

Warning: An incomplete or missing proforma may have resulted from system verification processing

Title: STRUCTURAL ANALYSIS  
Status: Definitive  
Code: **4022BEHN** (102294)  
Version Start Date: 01-08-2016

Owning School/Faculty: Astrophysics Research Institute  
Teaching School/Faculty: Astrophysics Research Institute

Team	Leader
Nick Eden	Y

**Academic Level:** FHEQ4      **Credit Value:** 12      **Total Delivered Hours:** 50  
**Total Learning Hours:** 120      **Private Study:** 70

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	24
Practical	12
Tutorial	12

**Grading Basis:** BTEC

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Unseen examination	70	2
Report	AS2	Assignment	30	

### Aims

*To equip the students with the necessary analytical tools to enable them to assess structural components including beams and columns.*

*To produce shear force and bending moment diagrams for statically determinate beams.*

*To assess the bending and shear stresses induced in statically determinate beams by the application of concentrated and uniformly distributed loads.*  
*To assess the combined stresses induced in foundation pads under applied loads.*  
*To assess stresses induced in columns under load.*

## **Learning Outcomes**

After completing the module the student should be able to:

- 1 Calculate bending moments and shear forces for simple structures and draw shear force and bending moment diagrams
- 2 Calculate bending deflections for simple structures.
- 3 Determine the critical load for an elastic column.

## **Learning Outcomes of Assessments**

The assessment item list is assessed via the learning outcomes listed:

EXAM	1	2	3
REPORT	1	2	

## **Outline Syllabus**

*Bending Moments and Shear Forces : Analyse cantilevers and simply supported beams under the application of a number of concentrated and uniformly distributed loads.*

*Bending Deflection: Determine the maximum deflection for cantilevers and simply supported beams of uniform section carrying a point load or a uniformly distributed load. Explore the effect of different materials and beam section on bending deflection in beams.*

*Elastic Columns: Investigate elastic buckling using Euler's method to determine the critical load for an elastic column. Investigate the concept of effective length.*

## **Learning Activities**

Lectures, tutorials, laboratory and computer practicals, problem solving sessions.

## **Notes**

This module introduces the students to the concepts of structural analysis. It forms a basis for the structural design module studied in the second semester.