Electromagnetic Sensor Networks Masters/MSc

Postgraduate degree programme Electromagnetic Sensor Networks Masters/MSc:

Electromagnetic sensor networks is an emerging field that will be at the forefront of economic growth and research in the next decade, helping to create a safer world for all. To design electromagnetic sensors networks an advanced knowledge of how the electromagnetic properties of sensors can be described mathematically is required. In addition to the standard M.Sc. programme we offer a **with Industrial Studies option** that includes an industrial placement module.

Study here and find out why the University of Birmingham has been awarded The Times and The Sunday Times University of the Year 2013-14

Course fact file

Type of Course: Continuing professional development, taught

Study Options: Full time, part time

Duration: 12 months full-time (can also be studied part-time)

Start date: September/October

Related courses

Postgraduate degree courses - Electronic, Electrical and Computer Engineering

Electromagnetic Sensor Networks Masters/MSc with Industrial Studies

Contact

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School of Electronic, Electrical and Computer Engineering

Details

Electromagnetic sensor networks is an emerging field that will be at the forefront of economic growth and research in the next decade, helping to create a safer world for all. To design electromagnetic sensors networks an advanced knowledge of how the electromagnetic properties of sensors can be described mathematically is required.

Typically, sensor networks involve a number of sensors (acoustic, seismic, etc) maintained on communication and processing platforms (nodes). Sensor information can be generated through the analysis of distortion in communication channels between the nodes. These signals enable objects to be recognised, classified and even reconstructed as silhouettes.

A wide range of topics are available for study including communications engineering and sensor networks with options in electromagnetic, antennas, propagation, computer communications networks and RF and microwave engineering.

You will learn how to design and characterise sensors, how to model their behaviour mathematically and how to apply theoretical concepts to practical aims.

Current research on the fundamentals of networks, including dynamic and ad-hoc networks, forms an important part of this programme. Lecturers include staff from the Microwave Integrated Systems Lab in the School.

This programme will equip you with the knowledge and skills needed to play a leading part in future developments that are central to the security and surveillance industry and which will help protect us all as we go about our daily activities.

An **Electromagnetic Sensor Networks MSc with Industrial Studies** programme is also available.

Related links

- **Postgraduate degree courses - Electronic, Electrical and Computer Engineering**
- **Postgraduate degree courses FAQ**

Modules

The programme provides specialist study in a wide range of topics that are available for study full-time and part-time. Each degree programme provides a coherent stream of study, which can be tailored to individual needs by the selection of appropriate options.

Most of the individual modules are available as short courses for professional engineers who want a course on an unfamiliar topic or to refresh their knowledge.

The course structure is designed to promote a thorough understanding of appropriate material and to encourage independence by means of enquiry based learning. This is achieved through a series of assignments and a substantial project. Most of the modules are assessed by a combination of an examination and a substantial coursework element. Coursework assignments can be individual or group based.

Students take modules totalling 180 credits from the following lists:

Course outline

Compulsory modules	Semester
Introductory Module for Communications	1
Principles of Communication Systems	1
RF Sensors and Systems	2
Individual Project	3

Cross Programme Options (Take two of the following)	Semester
Computer and Communications Networks	2
RF and Microwave Engineering	2
Electromagnetics Antennas and Propagation	2

Fees and funding

Tuition fees

Tuition fees for 2014/2015 are as follows:

- £5,940 for **home/EU students**
- £17,355 for **international students**

Part-time programmes

Most part-time programmes run for two years and their fees are one half of the standard full-time programme fees. A small number of part-time programmes run for three years and in these cases the annual fees are one third of the total full-time cost. Contact us for further information.

UK student visa regulations mean that students classed as overseas for fees purposes may normally only register on a full-time basis.

Also see the fees for international students page.

Further funding information

Standard fees apply
Learn more about **fees and funding**

Scholarships and studentships
Scholarships may be available. International students can often gain funding through overseas research scholarships, Commonwealth scholarships or their home government.

For further information contact the School directly or email **sfo@contacts.bham.ac.uk**

Entry requirements

At least a lower second-class Honours degree in Computing, Electrical Engineering, Electronic Engineering from a university of high international standing.

Learn more about **entry requirements**

International students
We accept a range of qualifications from different countries – learn more about **international entry requirements**

Standard English language requirements apply

How to apply

When clicking on the Apply Now button you will be directed to an application specifically designed for the programme you wish to apply for where you will create an account with the University application system and submit your application and supporting documents online. Further information regarding how to apply online can be found on the **How to apply pages**

Apply now

Related links

Postgraduate degree courses - Electronic, Electrical and Computer Engineering

Postgraduate degree courses FAQ - Electronic, Electrical and Computer Engineering

Electronic, Electrical and Computer Engineering MSc and MRes brochure (PDF 3.7MB)

Learning and teaching

Patterns of study

The majority of students study our taught Masters programmes full time. Our programmes are also suitable for practising engineers who wish to study part-time or take a single module to earn Continuing Professional Development (CPD) points. Many modules are completed in three-day sessions allowing you to focus one topic at a time. Following each session of lectures there is an opportunity for you to deepen your understanding through private study and in most cases there is also an assessed assignment.

Overview module

There is a shared introduction to topics from communications engineering, requirements analysis and object-oriented design, and an introduction to and recap of C programming. For the communications engineering programmes there is an introduction to key issues in the design of antennas, radio frequency circuits and link budgets. For the computing programmes there is an introduction to object-oriented programming.

Core modules

These modules cover the advanced specialist topics required for your specific degree programme, such as statistical signal processing and coding and advanced digital design. These technologies are at the heart of many current developments in modern electronic systems.

Cross-programme option modules

These options specialize in topics relevant to each degree programme and give you the opportunity to adapt the programme that you have chosen to study. The prior knowledge needed for each module is specified in the student handbook to help you make the most appropriate choice. This allows you the greatest possible freedom to customise your study package appropriately.

Individual project

This is an opportunity for you to develop specialist knowledge. Some projects are undertaken in collaboration with companies and, in some cases, you may work on company premises investigating issues of direct concern to future product development. Typical projects include the development of hardware for automotive radar signal processing and the detection of leaks in landfill sites, wireless access systems, 3G mobile radio for light aircraft, the creation of 3D worlds for surgery simulation and wearable computing.

Assessment and awards

Assessment is by a combination of written examination and course work. There is a strong emphasis on course work to deepen understanding. The pass mark is 50%. A merit is awarded to students with an average of 60% or more and a distinction is awarded to students with an average of 70% or more, in both taught and project modules. There are prizes for students who perform especially well overall and for those who complete exceptionally good individual projects.

Employability

University Careers Network

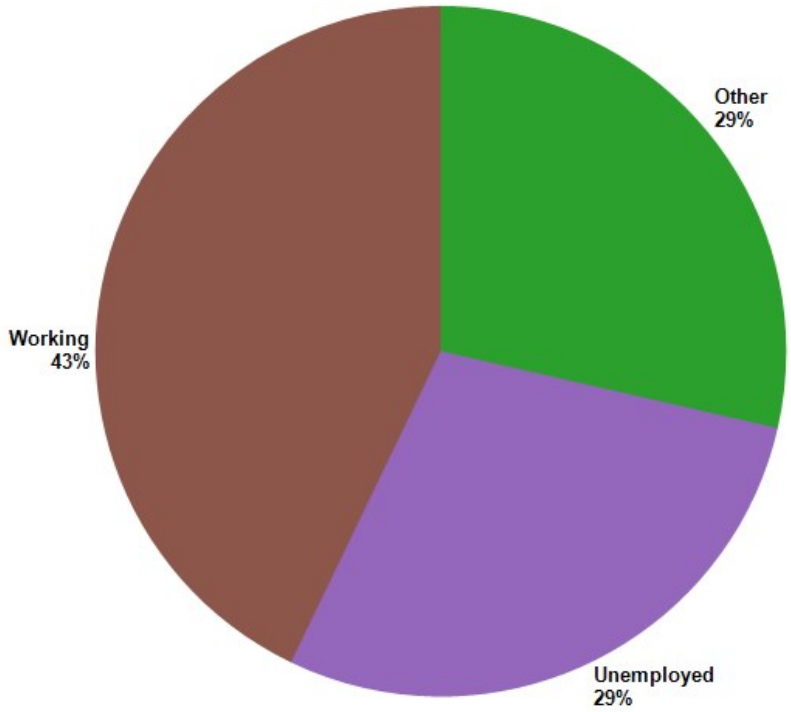
Preparation for your career should be one of the first things you think about as you start university. Whether you have a clear idea of where your future aspirations lie or want to consider the broad range of opportunities available once you have a Birmingham degree, our Careers Network can help you achieve your goal.

Our unique careers guidance service is tailored to your academic subject area, offering a specialised team (in each of the five academic colleges) who can give you expert advice. Our team source exclusive work experience opportunities to help you stand out amongst the competition, with mentoring, global internships and placements available to you. Once you have a career in your sights, one-to-one support with CVs and job applications will help give you the edge.

If you make the most of the **wide range of services** you will be able to develop your career from the moment you arrive.

Destinations of Leavers from Higher Education (DLHE) 2011/12 (postgraduate taught graduates)

The DLHE survey is conducted 6 months after graduation.



Examples of employers

Aero Engine Controls

Jaguar Land Rover

Ministry of Defence

Price Waterhouse Coopers

Ernst and Young

Arup

Glaxo SmithKline

NHS

Talk Talk

Autologic

Examples of occupations

Electronic Engineer

Applications Engineer

Communications (Electronic) Engineer - Officer

Optimisation Consultant

Manufacturing Engineer

Junior Business Analyst

Test Engineer

Service Specialist

IT Analyst

Development Engineer

Further study - examples of courses

- MSc Project Management
- MSc Radio Frequency and Microwave Engineering
- MSc Electronic and Computer Engineering
- MSc Physics and Technology
- Postgraduate Certificate in Education - teaching
- AAT accountancy

Visit the **Careers section of the University website** for further information.

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