

## MODULE DESCRIPTION FORM

### DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

## 16327 STRUCTURAL MECHANICS

Module Registrar: Prof D H Nash <a href="mailto:d.nash@strath.ac.uk">d.nash@strath.ac.uk</a>	Taught To (Course): All third-year undergraduate degree programmes delivered by MAE		
Other Lecturers Involved:	Credit Weighting: 10 (ECTS 5)	Semester: 1	
Assumed Prerequisites: Y2 Structural mechanics	Compulsory module	Academic Level: 3	Suitable for Exchange: Y

#### Module Format and Delivery (HOURS i.e. 1 credit = 10hrs of study):

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	Total
20	20							60	100

#### Educational Aim

This module aims to:

extend the students' knowledge and understanding of the mechanical behaviour of materials and structures under a variety of loading conditions. It addresses key failure modes including yielding and buckling.

#### Learning Outcomes

On completion of the module the student is expected to be able to:

LO1 fully understand the central principle of solid mechanics, namely, the application of equilibrium, compatibility and constitutive relations to determining the deformation of loaded materials and demonstrate this understanding through successful mathematical analysis of various problems of relevance.

LO2 determine the deformation of various common structural elements, namely cylinders, beams and columns under various loading conditions, and be competent in analytically analysing relevant structural analysis problems.

#### Syllabus

The module will teach the following:

Solid Mechanics: Two-dimensional stress and strain; multiaxial elastic constitutive relations; multiaxial yield criteria; general equations of elasticity leading to solutions for thick and thin cylindrical structures.

Structural Mechanics: Equations and analysis of continuous beams, both determinate and indeterminate; introduction to energy methods of analysis; superposition and dynamic loading effects; introduction to instability and buckling, including end-loaded columns with imperfections; design analysis of columns using British Standards or Euro-Codes.

#### Assessment of Learning Outcomes

##### Criteria

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning:

LO1

C1 Demonstrate understanding of solid mechanics principles and ability to analyse problems involving the deformation of loaded materials.

**LO2**

C1 Demonstrate understanding of structural mechanics principles and ability to analyse problems involving the behaviour of loaded structures.

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

**Principles of Assessment and Feedback**

(within Assessment and Feedback Policy at: <https://www.strath.ac.uk/professionalservices/staff/policies/academic/>)

Formative feedback will be provided at tutorial sessions primarily through individual or group discussion of exercises prepared in advance by students. Note: to receive this feedback students should participate in these tutorials but attendance is not mandatory.

Summative feedback will be provided by the return of examination marks to students after the December exam.

**Assessment Method(s) Including Percentage Breakdown and Duration of Exams (individual weightings)**

Examination				Online Quiz		Practical		Project	
Number	Month(s)	Duration	Weighting	Number	Weighting	Number	Weighting	Number	Weighting
1	Dec	1.5hrs	70%	1 online	30%				
LO1 & 2				LO1 & 2		*		*	

\* **L/Os:** Indicate which Learning Outcomes (L01, L02, etc) are to be assessed by exam/coursework/practical/project as required.

**Coursework / Submission deadlines (academic weeks):**

Wk6 Time Constrained online quiz - will open for extended period of time: 24hours+. Once opened, quiz will time out after quiz period (e.g. 1 hour).

**Resit Assessment Procedures:**

1.5hr examination in July/August diet.

\*\*NOTE: Assessment details apply under normal circumstances; alternative arrangements may be required during unforeseen periods of disruption

**PLEASE NOTE:**

**Students must gain a summative mark of at least 40% to pass the module. Students who fail the module at the first attempt will be re-assessed prior during the July/August exam diet. This re-assessment will consist entirely of an exam. No marks from any previous attempts will be transferred to a new resit attempt.**

**Recommended Reading**

\*\*\*Purchase recommended    \*\*Highly recommended reading    \*For reference

\*\* Mechanics of Engineering Materials" 2<sup>nd</sup> edition, by Benham, Crawford & Armstrong, Addison Wesley Longman

**Additional Student Feedback**

Date	Time	Room No
TBA		Check timetable webpages / app for details

Session: 2025/26

**Approved:**

Programme Lead/Director Signature: Dr Andrew McLaren

Date of Last Modifications: 25 August 2025

# MODULE TIMETABLE

## **Module Code:**

16327

## Module Title:

## Structural Mechanics

**Brief Description of Assessment:**

1.5 hour exam in December exam period (70%) and online Time Constrained Quiz (shown as 'Online Test' below) in week 6 (30%).

## Assessment Timing

Indicated on the table below are the start/submission dates for each assignment/project and the timing of each exam/assessment.

**Please note: Timings could change during unforeseen periods of disruption; this should only be used as a guide.**

Semester One	W&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Online Test	Choose an item. Choose an item.	Exam									