Module specification

When printed this becomes an uncontrolled document. Please access the Module Directory for the most up to date version by clicking on the following link: Module directory

Refer to the module guidance notes for completion of each section of the specification.

Module code	ENG428
Module title	Mechanical Science
Level	4
Credit value	20
Faculty	FAST
Module Leader	Mr R. Bolam
HECoS Code	100193
Cost Code	GAME

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
HNC Mechanical Technology	Core

Pre-requisites

L3 Mechanical Principles and Applications (or similar).

Breakdown of module hours

Learning and teaching hours	60 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	**60** hrs
Placement / work based learning	0 hrs
Guided independent study	140 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	August 2016
With effect from date	September 2021

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Date and details of revision	6 July 2021, revalidated
Version number	Version 2

Module aims

To understand the major mechanical and engineering science principles which underpin the design and operation of mechanical engineering systems.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Investigate and analyse static, dynamic and fluid engineering systems theory.
2	Solve and analyse practical engineering situations.
3	Determine parameters within mechanical engineering systems.

Assessment

Indicative Assessment Tasks:

Assessment is 100% in-course.

Assessment One: Outcomes 1, 2 will be assessed by the student producing a portfolio of short reports on mechanical science based practical exercises (2000 words).

Assessment Two: Outcome 3 will be assessed using an in-class test based on solving real life engineering problems (1hr 30 mins).

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1, 2	Portfolio	50%
2	3	In-class test	50%

Derogations

None.

Learning and Teaching Strategies

The module will be presented to students through a specified series of lectures assisted by notes via VLE platform. Lectures will deliver key concepts, ideas, theories and examples. Relevant videos and practical or demonstration laboratory work where possible will also be used to aid the learning process.

Evaluation of learning will be as outlined above with report including a write up of practical work if possible. Assessments will ensure that the student has the opportunity to meet all of the stipulated learning outcomes

Indicative Syllabus Outline

1. **Statics**
   Compound Bars: force and temperature effects.
   Shear force and Bending Moment Diagrams: simply supported and cantilever beams.
   Bending Equation: derivation and application, selection of beam from tables.
   Torsion Equation: derivation and application.
2. **Dynamics**
   Angular motion: equations of motion, relationships between linear and angular motion, moment of inertia, radius of gyration, flywheels, angular kinetic energy, raising and lowering of masses by drums, centripetal acceleration, balancing of rotating masses in one plane.
   Vibrations: simple harmonic motion, spring mass systems, pendulums, resonance, damping effects.
3. **Fluids in Motion**
   Definitions: steady flow, incompressible liquid, friction, velocity flow rate, volumetric flow rate, mass flow rate.
   Energy in liquids: continuity equation, Bernoulli's equation, viscosity, laminar and turbulent flow, Reynolds number, friction losses, Darcy equation, Moody diagram, Blasius formula.

Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads

Tooley M., Dingle L. (2020) Engineering Science: For Foundation Degree and Higher National. 2nded. Routledge

Other indicative reading

Hannah J., Hillier M.J. (2007) Mechanical Engineering Science. Prentice Hall.

Employability skills – the Glyndŵr Graduate

Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes

and each module may cover different areas. Click here to read more about the Glyndwr Graduate attributes

Guidance, from the following list, delete the attributes that are not covered by this module

Core Attributes
Engaged
Creative
Ethical

Key Attitudes
Curiosity
Resilience
Confidence
Adaptability

Practical Skillsets
Digital Fluency
Critical Thinking
Communication