Module Specification

Foundation Mechanics

Version: 2023-24, v4.0, 13 Mar 2023

Contents

Part 1: Information

Module title: Foundation Mechanics

Module code: UFMFAG-30-0

Level: Level 3

For implementation from: 2023-24

UWE credit rating: 30

ECTS credit rating: 15

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Field: Engineering, Design and Mathematics

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: Not applicable

Features: Not applicable

Educational aims: See Learning Outcomes.

Outline syllabus: Triangles: Pythagoras' Theorem; Trigonometric Ratios; Cosine and sine rule; Trigonometry, Graphs and Waveforms; Trigonometrical Identities and other special relationships.

Fundamental Units, Vectors and Scalars. Vectorial Representation and force components.

Static Equilibrium: Newton's 1st and 3rd Laws, force, weight, resultant component. Moments, equilibrium, Centre of gravity, Centre of area. Free body diagrams. Stress and strain - shear, direct stress, basic definitions. Basic stress analysis.

Dry Friction: Limiting friction; Body at rest on an inclined plane; Impending motion up and down an incline.

Rigid Body Motion: Linear motion, displacement, velocity, acceleration, falling bodies, projectiles, relative velocity, application of Newton's 2nd Law. Work done, power and Conservation of Energy.

Angular Motion: Radians, angular velocity and accelerations. Centripetal and centrifugal acceleration.

Behaviour of Fluids: Fluid properties - pressure, temperature, density. Pressure and pressure measurement. Incompressible Fluid Flow. Volume flow rate and mass flow rate. Continuity Equation. Branched Pipes.

Part 3: Teaching and learning methods

Teaching and learning methods: Scheduled teaching and learning includes lectures and tutorial sessions. Demonstrations and practical experiments will be given within the taught sessions and worked examples, class examples and multiple tutorial questions used to clarify and compound understanding.

Independent learning includes hours engaged in problem solving and preparation of tutorial questions and assignment preparation.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Show an awareness of the basic properties of materials and simple stress analysis

MO2 Show a basic understanding of mechanical principles

MO3 Apply mechanical principles to solve problems in static and dynamic engineering situations

MO4 Show cognitive skills with respect to simplifying real problems and applying mathematical methods of analysis

MO5 Apply the principles of Equilibrium, Motion and Conservation of Energy and Conservation of Mass to solve practical problems

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 hours

Total = 300

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/modules/ufmfag-30-0.html

Part 4: Assessment

Assessment strategy: The assessments on this module consists of 3 compulsory Tasks.
Task1: Online assessment on Maths taught within the Foundation Mechanics module.
Task2: Online assessment based on Statics part of Foundation Mechanics
Task3: Online assessment for Dynamics and Fluids part of Foundation Mechanics.

The resit will be the same as the first sit.

Assessment tasks:

Examination (Online) (First Sit)
Description: Task: Online assessment on Maths taught within the Foundation Mechanics module (DEWIS 2 hours)
Weighting: 10 %
Final assessment: No
Group work: No
Learning outcomes tested: MO4

Examination (Online) (First Sit)
Description: Task: Online assessment based on Statics part of Foundation Mechanics (DEWIS 3 hours)
Weighting: 40 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3

Examination (Online) (First Sit)
Description: Task: Online assessment for Dynamics and Fluids part of Foundation Mechanics (DEWIS 3 hours)
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO3, MO5

Examination (Online) (Resit)
Description: Task: Online assessment on Maths taught within the Foundation Mechanics module (DEWIS 2 Hours).
Weighting: 10 %
Final assessment: No

Group work: No
Learning outcomes tested: MO4

Examination (Online) (Resit)
Description: Task: Online assessment based on Statics part of Foundation Mechanics
(DEWIS 3 hours).
Weighting: 40 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3

Examination (Online) (Resit)
Description: Task: Online assessment for Dynamics and Fluids part of Foundation Mechanics (DEWIS 3 hours).
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO3, MO5

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Automation and Robotics Engineering {Foundation} [GCET] DipHE 2023-24

Mechatronics Engineering {Foundation} [Frenchay] MEng 2023-24

Mathematics {Foundation} [Frenchay] BSc (Hons) 2023-24

Automation and Robotics Engineering {Foundation} [GCET] BEng (Hons) 2023-24

Energy Technology and Management {Foundation} [GCET] BSc (Hons) 2023-24

Energy Technology and Management {Foundation} [GCET] DipHE 2023-24

Building Services Engineering {Foundation} [GCET] DipHE 2023-24

Electronic Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Engineering {Foundation} [Frenchay] BSc (Hons) 2023-24

Automotive Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering with Pilot Studies {Foundation} [Frenchay] BEng (Hons) 2023-24

Civil Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Mechatronics Engineering {Foundation}[Frenchay] BEng (Hons) 2023-24

Electrical and Electronic Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Building Services Engineering {Foundation} [GCET] BEng (Hons) 2023-24

Robotics {Foundation} [Frenchay] BEng (Hons) 2023-24