



Module Specification

Industrial Nuclear Science and Technology

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Part 1: Information

Module title: Industrial Nuclear Science and Technology

Module code: UFMFBQ-20-3

Level: Level 6

For implementation from: 2023-24

UWE credit rating: 20

ECTS credit rating: 10

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: The topics covered in this unit are:

Nuclear Fuel:

Recovery

Enrichment

Fabrication

Reprocessing

Nuclear Reactors:

Reactor Types

Reactor Cores

Steam Generators

Auxiliary Systems

Nuclear Decommissioning:

Waste Categorisation

Waste Retrieval and Removal

Waste Disposal

Environmental Remediation

Neutron Physics:

Binding Energy

Fission Barrier

Reaction Rates

Criticality

Part 3: Teaching and learning methods

Teaching and learning methods: The syllabus is designed to give the learner a breadth and depth of knowledge science and technology in the industrial nuclear environment. The learner has the choice of 1 of 4 topics (Fuel Technology, Reactor Systems, Decommissioning or Neutron Physics) to research and further their wider nuclear industry technological and scientific understanding.

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

MO1 Explain and analyse the application of nuclear science and technology in industrial nuclear processes

MO2 Analyse the science and technology used in industrial nuclear processes

MO3 Evaluate the science and technology of a nuclear process (either Nuclear Fuel Cycle; Nuclear Reactor Systems; Nuclear Decommissioning; or Neutron Physics)

Hours to be allocated: 200

Contact hours:

Independent study/self-guided study = 282 hours

Face-to-face learning = 18 hours

Total = 300

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/index.html) via the following link <https://uwe.rl.talis.com/index.html>

Part 4: Assessment

Assessment strategy: The assessment for this module is as follows:

Oral Examination – The learner is assessed on their ability to explain the applications of nuclear science and technology to a panel of academics and industrial experts. Learners will be asked questions within their chosen topic (Fuel Technology, Reactor Systems, Decommissioning or Neutron Physics).

Journal Article – The learner is to analyse evaluate the effectiveness of a particular piece of industrial nuclear technology or scientific theory, based on their track of choice. This analysis and evaluation is framed in the form of a journal style article.

Resit is the same as the first sit

Assessment tasks:

Presentation (First Sit)

Description: Oral examination (20 minutes)

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1

Written Assignment (First Sit)

Description: Journal article (1500 words)

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3

Presentation (Resit)

Description: Oral examination (20 minutes)

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested:

Written Assignment (Resit)

Description: Journal article (1500 words)

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested:

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electrical, Electronic and Control Engineering with Nuclear {Apprenticeship-UCS}
[Sep][FT][UCS][4yrs] BEng (Hons) 2020-21

Mechanical Engineering with Nuclear {Apprenticeship-UCS} [Sep][FT][UCS][4yrs]
BEng (Hons) 2020-21

Electrical, Electronic and Control Engineering with Nuclear {Apprenticeship-UCS}
[Sep][FT][UCS][5yrs] BEng (Hons) 2019-20

Mechanical Engineering with Nuclear {Apprenticeship-UCS} [Sep][FT][UCS][5yrs]
BEng (Hons) 2019-20