AMITY UNIVERSITY
UTTAR PRADESH

**Course Title:** **Theory of Structures - I**
**Course Code:** **ARCH144**
**Credit Units:** **2**
**Level:** **UG**

| L | T | P/S | SW/FW | TOTAL CREDIT UNITS |
|---|---|---|---|---|
| 2 | - | - | - | 2 |

| # | Course Title<br>THEORY OF STRUCTURES - I | Weightage (%) |
|---|---|---|
| 1 | **Course Objectives:**<br>To introduce the structural system in a building with all the basic components to understand the functions of various elements and building technologies used in various types of buildings. | |
| 2 | **Prerequisites:**<br>NIL | |
| 3 | **Student Learning Outcomes:**<br>Understanding of principles of structural behavior in withstanding gravity and lateral forces and the evolution, range, and appropriate application of contemporary structural systems | |
| **Course Contents / Syllabus:** | | |
| 4 | **Module I: Elements of Static** | **10** |
| | Law of parallelogram of forces, resolution of a forces, law of triangular of forces, polygon of forces, Theorem of resolved parts resultant of number of concurrent coplanar forces, conditions of equilibrium, moment of a forces. Moment and arm of a couple, theorems on couples | |
| 5 | **Module II: Simple Stresses and Strains** | **20** |

<table>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td>Elasticity, Stress, Strain, Types of Stresses, Elastic limit, Hook’s Law Modulus of Elasticity, Stresses in Composite Bars. Primary of Linear Strain, Poison’s ratio, shear stress, Principal, stresses and strains</td><td></td></tr>
<tr><td>6</td><td>Module III: Shearing force and Bending, Moment</td><td>20</td></tr>
<tr><td></td><td>Beams, Shearing force and bending moment, Moment of resistance. S. F. and B.M diagrams of simple cases.</td><td></td></tr>
<tr><td>7</td><td>Module IV: Centre of Gravity and Moment of Inertia</td><td>20</td></tr>
<tr><td></td><td>Definition, Methods of finding out C.G of Simple figures, Centre of Parallel forces, Important theorems, section Modulus, Calculation of M.I by first Principal and its application M.I of Composite sections.</td><td></td></tr>
<tr><td>8</td><td>Module V: Types of loads</td><td>30</td></tr>
<tr><td></td><td>Concept and definitions of dead load, imposed load, seismic load, wind load and snow load as per IS: 875- 1987 (Part I- V) and IS: 1893- 2002.</td><td></td></tr>
<tr><td>9</td><td>Pedagogy for Course Delivery:<br>Lecture, Site Visit, Construction Yard</td><td></td></tr>
<tr><td>10</td><td>Assessment/ Examination Scheme:
<table>
<tr><th>Theory (%)</th><th>Lab/Practical/Studio (%)</th><th>Total</th></tr>
<tr><td>100%</td><td>NIL</td><td>100%</td></tr>
<tr><td colspan="3">Theory Assessment L/T</td></tr>
</table>
<table>
<tr><th>Components (Drop down)</th><th>A</th><th>C</th><th>H</th><th>CP</th><th>EE</th></tr>
<tr><td>Weightage (%)</td><td>05</td><td>20</td><td>20</td><td>5</td><td>50</td></tr>
</table>
A – Attendance, C – Class Test, H – Home Assignment, CP – Class Performance, EE – External Examination</td><td></td></tr>
</table>

***Text:***

- Building Construction – Materials, M.V. Naik
- Strength of Materials, Khurmi R. S.

- Applied Mechanics and Strength of Materials, Khurmi R. S.
- Civil Engineering Handbook, P.N. Khanna
- R.C.C. Design, Khurmi, Punmia, Sushil Kumar
- Design of Steel Structure, Negi
- Structure in Architecture, Salvadori and Heller

***References:***

- Elements of Structure, Morgan
- Structures in Architecture, Salvadori
- Building Construction, Mackay WB Vol. 1-4
- Construction Technology, Chudley Vol. 1-6
- Elementary Building Construction, Mitchell