



MODULE SPECIFICATION

| Part 1: Information | | | |
|-------------------------|---|--------------------|-------------------------------------|
| Module Title | Energy and Thermodynamics | | |
| Module Code | UFMFF3-15-1 | Level | Level 4 |
| For implementation from | 2018-19 | | |
| UWE Credit Rating | 15 | ECTS Credit Rating | 7.5 |
| Faculty | Faculty of Environment & Technology | Field | Engineering, Design and Mathematics |
| Department | FET Dept of Engin Design & Mathematics | | |
| Contributes towards | <p>Mechanical Engineering with Manufacturing {Apprenticeship} [Sep][PT][Frenchay][4yrs] BEng (Hons) 2018-19</p> <p>Aerospace Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19</p> <p>Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][5yrs] MEng 2018-19</p> <p>Aerospace Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19</p> <p>Mechanical Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19</p> <p>Automotive Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19</p> <p>Mechanical Engineering (Nuclear) - Not Running BEng (Hons) 2017-18</p> <p>Mechanical Engineering [Sep][PT][UCW][3yrs] FdSc 2018-19</p> <p>Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19</p> <p>Mechanical Engineering [Sep][FT][BTC][2yrs] FdSc 2018-19</p> <p>Mechanical Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19</p> <p>Mechanical Engineering [Sep][FT][Frenchay][3yrs] BEng 2018-19</p> <p>Mechanical Engineering [Sep][SW][Frenchay][4yrs] BEng 2018-19</p> <p>Aerospace Engineering (Design) [Sep][SW][Frenchay][5yrs] MEng 2018-19</p> <p>Aerospace Engineering (Systems) [Sep][FT][Frenchay][4yrs] MEng 2018-19</p> <p>Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19</p> <p>Aerospace Engineering with Pilot Studies (Design) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19</p> <p>Aerospace Engineering with Pilot Studies (Design) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19</p> <p>Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][4yrs] MEng 2018-19</p> <p>Automotive Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19</p> <p>Automotive Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19</p> | | |

STUDENT AND ACADEMIC SERVICES

Automotive Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering with Pilot Studies (Design) [Sep][SW][Frenchay][5yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies (Manufacturing) [Sep][SW][Frenchay][5yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies (Systems) [Sep][SW][Frenchay][5yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies (Systems) [Sep][FT][Frenchay][4yrs] MEng 2018-19

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Aerospace Engineering (Systems) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering (Systems) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19

Aerospace Engineering (Manufacturing) {Apprenticeship} [Sep][PT][UCW][4yrs] BEng (Hons) 2018-19

Aerospace Engineering (Manufacturing) {Apprenticeship} [Sep][PT][UCW][5yrs] BEng (Hons) 2018-19

Aerospace Engineering (Design) {Apprenticeship} [Sep][PT][COBC][4yrs] BEng (Hons) 2018-19

Mechanical Engineering with Manufacturing [Sep][PT][Frenchay][4yrs] BEng (Hons) 2018-19

Mechanical Engineering with Manufacturing {Apprenticeship} [Sep][PT][UCW][4yrs] BEng (Hons) 2018-19

Mechanical Engineering with Manufacturing {Apprenticeship} [Sep][PT][COBC][4yrs] BEng (Hons) 2018-19

Mechanical Engineering with Manufacturing {Apprenticeship} [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering (Manufacturing) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19

Aerospace Engineering (Systems) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19

Aerospace Engineering (Systems) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19

Aerospace Engineering with Pilot Studies {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19

STUDENT AND ACADEMIC SERVICES

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|---------------------------|--|--|
| | Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19 | |
| Module type: | Standard | |
| Pre-requisites | None | |
| Excluded Combinations | None | |
| Co- requisites | None | |
| Module Entry requirements | None | |

Part 2: Description

Educational Aims: The study of thermodynamics forms one of the disciplines that underpin many areas of engineering. This module is designed to provide a solid foundation of knowledge which will be used to extend specialist knowledge in future years.

Outline Syllabus: Concepts of pressure and temperature, work, heat and energy, absolute temperature and pressure.

Concepts of total and specific energy etc; notation; units; problem solving.

Closed Systems; analysis of closed systems; internal energy, the NFEE.

Work producing processes, process laws, work equations.

Open systems; analysis of open systems; the SFEE and continuity.

Properties of ideal gases, gas laws, property relations.

Problems involving gases.

Water and Steam; phase change; definitions of state; use of Steam Tables; properties of 2-phase mixture.

Problems involving water and steam.

Entropy; pV and TS diagrams.

Power Cycles: Otto, Brayton, Rankine.

Teaching and Learning Methods: Large group lecture supported by small group tutorial sessions. Study time outside of contact hours will be spent on going through exercises and example problems.

Scheduled learning includes lectures and tutorials.

Independent learning includes hours engaged with essential reading, exercise preparation and completion etc.

Hours

Contact: 36

STUDENT AND ACADEMIC SERVICES

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| Assimilation and skill development: 70 Coursework preparation: 0 Exam preparation: 44 Total: 150 |
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| Part 3: Assessment | | | |
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| Component A: Assessed via end of semester Exam 3 hours (100%) to include sufficient time for students to read and assimilate associated data sheets. Summative assessment. | | | |
| Formative assessment (not contributing to module mark) is provided via support in tutorials. | | | |
| First Sit Components | Final Assessment | Element weighting | Description |
| Examination - Component A | ✓ | 100 % | End of semester exam (3 hours) |
| Resit Components | Final Assessment | Element weighting | Description |
| Examination - Component A | ✓ | 100 % | End of semester exam (3 hours) |

| Part 4: Teaching and Learning Methods | | | | | | | | | | | | |
|---------------------------------------|---|--|--|-----|--|--------------------------|--|-------------------------------------|--|---------------------------------------|---|------------|
| Learning Outcomes | On successful completion of this module students will be able to: | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th colspan="2">Module Learning Outcomes</th> </tr> </thead> <tbody> <tr> <td>MO1</td> <td>Use specialist engineering knowledge and understanding of key principles and results in thermodynamics</td> </tr> <tr> <td>MO2</td> <td>Apply appropriate theoretical methods to the analysis of problems in thermodynamics, based on knowledge of the relevant engineering principles</td> </tr> <tr> <td>MO3</td> <td>Show cognitive skills with respect to modelling and simplifying real problems in thermodynamics, and applying mathematical methods of analysis</td> </tr> <tr> <td>MO4</td> <td>Apply appropriate theoretical and practical methods in problem formulation and decision-making, interpreting experimental results</td> </tr> </tbody> </table> | Module Learning Outcomes | | MO1 | Use specialist engineering knowledge and understanding of key principles and results in thermodynamics | MO2 | Apply appropriate theoretical methods to the analysis of problems in thermodynamics, based on knowledge of the relevant engineering principles | MO3 | Show cognitive skills with respect to modelling and simplifying real problems in thermodynamics, and applying mathematical methods of analysis | MO4 | Apply appropriate theoretical and practical methods in problem formulation and decision-making, interpreting experimental results | |
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| Contact Hours | <table border="1"> <thead> <tr> <th colspan="2">Contact Hours</th> </tr> </thead> <tbody> <tr> <td colspan="2"> </td> </tr> <tr> <th colspan="2">Independent Study Hours:</th> </tr> <tr> <td style="text-align: center;">Independent study/self-guided study</td> <td style="text-align: center;">114</td> </tr> <tr> <td colspan="2" style="text-align: center;">Total Independent Study Hours:</td> <td style="text-align: center;">114</td> </tr> </tbody> </table> | Contact Hours | | | | Independent Study Hours: | | Independent study/self-guided study | 114 | Total Independent Study Hours: | | 114 |
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| Independent study/self-guided study | 114 | | | | | | | | | | | |
| Total Independent Study Hours: | | 114 | | | | | | | | | | |
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STUDENT AND ACADEMIC SERVICES

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| | Scheduled Learning and Teaching Hours: | |
| | Face-to-face learning | 36 |
| | Total Scheduled Learning and Teaching Hours: | 36 |
| | Hours to be allocated | 150 |
| | Allocated Hours | 150 |
| Reading List | <p><i>The reading list for this module can be accessed via the following link:</i></p> <p>https://uwe.rl.talis.com/modules/ufmff3-15-1.html</p> | |