# S.Y.B.Tech.
# (Civil Engineering)
# Sem. III & IV
## Course Credit System Regulation 2018

BHARTIYA VIDYA BHAVAN'S
SARDAR PATEL COLLEGE OF ENGINEERING
Munshi Nagar Andheri (W)

| Scheme for S.Y.B.Tech. In Civil Engineering (Semester - III)<br>Academic Year 2022-23 (not applicable for R22) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr. No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs)** | | | **Credits** | **In semester Evaluation (Points)** | | | **End Semester Evaluation (Points)** | | **End semester weightage (%)** | **Term work / Practical** | **Total Points** |
| | | | **L** | **P** | **T** | | **T-I** | **T-II** | **IE** | **Points** | **Time (Hrs)** | | | |
| | **Core Courses** | | | | | | | | | | | | | |
| 1 | Mathematics III | BS-BTC301 | 2 | 0 | 0 | 2 | 15 | 15 | 10 | 100 | 3 | 60% | 0 | 100 |
| 2 | Mechanics of Materials | ES-BTC302 | 3 | 0 | 0 | 3 | 15 | 15 | 10 | 100 | 3 | 60% | 0 | 100 |
| 3 | Basics of Surveying | PC-BTC303 | 2 | 0 | 0 | 2 | 15 | 15 | 10 | 100 | 3 | 60% | 0 | 100 |
| 4 | Building Drawing with CAD | ES-BTC304 | 2 | 0 | 0 | 2 | 15 | 15 | 10 | 100 | 3 | 60% | 0 | 100 |
| 5 | Engineering Geology | BS-BTC305 | 2 | 0 | 0 | 2 | 15 | 15 | 10 | 100 | 3 | 60% | 0 | 100 |
| 6 | Fluid Mechanics | PC-BTC306 | 3 | 0 | 0 | 3 | 15 | 15 | 10 | 100 | 3 | 60% | 0 | 100 |
| 7 | Building Materials and Construction | PC-BTC307 | 2 | 0 | 1 | 3 | 15 | 15 | 10 | 100 | 3 | 60% | 25 | 125 |
| | **Laboratory Courses** | | | | | | | | | | | | | |
| 8 | Mechanics of Materials (Lab) | ES-BTC351 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0% | 25 | 25 |
| 9 | Basics of Surveying (Lab.) | PC- BTC352 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0% | 25 | 25 |
| 10 | Fluid Mechanics (Lab.) | PC- BTC353 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0% | 25 | 25 |
| 11 | Materials Testing & Evaluation (Lab.) | PC- BTC354 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0% | 25 | 25 |
| 12 | Building Drawing with CAD (Lab.) | ES-BTC355 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0% | 25 | 25 |
| 13 | Engineering Geology (Lab.) | BS-BTC356 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0% | 25 | 25 |
| | **Online Courses** | | | | | | | | | | | | | |
| 14 | #Online Course | OL-BTCxxx | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Value Added Courses | | | | | | | | | | | | | |
| 15 | UHV-I/Or Any other | VA-BTC301 | 2 | | | 0 | 15 | 15 | 10 | 50 | 2 | 0 | 0 | 0 |
| | **TOTAL** | | **16** | **12** | **1** | **23** | | | | | | | | |

IE: Internal Evaluation
#List of courses to be anounced at start of the year

# NOTES

**Scheme for S.Y.B.Tech. In Civil Engineering (Semester - IV)**
**Academic Year 2022-23 (not applicable for R22)**

| Sr. No. | Course Name | Code | Course Plan per Week (Hrs) | | | Credits | In semester Evaluation(Points) | | | End Semester Evaluation (Points) | | End semester weightage (%) | Term work / Practical | Total Points |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | | T-I | T-II | IE | Points | Time (Hrs) | | | |
| | **Core Courses** | | | | | | | | | | | | | |
| 1 | Probability, Statistics and Operational Research | BS-BTC401 | 2 | 0 | 0 | 2 | 15 | 15 | 10 | 100 | 3 | 60% | 0 | 100 |
| 2 | Structural Mechanics | PC-BTC402 | 3 | 0 | 1 | 4 | 15 | 15 | 10 | 100 | 3 | 60% | 25 | 125 |
| 3 | Concrete Technology | PC-BTC403 | 2 | 0 | 0 | 2 | 15 | 15 | 10 | 100 | 3 | 60% | 0 | 100 |
| 4 | Surveying & Geomatics | PC-BTC404 | 3 | 0 | 0 | 3 | 15 | 15 | 10 | 100 | 3 | 60% | 0 | 100 |
| 5 | Hydraulic Engineering | PC-BTC405 | 2 | 0 | 0 | 2 | 15 | 15 | 10 | 100 | 3 | 60% | 0 | 100 |
| 6 | Transportation Engineering | PC-BTC406 | 2 | 0 | 1 | 3 | 15 | 15 | 10 | 100 | 3 | 60% | 25 | 125 |
| 7 | Environmental Engineering-I | PC-BTC407 | 3 | 0 | 0 | 2 | 15 | 15 | 10 | 100 | 3 | 60% | 0 | 100 |
| | **Laboratory Courses** | | | | | | | | | | | | | |
| 8 | Concrete Technology (Lab) | PC-BTC451 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 25 |
| 9 | Surveying &Geomatics(Lab.) | PC-BTC452 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 25 |
| 10 | Hydraulic Engineering (Lab.) | PC-BTC453 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 25 |
| | **Mandatory Course** | | | | | | | | | | | | | |
| 12 | Indian Traditional Knowledge | MC-BT002 | 2 | 0 | 0 | 0 | 15 | 15 | 10 | 50+50 * | 3 | 60% | 0 | 100 |
| | **Online Courses** | | | | | | | | | | | | | |
| 13 | #Online Course | OL-BTCxxx | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Value Added Courses** | | | | | | | | | | | | | |
| 14 | VA-BTC | VA-BTCxxx | 2 | 0 | 0 | 0 | 15 | 15 | 10 | 50 | 2 | 0 | 0 | 0 |
| | **TOTAL** | | **18** | **6** | **2** | **22** | | | | | | | | |

IE: Internal Evaluation

#List of courses to be anounced at start of the year ; *
Assignments during the coursework

**Notes:**

(1) Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details
(2) Laboratory course is considered as a separate head of passing.
(3) Assessment criteria for laboratory/Tutorial work. i.e. weightage for assessment shall be as follows: i) Participation in Laboratory/Tutorial = 20%, (ii) Journal= 40%, (iii) Practical Examination (and/or) Mini project (and/or) Quiz (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.
(4) Student can opt for an online course available on https://swayam.gov.in/ or https://onlinecourses.nptel.ac.in/ subject to approval from the department. After successful completion of the course, the course title can appear on the grade card of student.
(5) The Mandatory courses are with Pass (P) and No Pass (NP) grades.
(6) Department will offer the Value Added courses in a semester subject to availability of resources and enrolment of minimum 20 students opting for the course. Upon completion of the Value Added course, the course title shall appear in the grade card of the student.
(7) Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE) . Upon successful completion of the course , the course title shall appear on student's grade card.
(8) The contents of core courses are aligned with the latest GATE syllabus. The mapping between GATE syllabus topics and core courses is given in Table GATE-MAP.

# T.Y.B.Tech.
# (Civil Engineering)
# Sem. V & VI
## Course Credit System Regulation 2018

| Scheme for T.Y.B.Tech.in Civil Engineering, (Semester - V) Year 2023-24 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr. No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs)** | | | **Credits** | **In semester Evaluation (Points)** | | **End Semester Evaluation (Points)** | | **End semester weightage (%)** | **Term work/ Practical** | **Total Points** |
| | | | **L** | **P** | **T** | | **T- I** | **T-II** | **Points** | **Time (hrs)** | | | |
| **Core Courses** | | | | | | | | | | | | | |
| 1 | Structural Engineering | PC-BTC501 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 2 | Hydrology & Water Resources Engineering | PC-BTC502 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 3 | Soil Mechanics | PC-BTC503 | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 4 | Highway Engineering | PC-BTC504 | 2 | 0 | 0 | 2 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 5 | Environmental Engineering-II | PC-BTC506 | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 6 | Organizational Communication and Interpersonal Skills | HSM-BTC507 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| **Laboratory Courses (Note 2&3)** | | | | | | | | | | | | | |
| 7 | Highway Engineering (Lab) | PC-BTC551 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 25 |
| 8 | Environmental Engineering (Lab) | PC- BTC552 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 25 |
| 9 | Soil Mechanics (Lab) | PC- BTC553 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 25 |
| **Online Courses (Note 5)** | | | | | | | | | | | | | |
| 10 | Online Course | OL-BTCxxx | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Value Added Courses (Note7)** | | | | | | | | | | | | | |
| 11 | Introduction to Offshore Engineering | VA –BTC 572 | 2 | 0 | 0 | 0 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 12 | Legal Aspects in Projects | VA –BTC 573 | 1 | 0 | 1 | 0 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| **Value Added Non-Technical Courses (Note10)** | | | | | | | | | | | | | |
| 11 | Refer Table-VNT | VNT-BTxxx | Refer Table-VNT | | | | | | | | | | |
| | **TOTAL** | | **17** | **4** | **3** | **22** | | | | | | | |

**Non-technical value Added Courses-VNT**

VN-BT001: Ubuntu
VN-BT002: Performing Arts and Script Writing
VN-BT003: Financial Literacy
VN-BT004: Self Defence Training program
VN-BT005: Yoga health technology for self-management
VN-BT006: Integrated self-management
VN-BT007: Photography

# NOTES

(1) Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details
(2) Laboratory course is considered as a separate head of passing.
(3) Assessment criteria for laboratory/Tutorial work/Term work. i.e. weightage for assessment shall be as follows: i) Participation in Laboratory/Tutorial = 20%, (ii) Journal= 40%, (iii) Practical Examination (and/or) Mini project (and/or) Quiz (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.
(4) Student can opt for an online course available on https://swayam.gov.in/ or https://onlinecourses.nptel.ac.in/ subject to approval from the department. After successful completion of the course, the course title can appear on the grade card of student.
(5) The Mandatory courses are with Pass (P) and No Pass (NP) grades.
(6) Department will offer the Value Added courses in a semester subject to availability of resources and enrolment of minimum 20 students opting for the course. Upon completion of the Value Added course, the course title shall appear in the grade card of the student.
(7) Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE) . Upon successful completion of the course , the course title shall appear on student's grade card.
(8) The contents of core courses are aligned with the latest GATE syllabus. The mapping between GATE syllabus topics and core courses is given in Table GATE-MAP

| Scheme for T.Y.B.Tech.in Civil Engineering, (Semester - VI) Year 2023-24 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr. No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs)** | | | **Credits** | **In semester Evaluation (Points)** | | **End Semester Evaluation (Points)** | | **End semester weightage (%)** | **Term work/ Practical** | **Total Points** |
| | | | **L** | **P** | **T** | | **T-I** | **T-II** | **Points** | **Time (Hrs)** | | **(Note 3)** | |
| **Core Courses** | | | | | | | | | | | | | |
| 1 | Construction Engineering & Management | PC-BTC601 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25# | 125 |
| 2 | Design of Steel Structures | PC-BTC602 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25# | 125 |
| 3 | Foundation Engineering | PC-BTC603 | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 4 | Design of RCC Elements | PC-BTC604 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25# | 125 |
| 5 | Elective - I | REFER TABLE - Professional Elective I | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0/25* | 100/125* |
| 6 | Elective II | REFER TABLE- -Professional Elective II | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0/25* | 100/125* |
| 7 | Open Elective-I | REFER TABLE - Open Elective I | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0/25* | 100/125* |
| **Mandatory Course** | | | | | | | | | | | | | |
| 8 | Environmental studies | MC-102 | 2 | 0 | 0 | 0 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| **Online Courses (Note 5)** | | | | | | | | | | | | | |
| 12 | Online Course | OL-BTC xxx | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Value Added Courses (Note 7)** | | | | | | | | | | | | | |
| 13 | Geographic Information System (GIS) and its Applications | VA-BTC671 | 1 | 0 | 1 | 0 | 20 | 20 | 100 | 3 | 60 | 25 | 125 |
| 14 | Business and Professional Communication | VA-BTC672 | 1 | 0 | 1 | 0 | 20 | 20 | 100 | 3 | 60 | 25 | 125 |
| **Value Added Non-Technical Courses** | | | | | | | | | | | | | |
| 15 | Refer Table-VNT | VNT-BTxxx | Refer Table-VNT | | | | | | | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | | **26** | **0** | **3** | **24** | | | | | | | |

**Non-technical value Added Courses-VNT**

VN-BT001: Ubuntu
VN-BT002: Performing Arts and Script Writing
VN-BT003: Financial Literacy
VN-BT004: Self Defence Training program
VN-BT005: Yoga health technology for self-management
VN-BT006: Integrated self-management
VN-BT007: Photography

**Professional Elective I**

| **Specialization** | **Sr. No.** | **Code** | **Elective** |
|---|---|---|---|
| Structures | 1 | PE-BTC621 | Analysis of Indeterminate Structures |
| | 2 | PE-BTC622 | Geographic Information System Science and Application |
| Water Resources | 3 | PE-BTC631 | Hydraulic structures & Irrigation Engineering |
| | 4 | PE-BTC 632 | Introduction to Offshore Engineering |
| Construction Management | 5 | PE-BTC641 | Special Construction Materials & Methods |
| Environmental Engg. | 6 | PE-BTC 651 | Solid and Hazardous Waste Management |
| | 7 | PE-BTC 652 | Air and Noise Pollution Control |
| Transporatation and Geo-Tech | 8 | PE-BTC 661 | Pavement Subgrade and Materials |
| | 9 | PE-BTC 662 | Ground Improvement Techniques |

**Professional Elective II**

| **Specialization** | **S. No** | **Code** | **Elective** |
|---|---|---|---|
| Structures | 1 | PE-BTC 624 | Structural Dynamics |
| Water Resources | 2 | PE-BTC 633 | Open Channel Flow |
| | 3 | PE-BTC 634 | Ground Water Development and Management |
| | 4 | PE-BTC 635 | Urban Hydrology and hydraulics |
| | 5 | PE-BTC636 | Watershed Management |
| Construction Management | 5 | PE-BTC 642 | Disaster Preparedness , Planning and Management |
| | 6 | PE-BTC 644 | TQM and MIS in construction |
| Environmental Engg. | 7 | PE-BTC 653 | Rural Water Supply and Sanitation |

| | | | |
|---|---|---|---|
| | 8 | PE-BTC 654 | Physico chemical processes |
| Transporatation and Geo-Tech | 9 | PE-BTC 663 | Low Cost Roads |
| | 10 | PE-BTC 664 | Traffic engineering and control |
| | 11 | PE-BTC 665 | Introduction to Geotechnical Earthquake Engineering |

| **Open Elective-I** | | |
|---|---|---|
| **Sr. No.** | **Code** | **Elective** |
| 1 | OE-BTC 611 | Human Resources Development And Organizational Behavior |
| 2 | OE-BTC 612 | Sustainable Development |
| 4 | OE-BTC 614 | Artificial Intelligence Techniques |
| 5 | OE-BTC 615 | Numerical Computations |
| 6 | OE –BTE 601 | Project Management |
| 7 | OE-BTE 602 | Artificial Intelligence |
| 8 | OE-BTE 605 | Linear Algebra And Matrix Computation |
| 9 | OE-BTM 611 | Computational Methods |
| 10 | OE-BTM 613 | Entrepreneurship Development And Start Up |
| 11 | OE-BTM 614 | Introduction To Optimization Methods |

*** Professional elective can be for 2 lectures + 1 tutorial based on course instructor's discretion; For such courses, the total marks will be 125 i.e 25 marks for tutorial added. However, the total credits shall remain same. This should be conveyed to exam section at the start of semester**

**Notes:**

(1) Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details
(2) Laboratory course is considered as a separate head of passing.
(3) Assessment criteria for laboratory/Tutorial work. i.e. weightage for assessment shall be as follows: i) Participation in Laboratory/Tutorial = 20%, (ii) Journal= 40%, (iii) Practical Examination (and/or) Mini project (and/or) Quiz (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.
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(7) Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE) . Upon successful completion of the course , the course title shall appear on student's grade card
(8) The contents of core courses are aligned with the latest GATE syllabus. The mapping between GATE syllabus topics and core courses is given in Table GATE-MAP

# B.Tech.

# (Civil Engineering)
# Sem. VII & VIII
Course Credit System Regulation 2018

| Scheme for Final Year B.Tech.in Civil Engineering, (Semester - VII) Academic Year 2023-24 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr. No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs)** | | | **Credits** | **In semester Evaluation (Points)** | | **End Semester Evaluation (Points)** | | **End semester weightage (%)** | **Term work/Practical** | **Total Points** |
| | | | **L** | **P** | **T** | | **T-I** | **T-II** | **Points** | **Time (Hrs)** | | **(Note 3)** | |
| **Core Courses** | | | | | | | | | | | | | |
| 1 | Design of concrete structures | PC-BTC701 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25# | 125 |
| 2 | Professional Elective III | REFER TABLE - Professional Elective III | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0/25* | 100/125 * |
| 3 | Professional Elective IV | REFER TABLE - Professional Elective IV | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0/25* | 100/125 * |
| 4 | Open Elective II | REFER TABLE -Open Elective II | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0/25* | 100/125 * |
| 5 | Project-Stage I | PROJ-BTC751 | 0 | (2+6) $ | 0 | 4 | 0 | 0 | 0 | 0 | 0% | 50##** (Note 9) | 50 |
| **Online Courses (Note 5)** | | | | | | | | | | | | | |
| 6 | Online Course | OL-BTCxxx | 3 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Value Added Courses (Note 7)** | | | | | | | | | | | | | |
| 7 | Environmental Impact Assessment and Mgt. | VA-BTC772 | 2 | 0 | | | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 8 | Conventional and Nonconventional Materials in Highway Sub-grade | VA-BTC773 | 2 | 0 | | | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| **Value Added Non-Technical Courses** | | | | | | | | | | | | | |
| 9 | Non-technical value added course | VN-BTXXX | Refer Table-VNT | | | | | | | | | | |
| | **TOTAL** | | **12** | **8** | **1** | **17** | | | | | | | |

**Non-technical value Added Courses-VNT**

VN-BT001: Ubuntu
VN-BT002: Performing Arts and Script Writing VN-BT003: Financial Literacy
VN-BT004: Self Defence Training program
VN-BT005: Yoga health technology for self-management VN-BT006: Integrated self-management
VN-BT007: Photography

## Professional Elective III

| Specialization | Sr. No. | Code | Elective |
|---|---|---|---|
| Structures | 1 | PE-BTC721 | Advanced Structural Analysis |
| | 2 | PE-BTC 722 | Structural analysis by Matrix Methods |
| | 3 | PE-BTC 723 | Repair and rehabilitation of structures |
| Water Resources | 4 | PE-BTC 731 | Surface Hydrology |
| Environmental Engg. | 5 | PE-BTC 741 | Water and Air quality Modelling |
| | 6 | PE-BTC742 | Environmental Impact Assessment |
| Transportation and Geo-Tech | 7 | PE-BTC 761 | Pavement Design & Construction |
| | 8 | PE-BTC 762 | Advanced Foundation Engineering |
| | 9 | PE-BTC 763 | Rock Mechanics |

BHARTIYA VIDYA BHAVAN'S
SARDAR PATEL COLLEGE OF ENGINEERING
Munshi Nagar Andheri (W)

## Professional Elective IV

| Specialization | Sr. No. | Code | Elective |
|---|---|---|---|
| Structures | 1 | PE-BTC 726 | Prestressed concrete |
| Water Resources | 2 | PE-BTC732 | Hydraulic Modelling |
| Environmental Engg | 3 | PE-BTC 742 | Sustainable Engineering and technology |
| | 4 | PE-BTC743 | Industrial Wastewater treatment |
| Construction Management | 5 | PE-BTC 751 | Engineering risk and uncertainty |
| | 6 | PE-BTC752 | Infrastructure Planning and Management |
| Transportation and Geo-Tech | 7 | PE-BTC 764 | Design and Construction of Rigid Pavements |

| Open Elective-II | | |
|---|---|---|
| **Sr. No.** | **Code** | **Elective** |
| 1 | OE-BTC 711 | Economic policies of India |
| 2 | OE-BTC 712 | Entrepreneurship, Innovation and Design Thinking |
| 3 | OE-BTC 713 | Disaster Management and preparedness |
| 4 | OE-BTC 714 | Engineering System and development |
| 5 | OE-BTE 701 | Computer network |
| 6 | OE-BTE 702 | Engineering economics |
| 7 | OE-BTE 703 | Embedded system |
| 8 | OE-BTE 704 | Internet of things |
| 9 | OE-BTM 714 | Introduction to Micro-Electro-Mechanical Systems (MEMS) |
| 10 | OE-BTM 715 | Solar and Wind Technology |
| 11 | OE-BTM 717 | Introduction to Augmented Reality |
| 12 | OE-BTM 718 | Fundamental of Artificial Intelligence (AI) and Machine Learning |

*** Professional elective can be for 2 lectures + 1 tutorial based on course instructor's discretion; For such courses, the total marks will be 125 i.e 25 marks for tutorial added. However, the total credits shall remain same. This should be decided at the start of semester and conveyed to exam section**

# NOTES

(1) Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details
(2) Laboratory course is considered as a separate head of passing.
(3) Assessment criteria for laboratory/Tutorial work. i.e. weightage for assessment shall be as follows: i) Participation in Laboratory/Tutorial = 20%, (ii) Journal= 40%, (iii) Practical Examination (and/or) Mini project (and/or) Quiz (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.
(4) Student can opt for an online course available on https://swayam.gov.in/ or https://onlinecourses.nptel.ac.in/ subject to approval from the department. After successful completion of the course, the course title can appear on the grade card of student.
(5) The Mandatory courses are with Pass (P) and No Pass (NP) grades.
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(7) Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE) . Upon successful completion of the course , the course title shall appear on student's grade card.
(8) The contents of core courses are aligned with the latest GATE syllabus. The mapping between GATE syllabus topics and core courses is given in Table GATE-MAP

| Scheme for Final Year B.Tech.in Civil Engineering, (Semester - VIII) Academic Year 2023-24 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr. No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs)** | | | **Credits** | **In semester Evaluation (Points)** | | **End Semester Evaluation (Points)** | | **End semester weightage (%)** | **Term work/Practical** | **Total Points** |
| | | | **L** | **P** | **T** | | **T-I** | **T-II** | **Points** | **Time (Hrs)** | | **(Note 3)** | |
| **Core Courses** | | | | | | | | | | | | | |
| 1 | Engineering Economics Estimation and Costing | PC-BTC801 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25# | 125 |
| 2 | Elective V | REFER TABLE - Professional Elective V | 2 | 0 | 0 | 2 | 20 | 20 | 100 | 3 | 60% | 0/25* | 100/125* |
| 3 | Elective VI | REFER TABLE - Professional Elective VI | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0/25* | 100/125* |
| 4 | Open Elective III **OR** Internship | REFER TABLE - Open Elective III | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0/25* | 100/125* |
| 5 | Project –Stage II* | PROJ-BTC851 | 0 | (2+12)$ | 0 | 7 | 0 | 0 | 0 | 0 | 100% | 100 | 100 |
| **Online Courses (Note 5)** | | | | | | | | | | | | | |
| 6 | Online Course | OL-BTCxxx | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Value Added Courses (Note 7)** | | | | | | | | | | | | | |
| 7 | Low Cost Rural Roads | VA-BTC873 | 2 | 0 | 1 | AU | 20 | 20 | 100 | 3 | 60% | 25# | 125 |
| **Value Added Non-Technical Courses** | | | | | | | | | | | | | |
| 8 | Refer Table-VNT | VN-BTxxx | Refer Table-VNT | | | | | | | | | | |
| | **TOTAL** | | **11** | **14** | **1** | **19** | | | | | | | |

**Non-technical Value Added Courses-VNT**

VN-BT001: Ubuntu
VN-BT002: Performing Arts and Script Writing
VN-BT003: Financial Literacy
VN-BT004: Self Defence Training program
VN-BT005: Yoga health technology for self-management
VN-BT006: Integrated self-management
VN-BT007: Photography

| **Professional Elective – V** | | | |
|---|---|---|---|
| **Specialization** | **Sr. No.** | **Code** | **Elective** |
| Structures | 1 | PE-BTC824 | Finite Element Analysis |
| | 2 | PE-BTC825 | Advanced structural mechanics |
| Water Resources | 4 | PE-BTC832 | Water Resources Economics Planning and Management |
| Environmental Engg | 5 | PE-BTC842 | Environmental Law and Policy |
| Construction Management | 6 | PE-BTC853 | Valuation and Value Engineering |
| | 7 | PE-BTC854 | Risk and Disaster management |
| Transportation and Geo-Tech | 8 | PE-BTC863 | Transportation Planning and Economics |

| **Professional Elective – VI** | | | |
|---|---|---|---|
| **Specialization** | | | **Elective** |
| Structures | 1 | PE-BTC821 | Earthquake Engineering |
| | 2 | PE-BTC822 | Bridge Engineering |
| | 3 | PE-BTC 823 | Decision and Risk analysis |
| | 4 | PE-BTC824 | Advanced design of steel structures |
| Water Resources | 5 | PE-BTC831 | Introduction to Offshore Engineering |
| Environmental Engg | 6 | PE-BTC841 | Environmental Impact assessment |
| Construction Management | 7 | PE-BTC 851 | Construction Productivity & Cost analysis |
| | 8 | PE-BTC 852 | Contracts Management |
| | 9 | PE-BTC 855 | Appraisal & Implementation of Infrastructure Projects |
| | 10 | PE-BTC854 | Advance computational Techniques |
| Transportation and Geo-Tech | 11 | PE-BTC 861 | Conventional and Nonconventional Materials in Highways |
| | 12 | PE-BTC862 | Soil Dynamics |
| **Open Elective-III** | | | |

| Sr. No. | Code | Elective |
|---|---|---|
| 1 | OE-BTC 811 | Mechanics of water waves |
| 2 | OE-BTC 812 | Human Resource Development& Organizational Behavior |
| 3 | OE-BTC814 | Disaster Management and preparedness |
| 4 | OE-BTE801 | Robotics |
| 5 | OE-BTE802 | Power Plant Engineering |
| 6 | OE-BTE803 | Electrical engineering materials |
| 7 | OE-BTE804 | Medical Electronics |
| 8 | OE-BTE805 | Image processing |
| 9 | OE-BTM712 | Introduction to Research Methodology |
| 10 | OE-BTM719 | Value Engineering |

*** Professional elective can be for 2 lectures + 1 tutorial based on course instructor's discretion; For such courses, the total marks will be 125 i.e 25 marks for tutorial added. However, the total credits shall remain same**

# NOTES

(1) Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details

(2) Laboratory course is considered as a separate head of passing.

(3) Assessment criteria for laboratory/Tutorial work. i.e. weightage for assessment shall be as follows: i) Participation in Laboratory/Tutorial = 20%, (ii) Journal= 40%, (iii) Practical Examination (and/or) Mini project (and/or) Quiz (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.

(4) Student can opt for an online course available on https://swayam.gov.in/ or https://onlinecourses.nptel.ac.in/ subject to approval from the department. After successful completion of the course, the course title can appear on the grade card of student.

(5) The Mandatory courses are with Pass (P) and No Pass (NP) grades.

(6) Department will offer the Value Added courses in a semester subject to availability of resources and enrolment of minimum 20 students opting for the course. Upon completion of the Value Added course, the course title shall appear in the grade card of the student.

(7) Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE) . Upon successful completion of the course , the course title shall appear on student's grade card.

(8) The contents of core courses are aligned with the latest GATE syllabus. The mapping between GATE syllabus topics and core courses is given in Table GATE-MAP

**Table GATE-MAP: Alignment of Course Content with GATE Syllabus (2023)B.Tech. in Civil Engineering**

| No. | Section | Core courses in SPCE Curriculum 2022-23 | Topics From GATE Syllabus (2023) |
|---|---|---|---|
| 1 | S | Engg. Mechanics I- Engg. Mechanics II- | Engineering Mechanics |
| 2 | S | Mechanics of Materials | Solid Mechanics |
| 3 | S | Structural Mechanics | Structural Analysis |
| 4 | S | Structural Engineering | |
| 5 | S | Building Materials and Construction | Construction Materials andManagement |
| 6 | | Concrete Technology | |
| 7 | | Construction Engineering & Management | |
| 8 | | Engineering economics, estimation and costing | |
| 9 | S | Design of RCC Elements (Limit State Method) | Concrete Structures |
| 10 | S | Design of Reinforced ConcreteStructures | |
| 11 | S | Design of Steel Structures | Steel Structures |
| 12 | G | Soil Mechanics | Soil Mechnaics |
| 13 | G | Foundation Engineering | Foundation Engg |
| 14 | W | Fluid Mechanics | Fluid Mechanics |
| 15 | W | Hydraulic Engineering | Hydraulics |
| 16 | W | Hydrology & Water Resources Engineering | Hydrology |
| 17 | W | Water Resources Engineering | Irrigation |
| 18 | E | Environmental Engineering-I Environmental Engineering | Water and Waste Water |
| 19 | E | EVS | Air Pollution |
| 20 | E | Environmental Engineering-I & II | Municipal Solid Waste |
| 21 | E | EVS EIA | Noise Pollution |
| 22 | T | Transportation Engineering | Transportation Infrastructure |
| 23 | T | Highway Engineering | Highway Pavements |
| 24 | T | Highway Engineering | Traffic Engineering |
| 25 | G | Basics of Surveying | Principles of surveying |
| 26 | G | Surveying & Geomatics | Photogrammetry |
| 27 | MATH | Differential calculus and complex numbers, Integral calculus and differential equations, Engineering mathematics III, Probability and statistics | Linear Algebra, Calculus, Differential Equations, Complex variables, Probability and Statistics, NumericalMethods |

**Note:**Sections are: S - Structural Engg, G-Geotechnical Engg,W-Water Resource Engg, E-EnvironmentalEngg.,T-TransportationEngg,G-GeomaticsEngg., MATH - Engineering Mathematics