No	Information of Nuclear Physics	
1	Unit name	Nuclear physics
2	Code	NE 21012
3	Classification	Major Subject
4	Credit value	3
5	Semester / year Offered	1/6
6	Pre-requisite	NA
7	Mode of delivery	Text
8	Assessment system and breakdown of marks	Tutorial, Assignment, Exam
	Assignment	5%
	Tutorial	10%
	Exam	35%
9	Academic staff teaching unit	Department of Nuclear Technology
10	Course outcome of unit	After teaching of this course, students will be able to 1. Understand the concepts of a good quantum number and simultaneous observability 2. Understand the origin of the widths and shapes in atomic spectra 3. Understand the quantum numbers, including their physical significance, and quantum mechanical states of the hydrogen atom 4. Understand time independent perturbation theory including its derivation and be able to apply it to simple systems, including Zeeman effect.
11	Synopsis of unit	All of the fundamental laws of physics have the same form in all internal frames of reference. The speed of light in vacuum is the same in all inertial frames and is independent of the motion of the source. The Lorentz coordinate transformation relate the coordinates and time of an event in a internal frame to the coordinate and time of the same event as observed in a second inertial frame moving at velocity relative to the first. For a source moving toward the observer with equal gives the received frequency in terms of the emitted frequency. The total energy can also be expressed in terms of the magnitude of momentum and rest mass. The energy of one photon is proportional to the wave frequency and inversely proportional to the wavelength and is proportional to a universal quantity h called Plank's constant. The Rutherford scattering experiments show that at the center of an atom is a dense nucleus much smaller than the overall size of the atom but containing all of the positive charge and most of the mass. In the Bohr model of the hydrogen atom, the permitted values of angular momentum are integral multiple of $h/2\pi$. The laser operates on the principle of stimulated emission, by which many photons with identical wavelength and phase are emitted. For free electrons, the wavelengths of incident and scattered photons are related to the photon scattering angle. The total radiation intensity from a blackbody surface is proportional to the fourth power of the absolute

		temperature. Electrons and other particles have wave properties. The wavelength of the wave depends on the particle's momentum in the same way as for photons. Electron microscopes use the very small wavelengths of fast-moving electrons to make images with resolution thousands of times finer than is possible with visible-light microscope. The Heisenberg uncertainty principle is impossible to make precise determinations of a coordinate of a particle and of the corresponding momentum component at the same time. For a particle that moves in one dimension in the process of a potential-energy function, the wave function for a stationary state of energy satisfies the Schrodinger equation. Wave functions are usually normalized so that the total probability for finding the particle somewhere is unity. In a potential well with finite depth the energy levels are lower than those for an infinity deep well with the same width and the number of energy levels corresponding to bound states is finite. There is a certain probability that a particle will penetrate a potential-energy barrier even though its initial kinetic energy is less than the barrier height. This process is called tunneling.
12		
13		
14	Main references:	University physics with modern physics, 12^{th} edition ,H.D. Young
15	Additional references:	Physics for scientists and engineers with modern physics, 8^{th} edition,2010 Raymond A. Serway and John W, Jewett ,Jr

Department of Nuclear Engineering

Course Information on NE 21051 (Analytical Method for Nuclear Engineering I)

(2019-2020) Academic Year

No	Course Information	
1	Unit name:	Analytical Method for Nuclear Engineers I
2	Code:	NE 21051
3	Classification:	General Course
4	Credit value:	3
5	Semester/ Year Offered:	1/2
6	Pre-requisite:	NA
7	Mode of delivery:	Lecture, Presentation, Discussion, Practical, Tutorial
8	Assessment system and breakdown of marks:	Examination, Class activity, Report, Presentation
	Performance	5%
	Report and presentation	20%
	Class Test	15%
	Mid-term/ final Examination	60%
9	Academic staff teaching unit:	Department of Nuclear Engineering
10	Course outcome of unit: In this course, students will be able (a) Recognize the terms used in statistical analysis (b) Differentiate between descriptive and inferential statistics (c) Describe their analysis result (d) Perform analysis in their field of interest statistically	
11	Synopsis of unit: The course introduces students to the statistical analysis of data. It includes collecting data, describing data, summarizing data. And the course covers probability distribution to help understand making decision in the data analysis. The course also introduces inferential statistics. The knowledge and skill obtained from this course can be applied in the systematical analysis in the student's research work.	
12	Topic: 1. Introduction to the statistics 2. Describing Data set 3. Summarizing Data Set	

	4. Probability Distribution 5. Principle of Inference
14	Main references: Introductory Statistics
15	Additional references: 1.

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	➢		➢