**SIDDHARTHA INSTITUTE OF TECHNOLOGY & SCIENCES**
**(UGC – AUTONOMOUS)**
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A+' Grade
Narapally, Korremula Road, Ghatkesar, Medchal-Malkajgiri(Dist)-501 301

## B.Tech – CSE (Internet of Things)

### Course Structure (SITS - R22)

Applicable From 2022-23 Admitted Batch

**Structure Breakup**

| S. No | Category | Breakup of credits (Total 160 credits) |
|---|---|---|
| 1 | Humanities and Social Sciences including Management Courses (HSMC) | 9 |
| 2 | Basic Sciences Courses(BS) | 22.5 |
| 3 | Engineering Sciences Courses including Workshop, Drawing basics of Electrical/Mechanical/Computer etc.(ES) | 20.5 |
| 4 | Professional Core Courses(PC) | 42 |
| 5 | Professional Electives(PE) | 19 |
| 6 | Open Electives(OE) | 9 |
| 7 | Project work, Seminar and Internship in Industry or elsewhere (PS) | 18 |
| 8 | Mandatory Courses | - |
| **TOTAL** | | **160** |

# B.Tech - CSE (Internet of Things)
## Course Structure (SITS - R22)
Applicable From 2022-23 Admitted Batch

**I YEAR I SEMESTER**

| S. No. | Course Code | Course Name | Course Area | Periods per week | | | Credits | Scheme of Examination Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Internal (CIE) | External (SEE) | Total |
| 1 | 2210001 | Matrices and Calculus | BS | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 2 | 2210009 | Applied Physics | BS | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 3 | 2210503 | Programming for Problem Solving | ES | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | 2210302 | Engineering Workshop | ES | 0 | 1 | 3 | 2.5 | 40 | 60 | 100 |
| 5 | 2210011 | English for Skill Enhancement | HS | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 6 | 2210574 | Elements of Computer Science & Engineering | PC | 0 | 0 | 2 | 1 | 50 | - | 50 |
| 7 | 2210071 | Applied Physics Laboratory | BS | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 8 | 2210573 | Programming for Problem Solving Laboratory | ES | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 9 | 2210073 | English Language and Communication SkillsLaboratory | HS | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 10 | 221MC01 | Environmental Science | *MC | 3 | 0 | 0 | 0 | - | - | - |
| | | Induction Programme | - | - | - | - | - | - | - | - |
| **TOTAL** | | | | **14** | **3** | **12** | **20** | **370** | **480** | **850** |

**I YEAR II SEMESTER**

| S. No. | Course Code | Course Name | Course Area | Periods per week | | | Credits | Scheme of Examination Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Internal (CIE) | External (SEE) | Total |
| 1 | 2220002 | Ordinary Differential Equations and Vector Calculus | BS | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 2 | 2220010 | Engineering Chemistry | BS | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 3 | 2220301 | Computer Aided Engineering Graphics | ES | 1 | 0 | 4 | 3 | 40 | 60 | 100 |
| 4 | 2220201 | Basic Electrical Engineering | ES | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 5 | 2220401 | Electronic Devices and Circuits | ES | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 6 | 2220575 | Python Programming Laboratory | ES | 0 | 1 | 2 | 2 | 40 | 60 | 100 |
| 7 | 2220072 | Engineering Chemistry Laboratory | BS | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 8 | 2220271 | Basic Electrical Engineering Laboratory | ES | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 9 | 2220577 | IT Workshop | ES | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| **TOTAL** | | | | **11** | **3** | **12** | **20** | **320** | **480** | **800** |

***MC-Satisfactory/Unsatisfactory**

**II YEAR I SEMESTER**

| S. No. | Course Code | Course Name | Course Area | Periods per week | | | Credits | Scheme of Examination Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Internal (CIE) | External (SEE) | Total |
| 1 | 2230403 | Fundamentals of Digital Electronics | ES | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | 2230504 | Data Structures | PC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3 | 2230507 | Operating Systems | PC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | 2235601 | Software Engineering | PC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 5 | 2230008 | Discrete Mathematics | BS | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 6 | 2230472 | Fundamentals of Digital Electronics Lab | ES | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 7 | 2230578 | Data Structures Lab | PC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 8 | 2230580 | Operating Systems Lab | PC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 9 | 2236771 | Data visualization- R Programming/ Power BI | PC | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 10 | 223MC02 | Constitution of India | *MC | 3 | 0 | 0 | 0 | - | - | - |
| **TOTAL** | | | | **18** | **0** | **10** | **20** | **320** | **480** | **800** |

**II YEAR II SEMESTER**

| S. No. | Course Code | Course Name | Course Area | Periods per week | | | Credits | Scheme of Examination Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Internal (CIE) | External (SEE) | Total |
| 1 | 2240007 | Computer Oriented Statistical Methods | BS | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 2 | 2240505 | Computer Organization and Architecture | PC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3 | 2240405 | Sensors and Devices | ES | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 4 | 2240506 | Object Oriented Programming through Java | PC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 5 | 2246201 | Computer Networks | PC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 6 | 2240474 | Sensors and Devices Lab | ES | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 7 | 2240582 | Java Programming Lab | PC | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 8 | 224PS01 | Real-time Research Project/ Field Based Research Project | PS | 0 | 0 | 4 | 2 | 50 | - | 50 |
| 9 | 2246772 | Node JS/ React JS/ Django | PC | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 10 | 224MC03 | Gender Sensitization Lab | *MC | 0 | 0 | 2 | 0 | - | - | - |
| **TOTAL** | | | | **14** | **1** | **12** | **20** | **370** | **480** | **850** |

***MC-Satisfactory/Unsatisfactory**

**III YEAR I SEMESTER**

| S. No. | Course Code | Course Name | Course Area | Periods per week | | | Credits | Scheme of Examination Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Internal (CIE) | External (SEE) | Total |
| 1 | 2256601 | Automata Theory and Compiler Design | PC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | 2250406 | Microprocessors & Microcontrollers | PC | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 3 | 2250508 | Database Management Systems | PC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | 2250012 | Business Economics & Financial Analysis | HS | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 5 | | Professional Elective-I | PE | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 6 | 2250581 | Database Management Systems Lab | PC | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 7 | 2250475 | Microprocessors & Microcontrollers Lab | PC | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 8 | 2250074 | Advanced English Communication Skills Lab | HS | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 9 | 2255672 | UI design- Flutter | PC | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 10 | 225MC04 | Intellectual Property Rights | *MC | 3 | 0 | 0 | 0 | - | - | - |
| **TOTAL** | | | | **18** | **01** | **08** | **20** | **320** | **480** | **800** |

**III YEAR II SEMESTER**

| S. No. | Course Code | Course Name | Course Area | Periods per week | | | Credits | Scheme of Examination Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Internal (CIE) | External (SEE) | Total |
| 1 | 2266926 | IoT Communication Protocols | PC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | 22669A9 | Computer Vision and Robotics | PC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3 | 2266927 | Programming Languages for IoT | PC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | | Professional Elective – II | PE | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 5 | | Open Elective-I | OE | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 6 | 2266972 | IoT Communication Protocols Lab | PC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 7 | 2266971 | Computer Vision Lab | PC | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 8 | 226PS02 | Industrial Oriented Mini Project/ Internship/ Skill Development Course (Big data-Spark) | PS | 0 | 0 | 4 | 2 | - | 100 | 100 |
| 9 | 226MC01 | Environmental Science | *MC | 3 | 0 | 0 | 0 | - | - | - |
| **TOTAL** | | | | **18** | **0** | **10** | **20** | **320** | **580** | **900** |

***MC-Satisfactory/Unsatisfactory**

****MC-Environmental Science in III Yr II Sem Should be Registered by Lateral Entry Students Only.**

**IV YEAR I SEMESTER**

| S. No. | Course Code | Course Name | Course Area | Periods per week | | | Credits | Scheme of Examination Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Internal (CIE) | External (SEE) | Total |
| 1 | 22769B9 | IoT Cloud Processing and Analytics | PC | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | 2276928 | IoT Security | PC | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 3 | | Professional Elective -III | PE | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | | Professional Elective -IV | PE | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 5 | | Open Elective - II | OE | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 6 | 2270015 | Professional Practice, Law & Ethics | HS | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 7 | | Professional Elective -III Lab | PE | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| 8 | 227PS03 | Project Stage - I | PS | 0 | 0 | 6 | 3 | 100 | - | 100 |
| **TOTAL** | | | | **14** | **0** | **12** | **20** | **380** | **420** | **800** |

**IV YEAR II SEMESTER**

| S. No. | Course Code | Course Name | Course Area | Periods per week | | | Credits | Scheme of Examination Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Internal (CIE) | External (SEE) | Total |
| 1 | | Professional Elective – V | PE | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | | Professional Elective - VI | PE | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 3 | | Open Elective - III | OE | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | 228PS04 | Project Stage – II including seminar | PS | 0 | 0 | 22 | 11 | 40 | 60 | 100 |
| **TOTAL** | | | | **9** | **0** | **22** | **20** | **160** | **240** | **400** |

***MC-Satisfactory/Unsatisfactory**

**#Skill Course - 1 credit with 2 Practical Hours**

## Professional Elective (PE) Courses

**PE-I: Professional Elective - I**

| S. No. | Course Code | Course Title |
|---|---|---|
| 1 | 22569A3 | Architecting Smart IoT Devices |
| 2 | 22569A4 | Data Analytics for IoT |
| 3 | 22569A5 | IoT System Architectures |
| 4 | 22569A6 | Operating Systems for IoT |
| 5 | 22505A1 | Design and Analysis of Algorithms |

**PE-II: Professional Elective – II**

| S. No. | Course Code | Course Title |
|---|---|---|
| 1 | 22666A1 | Machine Learning |
| 2 | 22669A7 | Real Time Systems |
| 3 | 22604A4 | Embedded Hardware Design |
| 4 | 22602A1 | Energy Sources and Power Management |

**PE-III: Professional Elective – III**

| S. No. | Course Code | Course Title |
|---|---|---|
| 1 | 22769B1 | Mobile Application Development for IoT |
| 2 | 22756A5 | Software Testing Methodologies |
| 3 | 22767B8 | Cloud Computing and Virtualization |
| 4 | 22766A2 | Artificial Intelligence |
| 5 | 22762A7 | Lightweight Cryptography |

**PE-III Lab: Professional Elective – III Lab**

| S. No. | Course Code | Course Title |
|---|---|---|
| 1 | 22769E2 | Mobile Application Development for IoT Lab |
| 2 | 22756E2 | Software Testing Methodologies Lab |
| 3 | 22767E3 | Cloud Computing and Virtualization Lab |
| 4 | 22766E2 | Artificial Intelligence Lab |
| 5 | 22762E5 | Lightweight Cryptography Lab |

[#] **Courses in PE - III and PE - III Lab must be in 1-1 correspondence.**

**PE-IV: Professional Elective – IV**

| S. No. | Course Code | Course Title |
|---|---|---|
| 1 | 22769A2 | Quantum Computing |
| 2 | 22769B2 | Wireless Networks |
| 3 | 22766A9 | Augmented Reality & Virtual Reality |
| 4 | 22769B3 | IoT Automation |
| 5 | 22769A1 | Ad-hoc & Sensor Networks |

**PE-V: Professional Elective – V**

| S. No. | Course Code | Course Title |
|---|---|---|
| 1 | 22869B4 | Embedded Software Design |
| 2 | 22869B5 | 5G & IoT Technologies |
| 3 | 22866B2 | Cognitive Computing |
| 4 | 22856A4 | Distributed Systems |
| 5 | 2286704 | Edge Computing |

**PE-VI: Professional Elective – VI**

| S. No. | Course Code | Course Title |
|---|---|---|
| 1 | 22869B6 | Industrial IoT |
| 2 | 22869B7 | Fog Computing |
| 3 | 22869B8 | Smart Sensor Technologies |
| 4 | 22862B7 | Digital Forensics |
| 5 | 22862A6 | Blockchain Technology |

## Open Elective (OE) Courses

| S. No | Open Elective | Course Code | Course Title |
|---|---|---|---|
| 1 | Open Elective- I | 22669G1 | Introduction to IoT |
| | | 22669G2 | IoT sensors |
| 2 | Open Elective–II | 22769G3 | IoT Automation |
| | | 22766G4 | AI applications |
| 3 | Open Elective-III | 2286928 | IoT Security |
| | | 22869B6 | Industrial IoT |

***Note:*** *Open Elective subject's syllabus is provided in a separate document. Student should take open electives from the list of offered by other departments/branches only.*