# BTECH CIVIL ENGINEERING COURSE STRUCTURE

# EFFECTIVE 2025-26 ADMISSION BATCH

Approved in Academic Council held on 30 July 2025

# B.TECH. CIVIL ENGINEERING PROGRAM OBJECTIVES

**PO1:** Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
**PO2:** Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

**PO3**: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

**PO4:** Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).

**PO5:** Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

**PO6:** The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

**PO7:** Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

**PO8:** Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

**PO9:** Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

**PO10:** Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

**PO11:** Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

# JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, SOLAN

## COURSE CURRICULUM OF CIVIL DEPARTMENT- 166 CREDITS (JULY 2025 ONWARDS)

### B. TECH (CIVIL ENGINEERING) 1ST SEMESTER

| S. NO. | CATEGORY CODE | SUBJECT CODE | NAME OF THE SUBJECTS | COURSE HOURS | | | CREDITS | TOTAL HOURS |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | |
| 1 | BSC | 25B11MA113 | MATHEMATICS-I | 3 | 1 | 0 | **4** | **4** |
| 2 | BSC | 25B11PH111 | PHYSICS-I | 3 | 1 | 0 | **4** | **4** |
| 3 | BSC | 25B17PH171 | PHYSICS LAB-I | 0 | 0 | 2 | **1** | **2** |
| 4 | ESC | 25B11CI11 | SOFTWARE DEVELOPMENT FUNDAMENTALS - I | 3 | 1 | 0 | **4** | **4** |
| 5 | ESC | 25B17CI172 | SOFTWARE DEVELOPMENT FUNDAMENTALS LAB - I | 0 | 0 | 2 | **1** | **2** |
| 6 | ESC | 25B11EC111 | BASIC ELECTRONICS | 3 | 1 | 0 | **4** | **4** |
| 7 | ESC | 25B17EC171 | BASIC ELECTRONICS LAB | 0 | 0 | 2 | **1** | **2** |
| 8 | HSC | 21B11HS111 | ENGLISH | 1 | 0 | 2 | **2** | **3** |
| 9 | ESC | 25B17GE171 | WORKSHOP **OR** | 0 | 0 | 3 | **1.5** | **3** |
| | | 25B17GE172 | ENGINEERING DRAWING & DESIGN | 0 | 0 | 3 | | |
| | | | | TOTAL | | | **22.5** | **28** |

### B. TECH (CIVIL ENGINEERING) 2ND SEMESTER

| S. NO. | CATEGORY CODE | SUBJECT CODE | NAME OF THE SUBJECTS | COURSE HOURS | | | CREDITS | TOTAL HOURS |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | |
| 1 | BSC | 25B11MA21 | MATHEMATICS-II | 3 | 1 | 0 | **4** | **4** |
| 2 | BSC | 25B11PH211 | PHYSICS-II | 3 | 1 | 0 | **4** | **4** |
| 3 | BSC | 25B17PH271 | PHYSICS LAB-II | 0 | 0 | 2 | **1** | **2** |
| 4 | ESC | 25B11CI211 | SOFTWARE DEVELOPMENT FUNDAMENTALS - II | 3 | 1 | 0 | **4** | **4** |
| 5 | ESC | 25B17CI271 | SOFTWARE DEVELOPMENT FUNDAMENTALS LAB - II | 0 | 0 | 2 | **1** | **2** |
| 6 | HSC | 25B17HS271 | LIFE SKILL & PROFESSIONAL COMMUNICATION LAB (AUDIT) | 0 | 0 | 2 | **0** | **2** |
| 7 | ESC | 25B17GE171 | WORKSHOP **OR** | 0 | 0 | 3 | **1.5** | **3** |
| | | 25B17GE172 | ENGINEERING DRAWING & DESIGN | 0 | 0 | 3 | | |
| 8 | HSC | 25B11HS211 | UNIVERSAL HUMAN VALUES (UHV) | 2 | 1 | 0 | **3** | 3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | TOTAL | | | **18.5** | **24** |
| **B. TECH (CIVIL ENGINEERING) 3RD SEMESTER** | | | | | | | | |
| **S. NO.** | **CATEGORY CODE** | **SUBJECT CODE** | **NAME OF THE SUBJECTS** | **COURSE HOURS** | | | **CREDITS** | **TOTAL HOURS** |
| | | | | **L** | **T** | **P** | | |
| 1 | HSC | 25B11HS311 | ECONOMICS | 2 | 1 | 0 | **3** | **3** |
| 2 | BSC | 25B11CE314 | CHEMISTRY | 3 | 0 | 0 | **3** | **3** |
| 3 | BSC | 25B17CE374 | CHEMISTRY LAB | 0 | 0 | 2 | **1** | **2** |
| 4 | PCC | 25B11CE311 | ENGINEERING MECHANICS | 3 | 1 | 0 | **4** | **4** |
| 5 | PCC | 25B17CE375 | COMPUTER AIDED CIVIL ENGINEERING DRAWING | 0 | 0 | 2 | **1** | **2** |
| 6 | PCC | 25B17CE371 | ENGINEERING MECHANICS LAB | 0 | 0 | 2 | **1** | **2** |
| 7 | PCC | 25B11CE313 | FLUID MECHANICS | 3 | 1 | 0 | **4** | **4** |
| 8 | PCC | 25B11CE312 | SURVEYING | 3 | 0 | 0 | **3** | **3** |
| 9 | PCC | 25B17CE373 | FLUID MECHANICS LAB | 0 | 0 | 2 | **1** | **2** |
| 10 | PCC | 25B17CE372 | SURVEYING LAB | 0 | 0 | 2 | **1** | **2** |
| 11 | PRC | 25B19CE391 | SUMMER TRAINING I (4 WEEKS) | 0 | 0 | 0 | **2** | **0** |
| | | | | TOTAL | | | **24** | **27** |
| **B. TECH (CIVIL ENGINEERING) 4$^{TH}$ SEMESTER** | | | | | | | | |
| **S. NO.** | **CATEGORY CODE** | **SUBJECT CODE** | **NAME OF THE SUBJECTS** | **COURSE HOURS** | | | **CREDITS** | **TOTAL HOURS** |
| | | | | **L** | **T** | **P** | | |
| **1** | HSC | | HSS ELECTIVE I | **2** | **1** | **0** | **3** | 3 |
| 2 | OMC | 25B11GE411 | ENVIRONMENTAL STUDIES | 3 | 0 | 0 | **0** | **3** |
| 3 | PCC | 25B11CE414 | MECHANICS OF SOLIDS | 3 | 1 | 0 | **4** | **4** |
| 4 | PCC | 25B11CE413 | CIVIL ENGINEERING MATERIALS | 3 | 0 | 0 | **3** | **3** |
| 5 | PCC | 25B11CE411 | GEOTECHNICAL ENGINEERING | 3 | 0 | 0 | **3** | **3** |
| 6 | PCC | 25B11CE412 | HIGHWAY ENGINEERING | 3 | 0 | 0 | **3** | **3** |
| 7 | PCC | 25B17CE472 | HIGHWAY ENGINEERING LAB | 0 | 0 | 2 | **1** | **2** |
| 8 | PCC | 25B17CE473 | MATERIALS LAB | 0 | 0 | 2 | **1** | **2** |
| 9 | PCC | 25B17CE471 | GEOTECHNICAL ENGINEERING LAB | 0 | 0 | 2 | **1** | **2** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10 | PEC | | DISCIPLINE ELECTIVE I | 3 | 0 | 0 | **3** | **3** |
| | | | | TOTAL | | | **22** | **28** |

**B. TECH (CIVIL ENGINEERING) 5 TH SEMESTER**

| S. NO. | CATEGORY CODE | SUBJECT CODE | NAME OF THE SUBJECTS | COURSE HOURS | | | CREDITS | TOTAL HOURS |
|---|---|---|---|---|---|---|---|---|
| | | | | **L** | **T** | **P** | | |
| 1 | **BSC** | | SCIENCE ELECTIVE | 3 | 0 | 0 | **3** | **3** |
| 2 | PCC | | STRUCTURAL ANALYSIS | 3 | 0 | 0 | **3** | **3** |
| 3 | PCC | | ENVIRONMENTAL ENGINEERING LAB | 0 | 0 | 2 | **1** | **2** |
| 4 | PCC | | WATER SUPPLY ENGINEERING | 3 | 0 | 0 | **3** | **3** |
| 5 | PCC | | DESIGN OF CONCRETE STRUCTURE | 3 | 1 | 0 | **4** | **4** |
| 6 | PCC | - | FOUNDATION ENGINEERING | 3 | 0 | 0 | **3** | **3** |
| 7 | PEC | - | DISCIPLINE ELECTIVE II | 3 | 0 | 0 | **3** | **3** |
| 8 | PEC | - | DISCIPLINE ELECTIVE III | 3 | 0 | 0 | **3** | **3** |
| 9 | OMC | | INDIAN CONSTITUTION & TRADITIONAL KNOWLEDGE (AUDIT) | 3 | 0 | 0 | **0** | **3** |
| 10 | PRC | | SUMMER TRAINING II (6 WEEKS) | 0 | 0 | 0 | **2** | **0** |
| 11 | HSC | | LOGICAL AND QUANTITATIVE TECHNIQUES - I | 2 | 0 | 0 | **2** | **2** |
| | | | | TOTAL | | | **27** | **29** |

**B. TECH (CIVIL ENGINEERING) 6 TH SEMESTER**

| S. NO. | CATEGORY CODE | SUBJECT CODE | NAME OF THE SUBJECTS | COURSE HOURS | | | CREDITS | TOTAL HOURS |
|---|---|---|---|---|---|---|---|---|
| | | | | **L** | **T** | **P** | | |
| 1 | PCC | - | DESIGN OF STEEL STRUCTURE | 3 | 0 | 0 | **3** | **3** |
| 2 | PCC | | SEWAGE TREATMENT AND DISPOSAL | 3 | 0 | 0 | **3** | **3** |
| 3 | PCC | | WATER RESOURCES ENGINEERING | 3 | 1 | 0 | **4** | **4** |
| 4 | PEC | | DISCIPLINE ELECTIVE IV | 3 | 0 | 0 | **3** | **3** |
| 5 | PEC | | DISCIPLINE ELECTIVE V | 3 | 0 | 0 | **3** | **3** |
| 6 | OEC | | OPEN ELECTIVE I | 3 | 0 | 0 | **3** | **3** |
| 7 | VALUE ADDED | | SELECTED VALUE-ADDED COURSE (AUDIT) | 2 | 0 | 0 | **0** | **2** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8 | HSC | | SOFT SKILLS FOR EMPLOYABILITY | 0 | 0 | 2 | **1** | **2** |
| 9 | PRC | | MINOR PROJECT | 0 | 0 | 4 | **2** | **4** |
| 10 | HSC | | LOGICAL AND QUANTITATIVE TECHNIQUES - II | 2 | 0 | 0 | **2** | **2** |
| | | | | TOTAL | | | **24** | **29** |

**B. TECH (CIVIL ENGINEERING) 7TH SEMESTER**

| S. NO. | CATEGORY CODE | SUBJECT CODE | NAME OF THE SUBJECTS | COURSE HOURS | | | CREDITS | TOTAL HOURS |
|---|---|---|---|---|---|---|---|---|
| | | | | **L** | **T** | **P** | | |
| 1 | PEC | | DISCIPLINE ELECTIVE VI | 3 | 0 | 0 | **3** | **3** |
| 2 | OEC | | OPEN ELECTIVE II | 3 | 0 | 0 | **3** | **3** |
| 3 | PRC | | MAJOR PROJECT I | 0 | 0 | 8 | **4** | **8** |
| | | | SUMMER TRAINING III (6 WEEKS) | 0 | 0 | 0 | **4** | **0** |
| | | | | TOTAL | | | **14** | **14** |

**B. TECH (CIVIL ENGINEERING) 8TH SEMESTER**

| S. NO. | CATEGORY CODE | SUBJECT CODE | NAME OF THE SUBJECTS | COURSE HOURS | | | CREDITS | TOTAL HOURS |
|---|---|---|---|---|---|---|---|---|
| | | | | **L** | **T** | **P** | | |
| 1 | PEC | | DISCIPLINE ELECTIVE VII | 3 | 0 | 0 | **3** | **3** |
| 2 | OEC | | OPEN ELECTIVE III | 3 | 0 | 0 | **3** | **3** |
| 3 | PRC | | MAJOR PROJECT II | 0 | 0 | 16 | **8** | **16** |
| | | | | TOTAL | | | **14** | **22** |

**COURSE CATEGORY-WISE CREDIT BREAKUP**

| | TOTAL CREDITS | |
|---|---|---|
| HUMANITIES & SOCIAL SCIENCES | HSC | 16 |
| BASIC SCIENCE | BSC | 25 |
| ENGINEERING SCIENCE | ESC | 18 |

| | | |
|---|---|---|
| PROFESSIONAL CORE | PCC | 55 |
| DISCIPLINE ELECTIVE | PEC | 21 |
| OPEN ELECTIVE | OEC | 9 |
| PROJECT | PR | 14 |
| MANDATORY COURSE | OMC | 0 |
| SUMMER TRAINING | STR | 8 |
| **TOTAL** | | **166** |

**LIST OF DISCIPLINE ELECTIVES (JULY 2025 ONWARDS)**

**ELECTIVE-I (IV SEM)**

| S. NO. | CATEGORY CODE | SUBJECT CODE | NAME OF THE SUBJECTS | COURSE HOURS | | | CREDITS | TOTAL HOURS |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | |
| 1 | PEC | 25B11CE415 | COMPUTER AIDED PLANNING & COSTING | 3 | 0 | 0 | 3 | 3 |
| 2 | PEC | | BUILDING DRAWING | 3 | 0 | 0 | 3 | 3 |
| 3 | PEC | | GEOINFORMATICS | 3 | 0 | 0 | 3 | 3 |
| | | | **ELECTIVE-II (SEM V)** | | | | | |
| **S. NO.** | **CATEGORY CODE** | **SUBJECT CODE** | **NAME OF THE SUBJECTS** | **COURSE HOURS** | | | **CREDITS** | **TOTAL HOURS** |
| | | | | L | T | P | | |
| 1 | PEC | | TRAFFIC ENGINEERING | 3 | 0 | 0 | 3 | 3 |
| 2 | PEC | | TRANSPORTATION ENGINEERING | 3 | 0 | 0 | 3 | 3 |
| 3 | PEC | | HIGHWAY CONSTRUCTION MANAGEMENT & MAINTENANCE | 3 | 0 | 0 | 3 | 3 |
| | | | **ELECTIVE-III (SEM V)** | | | | | |
| **S. NO.** | **CATEGORY CODE** | **SUBJECT CODE** | **NAME OF THE SUBJECTS** | **COURSE HOURS** | | | **CREDITS** | **TOTAL HOURS** |
| | | | | L | T | P | | |
| 1 | PEC | | CONSTRUCTION TECHNOLOGY AND MANAGEMENT | 3 | 0 | 0 | 3 | 3 |
| 2 | PEC | | GEOSYNTHETIC | 3 | 0 | 0 | 3 | 3 |
| 3 | PEC | | AIR & NOISE POLLUTION & CONTROL | 3 | 0 | 0 | 3 | 3 |
| 4 | PEC | | MODELLING SIMULATION AND COMPUTER APPLICATION | 3 | 0 | 0 | 3 | 3 |
| | | | **ELECTIVE-IV (SEM VI)** | | | | | |

| S. NO. | CATEGORY CODE | SUBJECT CODE | NAME OF THE SUBJECTS | COURSE HOURS | | | CREDITS | TOTAL HOURS |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | |
| 1 | PEC | | ADVANCED CONCRETE TECHNOLOGY | 3 | 0 | 0 | 3 | 3 |
| 2 | PEC | | OPEN CHANNEL FLOW AND HYDRAULIC MACHINE | 3 | 0 | 0 | 3 | 3 |
| 3 | PEC | | UNDERGROUND TECHNOLOGY | 3 | 0 | 0 | 3 | 3 |
| 4 | PEC | | INDUSTRIAL WASTE TREATMENT | 3 | 0 | 0 | 3 | 3 |
| | | | **ELECTIVE-V (SEM VI)** | | | | | |
| **S. NO.** | **CATEGORY CODE** | **SUBJECT CODE** | **NAME OF THE SUBJECTS** | **COURSE HOURS** | | | **CREDITS** | **TOTAL HOURS** |
| | | | | L | T | P | | |
| 1 | PEC | | ADVANCED STRUCTURAL ANALYSIS | 3 | 0 | 0 | 3 | 3 |
| 2 | PEC | | PAVEMENT ANALYSIS AND DESIGN | 3 | 0 | 0 | 3 | 3 |
| 3 | PEC | | SOLID WASTE MANAGEMENT | 3 | 0 | 0 | 3 | 3 |
| 4 | PEC | | CONSTRUCTION MANAGEMENT COMPUTATION | 3 | 0 | 0 | 3 | 3 |
| | | | **ELECTIVE-VI (SEM VII)** | | | | | |
| **S. NO.** | **CATEGORY CODE** | **SUBJECT CODE** | **NAME OF THE SUBJECTS** | **COURSE HOURS** | | | **CREDITS** | **TOTAL HOURS** |
| | | | | L | T | P | | |
| 1 | PEC | | EARTHQUAKE ENGINEERING | 3 | 0 | 0 | 3 | 3 |
| 2 | PEC | | DESIGN OF PRESTRESSED CONCRETE STRUCTURES | 3 | 0 | 0 | 3 | 3 |
| 3 | PEC | | DAM AND RESERVOIR DESIGN | 3 | 0 | 0 | 3 | 3 |
| 4 | PEC | | ADVANCED HIGHWAY MATERIAL AND CONSTRUCTION | 3 | 0 | 0 | 3 | 3 |
| | | | **ELECTIVE-VII (SEM VIII)** | | | | | |
| **S. NO.** | **CATEGORY CODE** | **SUBJECT CODE** | **NAME OF THE SUBJECTS** | **COURSE HOURS** | | | **CREDITS** | **TOTAL HOURS** |
| | | | | T | P | P | | |
| 1 | PEC | | ADVANCED FOUNDATION ENGINEERING | 3 | 0 | 0 | 3 | 3 |
| 2 | PEC | | ADVANCED REINFORCED CONCRETE DESIGN | 3 | 0 | 0 | 3 | 3 |
| 3 | PEC | | ENVIRONMENTAL MANAGEMENT AND IMPACT ASSESSMENT | 3 | 0 | 0 | 3 | 3 |
| 4 | PEC | | HYDROPOWER ENGINEERING | 3 | 0 | 0 | 3 | 3 |