Part IIA Modules 2018-19

The Faculty Board of Engineering give notice that the modules prescribed for examination in 2019, and the mode of examination for each module, will be as listed below. Candidates must offer 10 modules for examination. Candidates may offer only one module from any one of the sets. Students may not take more than two management modules.

p=examination only

Unit	Title	Set	Mode	Notes
Group A: Energy, Fluid Mechanics, and Turbomachinery				
3A1	Fluid Mechanics I	IIAM8&L7	p	Double module
3A3	Fluid Mechanics II	IIAM1&L1	p	Double module
3A5	Thermodynamics and Power Generation	IIAM7	p	
3A6	Heat and Mass Transfer	IIAL3	p	
Group B: Electrical Engineering				
3B1	Radio Frequency Electronics	IIAM3	p	
3B2	Integrated Digital Electronics	IIAL3	p	
3B3	Switch-Mode Electronics	IIAM2	p	
3B4	Electric Drive Systems	IIAL2	p	
3B5	Semiconductor Engineering	IIAM8	p	
3B6	Photonic Technology	IIAL7	p	
Group C: Mechanics, Materials, and Design				
3C1/3P1	Materials Processing and Design (Engineering)	IIAM5	p	Offered by MET as 3P1
3C5	Dynamics	IIAM6	p	
3C6	Vibration	IIAL6	p	
3C7	Mechanics of Solids	IIAM4	p	
3C8	Machine Design	IIAM3	p	
3C9	Fracture Mechanics of Materials and Structures	IIAL5	p	
Group D: Civil, Structural, and Environmental Engineering				
3D1	Geotechnical Engineering I	IIAM1	p	
3D2	Geotechnical Engineering II	IIAL1	p	
3D3	Structural Materials and Design	IIAM2	p	
3D4	Structural Analysis and Stability	IIAL2	p	
3D5	Water Engineering	IIAM10	p	
3D7	Finite Element Methods	IIAL4	p	
3D8	Building Physics and Environmental Geotechnics	IIAM3	p	
Group E: Management and Manufacturing				
3E1	Business Economics	IIAL8	p	
3E2	Marketing	IIAM9	p	
3E3	Modelling Risk	IIAM9	p	
3E6	Organisational Behaviour	IIAL8	p	
3E10	Operations Management for Engineers	IIAL8	p	
3E11	Environmental Sustainability & Business	IIAM9	p	
Group F: Information Engineering				
3F1	Signals and Systems	IIAM4	p	
3F2	Systems and Control	IIAL5	p	
3F3	Statistical Signal Processing	IIAM1	p	
3F4	Data Transmission	IIAL6	p	
3F7	Information Theory and Coding	IIAM5	p	
3F8	Inference	IIAL4	p	
Group G: Bioengineering				
3G1	Introduction to Molecular Bioengineering	IIAM7	p	
3G2	Mathematical Physiology	IIAL3	p	
3G3	Introduction to Neuroscience	IIAL2	p	
3G4	Medical Imaging and 3-D Computer Graphics	IIAL1	p	
3G5	Biomaterials	IIAM8	p	
Group M: Multidisciplinary modules				
3M1	Mathematical Methods	IIAL10	p	
Group S: Modules shared with Part IIB				
4C4	Design Methods	IIAM7	p	Shared module
4D16	Construction Management	IIAL9	p	Shared module. Alts with 4D8.
4M12	Partial Differential Equations and Variational Methods	IIAL9	p	Shared module
4M16	Nuclear Power Engineering	IIAL9	p	Shared module

Part IIA Sets Michaelmas Term 2018-19

All lectures AM except those indicated as PM.

Set	Unit	Title	Mode	Notes
IIAM1	3A3	Fluid Mechanics II	p	Double module
	3D1	Geotechnical Engineering I	p	
	3F3	Statistical Signal Processing	p	
IIAM2	3B3	Switch-Mode Electronics	p	
	3D3	Structural Materials and Design	p	
IIAM3	3B1	Radio Frequency Electronics	p	
	3C8	Machine Design	p	
	3D8	Building Physics and Environmental Geotechnics	p	
IIAM4	3C7	Mechanics of Solids	p	
	3F1	Signals and Systems	p	
IIAM5	3C1	Materials Processing and Design	p	Offered by MET as 3P1
	3F7	Information Theory and Coding	p	
IIAM6	3C5	Dynamics	p	
IIAM7	3A5	Thermodynamics and Power Generation	p	
	3G1	Introduction to Molecular Bioengineering	p	
	4C4	Design Methods	p	Shared with IIB
IIAM8	3A1	Fluid Mechanics I	p	Double module
	3B5	Semiconductor Engineering	p	
	3G5	Biomaterials	p	
IIAM9 (PM lectures)	3E3	Modelling Risk	p	
	3E2	Marketing	p	
	3E11	Environmental Sustainability & Business	p	
IIAM10 (PM double lectures)	3D5	Water Engineering	p	

Part IIA Sets Lent Term 2018-19

Set	Unit	Title	Mode	Notes
IIAL1	3A3	Fluid Mechanics II	p	Double module
	3D2	Geotechnical Engineering II	p	
	3G4	Medical Imaging & 3-D Computer Graphics	p	
IIAL2	3B4	Electric Drive Systems	p	
	3D4	Structural Analysis and Stability	p	
	3G3	Introduction to Neuroscience	p	
IIAL3	3A6	Heat and Mass Transfer	p	
	3B2	Integrated Digital Electronics	p	
	3G2	Mathematical Physiology	p	
IIAL4	3D7	Finite Element Methods	p	
	3F8	Inference	p	
IIAL5	3C9	Fracture Mechanics of Materials & Structures	p	
	3F2	Systems and Control	p	
IIAL6	3C6	Vibration	p	
	3F4	Data Transmission	p	
IIAL7	3A1	Fluid Mechanics I	p	Double module
	3B6	Photonic Technology	p	
IIAL8 (PM lectures)	3E1	Business Economics	p	
	3E6	Organisational Behaviour	p	
	3E10	Operations Management for engineers	p	
IIAL9	4D16	Construction Management	p	Shared with IIB. Alternates with 4D8.
	4M12	Partial Differential Equations and Variational Methods	p	Shared with IIB
	4M16	Nuclear Power Engineering	p	Shared with IIB
IIAL10	3M1	Mathematical Methods	p	

Part IIB Modules for 2018-19

Conditions for candidates:

– candidates must offer 8 modules for examination;

− candidates may offer only one module from any set and not more than two 4E modules overall (one per term);

− in addition, candidates may not take not more three from the following: 4E modules; 4I1 and 4I7; 4M1–3; and 4D16;

− no candidate who offered any module for Part IIA may again offer the same module for Part IIB.

Notes:

− there will be no Group R (research) modules available to Part IIB students in 2018-19;

− as we do not have exclusive control over imported modules we cannot guarantee that they will not clash with other sets;

− pre-requisites are listed below for new/revised modules only. For pre-existing modules the individual syllabus pages are the definitive source of information about pre-requisites. A summary is also given on the syllabus index page;

− c = coursework only, p = exam only, p+c = coursework and exam.

Unit	Name	Set	Mode	Notes
Group A: Energy, Fluid Mechanics, and Turbomachinery				
4A2	Computational Fluid Dynamics	IIBM1	c	
4A3	Turbomachinery I	IIBM4	p+c	
4A7	Aerodynamics	IIBM8	c	
4A9	Molecular Thermodynamics	IIBM7	p	
4A10	Flow Instability	IIBL11	p	
4A12	Turbulence and Vortex Dynamics	IIBL3	p	
4A13	Combustion and IC Engines	IIBL5	p	
4A15	Aeroacoustics	IIBM6	p	
Group B: Electrical Engineering				
4B2	Power Microelectronics	IIBM6	p	
4B6	Solid State Devices and Chemical/Biological Sensors	IIBL3	p	
4B11	Photonic Systems	IIBM5	p	
4B13	Electronic Sensors and Instrumentation	IIBL1	p	
4B19	Renewable Electrical Power	IIBM2	p	
4B21	Analogue Integrated Circuits	IIBM3	p	
4B22	Flexible and Stretchable Electronics	IIBL5	p	
4B23	Optical Fibre Communication	IIBL2	p+c	
4B24	Radio Frequency Systems	IIBL4	p+c	
4B25	Embedded Systems for the Internet of Things	IIBM7	c	
Group C: Mechanics, Materials, and Design				
4C2	Designing with Composites	IIBM3	p+c	
4C3	Advanced Functional Materials and Devices	IIBM8	p	
4C4	Design Methods	IIBM2	p	Shared with IIA.
4C5	Design Case Studies	IIBL4	c	
4C6	Advanced Linear Vibrations	IIBM4	p+c	
4C7	Random and Non-Linear Vibrations	IIBM5	p+c	
4C8	Vehicle Dynamics	IIBL8	p+c	
4C9	Continuum Mechanics	IIBL7	p	
4C15	MEMS: Design	IIBL2	p+c	
Group D: Civil, Structural, and Environmental Engineering				
4D4	Construction Engineering	IIBL4	c	
4D5	Foundation Engineering	IIBL5	p	
4D6	Dynamics in Civil Engineering	IIBL2	p+c	
4D7	Concrete Structures	IIBM4	p+c	
4D10	Structural Steelwork	IIBM3	p+c	
4D13	Architectural Engineering	IIBM8	c	
4D14	Contaminated Land & Waste Containment	IIBL3	p+c	
4D16	Construction Management	IIBL1	p	Shared with IIA & alts with 4D8.

Group E: Management and Manufacturing

4E1	Innovation and Strategic Management of Intellectual Property	IIBM9	c	
4E4	Management of Technology	IIBM9	c	
4E5	International Business	IIBL9	c	Timetabled with IIBL12
4E6	Accounting and Finance	IIBM9	c	
4E11	Strategic Management	IIBL12	c	Timetabled with IIBL9
4E12	Project Management	IIBL9	c	IIB Engineering students only.

Group F: Information Engineering

4F1	Control System Design	IIBM5	p+c	
4F2	Robust and Nonlinear Systems and Control	IIBL7	p	
4F3	An Optimisation Based Approach to Control	IIBL11	p	
4F5	Advanced Information Theory and Coding	IIBL6	p	3F7 assumed
4F7	Statistical Signal Analysis	IIBL8	p	
4F8	Image Processing and Image Coding	IIBL3	p	
4F10	Deep Learning and Structured data	IIBM6	p	
4F12	Computer Vision	IIBM2	p	
4F13	Probabilistic Machine Learning	IIBM1	c	
4F14	Computer Systems	IIBL5	p+c	Part I Digital Circuits and Computing assumed.

Group G: Bioengineering

4G1	Mathematical Biology of the Cell	IIBM7	c	Capped at 15 for Physics.
4G2	Biosensors	IIBL6	c	
4G3	Computational Neuroscience	IIBL4	c	
4G6	Cellular and Molecular Biomechanics	IIBL11	p	

Group M: Multidisciplinary modules

4M1	French	IIBL10	c	
4M3	Spanish	IIBM10	c	
4M9	Surveying Field Course	IIBLV	c	Long vacation module taken in previous summer. **Cap=16**
4M12	Partial Differential Equations and Variational Methods	IIBL1	p	Shared with IIA.
4M16	Nuclear Power Engineering	IIBL1	p	Shared with IIA.
4M17	Practical Optimization	IIBM11	c	
4M19	Advanced Building Physics	IIBM2	c	
4M20	Robotics	IIBM8	c	
4M21	Software Engineering and Design	IIBL7	p	
4M22	Climate Change Mitigation	IIBM12	c	

Group I: Imported modules

4I1	Strategic Valuation (TPE6)	IIBCV	c	Christmas vacation module. **Cap= 14.** Borrowed from Technology Policy MPhil
4I7	Electricity and Environment (TPE7)	IIBL6	c	Borrowed from Technology Policy MPhil
4I8	Medical Physics	IIBL8	p	Borrowed from Physics. TBC if running.
4I10	Nuclear Reactor Engineering	IIBM5	p	Borrowed from Nuclear Energy MPhil.
4I11	Advanced Fission and Fusion Systems	IIBL8	c	Borrowed from NE MPhil.

IIB Sets Michaelmas Term 2018-19

Set	Unit	Title	Mode	Notes
IIBM1	4A2	Computational Fluid Dynamics	c	
	4F13	Probabilistic Machine Learning	c	
IIBM2	4B19	Renewable Electrical Power	p	
	4C4	Design Methods	p	Shared with IIA
	4F12	Computer Vision	p	
	4M19	Advanced Building Physics	c	
IIBM3	4B21	Analogue Integrated Circuits	p	
	4C2	Designing with Composites	p+c	
	4D10	Structural Steelwork	p+c	
IIBM4	4A3	Turbomachinery I	p+c	
	4C6	Advanced Linear Vibrations	p+c	
	4D7	Concrete Structures	p+c	
IIBM5	4B11	Photonic Systems	p	
	4C7	Random and Non-Linear Vibrations	p+c	
	4F1	Control System Design	p+c	
	4I10	Nuclear Reactor Engineering	p	
IIBM6	4A15	Aeroacoustics	p	
	4B2	Power Microelectronics	p	
	4F10	Deep Learning and Structured data	p	
IIBM7	4A9	Molecular Thermodynamics	p	
	4B25	Embedded Systems for the Internet of Things	c	
	4G1	Mathematical Biology of the Cell	c	Capped at 15 for Physics
IIBM8	4A7	Aerodynamics	c	
	4C3	Advanced Functional Materials and Devices	p	
	4D13	Architectural Engineering	c	
	4M20	Robotics	c	
IIBM9	4E1	Innovation and Strategic Management of Intellectual Property	c	
	4E4	Management of Technology	c	
	4E6	Accounting and Finance	c	
IIBM10	4M3	Spanish	c	
IIBM11	4M17	Practical Optimization	c	
IIBM12	4M22	Climite Change Mitigation	c	

Christmas Vacation

Set	Unit	Title	Mode	Notes
IIBCV	4I1	Strategic Valuation (TPE6)	c	Christmas vacation module. Cap=14

Set	Unit	Title	Mode	Notes
IIBL1	4B13	Electronic Sensors and Instrumentation	p	
	4D16	Construction Management	p	Shared with IIA & alts with 4D8.
	4M12	Partial Differential Equations & Variational Methods	p	Shared with IIA
	4M16	Nuclear Power Engineering	p	Shared with IIA
IIBL2	4B23	Optical Fibre Communication	p+c	
	4C15	MEMS: Design	p+c	
	4D6	Dynamics in Civil Engineering	p+c	
IIBL3	4A12	Turbulence and Vortex Dynamics	p	
	4B6	Solid State Devices & Chemical/Biological Sensors	p	
	4F8	Image Processing and Image Coding	p	
	4D14	Contaminated Land & Waste Containment	p+c	
IIBL4	4B24	Radio Frequency Systems	p+c	
	4C5	Design Case Studies	c	
	4D4	Construction Engineering	c	
	4G3	Computational Neuroscience	c	
IIBL5	4A13	Combustion and IC Engines	p	
	4B22	Flexible and Stretchable Electronics	p	
	4D5	Foundation Engineering	p	
	4F14	Computer Systems	p+c	Part I Digital Circuits and Computing assumed
IIBL6	4F5	Advanced Information Theory and Coding	p	3F7 assumed
	4G2	Biosensors	c	
	4I7	Electricity and Environment	c	
IIBL7	4C9	Continuum Mechanics	p	
	4F2	Robust and Nonlinear Systems and Control	p	
	4M21	Software Engineering and Design	p	
IIBL8	4C8	Vehicle Dynamics	p+c	
	4F7	Statistical Signal Analysis	p	
	4I8	Medical Physics	p	Physics to confirm if module will run
	4I11	Advanced Fission and Fusion Systems	c	
IIBL9	4E5	International Business	c	Timetabled with IIBL12
	4E12	Project Management	c	Part IIB Eng students only
IIBL10	4M1	French	c	
IIBL11	4A10	Flow Instability	p	
	4F3	An Optimisation Based Approach to Control	p	
	4G6	Cellular and Molecular Biomechanics	p	
IIBL12	4E11	Strategic Management	c	Timetabled with IIBL9

Long Vacation

LV1	4M9	Surveying field course	c	Cap =16