

APPROVAL SUPPORT DOCUMENT

**Faculty of Technology
School of Engineering**



MEng

in

Mechanical Engineering

September 2006

DATE OF FIRST INTAKE: September 2007

DATE OF FIRST AWARD: July 2009

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Programme Specification – **This includes the Programme Structure**

1.0 Introduction

In August 2003, the Department of Mechanical, Materials and Marine Engineering (DMMME) and the School of Civil and Structural Engineering (SCSE) combined to form the new School of Engineering (SoE) providing a considerable opportunity to build on their research and teaching strengths.

All staff are now located in the Reynolds Building and all teaching activities are now on the main campus.

This proposal is for a MEng in Mechanical Engineering which builds on the research strengths of the new School of Engineering and the wider Faculty of Technology. In the Research Assessment Exercise in 2001, Unit of Assessment 28: Civil Engineering, and Unit of Assessment 30: Mechanical, Aeronautical and Manufacturing Engineering both scored 4.

The former DMME did at one stage offer a MEng programme together with the former School of Civil and Structural Engineering and the School of Communication and Electrical Engineering. At the time student numbers were insufficient to justify continuing with the program, however the Civil Engineers continued with their MEng. As the School of Engineering now runs a MSc in Mechanical Engineering, for efficient delivery the proposal has a number of modules common with the MEng Civil Engineering and the MSc Mechanical Engineering.

This proposal is aimed primarily at students interested in Mechanical Engineering and possibly already on years 1 or 2 of our BEng(Hons) Mechanical Engineering course. However students on either of the other two associated BEng(Hons) courses, Mechanical Engineering with Composites and Marine Technology, can progress to this MEng at the end of year 2 of their BEng(Hons) courses, provided they meet the appropriate criteria.

2.0 Rationale

This proposal is in line with the University of Plymouth strategic objective to increase student numbers and offer a fully accredited route in Mechanical Engineering through to 'M' and Masters level. Offering this MEng degree is also expected to enhance the appeal and image of the School of Engineering by bringing it into line with other universities offering MEng programmes. It is expected that this will increase undergraduate recruitment as students realise they can proceed to MEng level at Plymouth rather than have to transfer to, or attend from the outset, another university.

The School strategy is to raise the level of courses offered and the development of this MEng is a part of this strategy.

The School of Engineering has particular strengths at undergraduate level in materials, design and control engineering along with industrial and project management, and this programme will draw on these strengths.

The three Royal Academy of Engineering Visiting Professors in Design, who do significant work within the School, will support Design at both first year and at final year levels. This is particularly important in Mechanical Engineering where Design is used to integrate the other areas of the course.

The programme will not only benefit from the School's research strengths but it will also be expected to support its research strategy and result in publishable papers and suitable candidates for PhD studentships.

The teaching will be underpinned by the School of Engineering's major industrial and research strengths, in Control, Composite Materials and Structural Integrity. It will also draw upon related expertise from other Schools to provide the additional inputs necessary for a holistic approach.

The programme has been designed to integrate with the existing undergraduate BEng(Hons) provision. The teaching, learning and assessment strategies reflect the integrated nature of the programme ensuring that students will experience a smooth transition from BEng(Hons) to MEng.

This programme builds upon the undergraduate studies and extends the scope of Mechanical Engineering to a level commensurate with IMechE accreditation requirements. These requirements typically extend the discipline into both technical and commercial spheres and fit students for both technical and management roles within industry.

The programme integrates the various modules through project and coursework, supporting a holistic view of Mechanical Engineering.

It is expected that the MEng qualification will significantly improve the career prospects of ambitious engineers. Increasingly major engineering employers are primarily recruiting people with MEng qualifications for posts leading to Chartered Engineering status. This programme has been developed for those who wish to

extend their skills beyond graduate level. It offers specialist technical ability together with project management and IT skills that go well beyond the basics. The programme may also be seen as a stepping stone for those considering studying for an engineering Ph.D.

Careers advice is embedded within the programme. Specialist staff will teach the majority of the modules and through interaction with the staff students will be made aware of the different career opportunities of the postgraduate qualification.

Although the MEng Mechanical Engineering will be a distinct programme of study, it will share a significant proportion of its taught content with the MSc Mechanical Engineering and the MEng Civil Engineering. This will enable a degree of optimisation in the delivery, whilst still enabling a distinctive programme to be offered. The mode of attendance will be full-time.

The programme has been designed to conform to Institution of Mechanical Engineers (based on that of the QAA) definition of a MEng Degree and to address its output criteria statements for a 'M' level programme. As such it should be acceptable as the "Further Learning" defined by the Engineering Council's "UK Spec" and as required by B.Eng. graduates seeking Chartered Engineer status. Retrospective accreditation will be sought on qualification of the first cohort.

3.0 Market Research

A November 2004 survey of 70 final year undergraduate BEng and BSc students on the SoE programmes with a significant Mechanical Engineering content revealed that 12 of the respondents "Would be interested in a Masters programme of study in the future" and 9 of those "Would be interested in a Mechanical Engineering Masters degree course". All but one of the 12 preferred the full time route and there was a 50/50 split over the importance of accreditation.

There is a growing demand for post graduate provision (in all its various forms) in Mechanical Engineering with total numbers enrolled increasing by 23% between 2001/2 and 2002/3 while the increase in undergraduate numbers was only 1.8%. Plymouth needs to be in a position to exploit the increasing demand for higher qualifications.

Repeated verbal advice from the Faculty Sub Dean Marketing, Recruitment and Admissions is that the Mechanical Engineering area needs this course to make it more attractive to higher quality applicants. This is a significant factor in the introduction of this course.

4.0 Aims and Programme Outcomes

Programme aims

The School of Engineering shares the values of the University and supports its mission through the provision of a range of courses relevant to the theory and practice of engineering aiming:

1. To be informative and challenging, and to establish a knowledge base suitable for a future career in engineering based industry.
2. To give students with a variety of entry qualifications an opportunity to realise their potential.
3. To enrich curriculum content and teaching quality through the professional and research expertise of staff and through industrial links.
4. To encourage and support students whilst they develop and apply technical and generic skills that will facilitate life-long learning and continuing professional development.
5. To produce graduates who can make a significant contribution to their professional field or business.

This programme specifically aims:

6. To produce graduates with an awareness of the current opportunities and limits of knowledge in Mechanical Engineering.
7. To produce graduates able to recognise and work within the technical and resource complexity of much of the engineering industry.
8. To produce graduates with technical ability beyond first principles and able to apply a range of advanced skills and techniques in the solution of engineering problems in Mechanical Engineering.
9. To equip graduates with a depth and breadth of knowledge and skills sufficient to enable them to work in their chosen specialist field within Mechanical Engineering.
10. To provide the opportunity to manage and execute a significant independent project in the field of Mechanical Engineering.

Outcomes are in accordance with QAA/FHEQ requirements for a 'M' level programme and are designed to address Knowledge and Understanding, Cognitive/Intellectual Skills, Key/Transferable Skills, Employment Related Skills and Practical Skills. See the Programme Specification for further details.

5.0 Research and Scholarship

The School of Engineering has both active areas of research and industrially relevant Technology Transfer activity including consultancy.

In the Research Assessment Exercise (RAE) 2001, research activities within the School of Engineering disciplines were submitted to

- Unit of Assessment 28: Civil Engineering, and
- Unit of Assessment 30: Mechanical, Aeronautical and Manufacturing Engineering

and both were awarded a rating of 4 (defined as 'quality that equates to attainable levels of national excellence in virtually all of the research activity submitted, showing some evidence of international excellence').

All staff of the School contributing to this programme are involved in research in some way. This research activity means that staff remain aware of current developments in their respective specialised areas which informs both postgraduate and undergraduate teaching within the School.

The following SoE areas of research contribute to this MEng:
Advanced Composites Manufacturing Centre (ACMC)
Structural Integrity
Mechanical Engineering and Manufacturing
Engineering Management
Marine and Industrial Dynamic Analysis (MIDAS)

Research from other Schools that contribute to this MEng includes:
Robotics and Intelligent Systems

See Appendix for more detail

Staff are also involved in technology transfer through Knowledge Transfer Partnerships (formerly known as TCS).

6.0 Resources/Teaching Facilities

The University is currently seeing a significant investment in facilities across its Plymouth campus including a major library extension, the Portland Square development and a £2.3 million refurbishment of the Smeaton Building which provides dedicated space for Masters provision and upgraded laboratories.

It is expected that a dedicated room (Smeaton 216) will be used as a base room for this new course. Laboratory/workshop facilities are available in the Brunel and Smeaton Buildings, together with experienced technical support staff.

A more detailed listing of resources used on this programme includes the following;

Project Management software, Microsoft project. Computer Aided Engineering (CAE) software including Matlab – Simulink and other associated toolboxes. The FAS (Flexible Automation System) design and off-line programming package for robot modelling.

An industry standard clean room, equipped with state-of-the-art thin-film deposition, micro-fabrication and magnetic measurement facilities.

A Structural Integrity Laboratory equipped with a range of Instron machines for tension/compression, torsion, fatigue and creep testing and a recently purchased confocal laser scanning microscope.

Resources in the Composite Materials Laboratory include an Aeroform autoclave, a RTM injection machine and a range of specialist tooling, ovens and data logging equipment.

Workshops in Smeaton and Brunel buildings provide a range of hand and machine tools including a CNC lathe and milling machines linked to the CAE suite.

Mechanical Engineering students will also have access to the Electron Microscope Centre. This is a modern, well equipped imaging and analysis laboratory which houses three Scanning Electron Microscopes (SEM) and a Transmission Electron Microscope (TEM). Recent research grant funding has seen the provision of upgrades in digital imaging and image analysis, X-ray microanalysis for materials characterisation and in cryo-preparation facilities. The centre has extensive industrial and research contacts and is a potential source of projects.

The CAE design facilities have been enhanced by the recent purchase of a rapid prototyping machine.

6.1 Computing

The University has a wide range of IT services and facilities which are based both centrally and within faculties. At the heart of the provision is the South-West of England regional network which links to the national academic network SuperJANET. It provides fast communication for IT services and video-conferencing.

Computing facilities for students at the Plymouth campus are provided in laboratories and teaching rooms as well as centrally in open access areas. There is a modern fleet of networked computers across the University with access to industry-standard software packages running on Windows XP and, through the student portal, to the internet, email, on-line databases and journals and learning materials. Many of the services are web-based enabling access from a PC at home or in halls of residence this includes the library catalogue system (Voyager), Web of Science (WoS) and specialist technical journals. Wireless laptops can also be used in designated areas.

As well as the 100+ PCs in Babbage, over 50 PCs are provided in an open access area in the Library building during library opening hours (soon to be expanded to

24 hour access). Other facilities are there to help with the preparation and presentation of work and computing/media staff at the student enquiry desks in the Babbage building and Library are on hand to advise and help.

Computer Aided Engineering software is available on 190 computers.

In addition to the numerous manuals, workbooks and information sheets available in hard copy and on the University web site, general and specialist advice can be obtained from the Computing Advisory Service in the Babbage open access area (including via email).

6.2 Library and Media Services

The recently extended library on the Plymouth Campus has a collection of 276,000 books (495,000 total holdings for all University of Plymouth campus libraries) and 1860 (3150 in total) journal titles. The Technology section comprises approximately 66,000 books and AV items and 550 current journal subscriptions. Using the latest technologies, including the internet, access is provided to numerous other university, national and international sources.

Dedicated subject support is provided by the library and computing staff within the Information and Learning Services Technology Faculty Team. Librarians and academic staff work closely together to ensure that services and stock meet the needs of teaching, learning and research within the School of Engineering. As part of this process, the Technology team sends representatives to Faculty Board and Programme Committees. The team also offers user education sessions to enable students to make efficient use of the library by learning how to exploit all sources of information, including electronic resources.

The library's management system provides a single database of all the materials in the University's libraries and offers facilities for self-renewal of items on loan and self-reservations, plus access to the catalogues of other University libraries. Careers information and advice is also available in the library.

Media Services provide open access workshops and expert technical support to assist students in exploiting a wide variety of media facilities. These include photocopying, colour printing, desktop publishing, video editing, binding and an equipment loan service. The media shop sells a range of presentation materials and computer consumables.

A 24 hour open access computing facility will shortly become available on level 0 of the library.

6.3 Staff Resources

The School of Engineering has approximately 550 FTE (Full time Equivalent) undergraduate students, 33 research degree candidates and 38 MSc students. With 35 FTE academic staff, the student: staff ratio is approximately 17:1

7.0 Programme Management Structure

The Head of School has overall responsibility for ensuring that academic standards are maintained. He/she is advised and assisted by the Programme Manager and subject group leaders of the major disciplines.

Organisation and conduct of admissions procedures is the responsibility of the Admissions Tutor.

Academic leadership, organisation and conduct of the programme on a day to day basis are the responsibility of the Programme Manager.

The programme will be managed formally via a Course Committee that meets at least once per term. Student representatives will be elected during the first few weeks to sit on this Committee. Meetings will be formally minuted, distributed to Committee Members and a copy kept by the School.

An informal but very useful process is via our Staff Student Liaison Group (SSLG) meetings. These happen at least once per term and all student representatives are invited. Through the SSLG, many problems can be resolved before the more formal Course Committee meeting.

Each student on the Programme has a member of the academic staff as a Personal Tutor.

The examination Panel and Progression and Award Board duties for the MEng will be added to those of the BEng Mechanical Engineering and Marine Technology courses.

8.0 Assessment Regulations

The current University of Plymouth Regulations apply.

9.0 Admissions Requirements

These are included in the Programme Specification.

Students on any of the three BEng(Hons) courses (Mechanical Engineering, Mechanical Engineering with Composites and Marine Technology) will be able to join and follow this MEng by following the module diet shown in the Programme Specification.

Admissions procedures and guidance will conform with the University's policies on students with disabilities.

10.0 Transitional Arrangements: None.

11.0 Changes to Existing Courses and Modules: None

12.0 Modes of Learning

Learning and teaching is in most modules a combination of lectures, with learning support material provided on the Student Portal or on public www pages, tutorial session and practical laboratory sessions.

Assessment is a combination of Examinations, unseen tests, course work and oral presentations as appropriate for each module.

Students, who are introduced to PDPs (Skills Plus) in the first year of the associated BEng courses, will have opportunities for developing and enhancing their portfolios at all stages of the BEng and while taking the MEng.

13.0 Tutorial Support

Groups of first year students are allocated to one or two members of staff who meet regularly with them and facilitate a series of activities around a theme relevant to the specific course the students are undertaking. This helps to build confidence and group cohesion and is expected to aid retention.

In years 2 and above there is a tutor covering the year group for each course group who acts both as a personal tutor and as a co-ordinator for the year.

In the third academic year the project supervisor is also the students tutor.

14.0 Careers Advice

The University provides a proactive careers service. Typically this involves staff from the careers service providing a series of talks for final year students.

All students are encouraged to take a years training placement after two years of academic study. The Faculty of Technology provides a placement support unit which provides talks promoting the importance of placements to students; assists students with obtaining placements and provides administrative support.

15.0 Methods of Assessment Strategy

Assessment is by an appropriate combination of examinations, course work, written reports and oral presentations.

The subjects studied within Mechanical Engineering are diverse and consequently a range of assessment methods are used. For some subjects studied with a significant analytical content, examinations are appropriate (although it should be noted that all engineering subjects have some laboratory / practical / case study investigation and these will usually be assessed by some sort of written report). For some subjects, such as Design, Computer Aided Engineering and the Project, examinations are not appropriate and assessment will be by (or mainly by) written report.

In some subjects students work in groups and for the final year Group Design, the group may contain up to 9 students (7 or 8 being the preferred normal size). Appropriate assessment procedures have been devised to ensure that students can receive individual marks. This is achieved by having regular formal meetings with the academic supervisor present, individual oral presentations, peer assessment and requiring every page of the group report to carry the name of the person responsible for it. Over a period of several years these procedures have met with the approval of external examiners.

Determination of class of degree

BEng (Hons):

The year 2 aggregate percentage is weighted 30% and the final year aggregate percentage is weighted 70% to give an overall aggregate %.

Assuming the students have the necessary number of credits (120 at each year level) the classification will be based initially on the overall aggregate % then: Those with an overall aggregate of 70% or more are awarded a 1st class Hons degree

Those with an overall aggregate of 60 - 69% are awarded a 2.1

Those with an overall aggregate of 50 - 59% are awarded a 2.2

Those with an overall aggregate of 40 - 49% are awarded a 3rd

If the aggregate % achieved by a candidate is not more than 3% below a classification band, the following alternative classification methods must be used.

Final year aggregate: a student will be awarded an Honours Degree with the higher classification if their aggregate % is not more than 3% below the next classification band providing their % at final year is in the higher classification band.

Module Profile: a student will be awarded an Honours Degree with the higher classification if they have an overall aggregate not more than 3% below the next classification band, provided that more than half of the students year 2 and final year credits are in the higher classification band. Each final year credit is double weighted (compared with a year 2 credit) for this purpose.

Students who have not successfully completed their individual project (undertaken in the third year of academic study) can not be awarded an honours degree.

MEng (Hons)

Students who have taken and passed the MEng currently do not receive a BEng but receive an MEng classified in a similar fashion to that described, above, for the BEng, except that the marks for the final two years of study are added together and weighted 70%.

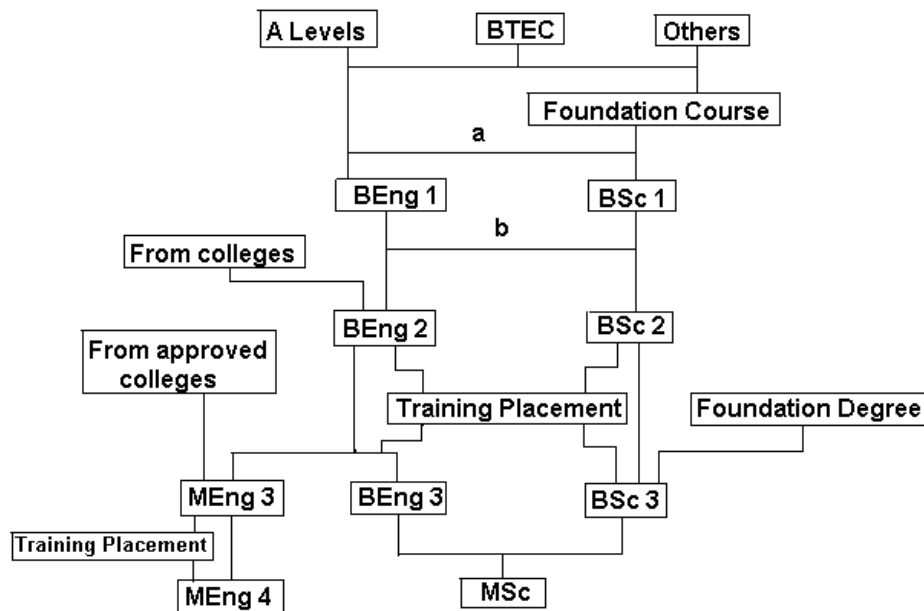
16.0 External 'Benchmarks'

This course is referenced against the QAA general engineering benchmarks, which are based on UK-SPEC. Detail is given in the intended learning outcomes near the end of the Programme Specification.

17.0 Referencing

Students are expected to use the 'Harvard' system of referencing.

David J Grieve, 1st March 2007.



a - Progression from Foundation Course depends upon marks achieved.

b - Very strong BSc students may move to BEng, weak BEng students may move to BSc

Programmes Scheme

Appendix

Research Activities

The following SoE areas of research contribute to this MEng:

ACMC (Advanced Composites Manufacturing Centre)

The Advanced Composites Manufacturing Centre (ACMC) is involved in research which seeks to explore the complex relationships between properties for performance and properties for manufacture. A specialist area is resin transfer moulding (RTM) and resin infusion under flexible tooling (RIFT), but the group also has research expertise in sandwich panel fabrication, materials characterisation and non-destructive testing (NDT)

Very strong links with industry exist and a Centre of Expertise has been established with support from the European Structural Fund.

Academic staff:

- Stephen Grove
- Miggy Singh
- John Summerscales

Recent research degrees:

- Jim Craen (MPhil, 2000), *Resin infusion under flexible tooling*
- Neil Pearce (PhD, 2001), *Property-process-fibre distribution relationships in fibre-reinforced composites*
- Iosif Progoulakis (MPhil, 2004), *Heated tooling for aerospace composite manufacture*

Structural Integrity

Structural integrity research covers a range of activities from numerical modelling of stresses, strains and crack growth phenomena, through residual stress measurements and experimental testing of welded joints, to failure analysis.

Academic staff:

- Neil James
- David Plane
- Colin Cristopher
- Marian Aron

Recent research degrees:

- Pat McGrath (PhD, 2001), *Investigation of residual stresses induced by forming processes on the fatigue resistance of automotive wheels*
- Gareth Bradley (PhD, November 2003), *Fatigue properties of metal inert gas and friction-stir welded joints in aluminium alloy 5383-H321*
- Craig Anthony Yeo (MPhil, 2004, subject to minor corrections), *Incorporation of parametric design into working practices of an SME*

Mechanical Engineering and Manufacture

Academic Staff:

- Jeff Barlow
- David Grieve
- Tom Paterson

Recent research degrees:

- Peter Dyson (PhD, 2000), *The modelling, testing and design of a surface piercing propeller drive*
- Robert Anthony Harrison (PhD, 2000), *An electromagnetic field model for design of radiofrequency reed relays*
- Alan Holman (PhD, 2001), *Fatigue of a spring steel with varying levels of non-metallic inclusions*

Engineering Management

While Engineering Management pervades all the research within the School of Engineering, it is also a research topic in its own right. Amongst the issues under consideration are:

- Leadership, trust, culture and change management
- Management Systems for Quality, Environment, Safety and Health (QuEnSH)
- Construction Efficiency, lean construction and prefabrication
- Legal issues in construction: adjudication and procurement methods
- Process modelling, information flow, supply chain management and WIP control
- Mistake-proofing (Poka Yoke)
- Sustainability (life cycle analysis, carbon balance, post-occupancy, waste management)

This research group acknowledges the underpinning of its research by the former Manufacturing and Business Systems (MABS) research group

Academic staff:

- Mike Miles
- Mike Riley
- Steve Donohoe
- Steve Goodhew
- Miggy Singh
- John Summerscales
- Sue Turpin-Brooks

Recent research degrees:

- John Bradford (PhD, 2000), *The systemic redesign of manufacturing systems in small to medium sized enterprises*
- Zahoor Ahmed Qurashi (PhD, 2000), *A generic approach, employing information systems, for introducing manufacturing information systems in SMEs*

- Joachim Gingele (PhD, 2001), *Modelling business processes with links to ISO 9001*
- Steve Hobbs (PhD, 2002), *A pre-transfer assessment framework for international technology transfer*
- W L Ijomah (PhD, 2002), *A model-based definition of the generic remanufacturing business process*
- Cita Lorraine Wood (PhD, 2002), *Linking performance requirements with process improvement actions for business process re-design*
- Craig Woodward (MPhil, 2002), *The application of Poka Yoke to administration functions within an organisation*
- Melanie Ashleigh (PhD, Southampton, 2002 - supervised by Mike Riley), *Trust in human supervisory control domains*
- David Brown (PhD, Southampton, 2003 - supervised by Mike Riley), *A methodology for selecting the construction team*
- Ibrahim Moustafa (PhD, Southampton, 2001 - supervised by Mike Riley), *A decision support system for the selection of the optimum contractor*

The theses supervised by Head of School in his previous institution are shown to indicate his interests.

MIDAS (Marine & Industrial Dynamic Analysis)

The Marine and Industrial Dynamic Analysis (MIDAS) research grouping comprises a multidisciplinary team, primarily from the School of Engineering, but also has links with other Schools within the University of Plymouth.

MIDAS has expertise in artificial intelligence (AI), advanced control systems engineering theory, multi-sensor data fusion, dynamics, industrial dynamics, thermodynamics and fluids, smart materials, marine power plant, marine vehicle performance prediction, propulsors, integrated navigation systems and marine renewable energy.

Of particular interest is the application of AI techniques to the navigation, guidance and control of autonomous vehicles, wave energy devices and marine propulsion systems.

Other areas of interest include system identification, modelling and control of industrial plant, and robotic systems.

Academic staff:

Robert Sutton
 Murray Bell
 Ming Dai
 Peter Dyson
 Sanjay Sharma

Recent research degrees:

- Gerald Peter Allington (MPhil, 2001), *Sailing rigs and their use on ocean-going merchant steamships 1820-1910*
- Fraser Johnson (MPhil, 2004, subject to minor corrections), *Multi-resonant converter wave energy device: proof of concept*
- Heather Kirby-Chambers (MPhil, 2001), *A thermodynamic and mechanical engineering investigation of a reciprocating Joule cycle engine*
- Matthew Knight (PhD, 2002), *Precision control of a sensorless brushless direct current motor system*
- Chris Leavey (MPhil, 2001), *Development of an intelligent decision support system for application to orthofunctional design*
- Yiu Kwong "Stephen" Li (PhD, 2002), *Port state control and its implications on ship safety*
- Anne McDermott (PhD, 2002), *Internet delivery mechanisms for the continuing professional development of the marine engineer*
- Andrew Pearson (PhD, 2002), *Intelligent fault-tolerant control schemes for autonomous underwater vehicles*
- Ralph Richter (PhD, 2000), *A predictive fuzzy-neural autopilot for the guidance of small motorised marine craft: a fuzzy-neural approach*
- Steve Roberts (PhD, 2002), *An investigation into the control of an upper-limb myoelectric prosthesis*
- Wei-Hui Wang (PhD, 2000), *Modelling machine induced noise and vibration in a ship structure*
- Antonio G M Zirilli (PhD, University of Wales - Newport, supervised by Bob Sutton), *Intelligent autopilots for ships*
- Dedy Loebis (PhD, 2004, subject to minor corrections), *An intelligent navigation system for an autonomous underwater vehicle*

Research from other Schools that contribute to this MEng includes:

Robotics and Intelligent Systems

The Centre for Robotics and Intelligent Systems houses a multidisciplinary group with interests in both static and mobile robotics and their constituent technologies. Biologically inspired control and behaviour is a common theme in much of the group's work. Applications include the development and study of miniature robot 'bugs' and myoelectric teleoperation. Dynamic vision sensing is another common theme in many projects. These include applications as diverse as the identification of marine plankton and autonomous robot navigation. Intelligent, multi-agent behaviour, as applied to Mirobot robot football, provides an interesting focus for group activities. The group has strong national and international links with both industry and research institutes. It is represented on the board of the British Automation and Robot Association, the IEE and EU funded projects.

Members:

- Paul Robinson
- Dr Phil Culverhouse
- Dr Mark Norman
- Dr Peter White
- Vincent Herry
- Lee Coombes
- Dr Guido Bugmann
- Professor Bob Stone
- Professor Geoff Skates
- Mr Simon Norman