No	Information on Mechanics of Materials I	
1.	Unit Name: Mechanics of Materials I	
2.	Unit Code: CE 31013	
3.	Classification : Engineering Subject	
4.	Credit Hours : 2	
	2for lecture: (2.5 hours ×15 weeks)	
5.	Semester/ Year Offered: 1/3	
6.	Pre-requisite (if any):	
7.	Mode of Delivery : Lecture and Tutorial	
8.	Assessment System and Breakdown of Marks::	
	Tutorial	20%
	Assignment	10%
	Final examination	70%
	Total	100%
9.	Academic Staff Teaching Unit:	
10.	Objective of Unit: The objective of this course is to - bread out civil engineering students who understand and analysis the basic concepts of mechanics of materials and design civil engineering structures and buildings.	
11.	Learning Outcome of Unit: On completion of this unit, students shall be able to: a) use equilibrium equations to find stress and strain b) determine relationship between stress and strain of materials c) analyze how axial , shear and torsional deformations for structures d) draw shear and bending moment diagrams for structures e) determine the stress in a member subjected to combined loading	
12.	Synopsis of Unit: The unit is intended to understand and calculation of stress and strain, mechanical properties of materials, axial loads, torsions, transverse shear, combined loadings, stress and strain transformation, design of beams and shafts, buckling of columns and energy method.	
13.	Topic 1 Stress	

- Introduction

- Equilibrium of a Deformation Body

- Stress

- Average Shear Stress

- Allowable Stress

- Design of Simple Connection

Topic 2 Strain

- Deformation

- Strain

Topic 3 Mechanical properties of materials

- The Tension and Compression Test

- The Stress-Strain Diagram

- Stress-Strain behavior of ductile and brittle materials

- Hooke's Law

- Strain Energy

- Poisson's Ratio

- The Shear Stress-Strain Diagram

- Failure of Materials Due to Creep and Fatigue

Topic 4 Axial loads

- Saint- Venant's Principle

- Elastic Deformation of an Axially loaded Member

- Principle of Superposition

- Statically Indeterminate Axially Loaded Member

- The force Method of Analysis for Axially Loaded members

- Thermal Stress

- Stress Concentrations

- Inelastic Axial Deformation

- Residual Stress

Topic 5 Torsion

- Torsional Deformation of a Circular Shaft
- The Torsion Formula
- Power Transmission
- Angle of Twist
- Statically Indeterminate Torque-Loaded Members
- Solid Noncircular Shafts
- Thin-Walled Tubes Having Closed Cross Sections
- Stress Concentration
- Inelastic Torsion
- Residual Stress

Topic 6 Bending
- Shear and Moment Diagram
-Graphical Method for Construting Shear and Moment Diagram
- Bending Deformation of a Straight Member
- The Flexure Formula
- Unsymmetric Bending
- Composite Beams
- Reinforced Concrete Beam
- Curved Beams
- Stress Concentrations
- Inelastic Bending

Topic 7 Transverse shear
- Shear in Straight Members
- The Shear Formula
- Shear Flow in Built-Up Members
- Shear Flow in Thin-Walled Members
- Shear Center For Open Thin-Wall Members

	Topic 8 Combined loading - Thin-Walled Pressure Vessels - State of Stress Caused by Combined loading.
14.	Main Referances: R.C Hibbler 10th edition, 8th edition, NJ: Pearson, 2015, LCCN 20115044964/ ISBN 9 780134319650