Engineering Career & Capability Development Framework
Practical learning for the real world

- A framework which can be tailored to the needs of the student, employer and accreditation bodies.
- A blend of work based, distance and taught learning.
- Providing professional development for students and enhanced capability for employers as required, when required.
- Supporting customer supplier development promoting integration and trust
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Introduction

Professional Degrees for the real world
Science and technology evolve at remarkable speed, and today’s technical professionals need to stay well ahead of the curve. Perhaps you need to gain expertise in an emerging field like machine vision. Maybe you need to build a foundation to take on new challenges in engineering management. Possibly your company needs to evaluate current energy alternatives or to adopt Lean practices to optimize your manufacturing efficiency. How do you plan to meet these needs? By enrolling in a flexible professional degree delivered in a format to fit your need and those of your employer.

These Advanced Study Programmes provide the framework that allows participants to access the best knowledge of our time, with the flexibility to create custom curricula from a spectrum of disciplines or within one core area, to meet individual or company objectives. As an Advanced Study Program student, you would be able to choose from management and technical post graduate modules across UWE as you study in the workplace, at home or on campus full time or part time, for a semester, a year, or longer. You have the ability to tailor your program to fit your personal schedule and goals.

Global Collaboration
You will connect with a group of people committed to advancing new knowledge, ensuring technological and operational excellence, and leading change in the world. You will be exposed to emerging technologies, theories, and practices that address societal and industry issues and needs. As a result, you will deepen your level of understanding and markedly broaden your perspective.

The Learning Framework
The Engineering Career and Capability Framework has been developed to offer industry flexible delivery modes to enhance skills and knowledge, and the ability to implement these in the work place.

This framework moves away from the traditional academic taught delivery model. Students and their employers have the opportunity to define their own learning path within their own business context and environment.

By developing this framework in conjunction with industry and the professional governing bodies we can be sure it enables both businesses and students to achieve professional recognition to support their development and long term goals.

The framework concentrates on graduate level learning and development through provision of post graduate activities and awards.
These Post Graduate awards are designed to send you on the road towards senior management. and will put you in a position to make a major impact on your organisation’s success. They will give you the skills you need to improve business and service performance, lead change, boost profitability and deliver long-term success through innovation.

We equip our students with the tools, skills, knowledge and confidence to ask the right questions. You will be trained to think more strategically about issues, reflecting on leading edge research and applying these ideas to real global business problems. At the same time you will develop your judgement and decisiveness, learning to make timely, as well as informed decisions.
Work Based, Part-time or Full-Time?

These awards can be undertaken as work based, part time or full time or a mix of all three. The courses are delivered through a number of methods including taught, distance learning and work based learning allowing students to elect to minimize time away from the workplace making the course more accessible to those outside the southwest area.

Examples
A part-time MSc within the framework, which can typically be completed in two to three years, designed for busy, experienced engineers or managers who wish to continue working whilst studying.

A work based learning MSc offers the opportunity to base learning around current business projects

A full-time MSc, which is a one year course, is ideal if you’re looking to build on your business management skills and develop the expertise to take you into a more senior management roles. On this challenging and intensive course you will be learning with a diverse range of students from across the world.
A Flexible Learning Framework leading to recognised professional status

Flexible work-based Masters degree programmes provide a new opportunity to learn while earning, making IEng or CEng status achievable for all practising engineers.

These individually programmes tailored to individual requirements integrate learning in the workplace with supervised work-based professional development.

Experience has shown that work related projects under focussed academic supervision have a very high completion rate, with major benefits to both employees and employers.

**Employer Benefits**
- A flexible and cost effective way of meeting company and employee aspirations, without losing engineers from the workplace
- A structured learning programme tailored to the needs of the employer.
- Results in an increased number of in-company professional qualified engineers
- Relationship with a university and the potential for knowledge exchange and collaboration
- Well qualified professional engineers provide a significant commercial advantage. Increasingly, tendering or post tender contract compliance requires key members of the project to be professional qualified.

**Employee Benefits**
- A workplace pathway to achieving academic qualifications, leading to Incorporated or Chartered status.
- Learning and the development of professional competence linked to workplace activities
- ‘Learning whilst earning; means no loss of income.
- Support and mentoring
- Better promotion prospects
- Increased job satisfaction

**Benefits of IEng or CEng**
- Internationally recognised qualifications
- Enhanced professional status and recognition
- Improved career prospects
- Greater influence within their organisation and industry
- The use of the post-nominals IEng or CEng
How the programme works

Engineers enrolling on the programme agree a ‘learning contract’ with an academic supervisor and their employer. This sets out an individual programme of learning, as well as development of professional competence. Based around the engineer’s work, it therefore meets the needs of the employer as well.

Industrial Support and Mentoring

Where learning and assessment is to be based around activities in the workplace it is expected that the employer will appoint a mentor to supervise and support the student in the workplace. The mentor will also witness the students work and as such will be involved in the assessment process.

Industrial Project

A significant part of the MSc is the completion of an industrial based project (nominally 600 hours of work). The project will integrate the taught material and develop your ability to engage in an in-depth study of a substantial technical or management problem, relevant to you organisation.

The industrial project is a particularly attractive feature for employers as it provides the opportunity to deal with a real issue or problem in a very cost effective way. The project will have both an industrial and an academic supervisor appointed. On completion of the project, you will be required to attend a viva voice examination which will allow you to share your research within your company.

Prepared for Professional Review

Successful completion of the programme results in the award of a Masters degree, while the structured programme means that each individual is well supported in preparation for the professional review for IEng or CEng qualification. The learning contract can be tailored to incorporate the requirements of UK Standard for Professional Engineering Competence (UK-SPEC) and and additional requirements of the elected institute or accrediting body and/or employer can also be incorporated.
MSc Framework

Bespoke Training Pack

The MSc framework is able to provide a bespoke training package to provide training to meet specific needs of both the student and employer organisations. This can be anything from short courses to accredited awards. The training is both tailor made and flexible with the opportunity for both in-house and distance learning delivery, depending on specific needs.

In house training is often a a more cost effective option for organisations wanting to put a group of employees on the same module.

Current examples of this include delivery of Avionic Systems and Aircraft Systems Technology training to both BAE Systems and Airbus UK. We run successful academically accredited programme for Rolls-Royce graduate trainees, with over 60 students enrolled.

Each module can be taken as a stand-alone short course or as part of a qualification’.

The advantage to the company is that on site training is usually more cost effective than sending employees away for training.

Networking Opportunities

The various MSc awards in the framework are built from a selection of modules shared across the framework giving students the opportunity to network with a mix of students across international boundaries and industry sectors.

Professional Accreditation

The MSc in Aerospace is accredited by the Aeronautical Society and the Institute of Mechanical Engineers. We are currently working with the Engineering Council, I Mech E, IET and other accreditation bodies to gain approval for the Professional Engineering MSc and the Engineering Management MSc. Successful completion of an MSc will contribute to the academic requirements for a Chartered Engineer.

These courses will develop your professional capabilities as an engineer or manager within the context of your organisation. They also seek to enhance your business and technical awareness, helping prepare you for key functions within industry.
A student friendly structure

Paul Morrell
MSc Student, Airbus UK
I chose the MSc Aerospace Programme because the part time and modular nature of the course means I am able to tailor my studies to both my personal and company needs. The time required to complete the modules is also, for the most part, able to be squeezed into my other commitments.

The course has been beneficial to my career in that it has developed a better understanding of the business, my role within it and how I interact with other colleagues. I now feel more capable of supporting the business as it evolves within the market place. I have a better understanding of the way the company functions and its long-term goals. I feel I am more able to support these goal, by tailoring my personal objectives with the targets of the company.

The mix of taught activities and project work is usually very good, with the taught activities being suitably planned and delivered to provide the tools to then complete the project work.

Award Structure

There are 3 post graduate qualifications available
- Post Graduate Certificate (60 masters level credits)
- Post Graduate Diploma (120 masters level credits)
- MSc (120 masters level guided credits, 60 Final Project credits)

Each award has both key (core) modules and optional modules see page x.

Each module can be a stand alone short course with assessment attached if required

Fees
Current fees for awards and short courses are available from the University website www...
# Modules *(What can I study?)*

C = Core Module, O = Optional Module, M = Mandatory Module

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<tr>
<th>Module</th>
<th>Professional Engineering</th>
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<th>Engineering Operations &amp; Improvement</th>
<th>Aerospace</th>
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<tr>
<td>Advanced Manufacturing</td>
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<td>Aerospace Design Process</td>
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<td>Airworthiness</td>
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<tr>
<td>Business Context &amp; Environment (Aerospace)</td>
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<tr>
<td>Engineering Project Management</td>
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<td>C</td>
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<td>Introduction to Aerospace Vehicle Design</td>
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<td>Lean Engineering</td>
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<td>C</td>
<td>O</td>
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<tr>
<td>Professional Development Appraisal &amp; Review</td>
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<td>Project Management B (Research Methods)</td>
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<td>Technical Business Operations</td>
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<td>MSc Project</td>
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Many other optional modules are available for all four awards, examples are listed below:

- Design Project
- Aerospace Risk Management
- Aircraft Systems Technology
- Avionic Systems
- Business Ethics & Critical Management
- Creativity & Innovation
- Decision Making for Manufacturing
- Excellence Through Project Management
- Financial Management & Control
- Foundations of Systems Engineering
- Holistic Gas Turbine Design
- Leading Change
- Operations & Logistics Management
- Reliability & Maintainability
- Requirements Engineering
- Simulation
- Sustainable Aviation
- Systems Engineering for Design
- Work-based Learning (for bespoke areas)
**Innovative and dynamic ways to learn**

These awards are reviewed on an annual basis internally, and externally through the Industrial Advisory Board to ensure that they are up-to-date, meet industry demands and have real world application. They are taught by experts in their fields, from diverse cultural and business backgrounds which enhances the overall learning experience by bringing international relevance to your studies.

You will also learn through group work and individual presentations, student led seminar groups, case studies, experiential work based learning and business simulations. These innovative methods create an environment that is enjoyable, varied and hugely reflective.

Assessment is a mix of examinations, class work, case study analysis work based projects and associated written reports. An award in this framework will present a challenge and will require a lot of commitment and dedication on your part. The more effort you put into it the more you will get out of it, whether you are relating this to your current job or a career you are working towards.

**First class facilities**

As a student in the Faculty of Environment and Technology, if required, you’ll have access to dedicated Post Graduate facilities with wireless access, PC Laboratories, specialised technical equipment from across the engineering spectrum, including Rapid Prototyping capability, Materials and Machine tool facilities. Study space for individual and group work including meeting rooms is also provided.

The Faculty of Environment and Technology is located on the main University campus at Frenchay five miles north of the city centre. The campus is large and includes accommodation and leisure facilities. The University has one of the largest university libraries in the UK, with 24 hour access and is particularly well equipped to serve the needs of students.

Most importantly of all you will be in a truly supportive environment. Whether on-site face to face or remotely through our extensive virtual learning environment we will help you achieve your goals. We get to know you and give you the support you need to ensure that your study is an invaluable investment for your career.
About Bristol

The city of ideas

A European Centre of Culture, the city of Bristol has a long tradition of discovery innovation and creativity from Brunel to Concorde and the Airbus A380 to the BBC and Aardman Animations. The Bristol area is recognised as having one of the most thriving and creative business environments in the UK.

- The region is a hotbed of creative industries, Aardman Animations, creations of the Oscar winning Wallace and Gromit Films are based in Bristol as is the BBC Natural History Unit which is the pinnical of wildlife programming.

- The region leads the way in cutting-edge aero-engine technology and is home to Rolls-Royce and British Aerospace’s centre for design and manufacture of the Airbus.

- Bristol is a central hub to major areas of industry and is regarded as the most productive and competitive economy in the UK outside of London (UK Competitive Index 2010).

- It has an overall high economic performance with Cities Outlook 2011 having reported Bristol as the only major city in the UK to have an employment rate above the Great Britain average.

- It is classified as a Fair Trade city and is the UK’s first Cycling City which was the only UK city nominated for the European Green Capital Award 2010/11.

The place to live, learn and develop

Top 10 World City to Visit - DK Eye witness Travel Guide 2009

Bristol is a creative, multi-cultural, thriving city surrounded by the beautiful countryside of the South West region. This unique area offers something for everyone, 365 days a year. It’s both lively and laid back. cutting-edge and historic. A place where you’ll never be short of new places, people and interests to discover.

A prime location

Two major railway stations, an international airport and prime location at the junction of the M4 and M5 motorways also to make Bristol a particular accessible city.
Entry requirements
Normally you should be a graduate with an honours degree relevant to the selected MSc from the framework (minimum 2.2 or equivalent) from a UK institution or a degree of a comparable standard from an institution outside the UK.

This framework provides the opportunity for candidates with non-standard academic backgrounds to participate in postgraduate learning to achieve professional recognition. We welcome applications from you if you fall into this category.

We are also very keen to consider experiential learning you may have.

Candidates may be interviewed individually or in conjunction with a representative of their employer.

English language requirements
If English is not your first language, you will be required to meet the UK Borders Agency and Universities minimum English Language requirements such as:

The International English Language Test (IELTS) 6.5 overall with a minimum of 5.5 in all components.

Further Information
For further information or an application form please contact:
CPDA Office
Faculty of Environment and Technology
University of the West of England
Frenchay Campus
Coldharbour Lane
Bristol BS16 1QY

Telephone 0117 32 83030
Email: cpda@uwe.ac.uk
Website:
www1.uwe.ac.uk/et/professional
Shortage of Engineers

Stephen Tetlow, Chief Executive of the Institution of Mechanical Engineers, said: “A shortage of engineers would affect every person in Britain, potentially damaging the country’s vitally important manufacturing sector, energy and transport systems, as well as the UK’s global competitiveness.” A recent report published by the institute states that ambitious infrastructure projects, a planned increase in UK manufacturing as a share of GDP and the implementation of low carbon energy plans all call for a flood of new engineers. The profession as a whole needs to create more flexible routes into engineering as an alternative to a traditional university degree, such as work-based learning.
Engineering
Career & Capability
Development Framework

For further information or an application form, please contact:
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Website: www1.uwe.ac.uk/et/professional