MEC 2102: Mechanics of Materials II

Hours per semester				Weighted total mark	Weighted exam mark	Weighted continuous assessment mark	Credit unit
LH	PH	TH	CH				CU
45	30	75	60	100	60	40	4

Course Description

This course covers the principles of deflection of beams, elastic stability of struts, thick cylinders, rotating discs and shafts, bending of circular plates, elastic stability of simple frames and mechanical springs.

Course objective

To study the behaviour of solid bodies under load. The way in which they react to applied forces, the deflections resulting and the stresses and strains set up within the bodies are all considered in an attempt to provide sufficient knowledge to enable a student to design any component such that it will not fail within its service life.

Course content

Deflection of Beams

Cantilever and simply supported beams

Deflection of Beams

Built-in and continuous beams

Elastic stability: Struts hours

Thick cylinders hours

Springs hours

Rings, discs and shafts subjected to rotational and thermal gradients

Bending of circular plates and diaphragms

Tests

4 hours

4 hours

6

6

6

6 hours 4 hours 4 hours

Tutorials hours

Practical's

Delivery Methods:

The course will be taught by using lectures and tutorials and laboratories

Assessment Methods:

Course work (assignments and tests) and final examination and their relative

contributions to final grade are shown as follows:

Requirement Percentage contribution

Course work 40 %

Final examination 60 %

Total 100%

References

1. Stephens R.C (1988). "Strength of Materials, Theory and Examples". Edward Arnold Educational, Academic and Medical Publishing Division of Hodder and Stoughton Limited, 41 Bedford Square, London, UK.

2. Gere J.M and Timoshenko S.P (1990). "Mechanics of Materials, Second SI Edition. Van Nostrand Reinhold (International) Company Limited. 11 New Fetter Lane, London EC4P4EE.

3. Case .J, Chilver. L and Ross C.T.F (1999). "Strength of Materials and Structures, Fourth Edition. John Wiley & Sons Inc., 605 Third Avenue, New York, NY 10158-0012.

4. Hearn J.E (1999). "Mechanics of Materials 2". An introduction to the mechanics of elastic and plastic deformation of solids and structural members. Third Edition. Butterworth-Heinemann Linacre House, Jordan Hill, Oxford OX2 225 Wildwood Avenues, Woburn, MA 01801-2041.A division of Reed Educational and Professional Publishing Ltd

Assessment Methods:

Course work (assignments and tests) and final examination and their relative

contributions to final grade are shown as follows:

Requirement Percentage contribution

Course work 40%

30 hours

Final examination 60% 3