University of Plymouth

Faculty of Science and Engineering

School of Engineering, Computing and Mathematics

Programme Specification

MSc Electrical and Electronic Engineering

September intake: 4676
January intake: 7420

Approved from:
September 2022

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 one-year programme (Table 1 – September start, Table 2 – January start) consists of 180 credits of study at Level 7 and will require students to study over two semesters and the summer.

September start

<table>
<tr><th>Timings</th><th colspan="3">Modules</th></tr>
<tr><td rowspan="2">September -> January

15 weeks</td><td>ELEC512
Nanotechnology & Nanoelectronics

13 Weeks
20 credits</td><td>ELEC518
Digital & Wireless Communications

13 Weeks
20 credits</td><td>SOFT564Z
Software Engineering for Distributed and Interactive Systems

13 Weeks
20 credits</td><td rowspan="4">PROJ518
MSc Dissertation and Research Skills

All Year
60 credits</td></tr>
<tr><td colspan="3">Guided Independent Study / Exams / Assessment
2 Weeks</td></tr>
<tr><td rowspan="2">January -> June

15 weeks</td><td>AINT515Z
Artificial Vision and Deep Learning

13 Weeks
20 credits</td><td>ELEC517
Integrated Power Systems

13 Weeks
20 credits</td><td>Option Module

13 Weeks
20 credits</td></tr>
<tr><td colspan="3">Guided Independent Study / Exams / Assessment
2 Weeks</td></tr>
<tr><td>June -> September</td><td colspan="3">Work on dissertation until hand in date through the summer
Submit September</td></tr>
</table>

Table 1: Programme Structure MSc Electrical and Electronic Engineering – September start

January start

<table>
<tr><th>Timings</th><th colspan="3">Modules</th></tr>
<tr><td rowspan="2">January -> June

15 weeks</td><td>AINT515Z
Artificial Vision and Deep Learning

13 Weeks
20 credits</td><td>ELEC517
Integrated Power Systems

13 Weeks
20 credits</td><td>Option Module

13 Weeks
20 credits</td><td rowspan="4">PROJ519
MSc Dissertation and Research Skills

All Year
60 credits</td></tr>
<tr><td colspan="2">Guided Independent Study / Exams / Assessment
2 Weeks</td><td></td></tr>
<tr><td>Summer June -> September</td><td colspan="3">Work on dissertation : Submit January</td></tr>
<tr><td rowspan="2">September -> January

15 weeks</td><td>ELEC512
Nanotechnology & Nanoelectronics

13 Weeks
20 credits</td><td>ELEC518
Digital & Wireless Communications

13 Weeks
20 credits</td><td>SOFT564Z
Software Engineering for Distributed and Interactive Systems

13 Weeks
20 credits</td></tr>
<tr><td colspan="2">Guided Independent Study / Exams / Assessment
2 Weeks</td><td></td></tr>
</table>

Table 2: Programme Structure MSc Electrical and Electronic Engineering – January start

Full-time students are normally expected to complete the programme in 12 months and part-time students within 24 months. Part-time study is allowed provided a minimum of 60 credits is studied in any one academic year and that the dissertation project is completed in a single academic year.

The core of the taught programme will be 120-credit modules. During the January to June semester a choice of 1 option module should be taken from the options given in Table 3.

Code	Option Modules	Credits
ROCO506Z	Science and Technology of Autonomous Vehicles	20
MAR536	Mechanics of ORE Structures	20

Table 3: Option Modules – MSc Electrical and Electronic Engineering

The dissertation project will develop research skills and demonstrate mastery of the Electrical and Electronic Engineering subject; the topic of the project will be an individual choice in consultation with the programme team (or supervisor).

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 Electrical and Electronic Engineering programme generally follows the University's Regulatory Framework for Taught Postgraduate Awards.

Post Graduate Certificate (PgCert)	Requires the successful completion of modules worth 60 credits at level 7
Post Graduate Diploma (PgDip)	Requires the successful completion of modules worth 120 credits at level 7.

Master of Science degree (MSc)	A Master's degree will be awarded to a student who has successfully completed the appropriate modules worth a minimum of 180 credits.
Master of Science degree with Merit (MSc with Merit)	A student will be awarded a Master's degree with Merit provided that s/he has achieved a credit-weighted average mark of 60% or above across all modules (including the dissertation/major project), and provided that the mark for the dissertation/major project is not less than 50%.
Master of Science degree with Distinction (MSc with Distinction)	A student will be awarded a Master's degree with Distinction provided that s/he has achieved a credit-weighted average mark of 70% or above across all modules (including the dissertation/major project), and provided that the mark for the dissertation/major project module is not less than 60%.

Table 4: Criteria for Final and Intermediate Postgraduate Awards

Table 4 shows the requirements for progression to final and intermediate awards, including the award of the MSc degree with merit or distinction.

Successful completion of a module:

- The pass mark for a module at Level 7 is 50%.
- 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.

The maximum period of registration allowed will be:

- Three years.
- Five years for part-time students.

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

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