Part IIA options offered in the Engineering Tripos

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Introduction

After Part IB of the Engineering Tripos students may, within the Faculty of Engineering, choose to study Part II of the Engineering Tripos or the Manufacturing Engineering Tripos. The opportunity also exists for a small number of CUED students reading for the Engineering Tripos to spend their third year at the National University of Singapore or Ecole Centrale Paris, returning to Cambridge for their fourth year.

Much of the administration of the third and fourth-year courses within the Department is based on an on-line web/database system called COMET (Cambridge Online Management of Engineering Teaching). **In the Easter term, between Friday 19th May 2017 and the end of Full Term, you must log on to COMET and make a provisional choice of your 3rd year course preference (Engineering IIA, MET IIA, or exchange). All students are required to make a provisional choice of Part IIA Engineering Area and modules – for MET and exchange students these are as a 'backup'.**

You will have the opportunity to update your modules during the long vacation, and again when you return in October. Module choices must be finalised by Wednesday 11th October 2017 for your Michaelmas modules, and Wednesday 24th January 2018 for your Lent modules. COMET will check that your selection is valid and will offer suggestions if it is not.

Timetable of talks

To be given to second year students by the different subject groups on choices for the third and fourth years. All talks are in LT0. The Meet the MET's lunch will be in LR4.

Thursday 9th February	12.00	**Options for Part II of the Engineering Tripos** **(Dr Claire Barlow,** Deputy Head of Department, Teaching)
	12.05	**Manufacturing Engineering and "Meet the METs" lunch**
	12.20	**Manufacturing Engineering (Dr Tim Minshall)**
	12.25	**Views of current MET students** **Lunch in LR4**

Tuesday 14th February	1.00 1.30	**Electrical Engineering** (**Prof Tim Wilkinson,** et al) A chance to meet the module leaders and graduate students in Electrical and Electronic Engineering, with a light lunch provided.
	2.00	**Civil, Structural and Environmental Engineering** (**Dr Stuart Haigh**)
	2.30	**Mechanical and Materials Engineering** (**Dr Hugh Shercliff**)
	3.00	**Fluid Mechanics, Thermodynamics and Energy** (**Prof Bill Dawes**)
Tuesday 21st February	2.00	**Information Engineering (Dr Fumiya Iida)**
	2.30	**Bioengineering (Dr Graham Treece)**
	3.00	**Engineering Management (Dr Matthew Jones)**

Engineering Tripos Part IIA

LECTURES AND EXAMINATION PAPERS

- Students choose **ten** modules from those on offer.
- **Five** modules are to be completed in each of the Michaelmas and Lent terms.
- Most third-year modules (preceded by numeral 3) have 16 lectures and 3 hours of small-group supervisions completed in one term (either Michaelmas or Lent). These are examined by an exam of 1.5 hour duration held early in the Easter term. However, some Group A courses are double modules that run throughout both the Michaelmas and Lent terms and are each examined by a 3 hour examination.
- Group S are Part IIB modules (thus preceded by numeral 4) available to Part IIA students.
  [Note 1: All modules shown here are provisional; confirmed list to be published in May.
  Note 2: There are no supervisions or separate coursework for fourth-year modules.]
- Group I modules are modules imported from departments outside CUED.
- No student may include more than two modules from the combination of Groups I and S in their total.

COURSES IN PART IIA

The list of modules on offer to IIA students (2016/17).

Limitations on the choice of modules: Engineering Areas

If you wish to qualify in an Engineering Area, at least **six** modules from your total of ten must fall within one of the Engineering Areas as defined by the Faculty Board of Engineering. A definitive list for 2017/18 will be available to you in the Easter term prior to you making your provisional selection on COMET. You may choose to qualify only in General Engineering, which means that you may choose any combination of modules (subject to restrictions on sets described below and Groups I and S described above). It would also be sensible to discuss with your Director of Studies before choosing a very eclectic mix of courses, in case a lack of overlap makes the workload unusually high.

In both the third year and the fourth year, the list of modules available will be subdivided into approximately twenty sets. Lectures and examinations for each set will be timetabled at the same time. Details of clashing sets for both years will be published in the Easter term. You are not permitted to take more than one module from any clashing set.

The titles of all the Engineering Areas for which you are qualified will appear on each of your third and fourth-year transcripts. It is likely – although not essential – that some of your Engineering Areas at Part IIB will be the same as that at Part IIA.

You must also complete a Part IIA **Extension Activity** as part of your coursework programme; there is no restriction on your choice of activity. More details of these, and of the other elements of Part IIA coursework, both practicals and projects, will be issued at the start of the Michaelmas term.

The Easter term of your third year starts with module examinations. For the remainder of the term, you will undertake two projects selected from a wide range of topics, including Foreign Language projects (currently Chinese, French, German, Spanish and Japanese). A list of those offered for the current year 2016/17 is available on the Third-Year Undergraduate Teaching Homepage. These **Third-Year Projects** do *not* have to be in your Engineering Area.

Advice on other modules in your third year

Group E Management and Manufacturing

Engineering management covers a range of topics relating to the main business processes of the engineering firm and to the economic, technological, social and industrial context within which it operates. The third-year courses provide an introduction to key areas of economics, operations and people management which can be taken without prerequisite as stand-alone modules or to complement those from other branches of engineering.

Number	Title of Module	Notes
3E1	Business Economics	
3E2	Marketing	
3E3	Modelling Risk	
3E5	Human Resource Management	
3E6	Orgainisational Behaviour and Change	
3E10	Operations Management	

Module 3M1 (Mathematical methods) covers linear algebra, optimisation and stochastic processes, topics that complement many module combinations in Part II, particularly for mechanical, design and information engineering.**GROUP M (Multidisciplinary)**

GROUPS I (Imported) and S (Shared with Part IIB)

Group I modules are offered from time to time by Departments other than Engineering.

Group S modules give you the flexibility of taking some 4th year topics of interest in your third year. Please note that some Shared modules are offered only in alternate years and thus may not be available to you in your fourth

year. **(Remember that there are no supervisions for 4th year modules.)**

RESTRICTIONS IN CHOICE OF OTHER MODULES

In Part IIA, no student may include more than two modules from the combination of Groups I and S in his/her total. Furthermore, the number of management modules is limited to a maximum of **two**. Management includes all 3Ex modules, and related Shared modules offered in some years by other subject groups (e.g. 4D16 Construction & Management).

Manufacturing Engineering Tripos (MET)

MET aims to prepare students to operate professionally as broadly-based leaders for business and technology, by giving them a thorough grounding in management and manufacturing technology, together with an understanding of the full range of activities from market analysis through product design and production, to sales and distribution.

MET is an integrated two year course. The number of places is limited to 40, and selection is based on interview and previous academic performance. There will be an **'Open Afternoon' in May** (date tbc) for you to find out more (details will be sent to you nearer the time), and there is a **"Meet the METs" lunch on Thursday 9th February 2017 in LR4, 1-2pm** following the MET Options talk which starts at 1pm.

In **MET IIA**, students take ten modules covering the following areas:

- Materials processing technology
- Production machines and systems
- Design
- Operations management
- Industrial engineering
- Organisational behaviour
- Managing people and business
- Financial and management accounting
- Industrial economics, strategy and governance
- Contemporary issues in manufacturing

The modules are complemented by a structured set of industrial visits and a business skills development programme. In addition, students undertake three pieces of integrated coursework, which are a CAD/CAM exercise, a Production Game and the Major Project. Students work on the Major Project in small groups. They research the market for a product, prepare a design and manufacturing plan, and finally a business plan, for a company or division based on that product. The Major Project involves external consultants, and each group is advised on its business plan by a local bank manager.

The MET IIA programme provides the foundations for MET IIB, where the core topics of manufacturing and management are expanded and applied. MET IIB represents a substantial departure from the standard university timetable and approach. Modules and practical activities run in sequence, with a module typically lasting one week. Teaching in the modules is seminar based, to encourage interaction and participation. Industrial speakers supplement the theory, with examples from practice. Throughout the year, students get to apply the principles through company-based project work. MET IIB concludes with an Overseas Research Project, organised by the students.

For more information on the MET course and how to apply, please see the MET website.

CUED student exchange programmes

The Department of Engineering runs two exchange programmes open to Part IIA Engineering Tripos students to spend their third year at National University of Singapore or Ecole Centrale Paris and then returning to Cambridge for their fourth year. Further information on the programmes can be found here.

Accreditation of the MEng

All students are encouraged to become student or affiliate members of one or more of the professional institutions.

Introduction

Most students reading Engineering at Cambridge will at some stage consider becoming professional engineers, and many will be firmly intending to do so. The engineering profession as a whole is currently supervised by the Engineering Council (UK). There are a number of chartered institutions or similar bodies, each concerned with a particular branch or type of engineering. Corporate membership of the appropriate institution is the professional qualification for that branch of engineering, and carries with it the title of Chartered Engineer.

A Cambridge Master of Engineering degree (MEng), with the appropriate choice of modules in Part II, provides exemption from part or all of the examination requirements at all the principal institutions (although a number of years of practical training and responsible experience are also required for corporate membership). See below for conditions of exemption for each institution.

The institutions welcome enquiries from engineering students and will supply, on request, information about careers and reading lists. Undergraduates may apply for student membership of any of the institutions listed below. Student membership is generally free and entitles the student to receive certain publications and to attend meetings organised in all parts of the country.

Accrediting bodies and CUED institutional liaison officers

All the four-year MEng courses offered by the Department of Engineering are accredited by one or more of the following institutions, depending on the engineering area studied. More details, including application forms, relating to membership of individual institutions can be obtained from the institutions' websites or from the appropriate liaison officer:

Acronym	Institution	Liaison officer
ICE	Institution of Civil Engineers	Dr D Liang
IStructE	Institution of Structural Engineers	Prof CJ Burgoyne
IMechE	Institution of Mechanical Engineers	Dr DJ Cole
IET	Institution of Engineering and Technology	Prof TD Wilkinson
RAeS	Royal Aeronautical Society	Dr J P Jarrett
InstMC	Institute of Measurement and Control	Professor M C Smith
CIHT	Chartered Institution of Highways and Transportation	Prof CJ Burgoyne
IHE	Institute of Highway Engineers	Prof CJ Burgoyne
IPEM	Institute of Physics and Engineering in Medicine	Dr GM Treece

The MEng course is also recognised by the European Network for Accreditation of Engineering Education (ENAEE) as meeting the requirements of a “second cycle” European accredited engineering programme. In essence, this means that it meets the European standard for a Master’s degree.

Conditions of exemption

Institutions	Conditions of exemption
All Institutions:	Students must complete two management modules (which includes those in Group E plus '4I1: strategic valuation') during the final two years of the MEng course.
CIHT, IHE, ICE and IStructE:	The MEng is accredited as fully satisfying the educational base for a Chartered Engineer (CEng) with the same requirement of two management modules being taken in Part II. For the purposes of accreditation, '4D16: construction and management' can be counted as one of the two management modules.
RAeS, IMechE and IET:	The MEng is accredited for all engineering areas.
InstMC:	The MEng is accredited for the instrumentation and control engineering area. Other engineering areas are also accredited provided that at least two of the following modules are taken: • 3F1: signals and systems • 3F2: systems and control • 4F1: control systems design • 4F2: robust multivariable control • 4F3: nonlinear and predictive control
IPEM:	The MEng is accredited for students who take the bioengineering engineering area in both Part IIA and Part IIB.

The Engineering Council

Graduates in Engineering, who are Corporate Members of one of the Engineering institutions above are invited to register with the Engineering Council to achieve Chartered Engineer status (CEng). This is usually acquired by application through the particular institution at the time of acceptance as a Corporate Member.

Students may like to become involved with the various activities of the Engineering Council which promote engineering among young people.

European-Accredited Engineering Programme

The Engineering Tripos (MEng) has been designated as a second cycle European-accredited engineering programme within the EUR-ACE system

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