Part IIB Modules for 2018-19

Conditions for candidates:

– candidates must offer 8 modules for examination;

– normally candidates may offer only one module from any set and not more than two 4E modules overall;

– 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.

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