

MODULE DESCRIPTION FORM

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

ME931 INDUSTRIAL METALLURGY

Module Registrar: Dr A I Toumpis athanasios.toumpis@strath.ac.uk	Taught To (Course): MSc Advanced Mechanical Engineering	
Other Lecturers Involved:	Credit Weighting: 10	Semester: 2
Compulsory (MSc AME with Materials) / Optional class	Academic Level: 5	Suitable for Exchange: N

Required prerequisites

Note: It is the responsibility of ALL students to ensure that they satisfy the prerequisite knowledge for this module BEFORE adding as part of curriculum selection. If unsure, please contact the Module Registrar or discuss with your Programme/Year Adviser of Studies.

Fundamental Materials Science knowledge:

Basic understanding of the structure of materials

Prior knowledge of basic analytical principles for the deformation behaviour of metals and alloys, along with the ability to employ fundamental stress, strain, modulus of elasticity and other equations.

Elementary knowledge of alloy equilibrium phase diagrams and of typical microstructures and phases in steel alloys

Basic engineering research skills:

Ability to research the engineering literature on a specified subject area and construct a formal engineering report

Appreciation of the diverse resources available and of the methods to access them

Basic competency in studying and summarising engineering journal papers

Module Format and Delivery (HOURS i.e. 1 credit = 10hrs of study):

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	Total
10	3				2		5	80	100

Educational Aim

This module aims to develop an understanding of applied industrial metallurgy, to include 'Deformation Behaviour and Properties of Metals and Alloys', 'Metal Extraction', 'Characterisation Methods', 'Heat Treatments', 'Welding Engineering' and 'Degradation Mechanisms'.

Learning Outcomes

On completion of the module the student is expected to:

LO1 Gain knowledge and understanding of applied metallurgy (structure, properties, application, etc.)

LO2 Develop skills in material selection and processes used for physical property manipulation

LO3 Be able to apply the knowledge gained across a range of industrial sectors

Syllabus

The module will teach the following:

- Introduction to the structure of metals, reviewing aspects such as crystal structure, mechanical properties, crystal defects and their effects on alloy properties
- Application of metallurgical principles in the extraction and processing of iron, steel and aluminium
- Theory of diffusion and the phenomenon of mass transport for heat treatments
- Phase diagrams (equilibrium and non-equilibrium conditions), focusing on steel phase transformations

Additional Student Feedback

(Please specify details of when additional feedback will be provided)

Date	Time	Room No
Check timetable webpages for details		

Session: 2021/22

Approved:

Course Director Signature: E Henderson

Date of Last Modifications: 01/09/2021

(Updated July 2021-MAE)

MODULE TIMETABLE

Module Code:

ME931

Module Title:

Industrial Metallurgy

Brief Description of Assessment:

- Assignment: research, analysis, reporting and presentation of a relevant subject area/topic in groups. The students will be informed of the specific presentation slots towards the semester start.
- Regular diet (covering all lectures & tutorials plus information provided in the presentations)

Assessment Timing

Indicated on the table below are the start/submission dates for each assignment/project and the timing of each exam/assessment. Dropdowns may be left blank. Add extra notes below the dropdowns where relevant.

Please note: Timings can and will change, this should only be used as a guide.

Semester One	W&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.

Semester Two	C&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Course work Set	Choose an item. Choose an item.	Choose an item. Choose an item.	Present ation	Present ation	Present ation	Present ation	Present ation	Choose an item. Choose an item.