



ODISHA UNIVERSITY OF TECHNOLOGY AND RESEARCH

Techno Campus, Mahalaxmi Vihar, Ghatikia, Bhubaneswar-751029.

Syllabus Structure (Effective from 2023-24)

School/ Department: School of Infrastructure and Planning

Course: M. Tech. (SSP, Part Time), Programme: Structural Engineering (STE),

Duration: 3 years (Six Semesters)

Abbreviation used:

| | | | | | |
|----|--------------------------|-----|--------------------------------|----|----------------------|
| AC | Audit course | LC | Lab Course | PA | Practical Assessment |
| PC | Professional Core | PR | Project/ Practical/ Internship | L | Lecture |
| PE | Professional Elective | SE | Seminar/ Expert Lecture/ Etc. | T | Tutorial |
| OE | Open Elective | IA* | Internal Assessment | P | Practical |
| MC | Mandatory/ Common Course | EA | End-Semester Assessment | | |

*Internal Assessment Mark (30 marks) consists of (i) Mid Semester (20 marks), (ii) Quiz/ Assignment (10 marks)

Subject Code Format:

| A1 | A2 | B3 | C4 | C5 | C6 |
|--|----|--|--------------|------------------------------------|----|
| School/ Dept. (Offering) | | Level | 0: AC | Serial Number (01 to 99) | |
| BH: Basic Sciences and Humanities | | 1: UG/ Int. Msc. (1 st Year) | 1: PC | 01/ 03/.../ 19: Odd Sem. (GTE) | |
| CS: Computer Sciences | | 2: UG/ Int. Msc. (2 nd Year) | 2: PE | 21/ 23/.../ 39: Odd Sem. (STE) | |
| EE: Electrical Sciences | | 3: UG/ Int. Msc. (3 rd Year) | 3: OE | 41/ 43/.../ 59: Odd Sem. (WRE) | |
| EI: Electronic Sciences | | 4: UG/ Int. Msc. (4 th Year) | 4: MC | 61/ 63/.../ 79: Odd Sem. (URP) | |
| IP: Infrastructure and Planning | | 5: UG/ Int. Msc. (5 th Year) | 5: LC | 81/ 83/.../ 99: Odd Sem. (Prog-5) | |
| MS: Mechanical Sciences | | 6: PG (1 st Year) | 6: PR | | |
| BT: Biotechnology | | 7: PG (2 nd Year) | 7: SE | 02/ 04/.../ 20: Even Sem. (GTE) | |
| TE: Textile Engineering | | 8: Ph.D. | 8: | 22/ 24/.../ 40: Even Sem. (STE) | |
| | | | 9: | 42/ 44/.../ 60: Even Sem. (WRE) | |
| | | | | 62/ 64/.../ 80: Even Sem. (URP) | |
| | | | | 82/ 84/.../ 98: Even Sem. (Prog-5) | |

1st Semester

| Sl. No. | Subject Type | Subject Code | Subject Name | Teaching Hours | | | Credit | Maximum Marks | | | |
|--------------|--------------|--------------|-------------------------------------|----------------|----------|----------|-----------|---------------|------------|------------|------------|
| | | | | L | T | P | | IA | EA | PA | Total |
| 1 | PC 1 | IP6121 | Theory of Elasticity and Plasticity | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| 2 | MC 1 | BS6401 | Mathematical Methods in Engineering | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| 3 | MC 2 | MS6403 | Research Methodology and IPR | 2 | 0 | 0 | 2 | 30 | 70 | - | 100 |
| 4 | LC 1 | IP6521 | Advanced Concrete Lab. | 0 | 0 | 4 | 2 | - | - | 100 | 100 |
| 5 | AC 1 | BH6001 | English for Research Paper Writing | 2 | 0 | 0 | 0 | 30 | 70 | - | 100 |
| Total | | | | 10 | 0 | 4 | 10 | 120 | 280 | 100 | 500 |



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2nd Semester

| Sl. No. | Subject Type | Subject Code | Subject Name | Teaching Hours | | | Credit | Maximum Marks | | | |
|--------------|-------------------|--------------|--|----------------|----------|----------|-----------|---------------|------------|------------|------------|
| | | | | L | T | P | | IA | EA | PA | Total |
| 1 | PC 2 | IP6123 | Finite Element Analysis and its Applications | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| 2 | PE 1 (Any One) | IP6221 | Structural Dynamics | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| | | IP6223 | Pre-stressed Concrete | | | | | | | | |
| | | IP6225 | Tall Structures | | | | | | | | |
| 3 | PE 2 (Any One) | IP6222 | Advanced Steel Structures | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| | | IP6224 | Bridge Engineering | | | | | | | | |
| | | IP6226 | Earthquake Resistance Design of Structures | | | | | | | | |
| 4 | LC 2 | IP6523 | Computational Lab | 0 | 0 | 4 | 2 | - | - | 100 | 100 |
| 5 | AC 2 | IP6002 | Disaster Management | 2 | 0 | 0 | 0 | 30 | 70 | - | 100 |
| Total | | | | 11 | 0 | 4 | 11 | 120 | 280 | 100 | 500 |

3rd Semester

| Sl. No. | Subject Type | Subject Code | Subject Name | Teaching Hours | | | Credit | Maximum Marks | | | |
|--------------|-------------------|---|--|----------------|----------|----------|-----------|---------------|------------|------------|------------|
| | | | | L | T | P | | IA | EA | PA | Total |
| 1 | PC 3 | IP6122 | Design of Advanced Concrete Structures | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| 2 | PE 3 (Any One) | IP6228 | Advanced Construction Materials | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| | | IP6230 | Elastic Stability and Behavior of Metal Structures | | | | | | | | |
| | | IP6232 | Soil Structure Interaction | | | | | | | | |
| 3 | OE 1 | Any One from the List of *OE 1 (Appendix-I) | | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| 4 | PR 1 | IP6622 | Project (Specialization Related) | 0 | 0 | 4 | 2 | - | - | 100 | 100 |
| Total | | | | 9 | 0 | 4 | 11 | 90 | 210 | 100 | 400 |

4th Semester

| Sl. No. | Subject Type | Subject Code | Subject Name | Teaching Hours | | | Credit | Maximum Marks | | | |
|--------------|--------------------|--------------|----------------------------------|----------------|----------|----------|-----------|---------------|------------|------------|------------|
| | | | | L | T | P | | IA | EA | PA | Total |
| 1 | PC 4 | IP6124 | Theory of Plates and Shells | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| 2 | PE 4* (Any One) | IP7221 | Mechanics of Composite Materials | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| | | IP7223 | Design of Masonry Structures | | | | | | | | |
| | | IP7225 | Advanced Design of Foundations | | | | | | | | |
| 3 | LC 3 | IP6522 | Advanced Structural lab | 0 | 0 | 4 | 2 | - | - | 100 | 100 |
| Total | | | | 6 | 0 | 0 | 08 | 60 | 140 | 100 | 300 |

* Virtual/Online Course either offered by OUTR or available in MOOCs platform (No physical class)

5th Semester

| Sl. No. | Subject Type | Subject Code | Subject Name | Teaching Hours | | | Credit | Maximum Marks | | | |
|--------------|--------------|--------------|------------------------|----------------|----------|-----------|-----------|---------------|----------|------------|------------|
| | | | | L | T | P | | IA | EA | PA | Total |
| 1 | PR 2 | IP7621 | Dissertation (Phase-I) | 0 | 0 | 24 | 12 | - | - | 100 | 100 |
| Total | | | | 0 | 0 | 20 | 12 | - | - | 100 | 100 |



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6th Semester

| Sl. No. | Subject Type | Subject Code | Subject Name | Teaching Hours | | | Credit | Maximum Marks | | | |
|--------------|--------------|--------------|-------------------------|----------------|----------|-----------|-----------|---------------|----------|------------|------------|
| | | | | L | T | P | | IA | EA | PA | Total |
| 1 | PR 3 | IP7622 | Dissertation (Phase-II) | 0 | 0 | 32 | 16 | - | - | 100 | 100 |
| Total | | | | 0 | 0 | 32 | 16 | - | - | 100 | 100 |

Credits and Maximum Marks

| Sl. No. | Semester | Credits | Maximum Marks |
|--------------|-----------------|-----------|---------------|
| 1 | 1 st | 10 | 500 |
| 2 | 2 nd | 11 | 500 |
| 3 | 3 rd | 11 | 400 |
| 4 | 4 th | 08 | 300 |
| 5 | 5 th | 12 | 100 |
| 6 | 6 th | 16 | 100 |
| Total | | 68 | 1900 |



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(APPENDIX-I)

LIST OF (MC/ *OE/ AC) SUBJECTS OFFERED BY SCHOOLS/ DEPARTMENTS

| School/ Department (Offering) | Subject Type | Subject Code | Subject Name |
|-------------------------------|-----------------------------|---|---|
| Basic Science and Humanities | MC 1 | BS6401 | Mathematical Methods in Engineering |
| | *OE 1 | BH6302 | Spectroscopic Techniques for Organic Compounds |
| | | BH6304 | Chemical Biology |
| | | BH6306 | Nanoscience and Technology |
| | | BH6308 | Statistical Methods |
| | | BH6310 | Operations Research |
| | | BH6312 | Advanced Numerical Methods |
| | AC 1 | BH6001 | English for Research Paper Writing |
| | | BH6003 | Sanskrit for Technical Knowledge |
| | | BH6005 | Value Education |
| | | BH6007 | Constitution of India |
| | AC 2 | BH6002 | Pedagogy Studies |
| | | BH6004 | Stress Management by Yoga |
| BH6006 | | Personality Development through Life Enlightenment Skills | |
| Computer Sciences | *OE 1 | CS6302 | Pattern Recognition |
| | | CS6304 | Distributed Systems |
| | | CS6306 | Microfluidic Biochip |
| | | CS6308 | Programming in C |
| | | CS6310 | Data Structure |
| | | CS6312 | Computer Vision |
| Electrical Sciences | *OE 1 | EE6302 | Quantitative Methods for Energy Management and Planning |
| | | EE6304 | Soft Computing application to Engineering |
| | | EE6306 | Illumination Engineering |
| | | EE6308 | AI and ML for Biomedical Sciences |
| Electronic Sciences | *OE 1 | EI6302 | Machine Learning and Artificial Intelligence |
| | | EI6304 | IoT and its Applications |
| | | EI6306 | Parallel Processing |
| | | EI6308 | Signal Processing in Mechatronics Systems |
| | | EI6310 | Micro Electro Mechanical Systems |
| Infrastructure and Planning | *OE 1 | IP6302 | Universally Accessible Built Environments |
| | | IP6304 | Environment Impact Analysis |
| | | IP6306 | Geotechnics for Waste Materials |
| | | IP6308 | Project Planning and Management |
| | AC 2 | IP6002 | Disaster Management |
| Mechanical Sciences | MC 2 | MS6403 | Research Methodology and IPR |
| | *OE 1 | MS6302 | Production Planning and Control |
| | | MS6304 | Design of Experiment |
| | | MS6306 | Total Quality Management and Six Sigma |
| | | MS6308 | Financial Institutions, Instruments and Markets |
| | | MS6310 | Renewable Energy Systems |
| | | MS6312 | Design of Thermal Systems |
| | | MS6314 | Sensors and Actuators in Industry |
| MS6316 | Robot Mechanics and Control | | |
| Biotechnology | *OE 1 | BT6302 | Nanobiotechnology |
| Textile Engineering | *OE 1 | TE6302 | Polymer Composite |

***N.B.:**

The Open Elective Subjects (*OE 1) are specifically open for all programs of Schools/ Departments, other than the School/ Department offering the same subject.