Department of Civil Engineering

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE OUTLINE TEMPLATE			
Course Title	Engineering Mechanics		
Course Code	CE 102	**No. of Credits**	3
Department	CIVIL ENGINEERING	**Faculty**	**Dr.Kavitha B**
Pre-requisites Course Code	NIL		
Course Coordinator(s) (if, applicable)	-		
Other Course Teacher(s)/Tutor(s) E-mail		**Telephone No.**	
Course Type	☑ **Core course** ☐ **Elective course**		

COURSE OVERVIEW

This course tries to develop the students in engineering to analyse any problem in a simple and logical manner based on well understood basic principles. The emphasis will be given on the correct understandings of the principles of mechanics and their application in the solution of Engineering problems.

COURSE OBJECTIVE

1. To explain the importance of mechanics in the context of engineering and conservation equations.
2. To explain the significance of centroid, centre of gravity and moment of inertia.
3. To introduce the techniques for analyzing the forces in the bodies.
4. To apply the different principles to study the motion of a body, and concept of relative velocity and acceleration.
5. To describe the trajectory of a particle under projectile motion.
6. To identify the basic elements of a mechanical system and write their constitutive equations.

COURSE OUTCOMES (CO)	
Course Outcomes	**Aligned Programme Outcomes (PO)**
A student would be able to identify and analyze the problems by applying the fundamental principles of Engineering mechanics and to proceed to research, design and development of the mechanical systems.	

COURSE TEACHING AND LEARNING ACTIVITIES

S.No	Week	Topic	Mode of Delivery
1	Week 1	Mechanics and its relevance, concepts of forces	Black board
2	Week 2	laws of mechanics - parallelogram law, Lami's theorem, law of polygon, concept of free-body diagram	Black board
3	Week 3	centroids, center of gravity, area moment of inertia, mass moment of inertia – simple and composite planes	Black board
4	Week 4	Friction-Laws of friction, static friction, rolling friction, Application of laws of friction, ladder friction, wedge friction	Black board
5	Week 5	Assessment-I	
6	Week 6	Body on inclined planes, simple screw jack – velocity ratio, Mechanical advantage, efficiency.	Black board
7	Week 7	Statics-Principles of statics, types of forces, concurrent and non-concurrent forces, composition of forces	
8	Week 8	Forces in a plane and space, simple stresses and strains, elastic coefficients	Black board
9	Week 9	Kinematics - Fundamentals of rectilinear and curvilinear motion,	Black board
10	Week 10	Assessment-II	
11	Week 11	Application of general equations, concept of relative velocity, analytical and graphical technique.	Black board
12	Week 12	Dynamics Principles of dynamics, D'Alembert's principle	Black board
13	Week 13	Conservation of momentum and energy	Black board
14	Week 14	Vibrations of simple systems	Black board
15	Week 15	Semester Examination	

COURSE ASSESSMENT METHODS

S.No	Mode of Assessment	Week	Duration	% Weightage
1	Assessment-I	Week 9	1 hour	20 marks
2	Assessment-II	Week 15	1 hour	20 marks
3	Assignments : 2	Week 6-8 and 12-14	1 week	10 marks
4	Final Examination	Week 18	3 hour	50 marks
5	Total			100 marks

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

Text Books:

1. Kumar, K. L., Kumar, V. Engineering Mechanics, Pub.: Tata McGraw Hill, 2011.
2. Palanichamy, M. S., and Nagan, S., Engineering Mechanics – Statics & Dynamics, Pub.: Tata McGraw Hill, 2002.
3. Timoshenko, S. and Young, D. H., Engineering Mechanics, Pub.: McGraw Hill, 2006.

Reference Books:

1. Popov, E. P., Engineering Mechanics of Solids, Pub.: Prentice Hall, 1998.
2. Shames, I. H. and Rao, G. K. M., Engineering Mechanics – Static and Dynamics, Pub.: Pearson Education, 2009.
3. Beer, F. P., and Johnson Jr. E. R., Vector Mechanics for Engineers, Pub.: McGraw Hill, Year of publication: 2009.
4. Rao, J. S. and Gupta, K., Introductory Course on Theory and Practice of Mechanical Vibrations, Pub.: New Age International, 1999

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

1. Class committee meetings
2. Feedback forms will be collected from the students

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

Min percentage of 75% attendance is compulsory for attending the final examination.

ADDITIONAL COURSE INFORMATION

The Course Coordinator's Room No.:
Timings:
Email ID:
Telephone No.:

FOR SENATE'S CONSIDERATION

Course Faculty _____ **CC-Chairperson** _____ 16/2/17 **HOD** _____