No.	Information of Strength of Materials	
1	Unit Name:	Strength of Materials
2	Code:	NE- 2021
3	Classification:	General Subject
4	Credit Value:	3
5	Semester/ Year Offered:	1/2
6	Pre-requisite:	NA
7	Mode of Delivery:	Lecture and Problem Solving
8	Assessment system and breakdown of marks:	Assignment, Tutorials
	Assignment/ Home Work	10%
	Tutorials	20%
	Q & A	70%
9	Academic staff teaching unit:	Department of Nuclear Technology
10	Course outcome of unit: After completion of this course, students will be able to - Define the basic concept of centre of gravity and moment of inertia - Explain about stress, strain and shearing force of materials - Recognize the nature of stresses on the wall - Compute the problems deal with strength of materials	
11	Synopsis of unit: The course covers the concepts of stress and strain as well as strength of various materials. This course contains centre of gravity, moment of inertia, direct shear stresses, thin-walled and thick-walled pressure vessels, shearing force and bending moment and various stresses. This course will be able to understand students about the condition of stress and strain, types and effects of loads and stresses concerned with various materials and etc. students recognize stresses deal with pressure vessels and can apply strength of materials in occupational field.	
12	Topic: - Centre of gravity - Moment of inertia - Stresses and strains - Shearing force and bending moment - Direct shear stresses - Biaxial stresses, combined stresses and general state of stresses - Thin-walled pressure vessels - Thick-walled pressure vessels	
13	Main references: STRENGTH OF MATERIALS: B.K. Sarkar, 2003 STRENGTH OF MATERIALS: W.A.Nash, Revised 4th Edition, 2010	
14	Additional references: STRENGTH OF MATERIALS: L.S.Negi (Principal Guru Nanak Dev Polytechic, Delhi), 6th Edition, Reprinted 2012	

NE 21021, Strength of Materials Instructor- **Daw Nan Zin Thiri Naung**

(2019/2020 Semester I, Lesson Plan)

Time	Learning Outcomes	Topics	Instruction methods	Duration	Assessment
Week 1		Course Introduction			
Week 2	• To explain the gravity and gravitational force • To determine the centre of gravity and location of centroid for regular areas	➢ Gravity and gravitational force ➢ Center of gravity ➢ Centroid ➢ Location of the centroid ➢ Centroids of regular areas ➢ Procedures for locating the centroid ➢ Problems solving	➢ Brainstorming ➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Classwork
Week 3	• To differentiate method of integration to locate the centroid or centre of gravity	➢ Centre of gravity of regular solids ➢ Location of centre of gravity of solids ➢ Method of integration to locate the centroid or centre of gravity ➢ Problems solving	➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Classwork
Week 4	• To determine the centre of gravity of irregular bodies • To solve the problems of centre of gravity	➢ Centre of gravity of irregular bodies ➢ Centre of gravity of composite sections ➢ Problems solving	➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Classwork
Week 5	• To describe the concepts of moment of inertia of a lamina and radius of gyration	➢ Moment of inertia ➢ Moment of inertia of a Lamina ➢ Radius of gyration ➢ Theorems involving moment of inertia of plane figures ➢ Problem solving	➢ Brainstorming ➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Classwork ➢

Week 6	• To identify mass and polar moment of inertia and radius • To calculate moment of inertia of given figure	➢ Moment of inertia of plane laminas ➢ Section modulus ➢ Mass moment of inertia ➢ Polar moment of inertia ➢ Mass moment of inertia and radius ➢ Problem solving	➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Class work ➢
Week 7	• To explain concepts of stress and strain	➢ Loads and forces ➢ Stress ➢ Strain ➢ Elasticity and elastic limit ➢ Hooke's Law ➢ Tutorial I	➢ Brainstorming ➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Class work ➢ Tutorial I
Week 8	• To realize concepts of stress-strain curve and changes in dimensions and volume	➢ Stress-strain curve for mild steel ➢ Factory of safety ➢ Poisson's ratio (1/m) ➢ Change in dimensions of a bar ➢ Change in volume ➢ Problem solving	➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Classwork ➢
Week 9	• To discuss theory of elongation and extension of bars and rod	➢ Elongation of bars of varying cross-section ➢ Elongation of uniformly tapering rod ➢ Extension of bar under its own weight ➢ Composite bar under tension or compression ➢ Temperature stress and strain ➢ Problem solving	➢ Brainstorming ➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Classwork ➢
Week 10	• To classify the beams and types of loading	➢ Beam ➢ Classification of beams ➢ Types of loading ➢ Shear force ➢ Bending moment ➢ Problem solving	➢ Brainstorming ➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Classwork

Week 11	• To manipulate the shear force and bending moment	➢ Sign convention ➢ Calculation of shear force at any section ➢ Calculation of bending moment at any section ➢ Shear force and bending moment diagrams ➢ Problem solving	➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Classwork
Week 12	• To compute the concentrated load at cantilever beams	➢ Cantilever beam with a concentrated load at the freed end ➢ Cantilever beam with number of concentrated loads ➢ Simply supported beam with a concentrated load at the mid-spam ➢ Simply supported beam with a u.d.i over the entire spam ➢ Problem solving	➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Classwork ➢
Week 13	• To apply concepts of various loads and various beams • To draw shearing force and bending moment diagrams	➢ Simply supported beam of span L which carries over its full span a load varying uniformly from zero at either ends to w N/m at mid-span ➢ Beams with oblique loading ➢ Overhanging loading ➢ Problems solving	➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Classwork ➢
Week 14	• To solve problems of shearing force and bending moment with various beams and various loads	➢ Problems solving ➢ Tutorial II	➢ Lecturer by instructor ➢ Discussion on lecture ➢ Solve the problems	2 hr 2 hr	➢ Short Questions ➢ Discussion ➢ Classwork ➢ Tutorial II
Week 15		➢ Revision	➢		➢