# MODULE SPECIFICATION

| Part 1: Information | | | |
|---|---|---|---|
| Module Title | Power Electronics | | |
| Module Code | UFMFDE-15-3 | Level | Level 6 |
| For implementation from | 2020-21 | | |
| 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 | | |
| Module type: | Standard | | |
| Pre-requisites | Practical Electronics 2020-21 | | |
| Excluded Combinations | None | | |
| Co- requisites | None | | |
| Module Entry requirements | None | | |

## Part 2: Description

**Overview**: Pre-requisites: Students take one of UFMFP8-15-1 Electrical and Electronic Principle A, UFMFVA-15-1 Electrical and Electronic Principle B, OR UFMFCA-15-1 Practical Electronics.

**Educational Aims:** See Learning Outcomes.

In addition to the learning outcomes, on successful completion of this module students will be able to show and demonstrate a detailed knowledge and understating of:

Problem formulation and decision making (not assessed formally)
Self-management: planning and undertaking learning activities based on module resources (not assessed formally)

**Outline Syllabus:** The syllabus includes:

Power Electronic Systems,
DC to DC Choppers,
AC to DC Converters,
DC to AC Inverters,
AC to AC Regulators,

Switched Mode Power Supplies,
Power Electronic Switches,
High Voltage DC Transmission,
FACTS (Flexible AC Transmission Systems),
Power Electronics for Wind, Solar and Hydro: Grid Interconnection.

**Teaching and Learning Methods:** The module delivers material on modern power electronics. Concepts and the Learning Methods scope of a topic will be introduced in lectures. These will be supported by directed reading and simulation laboratory based work. The labs sessions will enhance the understanding of students of real-world applications of the material delivered in the module. The students will learn through applying a variety of analysis methods, mathematical and simulation tools to design power electronics circuits. Relevant ethical issues will be highlighted and students will be encouraged to consider these further through directed reading.

Contact Hours:

Activity:
Contact: 36 hours
Assimilation and skill development: 66 hours
Undertaking Coursework: 24 hours
Exam preparation: 24 hours
Total: 150 hours

**Part 3: Assessment**

There will be a final written exam of 3 hours duration set at the end of the term and a total of 50% marks will be contributed from this element (A). The coursework (element B) is numerical-type/mini-research-based work. In the resit run element B will be an individual work assignment and the remaining part of the module assessment will be same as set in the first run.

| First Sit Components | **Final Assessment** | **Element weighting** | **Description** |
|---|---|---|---|
| Examination (Online) - Component A | ✓ | 50 % | Online Examination (3 hours) |
| Written Assignment - Component B | | 50 % | Coursework assignment |
| Resit Components | **Final Assessment** | **Element weighting** | **Description** |
| Examination (Online) - Component A | ✓ | 50 % | Online Examination (3 HOURS) |
| Written Assignment - Component B | | 50 % | Coursework assignment |

**Part 4: Teaching and Learning Methods**

Learning Outcomes

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

| Module Learning Outcomes | Reference |
|---|---|
| The operating principles of power electronic converters such as DC/DC, AC/DC, DC/AC and AC/AC | MO1 |
| Modern design of power electronics circuits | MO2 |
| Analysis and performance of power electronics circuits | MO3 |
| Modern power electronics usages in terms of FACTS (Flexible AC Transmission Systems), power conversion requirements etc. | MO4 |
| Designing the simulation case study of Power Electronic systems | MO5 |
| Research and presentation skills | MO6 |

Contact Hours

| | |
|---|---|
| **Independent Study Hours:** | |
| Independent study/self-guided study | 114 |
| **Total Independent Study Hours:** | 114 |
| **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

*The reading list for this module can be accessed via the following link:*

https://uwe.rl.talis.com/modules/ufmfde-15-3.html

**Part 5: Contributes Towards**

This module contributes towards the following programmes of study:

Electrical and Electronic Engineering {Top-Up} [May][PT][AustonSriLanka][1.3yrs] BEng (Hons) 2019-20

Electrical and Electronic Engineering {Top-Up} [Feb][PT][AustonSriLanka][1.3yrs] BEng (Hons) 2019-20

Electrical and Electronic Engineering {Top-Up} [Oct][PT][AustonSriLanka][1.3yrs] BEng (Hons) 2019-20

Electrical and Electronic Engineering {Top-Up} [May][PT][AustonSingapore][1.3yrs] BEng (Hons) 2019-20

Electrical and Electronic Engineering {Top-Up} [Feb][PT][AustonSingapore][1.3yrs] BEng (Hons) 2019-20

Electrical and Electronic Engineering {Top-Up} [Oct][PT][AustonSingapore][1.3yrs] BEng (Hons) 2019-20

Electronic and Computer Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Electronic Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19

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

Electronic and Computer Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19

Electronic and Computer Engineering [Sep][PT][GlosColl][5yrs] BEng (Hons) 2018-19

Electronic and Computer Engineering {Apprenticeship} [Sep][PT][GlosColl][5yrs] BEng (Hons) 2018-19