MSc/PgDip
Robotics and Embedded Systems

www.salford.ac.uk

www.estia.fr
Robotic and onboard hardware and software, and real-time software technologies. This qualification also provides a suitable
environment for understanding the underlying principles of mobile systems, a practical knowledge of its
applications, and an ability to analyse and solve related real-world autonomous systems problems.

Embedded Systems

The MSc Robotics and Embedded Systems will give you a firm grounding in control engineering and intelligent systems
concepts, along with the ability to comprehend and fully specify integrated Embedded Systems embodying intelligence,
Robotics and onboard hardware and software, and real-time software technologies. This qualification also provides a suitable
background for research in advanced autonomous systems with reference to robotics.

Systems Engineering

This Postgraduate programme is for students who already have an Engineering, Computer Science or
Bio-engineering, and Mechanical background and wish to specialise in Systems engineering, Robotics
and Real-time systems. With a particular emphasis on Advanced Robotics, the learning will focus on systems that are designed to
operate with a degree of intelligence and autonomy.

After spending 4 weeks in Salford (GB), the students will stay in Biarritz (French bask seaside), taught by the Salford lecturers,
by Estia lecturers, and by Industrial experts.

Teaching and assessment

Teaching is by a series of lectures and workshops with many modules taught via extensive hands-on practical lab-based design and
implementation of lecture material. Practical experience includes the use of robotics platforms to produce a software system using the
MATLAB toolboxes or the C programming language or to produce a
finished hardware/software-based Embedded or Robotics System.

Facilities

There are dedicated labs and facilities for Robotics and Automation students, including: Industrial robots, humanoid robots (Nao),
embedded platform (ARM μC board, real time OS kernel) and various mobile Robots, stereovision cameras, industrial cameras, plus dedicated
computing facilities.

If you carry out your MSc Project with an aerospace or automotive company, as many of our students do, then you will also have access to their facilities.

Job Prospects

Graduates can expect to find employment in a range of industries. Robotics and Automation presents many career opportunities in
areas such as control systems design and integration, manufacturing automation, design, software engineering, mechanical and
mechatronic engineering, process control, engineering management and research. Our graduates have gone on to successful careers with
organisations such as Airbus, Thales, Dassault Systems, Dassault Aviation, RATP and Siemens, BAE Systems, Electro Impact.

Modules

This module provides a detailed understanding of the tools, techniques and platforms that are used for
programming of Embedded Systems. Further it gives in-depth insight into a family of currently
used microcontrollers. The module also aims at developing a comprehensive knowledge of Real
Time needs of the Embedded System, by understanding the framework of RTOS and using state of
the art microcontrollers to designing and programme a range of RTOS based applications.

Advanced Embedded Systems

The aim of this module is to explore different 32-bit microcontroller hardware architectures, to understand common core architecture
and provide a deep insight into programming, microcontroller development, and ARM7. In addition a practical understanding of device I/O types including UART and interfacing
using I2C, USB, CAN and high speed buses: ISA, PCI, PCI-X, PCI is fully addressed. The Module
also develops a comprehensive knowledge of Embedded Linux programming with ARM, RTLinux
APIs and Device Driver programming.

Embedded Systems

The MSc Project

You will work under the direction of an academic supervisor to carry out an advanced research or development project related to Robotics, Automation and/or Systems Engineering. As part of this project you will be expected to:
- Plan, manage and implement a project related to Robotics and/or Automation and Systems Engineering
- Utilise appropriate sources of information to carry out and produce a literature review
- Develop a framework for critical assessment and evaluation
- Organise and produce an MSc Dissertation.

It may be carried out everywhere in the world, specially in conjunction with scientific platforms or companies associated with the University of Salford or with Estia.

Artificial Intelligence

Explore the role of Artificial Intelligence in engineering applications. The module develops both
theoretical knowledge and practical experience of using Artificial Intelligence, including
Fuzzy Logic, Artificial Neural Networks, Evolutionary Computing and Swarm Intelligence in a broad range of
Engineering applications. You will gain experience at applying AI techniques to a broad range of
industrial problems including diagnostics, control, robotics, scheduling, planning and optimisation.

Mobile Robotics

Autonomous intelligent systems are at the forefront of technology. This module will give you an
understanding of the underlying principles of mobile systems, a practical knowledge of its
applications, and an ability to analyse and solve related real-world autonomous systems problems.

With this knowledge you will be able to critically review and analyse current autonomous systems
by having the opportunity to programme and deploy a range of industrial standard mobile robotic/
software platforms.
The MSc Robotics and Embedded Systems is closely aligned with the research carried out in our Centre for Advanced Robotics Research. The Centre houses a multidisciplinary group lead by Prof. Samia NEFTI-MEZIANI with interests in Artificial Cognitive Systems and Robotics and their constituent technologies. The group has strong National and International links with both industry and other research institutes.

The Centre’s activities have their origin in 1987 when Salford University was chosen as the site of the United Kingdom’s National Advanced Robotics Research Centre. Since then Robotics has formed a major strategic direction within Engineering in the University of Salford where Researchers have been at the forefront of strategic national developments initiated by the Department of Trade and Industry (DTI), the Department for Environment, Food and Rural Affairs (DEFRA) and the Engineering and Physical Sciences Research Council (EPSRC) and international developments within the E.U.

ESTIA is a well known Academic French Institute in UK. They have been in Partnership with the University of Salford for nearly a decade. ESTIA has a very strong partnership with the industry (primes and SMEs). They has been chosen as a site to host the technical Centre « Compositadour » for Research, Knowledge transfer, and training in the area of Robotics, Composites products design and manufacturing. www.estia.fr

**Entry requirements:**

A minimum of a 2.2 honours degree in engineering or sciences and English proficiency. The French equivalent is: a Master-M1 (part1 validated) ; a Master degree (M2), a French or Spanish “titre d’ingenieur” / “titulo de ingeniero” are also suitable for this programme.

Estia has been in partnership with the University of Salford for seven years. If you are currently studying an engineering subject at Estia you will be able to complete this MSc as part of your final year of study. Please enquire for further information.

For information about the University of Salford visit [www.salford.ac.uk](http://www.salford.ac.uk)

about Estia visit [www.estia.fr](http://www.estia.fr) or [www.compositadour.estia.fr](http://www.compositadour.estia.fr)

See also : Msc/PgDip Robotics and automation

**Enquiries**

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