# SJCET B. Tech. (CS) Curriculum 2024

## (B.Tech. in Computer Science and Engineering)

Signed By:Devassia V P
Approved by SJCET Academic Council held on 29.11.2024

## FIRST SEMESTER (July-December)

**10 Days Compulsory Induction Program and UHV**

| Sl. No | Slot | Course Code | Course Type | Course Category | Course Title (Course Name) | Credit Structure | | | | SS | Total Marks | | Credits | Hrs./ Week |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | L | T | P | R | | CIE | ESE | | |
| 1 | A | 24SJGAMAT101 | BSC | GC | Mathematics for Information Science-1 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 2 | B S1 / S2 | 24SJGAPHT121 | BSC | GC | Physics for Information Science | 3 | 0 | 2 | 0 | 5.5 | 40 | 60 | 4 | 5 |
| | | 24SJGXCYT122 | | | Chemistry for Information Science and Electrical Science | | | | | | | | | |
| 3 | C | 24SJGXEST103 | ESC | GC | Engineering Graphics and Computer Aided Drawing. | 2 | 0 | 2 | 0 | 4 | 40 | 60 | 3 | 4 |
| 4 | D | 24SJGXEST104 | ESC | GC | Introduction to Electrical and Electronics Engineering (part 1: Electrical Engineering) | 2 | 0 | 0 | 0 | 3 | 20 | 30 | 2+2=4 | 4 |
| | | | | | (Part 2: Electronics Engineering) | 2 | 0 | 0 | 0 | 3 | 20 | 30 | | |
| 5 | F | 24SJICEST105 | ESC | IC | Algorithmic Thinking with Python | 3 | 0 | 2 | 0 | 5.5 | 40 | 60 | 4 | 5 |
| 6 | L | 24SJGXESL106 | ESC | GC | Basic Electrical and Electronics Engineering Workshop | 0 | 0 | 2 | 0 | 1 | 70 | 30 | 1 | 2 |
| 7 | I* S1 / S2 | 24SJICHWT127 | HWP | IC | Health and Wellness | 1 | 0 | 1 | 0 | 0 | 50 | 0 | 1 | 2/3 |
| | | 24SJICHUT128 | HMC | | Life Skills and Professional Communication | 2 | 0 | 1 | 0 | 3.5 | 100 | 0 | | |
| 8 | S1 / S2 | 24SJICSEM129 | SEC | IC | **Skill Enhancement Course: Digital 101(NASSCOM) | MOOC | | | | 2 | | | - | |
| **Total** | | | | | | | | | | **30/ 32** | | | **20** | **25/ 26** |

**Bridge Course (Mathematics or Introduction to Computer Science) : Total 15 Hrs.**

## SECOND SEMESTER (January-June)

| Sl. No: | Slot | Course Code | Course Type | Course Category | Course Title (Course Name) | Credit Structure | | | | SS | Total Marks | | Credits | Hrs./ Week |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | L | T | P | R | | CIE | ESE | | |
| 1 | A | 24SJGAMAT201 | BSC | GC | Mathematics for Information Science-2 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 2 | B S1 / S2 | 24SJGAPHT121 | BSC | GC | Physics for Information Science | 3 | 0 | 2 | 0 | 5.5 | 40 | 60 | 4 | 5 |
| | | 24SJGXCYT122 | | | Chemistry for Information Science and Electrical Science | | | | | | | | | |
| 3 | C | 24SJGXEST203 | ESC | GC | Foundations of Computing: From Hardware Essentials to Web Design | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 4 | D | 24SJGXEST204 | ESC | GC | Programming in C | 3 | 0 | 2 | 0 | 5.5 | 40 | 60 | 4 | 5 |
| 5 | E | 24SJPCCST205 | PC | PC | Discrete Mathematics | 3 | 1 | 0 | 0 | 5 | 40 | 60 | 4 | 4 |
| 6 | F | 24SJICEST206 | ESC | IC | Engineering Entrepreneurship and IPR | 3 | 0 | 0 | 0 | 4.5 | 60 | 40 | 3 | 3 |
| 7 | I* S1 / S2 | 24SJICHWT127 | HWP | IC | Health and Wellness | 1 | 0 | 1 | 0 | 0 | 50 | 0 | 1 | 2/3 |
| | | 24SJICHUT128 | HMC | | Life Skills and Professional Communication | 2 | 0 | 1 | 0 | 3.5 | 100 | 0 | | |
| 8 | L | 24SJGXESL208 | ESC | GC | IT Workshop | 0 | 0 | 2 | 0 | 1 | 50 | 50 | 1 | 2 |
| | S1/ S2 | 24SJICSEM129 | SEC | IC | **Skill Enhancement Course: Digital 101(NASSCOM) | MOOC | | | | | | | 1 | |
| **Total** | | | | | | | | | | **34** | | | **24** | **27/ 28** |

***No Grade Points will be awarded for the MOOC course and I slot course.***

- L-T-P-R: Lecture-Tutorial-Practical-Project
- SS (Self Study) Hours= 1.5L+0.5 T+0.5P+R
- CIE: Continuous Internal Assessment, ESE: End Semester Examination

**Note:** Physics, Chemistry, Health and Wellness & Life Skill and Professional Communication can be offered in both Semester 1 (S1) and Semester 2 (S2).

| Digital 101 (NASSCOM) | | |
|---|---|---|
| **Sl. No** | **Technologies Covered** | **Hours** |
| 1 | Artificial intelligence and Big Data Analytics (AI/BDA) | 11 |
| 2 | Internet of Things (IoT) | 2.5 |
| 3 | Cyber Security | 2.5 |
| 4 | Block Chain | 2.5 |
| 5 | Robotic Process Automation | 1.5 |
| 6 | Augmented Reality and Virtual Reality (AR and VR) | 2.5 |
| 7 | Cloud Computing | 2.5 |
| 8 | 3 D Printing and Modelling | 2 |
| 9 | Web, Mobile Dev and Marketing | 2 |
| 10 | Responsible AI | 1 |
| | **Total Hours** | **30** |

****Skill Enhancement Course:** Digital 101 is an introductory Massive Open Online Course (MOOC) offered by NASSCOM. It is designed to provide students with foundational knowledge and skills in digital technologies, preparing them for further studies and careers in the digital domain. By incorporating the Digital 101 course into the curriculum, SJCET ensures that all students gain valuable digital skills early in their academic journey, enhancing their readiness for advanced courses and future careers in technology.

**Course Registration and Completion**:

- Students have the flexibility to register and complete the Digital 101 course either in their first semester (S1) or second semester (S2).
- The credit for this course (1 credit) will be officially recorded in the second semester grade card.

| THIRD SEMESTER (July-December) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sl. No:** | **Slot** | **Course Code** | **Course Type** | **Course Category** | **Course Title (Course Name)** | **Credit Structure** | | | | **SS** | **Total Marks** | | **Credits** | **Hrs./ Week** |
| | | | | | | **L** | **T** | **P** | **R** | | **CIE** | **ESE** | | |
| 1 | A | 24SJGAMAT301 | BSC | GC | Mathematics for Computer and Information Science-3 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 2 | B | 24SJPCCST302 | PC | PC | Theory of Computation | 3 | 1 | 0 | 0 | 5 | 40 | 60 | 4 | 4 |
| 3 | C | 24SJPCCST303 | PC | PC | Data Structures and Algorithms | 3 | 1 | 0 | 0 | 5 | 40 | 60 | 4 | 4 |
| 4 | D | 24SJPBCST304 | PC-PBL | PB | Object Oriented Programming | 3 | 0 | 0 | 1 | 5.5 | 60 | 40 | 4 | 4 |
| 5 | F | 24SJGAEST305 | ESC | GC | Digital Electronics and Logic Design | 3 | 1 | 0 | | 5 | 40 | 60 | 4 | 4 |
| 6 | G S3/S 4 | 24SJICHUT346 | HMC | IC | Economics for Engineers | 2 | 0 | 0 | 0 | 3 | 50 | 50 | 2 | 2 |
| | | 24SJICHUT347 | | | Engineering Ethics and Sustainable Development | | | | | | | | | |
| 7 | L | 24SJPCCSL307 | PCL | PC | Data Structures Lab | 0 | 0 | 3 | 0 | 1.5 | 50 | 50 | 2 | 3 |
| 8 | Q | 24SJPCCSL308 | PCL | PC | Digital Lab | 0 | 0 | 3 | 0 | 1.5 | 50 | 50 | 2 | 3 |
| 9 | R/M | | VAC | | Remedial/Minor Course | 3 | 1 | 0 | 0 | 5 | | | 4* | 4* |
| **Total** | | | | | | | | | | **31 / 36** | | | **25/29*** | **27/31*** |
| **Bridge Course for Lateral Entry Students: Total 15 Hrs.** | | | | | | | | | | | | | | |

| FOURTH SEMESTER (January-June) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sl. No:** | **Slot** | **Course Code** | **Course Type** | **Course Category** | **Course Title (Course Name)** | **Credit Structure** | | | | **SS** | **Total Marks** | | **Credits** | **Hrs./ Week** |
| | | | | | | **L** | **T** | **P** | **R** | | **CIE** | **ESE** | | |
| 1 | A | 24SJGAMAT401 | BSC | GC | Mathematics for Computer and Information Science -4 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 2 | B | 24SJPCCST402 | PC | PC | Database Management Systems | 3 | 1 | 0 | 0 | 5 | 40 | 60 | 4 | 4 |
| 3 | C | 24SJPCCST403 | PC | PC | Operating Systems | 3 | 1 | 0 | 0 | 5 | 40 | 60 | 4 | 4 |
| 4 | D | 24SJPBCST404 | PC-PBL | PB | Computer Organization and Architecture | 3 | 0 | 0 | 1 | 5.5 | 60 | 40 | 4 | 4 |
| 5 | E | 24SJPECST41N | PE | PE | PE-1 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 6 | G S3/ S 4 | 24SJICHUT346 | HMC | IC | Economics for Engineers | 2 | 0 | 0 | 0 | 3 | 50 | 50 | 2 | 2 |
| | | 24SJICHUT347 | | | Engineering Ethics and Sustainable Development | | | | | | | | | |
| 7 | L | 24SJPCCSL407 | PCL | PC | Operating Systems Lab | 0 | 0 | 3 | 0 | 1.5 | 50 | 50 | 2 | 3 |
| 8 | Q | 24SJPCCSL408 | PCL | PC | DBMS Lab | 0 | 0 | 3 | 0 | 1.5 | 50 | 50 | 2 | 3 |
| 9 | R/M/ H | | VAC | | Remedial/Minor/Honours Course | 3 | 1 | 0 | 0 | 5 | | | 4* | 4* |
| **Total** | | | | | | | | | | **31 / 36** | | | **24/28*** | **26/30*** |

## PROGRAM ELECTIVE I: 24SJPECST41N

| SLOT | COURSE CODE | COURSES | L-T-P-R | HOURS | CREDIT |
|---|---|---|---|---|---|
| E | 24SJPECST411 | Software Engineering | 3-0-0-0 | 3 | 3 |
| | 24SJPECST412 | Pattern Recognition | 3-0-0-0 | | 3 |
| | 24SJPECST413 | Functional Programming | 3-0-0-0 | | 3 |
| | 24SJPECST414 | Coding Theory | 3-0-0-0 | | 3 |
| | 24SJPECST416 | Signals and Systems | 3-0-0-0 | | 3 |
| | 24SJPECST417 | Soft Computing | 3-0-0-0 | | 3 |
| | 24SJPECST418 | Computational Geometry | 3-0-0-0 | | 3 |
| | 24SJPECST419 | Cyber Ethics, Privacy, and Legal Issues | 3-0-0-0 | | 3 |
| | **24SJPECST415** | **VLSI Design** | 3-0-0-1 | | **5/3** |
| | **24SJPECST410** | **Advanced Data Structures** | 3-0-0-1 | | **5/3** |

***Note :*** *Level 5 courses in the B. Tech curriculum carry a total of 5 credits, consisting of 3 credits for the Programme Elective and 2 additional credits. The additional 2 credits shall be awarded only if the student meets the eligibility conditions specified in the B. Tech. 2024 regulations. If those conditions are not fulfilled, the student will receive only 3 credits for the course.*

### FIFTH SEMESTER (July-December)

| Sl. No: | Slot | Course Code | Course Type | Course Category | Course Title (Course Name) | Credit Structure | | | | SS | Total Marks | | Credits | Hrs./ Week |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | L | T | P | R | | CIE | ESE | | |
| 1 | A | 24SJPCCST501 | PC | PC | Computer Networks | 3 | 1 | 0 | 0 | 5 | 40 | 60 | 4 | 4 |
| 2 | B | 24SJPCCST502 | PC | PC | Design and Analysis of Algorithms | 3 | 1 | 0 | 0 | 5 | 40 | 60 | 4 | 4 |
| 3 | C | 24SJPCCST503 | PC | PC | Machine Learning | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 4 | D | 24SJPBCST504 | PC- PBL | PB | Microcontrollers | 3 | 0 | 0 | 1 | 5.5 | 60 | 40 | 4 | 4 |
| 5 | E | 24SJPECST52N | PE | PE | PE-2 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 6 | I* | 24SJICHUM506 | HMC | IC | Constitution of India (MOOC) | - | - | - | - | 2 | - | - | 1 | - |
| 7 | L | 24SJPCCSL507 | PCL | PC | Networks Lab | 0 | 0 | 3 | 0 | 1.5 | 50 | 50 | 2 | 3 |
| 8 | Q | 24SJPCCSL508 | PCL | PC | Machine Learning Lab | 0 | 0 | 3 | 0 | 1.5 | 50 | 50 | 2 | 3 |
| 9 | R/M/H | | VAC | | Remedial/Minor/Honours Course | 3 | 1 | 0 | 0 | 5 | | | 4* | 4* |
| | S5/S6 | Industrial Visit (Maximum 6 Days are permitted, Not exceeding more than 4 Working Days) /Industrial Training | | | | | | | | | | | | |
| **Total** | | | | | | | | | | **30 / 35** | | | **23/27*** | **24/28*** |

***No Grade Points will be awarded for the MOOC course and I slot course.***

***Industrial Training:***

*Students who are not participating in the industrial visit must attend industrial training during that period.*

## PROGRAM ELECTIVE 2: 24SJPECST52N

| SLOT | COURSE CODE | COURSES | L-T-P-R | HOURS | CREDIT |
|---|---|---|---|---|---|
| E | 24SJPECST521 | Software Project Management | 3-0-0-0 | 3 | 3 |
| | 24SJPECST522 | Artificial Intelligence | 3-0-0-0 | | 3 |
| | 24SJPECST523 | Data Analytics | 3-0-0-0 | | 3 |
| | 24SJPECST524 | Data Compression | 3-0-0-0 | | 3 |
| | 24SJPECST526 | Digital Signal Processing | 3-0-0-0 | | 3 |
| | 24SJPECST527 | Computer Graphics and Multimedia | 3-0-0-0 | | 3 |
| | 24SJPECST528 | Advanced Computer Architectures | 3-0-0-0 | | 3 |
| | 24SJPECST520 | Industry Elective | 3-0-0-0 | | 3 |
| | **24SJPECST525** | **Data Mining** | 3-0-0-0 | | **5/3** |
| | **24SJPECST529** | **Advanced Graph Algorithms** | 3-0-0-0 | | **5/3** |

### SIXTH SEMESTER (January-June)

| Sl. No: | Slot | Course Code | Course Type | Course Category | Course Title (Course Name) | Credit Structure | | | | SS | Total Marks | | Credits | Hrs/ Week |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | L | T | P | R | | CIE | ESE | | |
| 1 | A | 24SJPCCST601 | PC | PC | Compiler Design | 3 | 1 | 0 | 0 | 5 | 40 | 60 | 4 | 4 |
| 2 | B | 24SJPCCST602 | PC | PC | Advanced Computing Systems | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 3 | C | 24SJPECST63N | PE | PE | PE-3 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 4 | D | 24SJPBCST604 | PC-PBL | PB | Fundamentals of Cyber Security | 3 | 0 | 0 | 1 | 5.5 | 60 | 40 | 4 | 4 |
| 5 | F | 24SJGAEST605 | ESC | GC | Design Thinking and Product Development (Group Specific Syllabus) | 2 | 0 | 0 | 0 | 3 | 40 | 60 | 2 | 2 |
| 6 | O# | 24SJOE--T61N /24SJIE--T61N | OE/ILE | OE | OE/ILE-1 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 7 | L | 24SJPCCSL607 | PCL | PC | Systems Lab | 0 | 0 | 3 | 0 | 1.5 | 50 | 50 | 2 | 3 |
| 8 | P | 24SJPCCSP608 | PWS | PC | Mini Project: Socially Relevant Project | 0 | 0 | 0 | 3 | 3 | 50 | 50 | 2 | 3 |
| 9 | R/ M/ H | | VAC | | Remedial/Minor/Honours Course | 3 | 0 | 0 | 0 | 4.5 | | | 3* | 3* |
| | S5/ S6 | Industrial Visit (Maximum of 6 Days are permitted, Not exceeding more than 4 Working Days) /Industrial Training | | | | | | | | | | | | |
| **Total** | | | | | | | | | | **32 / 36** | | | **23/26*** | **25/28*** |

***# Open Electives/Industry Linked Electives are applicable to CS Students***

**Industrial Training:**

Students who are not participating in the industrial visit must attend industrial training during that period.

### PROGRAM ELECTIVE 3: 24SJPECST63N

| SLOT | COURSE CODE | COURSES | L-T-P-R | HOURS | CREDIT |
|---|---|---|---|---|---|
| C | 24SJPECST631 | Software Testing | 3-0-0-0 | 3 | 3 |
| | 24SJPECST632 | Deep Learning | 3-0-0-0 | | 3 |
| | 24SJPECST633 | Wireless and Mobile Computing | 3-0-0-0 | | 3 |
| | 24SJPECST634 | Advanced Database Systems | 3-0-0-0 | | 3 |
| | 24SJPECST636 | Digital Image Processing | 3-0-0-0 | | 3 |
| | 24SJPECST637 | Fundamentals of Cryptography | 3-0-0-0 | | 3 |
| | 24SJPECST638 | Quantum Computing | 3-0-0-0 | | 3 |
| | 24SJPECST639 | Social Engineering and Human Centric Threats | 3-0-0-0 | | 3 |
| | **24SJPECST635** | **Cloud Computing** | **3-0-0-1** | | **5/3** |
| | **24SJPECST630** | **Mobile Application Development** | **3-0-0-1** | | **5/3** |

## Open Electives offered to other branches

### OPEN ELECTIVE 1: 24SJOECST61N

| SLOT | COURSE CODE | COURSES | L-T-P-R | HOURS | CREDIT |
|---|---|---|---|---|---|
| O | 24SJOECST611 | Data Structures | 3-0-0-0 | 3 | 3 |
| | 24SJOECST612 | Data Communication | 3-0-0-0 | | 3 |
| | 24SJOECST613 | Foundations of Cryptography | 3-0-0-0 | | 3 |
| | 24SJOECST614 | Machine Learning for Engineers | 3-0-0-0 | | 3 |
| | 24SJOECST615 | Object Oriented Programming | 3-0-0-0 | | 3 |

### SEVENTH SEMESTER (July-December)

| Sl. No: | Slot | Course Code | Course Type | Course Category | Course Title (Course Name) | Credit Structure | | | | SS | Total Marks | | Credits | Hrs/ Week |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | L | T | P | R | | CIE | ESE | | |
| 1 | A | 24SJPECST74N / 24SJPECSM74N | PE | PE | PE-4 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 2 | B | 24SJPECST75N/ 24SJPECSM75N | PE | PE | PE-5 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 3 | O# | 24SJOE--T72N/ 24SJIE--T72N/ 24SJOE--M72N | OE/ ILE | OE | OE/ILE-2 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 4 | I* | 24SJIEHUT704/ 24SJIEHUM70N | HMC | IE | Elective | 2 | 0 | 0 | 0 | 3 | 50 | 50 | 2 | 2 |
| 5 | S | 24SJPCCSS705 | PWS | PC | Seminar | 0 | 0 | 3 | 0 | 1.5 | 50 | 0 | 2 | 3 |
| 6 | P** | 24SJPCCSP706/ 24SJPCCSI706 | PWS | PC | Option 1: Major Project<br>Option 2: Internship (4-6 Months) | 0 | 0 | 0 | 8 | 8 | 100 | 0 | 4 | 8 |
| 7 | R/H | | VAC | | Remedial/Honours Course | 3 | 0 | 0 | 0 | 4.5 | | | 3* | 3* |
| **Total** | | | | | | | | | | **26/ 31** | | | **17/20*** | **22/25*** |

**Note:** PE-4, PE-5, OE/ILE-2, Elective - Internship Students: Self Study/MOOC Approved by the Institution/Online Classes

**No Grade Points will be awarded for the I slot courses*

***Students can opt for the internship either in the **7th or 8th semester.***

*Option 1: Work on a Project in the institute/department under the mentorship of faculty members.*

*Option 2: Full semester Internship in an Industry/organization (**7th or 8th semester**)*

*# Open Electives/Industry Linked Electives are applicable to CS Students*

## PROGRAM ELECTIVE 4: 24SJPECST74N

| SLOT | COURSE CODE | COURSES | L-T-P-R | HOURS | CREDIT |
|---|---|---|---|---|---|
| A | 24SJPECST741 | Formal Methods in Software Engineering | 3-0-0-0 | 3 | 3 |
| | 24SJPECST742 | Web Programming | 3-0-0-0 | | 3 |
| | 24SJPECST743 | Bioinformatics | 3-0-0-0 | | 3 |
| | 24SJPECST744 | Information Security | 3-0-0-0 | | 3 |
| | 24SJPECST746 | Embedded Systems | 3-0-0-0 | | 3 |
| | 24SJPECST747 | Blockchain and Cryptocurrencies | 3-0-0-0 | | 3 |
| | 24SJPECST748 | Realtime Systems | 3-0-0-0 | | 3 |
| | 24SJPECST749 | Approximation Algorithms | 3-0-0-0 | | 5 |
| | **24SJPECST745** | **Computer Vision** | **3-0-0-1** | | **5/3** |
| | **24SJPECST740** | **Topics in Theoretical Computer Science** | **3-0-0-1** | | **5/3** |

## PROGRAM ELECTIVE 5: 24SJPECST75N

| SLOT | COURSE CODE | COURSES | L-T-P-R | HOURS | CREDIT |
|---|---|---|---|---|---|
| B | 24SJPECST751 | Advanced Computer Networks | 3-0-0-0 | 3 | 3 |
| | 24SJPECST752 | Responsible Artificial Intelligence | 3-0-0-0 | | 3 |
| | 24SJPECST753 | Fuzzy Systems | 3-0-0-0 | | 3 |
| | 24SJPECST754 | Digital Forensics | 3-0-0-0 | | 3 |
| | 24SJPECST756 | Game Theory and Mechanism Design | 3-0-0-0 | | 3 |
| | 24SJPECST757 | High Performance Computing | 3-0-0-0 | | 3 |
| | 24SJPECST758 | Programming Languages | 3-0-0-0 | | 3 |
| | 24SJPECST759 | Parallel Algorithms | 3-0-0-0 | | 3 |
| | **24SJPECST755** | **Internet of Things** | **3-0-0-1** | | **5/3** |
| | **24SJPECST750** | **Algorithms for Data Science** | **3-0-0-1** | | **5/3** |

## Open Electives offered to other branches
## OPEN ELECTIVE 2: 24SJOECST72N

| SLOT | COURSE CODE | COURSES | L-T-P-R | HOURS | CREDIT |
|---|---|---|---|---|---|
| O | 24SJOECST721 | Cyber Security | 3-0-0-0 | 3 | 3 |
| | 24SJOECST722 | Cloud Computing | 3-0-0-0 | | 3 |
| | 24SJOECST723 | Software Engineering | 3-0-0-0 | | 3 |
| | 24SJOECST724 | Computer Networks | 3-0-0-0 | | 3 |
| | 24SJOECST725 | Mobile Application Development | 3-0-0-0 | | 3 |

| Slot I: HMC Elective | |
|---|---|
| 1 | Project Management: Planning, Execution, Evaluation and Control |
| 2 | Proficiency course in French. (MOOC) (B1 level) |
| 3 | Proficiency Course in German (B1 Level). (MOOC) |
| 4 | Proficiency Course in Spanish (B1 Level) (MOOC) |
| 5 | Introduction to Japanese Language and Culture (N5 level). (MOOC) |

| EIGHTH SEMESTER (January-June) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sl. No: | Slot | Course Code | Course Type | Course Category | Course Title (Course Name) | Credit Structure | | | | SS | Total Marks | | Credits | Hrs/ Week |
| | | | | | | L | T | P | R | | CIE | ESE | | |
| 1 | A | 24SJPECST86N/ 24SJPECSM86N | PE | PE | PE-6 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 2 | O# | 24SJOE--T83N/ 24SJIE--T83N/ 24SJO--M83N | OE/ ILE | OE | OE/ILE-3 | 3 | 0 | 0 | 0 | 4.5 | 40 | 60 | 3 | 3 |
| 3 | I* | 24SJICHUT803/ 24SJICHUM803 | HMC | IC | Organizational Behavior and Business Communication | 2 | 0 | 0 | 0 | 3 | 50 | 50 | 1 | 2 |
| 4 | P** | 24SJPCCSP806/ 24SJPCCSI806/ 24SJPCCSJ806 | PWS | PC | Option 1: Major Project<br>Option 2: Internship (4-6 Months)<br>Option 3: Major Project Phase -II (For the students who have not opted for internship in S7) | 0 | 0 | 0 | 8 | 8 | 100 | 0 | 4 | 8 |
| **Total** | | | | | | | | | | **20** | | | **11** | **16** |

**Note:** PE-6, OE/ILE-3, Elective - Internship Students: Self Study/MOOC approved by the Institution/Online Classes

**No Grade Points will be awarded for the I slot courses***

***Students can opt for the internship either in the **7th or 8th semester.***

*Option 1: For the students who have opted for an internship in S7*

*Option 2: Full semester Internship in an Industry/organization*

*Option 3: For the students who have not opted for internship in S7*

**# Open Electives/Industry Linked Electives are applicable to CS Students**

## PROGRAM ELECTIVE 6: 24SJPECST86N

| SLOT | COURSE CODE | COURSES | L-T-P-R | HOURS | CREDIT |
|---|---|---|---|---|---|
| A | 24SJPECST861 | Software Architectures | 3-0-0-0 | 3 | 3 |
| | 24SJPECST862 | Natural Language Processing | 3-0-0-0 | | 3 |
| | 24SJPECST863 | Topics in Security | 3-0-0-0 | | 3 |
| | 24SJPECST864 | Computational Complexity | 3-0-0-0 | | 3 |
| | 24SJPECST866 | Speech and Audio Processing | 3-0-0-0 | | 3 |
| | 24SJPECST867 | Storage Systems | 3-0-0-0 | | 3 |
| | 24SJPECST868 | Prompt Engineering | 3-0-0-0 | | 3 |
| | 24SJPECST869 | Computational Number Theory | 3-0-0-0 | | 3 |
| | 24SJPECST860 | Randomized Algorithms | 3-0-0-0 | | 3 |
| | **24SJPECST865** | **Next Generation Interaction Design** | **3-0-0-1** | | **5/3** |

## Open Electives offered to other branches
## OPEN ELECTIVE 3: 24SJOECST83N

| SLOT | COURSE CODE | COURSES | L-T-P-R | HOURS | CREDIT |
|---|---|---|---|---|---|
| O | 24SJOECST831 | Introduction to Algorithms | 3-0-0-0 | 3 | 3 |
| | 24SJOECST832 | Web Programming | 3-0-0-0 | | 3 |
| | 24SJOECST833 | Software Testing | 3-0-0-0 | | 3 |
| | 24SJOECST834 | Internet of Things | 3-0-0-0 | | 3 |
| | 24SJOECST835 | Computer Graphics | 3-0-0-0 | | 3 |

| HMC Courses | | | |
|---|---|---|---|
| **Sl. No** | **Semester** | **Course Area** | **Credits** |
| 1 | **S1/S2** | Life Skills and Professional Communication | 1 |
| 2 | **S3/S4** | Economics for Engineers | 2 |
| 3 | | Engineering Ethics and Sustainable Development | 2 |
| 4 | **S5** | Constitution of India. (MOOC) | 1 |
| 5 | **S7** | Elective (Project Management/Foreign Languages) | 2 |
| 6 | **S8** | Organizational Behavior and Business Communication | 1 |
| **Total Credits** | | | **9** |

| BSC Courses | | | |
|---|---|---|---|
| **Sl. No** | **Semester** | **Course Area** | **Credits** |
| 1 | **S1** | Mathematics for Information Science-1 | 3 |
| 2 | **S1/S2** | Physics for Information Science | 4 |
| 3 | | Chemistry for Information Science and Electrical Science | 4 |
| 4 | **S2** | Mathematics for Information Science-2 | 3 |
| 5 | **S3** | Mathematics for Computer and Information Science-3 | 3 |
| 6 | **S4** | Mathematics for Computer and Information Science-4 | 3 |
| **Total Credits** | | | **20** |

| ESC Courses | | | |
|---|---|---|---|
| **Sl. No** | **Semester** | **Course Area** | **Credits** |
| 1 | **S1** | Engineering Graphics and Computer Aided Drawing | 3 |
| 2 | | Introduction to Electrical and Electronics Engineering | 4 |
| 3 | | Algorithmic Thinking with Python | 4 |
| 4 | | Basic Electrical and Electronics Engineering Workshop | 1 |
| 5 | **S2** | Foundations of Computing: From Hardware Essentials to Web Design | 3 |
| 6 | | Programming in C | 4 |
| 7 | | Engineering Entrepreneurship and IPR | 3 |
| 8 | | IT Workshop | 1 |
| 9 | **S3** | Digital Electronics and Logic Design | 4 |
| 10 | **S6** | Design Thinking and Creativity | 2 |
| **Total Credits** | | | **29** |

| Programme Core Courses (PC) | | | |
|---|---|---|---|
| **Sl. No** | **Semester** | **Course Area** | **Credits** |
| 1 | **S2** | Discrete Mathematics | 4 |
| 2 | **S3** | Theory of Computation | 4 |
| 3 | | Data Structures and Algorithms | 4 |
| 4 | | Data Structures Lab | 2 |
| 5 | | Digital Lab | 2 |
| 6 | **S4** | Database Management Systems | 4 |
| 7 | | Operating Systems | 4 |
| 8 | | Operating Systems Lab | 2 |
| 9 | | DBMS Lab | 2 |
| 10 | **S5** | Computer Networks | 4 |
| 11 | | Design and Analysis of Algorithms | 4 |
| 12 | | Machine Learning | 3 |
| 13 | | Networks Lab | 2 |
| 14 | | Machine Learning Lab | 2 |
| 15 | **S6** | Compiler Design | 4 |
| 16 | | Advanced Computing Systems | 3 |
| 17 | | Systems Lab | 2 |
| **Total Credits (Theory -10, Lab-7)** | | | **52** |

| Programme Core-Project Based Learning (PBL) | | | |
|---|---|---|---|
| **Sl. No** | **Semester** | **Course Area** | **Credits** |
| 1 | **S3** | Object Oriented Programming | 4 |
| 2 | **S4** | Computer Organization and Architecture | 4 |
| 3 | **S5** | Microcontrollers | 4 |
| 4 | **S6** | Fundamentals of Cyber Security | 4 |
| **Total Credits** | | | **16** |

| Programme Elective Courses (PE) | | | |
|---|---|---|---|
| **Sl. No** | **Semester** | **Course Type** | **Credits** |
| 1 | **S4** | PE-1 | 3 |
| 2 | **S5** | PE-2 | 3 |
| 3 | **S6** | PE-3 | 3 |
| 4 | **S7** | PE-4 | 3 |
| 5 | | PE-5 | 3 |
| 6 | **S8** | PE-6 | 3 |
| **Total Credits** | | | **18** |

| Open Elective Courses/Industry Linked Elective (OE/ILE) | | | |
|---|---|---|---|
| **Sl. No:** | **Semester** | **Course Type** | **Credits** |
| 1 | **S6** | OE/ILE-1 | 3 |
| 2 | **S7** | OE/ILE-2 | 3 |
| 3 | **S8** | OE/ILE-3 | 3 |
| **Total Credits** | | | **9** |

| Project/ Internship and Seminar (PWS) | | | |
|---|---|---|---|
| **Sl. No:** | **Semester** | **Course Type** | **Credits** |
| 1 | **S6** | Mini project | 2 |
| 2 | **S7** | Seminar | 2 |
| 3 | | Major Project/Internship | 4 |
| 4 | **S8** | Major Project/Internship/Research Project | 4 |
| **Total Credits** | | | **12** |

| Activity Points | | | | |
|---|---|---|---|---|
| **Sl. No.** | **Group** | **Courses** | **Credits** | **Minimum Credit Requirements** |
| 1 | I | NSS, NCC, NSO (National Sports Organization) | 1 (40 Points) | 3 Credits |
| 2 | | Arts/Sports/Games | | |
| 3 | | Union/Club Activities | | |
| 4 | II | English Proficiency Certification (TOFEL, IELTS, BEC etc.) | 1 (40 Points) | |
| 5 | | Aptitude Proficiency Certification (GRE, CAT, GMAT etc.)/ Valid Gate Score. | | |
| 6 | | Short Term Internship (Minimum 2 weeks), Clinical Exposure/Training (Minimum 2 weeks), Conferences/Paper Presentation/ Workshop Activities/ Professional Body Activities, Participation in University Level /State Level / National Level Hackathons | | |
| 7 | III | Journal Publication, Patents, Start-Up, Innovation, Winners of National/ International Level Hackathons | 1 (40 Points) | |
| 8 | | **Skilling Certificates** (Approved by the University) | | |

**Note:**

- Students are required to acquire a minimum of 120 activity points, with at least 40 points per group, to fulfill the curriculum requirement of 3 activity credits.
- For B. Tech Lateral Entry students, 30 points per group are required. A minimum of 90 activity points must be acquired to obtain the 3 activity credits mandated by the curriculum.

| Course classifications of the B. Tech Programmes and Overall Credit Structure | | | |
|---|---|---|---|
| **Sl. No** | **Category** | **Code** | **Credits** |
| 1 | Humanities and Social Sciences including Management Courses | HMC | 9 |
| 2 | Basic Science Courses | BSC | 20 |
| 3 | Engineering Science Courses | ESC | 29 |
| 4 | Programme (Professional) Core Courses | PCC | 52 |
| 5 | Programme (Professional) Core Courses-Project Based Learning | PBL | 16 |
| 6 | Programme Elective Courses | PEC | 18 |
| 7 | Open Elective Courses/Industry Linked Elective | OEC/ILE | 9 |
| 8 | Mini Project, Project Work/Internship and Seminar | PWS | 12 |
| 9 | Health and Wellness | HWP | 1 |
| 10 | Skill Enhancement Courses (Digital 101) | SEC | 1 |
| 11 | Mandatory Student Activities | MSA | 3 |
| **Total Credits** | | | **170** |

## COURSE CODING PATTERN

A course code in an engineering degree curriculum is a unique identifier assigned to a specific academic course. It is a combination of letters and numbers that serves as a shorthand reference for the course.

- Each course is denoted by a unique code consisting of twelve alphanumeric characters
  - Format: [24SJYYXXCSNN]
  - Eg**: 24SJICMAT201**
- The first four characters (24SJ) denote the year of introducing the scheme and curriculum followed by the institution code.
- The next five characters (YYXXC) will be alphabets, representing the course category (YY), name of the department (XX) offering that course followed by the nature of the course(C).
  - YY- Institution Core (**IC**), Group Core (**GC**), Programme Core (PC) etc.
  - XX- Computer Science (**CS**)
  - C- Theory(**T**), Lab(**L**), Seminar(**S**), Project(**P**) etc.
- The last three characters (SNN) will be digits, providing a unique numerical identifier for the course.
  - S- Semester Number (It can have a number from 1 to 8) in which the course is offered
  - NN- Course Sequence Number

This format aims to create a clear and consistent structure for course codes, making it easier for students, faculty, and administrative staff to identify and manage different courses within the institution. These course numbers are to be given in the curriculum and syllabi.

For Example:

24SJGAPHT121- is a theory course offered in the first semester. 24SJPCCSL507 - is a Programme core laboratory course for the CSE branch in the fifth semester. 24SJPBCST604 - is a Project-Based Learning course for the CSE branch offered in the sixth semester. 24SJICHUT803 is an institution core theory course in the Eighth semester.

SJCET offers various Engineering branches are grouped into three broad categories based on their specialization.

| GROUP | BRANCHES |
|---|---|
| A | Artificial Intelligence and Data Science (AD)<br>Computer Science and Engineering (CS)<br>Computer Science and Engineering (Artificial Intelligence) (CA)<br>Computer Science and Engineering (Cyber Security) (CC) |
| B | Electrical and Electronics Engineering (EE)<br>Electronics and Communication Engineering (EC)<br>Electronics and Computer Engineering (ER) |
| C | Civil Engineering (CE)<br>Mechanical Engineering (ME) |

| CODE | DESCRIPTION | EXAMPLE |
|---|---|---|
| GA | Courses Common to Group A | 24SJGAMAT101 |
| GB | Courses Common to Group B | 24SJGBPHT121 |
| GC | Courses Common to Group C | 24SJGCEST103 |
| GX | Courses Common to Group A & B | 24SJGXCYT122 |
| GY | Courses Common to Group B & C | 24SJGYMAT101 |

**Course Category**

- **Institution Core (IC):** The Institution core is a compulsory set of courses for all B. Tech students, which includes basic courses in Humanities and Computer Science.
- **Institution Elective (IE):** These are elective courses from a basket of courses in the Humanities and Social Sciences.
- **Group Core (GC):** Courses listed under Group Core of a curriculum are group specific. These courses ensure that students gain specialized knowledge and skills in their chosen field of study.

| Course Category | Branch/Department Code | Codes for the nature of the Course | Semester Number | Identification Number for Each Course |
|---|---|---|---|---|
| YY | XX | C | S | NN |
| IC | HU, HW | T-Theory<br>M-MOOC<br>L-Lab<br>S-Seminar<br>P-Project<br>J-Project Phase 2<br>I-Internship | 1 to 8 | 01, 02, 03.. |
| IE | | | | |
| GC | AD, CS, CA, CC, CE, EC, EE, ER, ME | | | |
| PC | | | | |
| PB | | | | |
| PE, OE/IE | | | | |
| HN-Honours<br>MN-Minor | | | | |