University of Plymouth

Faculty of Science and Engineering

School of Computing Electronics and Mathematics

Programme Specification

MSc Electrical and Electronic Engineering (4676)

September 2020

1. **MSc Electrical and Electronic Engineering**

   Final award title: **MSc Electrical and Electronic Engineering**

   Level 7 Intermediate award title(s)
   Postgraduate Certificate on completion of 60 credits
   Postgraduate Diploma on completion of 120 credits

   UCAS code
   JACS code H600

2. **Awarding Institution:** University of Plymouth

   Teaching institution(s): University of Plymouth

3. **Accrediting body: The Technology** **IET: The Institution of Engineering and**

4. **Distinctive Features of the Programme and the Student Experience**
This programme is aimed at engineers or people with electrical and electronic engineering background interested in the fields of power, communications and DSP. The course provides the knowledge, tools and context necessary for such specialisation and is underpinned by an individual research project.

5. **Relevant QAA Subject Benchmark Group(s)**
QAA Subject benchmark: **Engineering**.
The programme follows the **IET UK-SPEC** learning outcomes and integrates those not fully specified with additional QAA learning outcomes (e.g. Key and Transferable skills).

6. **Programme Structure**
The programme is usually only offered as a full-time course. The course lasts for 12 months and leads at the end of this time to the degree Master of Science (MSc). Early exit points are PgDip and PgCert.
- The MSc award requires 60 taught credits in the Autumn semester (S1), 60 taught credits in the Spring semester (S2), and an MSc Project of 60 credits i.e., requires a minimum of 180 credits with a minimum mark of 50%.
- The PgCert requires a minimum of 60 taught credits (i.e., excluding the Project) with a minimum mark of 50%.
- The PgDip requires a minimum of 120 credits with a minimum mark of 50%.

The MSc award only, is categorised into following specific grades:

MSc with Distinction: This award is achieved by a student gaining an overall average mark on the programme of study of 70% and above.

MSc with Merit: This award is achieved by a student gaining an overall average mark on the programme of study between 60% and 69.99%.

MSc: This award is achieved by a student gaining an overall mark in the programme of study between 50% and 59.99%

To pass a module requires a student to achieve at least 40% in both the exam and coursework elements and at least 50% in the overall module mark, or 50% overall if a coursework only module.

CORE

Semester	Module	Subject	Credit	E1 (%)	C1 (%)	T1 (%)	P1 (%)
1	ELEC512	Nanotechnology & Nanoelectronics	20	70	30		
1	ELEC518	Digital & Wireless Communications	20	70	30		
1	SOFT564Z	Software Engineering for Distributed and Interactive Systems	20	30	70		
2	AINT515Z	Artificial Vision and Deep Learning	20	50	50		
2	ELEC517	Integrated Power Systems	20	50	50		
AY	PROJ518	MSc Dissertation and Research Skills	60		100		

OPTIONAL (Choose one)

Semester	Module	Subject	Credit	E1 (%)	C1 (%)	T1 (%)	P1 (%)
2	ROCO506Z	Science and Technology of Autonomous Vehicles	20	50	50		
2	MAR528Z	Mechanics of MRE Structures	20	50	50		

7. Programme Aims

1. To meet relevant national and international postgraduate needs of the electrical and electronic engineering industry.
2. Develop research skills in a leading edge technology.
3. Develop a high level awareness of the technical and economic issues associated with the modern electrical and electronic engineering industry.
4. Develop an in-depth understanding of the theory and practise of key specialist topics in renewable power, digital communications engineering and associated signal processing techniques.
5. The ability to apply the course knowledge to a variety of problems, in industrial or research settings.
6. Provide a thorough knowledge of contemporary wireless and broadband communications used in cellular and optical networks.

8. Programme Intended Learning Outcomes

8.1. Knowledge and understanding

On successful completion graduates should have developed:

1. The Mathematics and Physics that is essential to communication engineering and DSP.
2. The fundamental concepts, principles and theories of electrical engineering.
3. Personal, professional and management – techniques that are relevant to engineers.
4. Detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to communication engineering design.
5. The professional and ethical responsibility of the engineer in society.

8.2. Cognitive and intellectual skills

1. Plan, conduct and report a programme of original research.
2. Analyse and solve engineering problems.
3. Be creative in the solution of problems and in the development of designs.
4. Evaluate designs, processes and products and make improvements.
5. Integrate and evaluate data from a variety of sources.
6. Select and apply suitable computer based methods for modelling and analysing engineering problems.

8.3. Key and transferable skills

1. The ability to communicate effectively in a variety of forms.
2. Work as a member of a team.
3. Manage resources and time.
4. Learn independently in familiar and unfamiliar situations

8.4. Practical skills

1. Plan and execute safely a series of experiments.

2. Use laboratory and workshop equipment to generate data.
3. Analyse experimental results and determine their strength and validity.
4. Prepare technical reports.
5. Research literature effectively.
6. Create algorithms
7. Use computational/ simulation tools and packages.

9. Admissions Criteria, including APCL, APEL and DAS arrangements

A lower second class honours degree (2:2) or better, in a electronic engineering, or similar engineering background.

Applicants with substantial industrial experience in lieu of formal qualifications will be considered on an individual basis.

The programme adhere to the University regulations and guidelines for Accreditation of Prior Experiential Learning (APEL) and Accreditation of Prior Certificated Learning (APCL) for Masters programmes.

10. Progression criteria for Final and Intermediate Awards

The MSc in Electrical and Electronic Engineering award requires minimum of 180 credits and is categorised into grades:

MSc with Distinction
This award is achieved by a student gaining an overall average mark on the programme of study of 70% and above, and the mark for the dissertation/major project module is not less than 70%

MSc with Merit
This award is achieved by a student gaining an overall average mark on the programme of study of 60% and above, and the mark for the dissertation/major project module is not less than 60%.

MSc pass
This award is normally achieved by a student gaining an overall average mark between 50% and 59.95%.

To pass a module requires a student to achieve at least 40% in both the exam and coursework elements and at least 50% in the overall module mark, or 50% overall if a coursework only module.

11. Exceptions to Regulations

Due to accreditation requirements students are required to achieve a minimum of 40% in each element at Level 7.

12. **Transitional Arrangements**

PROJ518 replaces PROJ509 from Sept 2020. Any student needing to repeat PROJ509 should take PROJ518.

13. **Mapping and Appendices:**
13.1. **ILO's against Modules Mapping**

Intended Programme Learning Outcomes	Module
A. Knowledge and Understanding	
1. Mathematics and Physics that is essential to communication engineering and DSP.	ELEC512, ELEC518, AINT515Z
2. The fundamental concepts, principles and theories of communication and renewable power engineering.	ELEC517, ELEC518, ROCO506Z
3. Personal, Professional and management techniques that are relevant to engineers.	PROJ518
4. Detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to communication and power engineering design.	ELEC517, ELEC518
5. The professional and ethical responsibility of the engineer in society.	PROJ518, ROCO506Z
B. Intellectual Skills	
1. Plan, conduct and report a programme of original research.	PROJ518, ELEC517, ELEC518
2. Analyse and solve engineering problems.	AINT515Z, ROCO506Z
3. Be creative in the solution of problems and in the development of designs.	PROJ518, AINT515Z, ROCO506Z, SOFT564Z
4. Evaluate designs, processes and products and make improvements.	PROJ518
5. Integrate and evaluate data from a variety of sources.	ELEC517, PROJ518
6. Select and apply suitable computer based methods for modelling and analysing engineering problems.	ELEC518, SOFT564Z, AINT515Z
C. Key and Transferable Skills	
1. The ability to communicate effectively in a variety of forms.	ELEC517, ELEC518, AINT515Z
2. Work as a member of a team.	ELEC517, ELEC512
3. Manage resources and time.	PROJ518
4. Learn independently in familiar and unfamiliar situations	ELEC518, AINT515Z, ELEC518, PROJ518

D. Practical Skills	
1. Plan and execute safely a series of experiments.	ELEC512, PROJ518
2. Use laboratory and workshop equipment to generate data.	ELEC512, PROJ518
3. Analyse experimental results and determine their strength and validity.	ELEC512, ELEC517
4. Prepare technical reports.	ELEC517, ELEC518, PROJ518
5. Research literature effectively.	ELEC518, AINT515Z, PROJ518
6. Create algorithms	AINT515Z, ELEC517, SOFT564Z
7. Use computational/ simulation tools and packages.	AINT515Z, ELEC517, SOFT564Z

13.2. Assessment against Modules Mapping

Semester	Module	Subject	Credit	E1 (%)	C1 (%)	T1 (%)	P1 (%)
1	ELEC512	Nanotechnology & Nanoelectronics	20	70	30		
1	ELEC518	Digital & Wireless Communications	20	70	30		
1	SOFT564Z	Software Engineering for Distributed and Interactive Systems	20	30	70		
2	ROCO506Z	Science and Technology of Autonomous Vehicles	20	50	50		
2	AINT515Z	Artificial Vision and Deep Learning	20	50	50		
2	ELEC517	Integrated Power Systems	20	50	50		
AY	PROJ518	MSc Dissertation and Research Skills	60		100		

13.3. Skills against Modules Mapping
(see 13.1)

13.4. Appendices
None