

Mechanisms for Design

Module Code:	MAE5008-A
Academic Year:	2018-19
Credit Rating:	10
School:	Department of Mechanical and Energy Systems Engineering
Subject Area:	Mechanical and Automotive Engineering
FHEQ Level:	FHEQ Level 5
Module Leader:	Dr Hongsheng Qi

Additional Tutors:

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	14
Tutorials	22
Directed Study	62
Examinations DO NOT USE	2

Availability Periods

Occurrence	Location/Period
BDA	University of Bradford / Semester 1 (Sep - Jan)

Module Aims

The aim of this module is to introduce the basic theoretical principles which underpin the kinematics of mechanisms and to show how analytical and CAE simulation techniques are used in the design of mechanisms.

Outline Syllabus

(1) Virtual design methods. (2) Basic Kinematics used in mechanism design and simulation: speed; acceleration; vector/scalar quantities; units. (3) Basic Kinetics used in mechanism design and simulation: mass; gravity; weight; force; torque; power; motor; actuator; Newton`s law. (4) Basic concepts in modelling of mechanisms: joints (sliding, revolute, spherical, etc); constraints (springs, dampers) (5) Material properties in mechanisms. (6) Typical mechanism and machine components: Wedge and screw thread; Disc Friction; belts and belt drives; machine gears. (7) Use of mechanism simulation software in the design process.

Module Learning Outcomes

On successful completion of this module, students will be able to...

- 1 1.1 Analyse the design of mechanisms via the use of computer-based simulation.
- 2 2.1 Solve mechanism problems using analytical and graphical methods as well as CAE tools.
- 3 3.1 Use the scientific method.
3.2 Interpret static and dynamic data.
3.3 Solve problems systematically and creatively.

Learning, Teaching and Assessment Strategy

Concepts are introduced using formal lectures. Deeper understanding is developed during examples and software-based classes. Practical aspects are introduced in the tutorial classes, using a demonstration of motion of mechanisms by the use of a Simple Mechanisms Kit, involving group work. Oral feedback is given during problems classes and after the in-class-tests. Written assessment combines in-class-tests and report on group work, with calculation work and work with CAE to address all the specified learning outcomes.

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
Referral	Coursework	Supplementary assessment: Individual report (report 2000 words)	0 hours	100%	No
Summative	Coursework	Group report (equivalent 2000 words per student)	0 hours	70%	No
Summative	Classroom test	In class open-book test 2 hours	2 hours	30%	Yes

Legacy Code (if applicable)

ENG2310M

Reading List

To view Reading List, please go to [rebus:list](#).