

# Aircraft Structures

## Module Information

2022.01, Approved

### Summary Information

Module Code	5511NCCG
Formal Module Title	Aircraft Structures
Owning School	Engineering
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 5
Grading Schema	40

### Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

### Partner Teaching Institution

Institution Name
Nelson and Colne College Group

### Learning Methods

Learning Method Type	Hours
Lecture	48
Practical	12

### Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
APR-PAR	PAR	April	12 Weeks
JAN-PAR	PAR	January	12 Weeks

SEP-PAR	PAR	September	12 Weeks
SEP_NS-PAR	PAR	September (Non-standard start date)	12 Weeks

## Aims and Outcomes

Aims	The aims of the module are to teach the theory required for analysing beam deflections, instability, and criteria for strength. To development of an appreciation of the Direct Stiffness method, the nature of elastic stability, the need for failure criterion and the nature of plastic strain is also covered. The student will be able to establish whether certain common types of structural component, under given loading conditions, are strong enough and are safe against buckling failure. To introduce the student to the methods used in the analysis of structures made of composite (i.e. non-homogeneous) materials.
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**After completing the module the student should be able to:**

### Learning Outcomes

Code	Number	Description
MLO1	1	Apply appropriate methods and techniques to simplify aircraft structures in order to perform stress calculations
MLO2	2	Carry out practical investigations of structural members under multiple loadings
MLO3	3	Demonstrate an understanding of the reasons for current airframe structural configurations
MLO4	4	Evaluate the effect the designs produced have on weight, balance, aerodynamics, manufacture, cost, repair in-service, test requirements, service life, decommissioning.

## Module Content

Outline Syllabus	Load distribution in statically determinate systems - principles of equilibrium. Direct Stiffness Method (DSM) Symmetric and unsymmetric beams under bending loads - stresses and deflections. Yield criteria and elementary plasticity. Macaulay's method to determine the deflection of beams. Introduction to energy methods in structural analysis - calculation of deflections. Structural instability - Euler method Composite structures
Module Overview	
Additional Information	

## Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Report	Assignment	100	0	MLO1, MLO3, MLO4
Competency	NCC Group Pass/Fail			MLO2

## Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Christian Matthews	Yes	N/A

**Partner Module Team**

Contact Name	Applies to all offerings	Offerings
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