# Birla Institute of Technology, Mesra, Ranchi

## Course Structure for B.Tech. (Computer Science and Engg)
### Based on NEP-2020, CBCS and OBE, Effective from 2024-2025

| Sr.No | Semester of Study (Recommended) | Category of Course | Course Code | Subjects | Mode of Delivery & Credits *L-Lecture; T-Tutorial; P-Practical* | | | Total Credits |
|---|---|---|---|---|---|---|---|---|
| | | | | | L (Periods/Week) | T (Periods/Week) | P (Periods/Week) | |
| | | | | **THEORY** | | | | |
| I.1 | | FS | MA24101 | Mathematics - I | 3 | 1 | 0 | 4 |
| I.2 | | | CH24101 | Chemistry | 3 | 1 | 0 | 4 |
| 1.3 | | GE | EC24101 | Basic Electronics | 2 | 1 | 0 | 3 |
| I.4 | | | ME24101 | Basic of Mechanical Engineering | 2 | 1 | 0 | 3 |
| I.5 | | FS | CE24101 | Environmental Sciences | 2 | 0 | 0 | 2 |
| | FIRST | | | **LABORATORIES** | | | | |
| I.6 | | FS | CH24102 | Chemistry Lab | 0 | 0 | 2 | 1 |
| I.7 | | GE | EC24102 | Basic Electronics Lab | 0 | 0 | 2 | 1 |
| I.8 | | | ME24102 | Engineering Graphics | 0 | 0 | 4 | 2 |
| I.9 | | | PE24102 | Workshop Practice | 0 | 0 | 2 | 1 |
| I.10 | | MC | MC24 101/ 102 /103/ 104/105 | Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA) /Entrepreneurship | 0 | 0 | 2 | 1 |
| **TOTAL (Theory + Labs)** | | | | | | | | **22** |
| | | | | | | | | |
| | | | | | | | | |
| | | | | **THEORY** | | | | |
| II.1 | | FS | MA24103 | Mathematics - II | 3 | 1 | 0 | 4 |
| II.2 | | | PH24101 | Physics | 3 | 1 | 0 | 4 |
| II.3 | | | BE24101 | Biological Sciences for Engineers | 2 | 0 | 0 | 2 |
| II.4 | | GE | CS24101 | Programming for Problem Solving | 3 | 1 | 0 | 4 |
| II.5 | | | EE24101 | Basics of Electrical Engineering | 2 | 1 | 0 | 3 |
| | SECOND | | | **LABORATORIES** | | | | |
| II.6 | | FS | PH24102 | Physics Lab | 0 | 0 | 2 | 1 |
| II.7 | | GE | CS24102 | Programming for problem Solving Lab. | 0 | 0 | 2 | 1 |
| II.8 | | | EE24102 | Electrical Engineering Lab. | 0 | 0 | 2 | 1 |
| II.9 | | HSS | HS24131 | Communication Skill - I | 0 | 0 | 3 | 1.5 |
| II.10 | | MC | MC24 106 /107/108/ 109/110 | Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA) /Entrepreneurship | 0 | 0 | 2 | 1 |
| **TOTAL (Theory + Labs)** | | | | | | | | **22.5** |
| **GRAND TOTAL FOR FIRST YEAR** | | | | | | | | **44.5** |

| | | | THEORY | | | | |
|---|---|---|---|---|---|---|---|
| III.1 | PC/PE | MA24205 | Discrete Mathematics | 3 | 0 | 0 | 3 |
| III.2 | | EC24203 | Digital System Design | 3 | 0 | 0 | 3 |
| III.3 | | CS24201 | Data Structures | 3 | 1 | 0 | 4 |
| III.4 | | CS24203 | Object Oriented Programming and Design Pattern | 3 | 0 | 0 | 3 |
| III.5 | | CS24205 | Computer Organization and Architecture | 3 | 0 | 0 | 3 |
| III.6 | HSS | MT24131 | UHV-II: Understanding Harmony | 3 | 0 | 0 | 3 |
| | | | LABORATORIES | | | | |
| III.7 | PC/PE | EC24204 | Digital System Design Lab | 0 | 0 | 2 | 1 |
| III.8 | | CS24202 | Data Structures Lab | 0 | 0 | 3 | 1.5 |
| III.9 | | CS24204 | OOPDP Lab | 0 | 0 | 3 | 1.5 |
| III.10 | MC | MC24 201/202/ 203/204 / 205 | Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA) / Entrepreneurship | 0 | 0 | 2 | 1 |
| | | | **TOTAL (Theory + Labs)** | | | | **24** |
| | | | THEORY | | | | |
| IV.1 | PC/PE | CS24211 | Data Base Management System | 3 | 1 | 0 | 4 |
| IV.2 | | CS24215 | Operating System | 3 | 1 | 0 | 4 |
| IV.3 | | CS24213 | Design and Analysis of Algorithm | 3 | 0 | 0 | 3 |
| IV.4 | | CS24219 | Formal Language and Automata Theory | 3 | 0 | 0 | 3 |
| IV.5 | PE | XX24XXX /MO24201 | Open Elective - I / MOOC - I | 3 | 0 | 0 | 3 |
| IV.6 | FS | MA24201 | Numerical Methods | 2 | 0 | 0 | 2 |
| IV.7 | MC | HS24211 | Indian Knowledge System | 2 | 0 | 0 | 0 |
| | | | LABORATORIES | | | | |
| IV.8 | PC/PE | CS24216 | Shell & Kernel | 0 | 0 | 3 | 1.5 |
| IV.9 | | CS24212 | DBMS Lab | 0 | 0 | 3 | 1.5 |
| IV.10 | | MA24202 | Numerical Methods Lab | 0 | 0 | 2 | 1 |
| IV.11 | | MC24 206/ 207/ 208 / 209/ 210 | Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA) / Entrepreneurship | 0 | 0 | 2 | 1 |
| IV.12 | MC | **CS24216** | Shell & Kernel | 0 | 0 | 3 | 1.5 |
| | | | **TOTAL (Theory + Labs)** | | | | **24** |
| | | | **GRAND TOTAL FOR SECOND YEAR** | | | | **48** |
| | | | THEORY | | | | |
| V.1 | PC/PE | CS24301 | Compiler Design | 3 | 0 | 0 | 3 |
| V.2 | | CS24303 | Data Mining Concepts and Techniques | 3 | 0 | 0 | 3 |
| V.3 | | CS24XXX | PE-I | 3 | 0 | 0 | 3 |
| V.4 | | CS24XXX | PE-II | 3 | 0 | 0 | 3 |
| V.5 | OE | XX24XXX / MO24301 | Open Elective - II / MOOC - II | 3 | 0 | 0 | 3 |
| | | | LABORATORIES | | | | |
| V.6 | PC | **CS24302** | Compiler Design Lab | 0 | 0 | 3 | 1.5 |
| V.7 | PC | **CS24306** | Basic IT Workshop | 0 | 0 | 3 | 1.5 |
| V.8 | PC | CS24304 | Data Mining Concepts and Techniques lab | 0 | 0 | 3 | 1.5 |
| V.9 | PE | CS24XXX | PE- II Lab | 0 | 0 | 3 | 1.5 |
| V.10 | PC | CS24300 | Project - I | | | | 2 |

| | | | | | TOTAL (Theory + Labs) | | | | 23 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | **THEORY** | | | | | |
| VI.1 | | PC/PE | CS24311 | Data Communication and Computer Networks | 3 | 0 | 0 | 3 |
| VI.2 | | | CS24313 | Artificial Intelligence and Machine Learning | 3 | 0 | 0 | 3 |
| VI.3 | | | CS24XXX | PE-III | 3 | 0 | 0 | 3 |
| VI.4 | | | CS24315 | Digital Image Processing | 3 | 0 | 0 | 3 |
| VI.5 | | OE | XX24XXX /MO243033 | Open Elective - III / MOOC - III | 3 | 0 | 0 | 3 |
| VI.6 | | HSS | MT24304 | Constitution of India | 2 | 0 | 0 | 0 |
| | SIXTH | | | **LABORATORIES** | | | | | |
| VI.7 | | PC | **CS24312** | Data Communication and Computer Networks Lab | 0 | 0 | 3 | 1.5 |
| VI.8 | | | **CS24314** | Artificial Intelligence and Machine Learning Lab | 0 | 0 | 3 | 1.5 |
| VI.9 | | | **CS24318** | Embedded Systems | 0 | 0 | 3 | 1.5 |
| VI.10 | | | **CS24316** | Digital Image Processing Lab | 0 | 0 | 3 | 1.5 |
| VI.11 | | | CS24350 | Project - II | | | | 2 |
| VI.12 | | HSS | HS24133 | Communication Skill - II | 0 | 0 | 3 | 1.5 |
| | | | | TOTAL (Theory + Labs) | | | | | 24.5 |
| | | | | GRAND TOTAL FOR THIRD YEAR | | | | | 47.5 |
| | | | | **THEORY** | | | | | |
| VII.1 | | OE | XX24XXX / MO24401 | Open Elective - IV / MOOC - IV | 3 | 0 | 0 | 3 |
| VII.2 | | PE | CS24XXX | PE-IV | 3 | 1 | 0 | 4 |
| VII.3 | | PE | CS24XXX | PE-V | 3 | 1 | 0 | 4 |
| | | | | **LABORATORIES** | | | | | |
| VII.4 | | MC | MC24400 | Summer Training (Minimum Four Weeks / 160 Hrs) | | | | 4 |
| VII.5 | SEVENTH | PE | CS24XXX | PE Lab-IV | 0 | 0 | 3 | 1.5 |
| VII.6 | | PE | CS24XXX | PE-Lab V | 0 | 0 | 3 | 1.5 |
| VII.7 | | PC | CS24400 | Project - III | | | | 3 |
| | | | | TOTAL (Theory + Labs) | | | | | 21 |
| VIII.1 | EIGHTH | PC/PE | CS24450/ CS24490 | Project-IV / Industry Internship | | | | 6 |
| VIII.2 | | | CS24498 | Comprehensive Viva | | | | 1 |
| | | | | TOTAL (Theory + Labs) | | | | | 7 |
| | | | | GRAND TOTAL FOR FOURTH YEAR | | | | | 28 |
| | | | | GRAND TOTAL FOR B.TECH. | | | | | 168 |