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MODULE DESCRIPTOR

Module Title

Design for Vibration

Reference	EN4503	Version	2
Created	August 2021	SCQF Level	SCQF 10
Approved	March 2021	SCQF Points	15
Amended	August 2021	ECTS Points	7.5

Aims of Module

To provide the student with the ability to analyse and interpret the dynamic structural behaviour of engineering system components.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Evaluate the natural frequencies and mode shapes of linear and rotational vibrational systems having two, three and more degrees of freedom.
- 2 Apply dynamic theory for problems related to vibration.
- 3 Assess the vibrational behaviour of complex system.
- 4 Appraise the use of numerical calculation and modal analysis for problems related to vibration of complex systems.

Indicative Module Content

Dynamics of engineering systems of two and more degrees of freedom; vibrational analysis of engineering components; basic numerical methods for dynamic analysis; Rayleigh's energy method; Vibration analysis of multi degree-of-freedom and continuous systems to periodic and transient loading. Systems modelling, transfer functions, transient and steady state response methods, frequency response methods, stability analysis, state space representation and signal flow graphs.

Module Delivery

The module is delivered by means of lectures, tutorials and self-guided study and is integrated with applications in the laboratory.

Indicative Student Workload	Full Time	Part Time
Contact Hours	46	N/A
Non-Contact Hours	104	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	N/A
Actual Placement hours for professional, statutory or regulatory body		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Coursework	Weighting:	50%	Outcomes Assessed:	2, 4
Description:	Report.				

Component 2

Type:	Examination	Weighting:	50%	Outcomes Assessed:	1, 3
Description:	Closed book examination.				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

The module has 2 components and to gain an overall pass a minimum D grade must be achieved in each component. The component weighting is as follows: C1 is worth 50% and C2 is worth 50%.

		Examination:						
		A	B	C	D	E	F	NS
Coursework:	A	A	A	B	B	E	E	
	B	A	B	B	C	E	E	
	C	B	B	C	C	E	E	
	D	B	C	C	D	E	E	
	E	E	E	E	E	E	F	
	F	E	E	E	E	F	F	
	NS	Non-submission of work by published deadline or non-attendance for examination						

Module Requirements

Prerequisites for Module	Mechanical Engineering Design 2 (EN2101) and Dynamics (EN2500), or their equivalent.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

- 1 RAO, S.S., 2017. Mechanical Vibrations. 6th ed. Upper Saddle River, NJ: Prentice Hall.
- 2 THOMSON W.T., 2013. Theory of Vibrations with Application. 5th ed. Cheltenham: Nelson Thornes.