MAR	Mandatory Additional Requirements (Score)	0	0	0	0	0
16.	MOOCs	MOOCS	Massive Open Online Course (Credit)	-	-	-	-	-
17.	IFC	IFC	Industry and Foreign Certification (Count)	0	0	0	0	0
TOTAL				21	0	12	4	28/37



Sixth Semester Syllabus

Sl. No.	Type	Subject Code	Topic	L	T	P	S	Credit Points
THEORY								
1.	PCC	PCCCS601	Computer Networks	3	0	0	0	3
2.	PCC	PCCCS602	Cloud Computing & IoT	2	0	0	0	2
3.	PEC	PECCS601	Introductory Cyber Security	3	0	0	0	3
4.	PEC	PECCS602	Elective - I	3	0	0	0	3
5.	PEC	PECCS603	Elective - II	3	0	0	0	3
6.	HSSM	ESP(CS)601	Essential Studies for Professionals – VI (CS)	2	0	0	0	0.5
PRACTICAL								
7.	PCC	PCCCS691	Computer Networks Laboratory	0	0	4	0	2
8.	PCC	PCCCS692	Cloud Computing & IoT Laboratory	0	0	4	0	2
9.	PEC	PECCS691	Introductory Cyber Security Laboratory	0	0	4	0	2
SESSIONAL								
10.	HSSM	SDP681	Skill Development for Professionals - VI	0	0	0	2	0.5
11.	PROJ	PRJCS681	Innovative Project – IV	0	0	0	6	3
12.	PCC	PCCCS681	Generative AI & Deep Learning	0	0	0	2	1
MANDATORY REQUIREMENTS								
13.	MAR	MAR	Mandatory Additional Requirements (Score)	-	-	-	-	0
14.	MOOCs	MOOCS	Massive Open Online Course (Credit)	-	-	-	-	-
15.	IFC	IFC	Industry and Foreign Certification (Count)	-	-	-	-	0
TOTAL				16	0	12	10	25/28

Elective Courses:

Program Name	Track	Elective - I	Elective - II
B. Tech in CSE	Network & Security	Blockchain, Cryptocurrency & NFT (PECCS602A)	Digital Forensics (PECCS603A)
	Artificial Intelligence & Data Science	Soft Computing (PECCS602B)	Natural Language Processing Data (PECCS603B)
	Theory & Systems	Graph Theory (PECCS602C)	Distributed Systems (PECCS603C)
	Applications	Image Processing (PECCS602D)	Computer Graphics (PECCS603D)
B. Tech in IT	Network & Security	Information Theory & Coding (PECCS602E)	Data Communication (PECCS603F)
	Artificial Intelligence	Soft Computing (PECCS602B)	Natural Language Processing (PECCS603B)
	Theory and Algorithms	Graph Theory (PECCS602C)	Computer Graphics (PECCS603D)
	Applications	Image Processing (PECCS602D)	E-Commerce (PECCS603I)
B. Tech in CSE (IOTCSBT)	Network & Security	Blockchain, Cryptocurrency & NFT (PECCS602A)	Digital Forensics (PECCS603A)
	Artificial Intelligence	-	Big Data Analytics (PECCS603G)
	Applications	-	Wireless Sensor Network (PECCS603H)
B. Tech in CSE (IOT)	Network & Security	5G Network Technology (PECCS602H)	Data Communication (PECCS603F)
	Artificial Intelligence	Soft Computing (PECCS602B)	Big Data Analytics (PECCS603G)
	Applications	Embedded System (PECCS602J)	Wireless Sensor Network (PECCS603H)
B. Tech in CSE (AI)	Artificial Intelligence	Soft Computing (PECCS602B)	Natural Language Processing (PECCS603B)
	Data Science	Data Science using Python (PECCS602K)	Cognitive Computing (PECCS603E)
B. Tech in CSE / CSIT	Network & Security	Blockchain, Cryptocurrency & NFT (PECCS602A)	Digital Forensics (PECCS603A)
	Artificial Intelligence	Soft Computing (PECCS602B)	Natural Language Processing (PECCS603B)
	Applications	-	Computer Graphics (PECCS603D)
B. Tech in CSE (AI & ML)	Theoretical AI	Soft Computing (PECCS602B)	Natural Language Processing (PECCS603B)
	Applied AI	Data Science using Python (PECCS602K)	Pattern Recognition (PECCS603J)
B. Tech in CSBS	Networks	Blockchain, Cryptocurrency & NFT (PECCS602A)	Wireless Sensor Network (PECCS603H)
	Applied AI	Data Science using Python (PECCS602K)	Natural Language Processing (PECCS603B)



Seventh Semester Syllabus

Sl. No.	Type	Subject Code	Topic	L	T	P	S	Credit Points
THEORY								
1.	PCC	PCCCS701	Compiler Design	3	0	0	0	3
2.	PEC	PECCS701	Elective - III	3	0	0	0	3
3.	OEC	OECCS701	Open Elective - I	3	0	0	0	3
4.	HSSM	ESP(CS)701	Essential Studies for Professionals – VII (CS)	2	0	0	0	0.5
PRACTICAL								
1.	PCC	PCCCS791	Compiler Design Laboratory	0	0	4	0	2
SESSIONAL								
1.	HSSM	SDP781	Skill Development for Professionals - VII	0	0	0	2	0.5
2.	PROJ	PRJCS781	Innovative Project – II	0	0	12	0	6
3.		SICS781	Summer Internship – I	0	0	0	0	4
MANDATORY REQUIREMENTS								
Sl. No.	Type of course	Course Code	Course Name	Hours per week				Score/Credit/Count
4.	MAR	MAR	Mandatory Additional Requirements (Score)	0	0	0	0	0
5.	MOOCs	MOOCs	Massive Open Online Course (Credit)	0	0	0	0	0
6.	IFC	IFC	Industry and Foreign Certification (Count)	0	0	0	0	0
TOTAL				11	0	16	2	22/34

#Students will undergo project/training/internship in the industry / research organization / reputed Institute during the vacation.



Offered Elective List:

Category	Course Name	Course Code
Professional Elective - III	Computer Vision	PECCS701D
	Advanced Deep Learning	PECCS701L
Open Elective - I	Enterprise System	OECCS701A
	Economic Policies in India	OECCS701B

Eight Semester Syllabus

Sl No.	Type	Subject Code	Topic	L	T	P	S	Credit Points
THEORY								
1.	PEC	PECS801	Elective - IV	3	0	0	0	3
2.	OEC	OECS801	Open Elective - II	3	0	0	0	3
3.	OEC	OECS802	Open Elective - III	3	0	0	0	3
4.	HSSM	ESP801	Essential Studies for Professionals – VIII (CS)	2	0	0	0	0.5
SESSIONAL								
5.	HSSM	SDP881	Skill Development for Professionals - VIII	0	0	0	2	0.5
6.	PROJ	PRJCS881	Project – III	0	0	0	12	6
7.		PCCCS881	Grand Viva-Voce	0	0	0	0	2
8.		INP881	Internship – II	0	0	0	0	4
MANDATORY REQUIREMENTS								
Sl. No.	Type of course	Course Code	Course Name	Hours per week				Score/Credit/Count
9.	MAR	MAR	Mandatory Additional Requirements (Score)	0	0	0	0	0
10.	MOOCs	MOOCs	Massive Open Online Course (Credit)	0	0	0	0	0
11.	IFC	IFC	Industry and Foreign Certification (Count)	0	0	0	0	0
12.	SAR	SAR	Skills As Additional Requirement	-	-	-	-	0
TOTAL				11	0	0	14	22



Professional Elective

Type	Choice - 1 (A) Track: Network & Security	Choice – 2 (B) Track: Artificial Intelligence & Data Science	Choice -3 (C) Track: Theory & Systems	Choice-4 (D) Track: Applications
PE- IV	Data Encryption and Compression (PECS801A)	Advanced AI (PECS801B)	Real Time Operating Systems (PECS801C)	Human Computer Interaction (PECS801D)

Open Elective

Type	Option - 1	Option – 2
OE- II	Soft Skills and Interpersonal Communication (OECS801A)	History of Science and Engineering (OECS801B)
OE - III	Cyber Law and IPR (OECS802A)	Introduction to Philosophical Thoughts (OECS802B)