IIB Sets Academic Year 2023-24

Conditions for candidates:

- candidates must offer 8 modules for examination;
- normally candidates may offer only one module from any set.
- in addition, candidates may take not more than three from the following: 4E modules; 4I1; 4M1–3; 4M23 and 4D16 (when running);
- 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 2023-24;
- 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;

Candidates are advised to take note of the conditions of exemption which are set by the professional engineering institutions that accredit the course: http://teaching.eng.cam.ac.uk/content/accreditation-meng#coe.

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

Set	Unit	Title	Mode	Notes
Group A: Energy, Fluid Mechanics, and Turbomachinery				
IIBM1	4A2	Computational Fluid Dynamics	c	
IIBM4	4A3	Turbomachinery I	p+c	
IIBM6	4A4	Aircraft Stability and Control	c	
IIBM8	4A7	Aircraft Aerodynamics and Design	c	
IIBM7	4A9	Molecular Thermodynamics	p	
IIBL4	4A10	Flow Instability	p	
IIBL3	4A12	Turbulence and Vortex Dynamics	p	
IIBL5	4A13	Combustion and Engines	p	
IIBL11	4A15	Acoustics	p	
Group B: Electrical Engineering				
IIBM6	4B2	Power Microelectronics	p	
IIBM11	4B5	Quantum and Nano-technologies	p	
IIBM5	4B11	Photonic Systems	p	
IIBL1	4B13	Electronic Sensors and Instrumentation	p	
IIBM2	4B19	Renewable Electrical Power	p	
IIBL2	4B23	Optical Fibre Communication	p+c	
IIBL4	4B24	Radio Frequency Systems	p+c	
IIBL7	4B25	Embedded Systems for the Internet of Things	c	
IIBL8	4B27	Internet of everything	c	
Group C: Mechanics, Materials, and Design				
IIBM3	4C2	Designing with Composites	p+c	
IIBM8	4C3	Advanced Functional Materials and Devices	p	
IIBM2	4C4	Design Methods	p	Shared module
IIBL4	4C5	Design Case Studies	c	
IIBM4	4C6	Advanced Linear Vibrations	p+c	
IIBM5	4C7	Random and Non-Linear Vibrations	p+c	
IIBL8	4C8	Vehicle Dynamics	p+c	
IIBL7	4C9	Continuum Mechanics	p	
IIBL2	4C11	Data-driven and Learning Based Methods in Mechanics and Materials	c	3C7 assumed, 3D7 useful. Numbers capped to 30?
Group D: Civil, Structural, and Environmental Engineering				

IIBL3	4D2	Advanced Structural Design	c	
IIBL11	4D4	Construction Engineering	c	3D1, 3D2, 4D16 useful
IIBM8	4D5	Deep Foundations and Underground Construction	p	
IIBL2	4D6	Dynamics in Civil Engineering	p+c	
IIBM4	4D7	Concrete and Prestressed Concrete	p+c	
IIBL5	4D9	Offshore Geotechnical Engineering	p	
IIBM3	4D10	Structural Steelwork	p+c	
IIBM12	4D13	Architectural Engineering	c	
IIBM2	4D16	Construction Management	p	Shared module

Group E: Management and Manufacturing				
IIBM9	4E1	Innovation and Strategic Management of Intellectual Property	c	
IIBM9	4E3	Business Innovation in a Digital Age	c	
IIBL9	4E5	International Business	c	
IIBM9	4E6	Accounting and Finance	p	
IIBL12	4E11	Strategic Management	c	
IIBL9	4E12	Project Management	c	

Group F: Information Engineering				
IIBM5	4F1	Control System Design	p+c	
IIBL7	4F2	Robust and Nonlinear Control	c	
IIBL11	4F3	An Optimisation Based Approach to Control	p	
IIBL6	4F5	Advanced Information Theory and Coding	p	
IIBL2	4F8	Image Processing and Image Coding	p	
IIBM6	4F10	Deep Learning and Structured data	p	
IIBM2	4F12	Computer Vision	p	
IIBM1	4F13	Probabilistic Machine Learning	c	
IIBL5	4F14	Computer Systems	p+c	

Group G: Bioengineering				
IIBM7	4G1	Mathematical Biology of the Cell	c	
IIBL4	4G3	Computational Neuroscience	c	
IIBL8	4G5	Materials and Molecules: Modelling, Simulation and Machine Learning	c	
IIBL5	4G6	Cellular and Molecular Biomechanics	p	
IIBM4	4G7	Control and Computation in Living Systems	p+c	
IIBL11	4G9	Biomedical Engineering	c	
IIBM6	4G10	Brain Machine Interfaces	c	

Group I: Imported modules				
IIBCV	4I1	Strategic Valuation (TPE25)	c	Numbers capped at 5 CUED students
IIBL8	4I8	Medical Physics	p	
IIBM5	4I10	Nuclear Reactor Engineering	p	
IIBL8	4I11	Advanced Fission and Fusion Systems	c	
IIBM3	4I14	Biosensors and Bioelectronics	c	

Group M: Multidisciplinary modules				
IIBL10	4M1	French	c	
IIBL10	4M2	German	c	
IIBM10	4M3	Spanish	c	
IIBL1	4M12	Partial Differential Equations & Variational Methods	p	Shared with Part IIA.
IIBL1	4M16	Nuclear Power Engineering	p	Shared with Part IIA.
IIBM11	4M17	Practical Optimization	c	
IIBM1	4M19	Advanced Building Physics	c	

IIBL7	4M21	Software Engineering and Design	p	
IIBM11	4M22	Climate Change Mitigation	c	
IIBL6	4M23	Electricity and Environment (TPE22)	c	
IIBM8	4M24	Computational Statistics and Machine Learning	p+c	
IIBL3	4M26	Algorithms and Data Structures	p	

Group S: Modules shared with Part IIA				
IIBM2	4C4	Design Methods	p	Shared with Part IIA.
IIBL1	4M12	Partial Differential Equations & Variational Methods	p	Shared with Part IIA.
IIBL1	4M16	Nuclear Power Engineering	p	Shared with Part IIA.
IIBM2	4D16	Construction Management	p	Shared with Part IIA.

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IIBM1	4A2	Computational Fluid Dynamics	c	
	4F13	Probabilistic Machine Learning	c	
	4M19	Advanced Building Physics	c	
IIBM2	4B19	Renewable Electrical Power	p	
	4C4	Design Methods	p	
	4D16	Construction Management	p	Shared with Part IIA.
	4F12	Computer Vision	p	
IIBM3	4C2	Designing with Composites	p+c	
	4D10	Structural Steelwork	p+c	
	4I14	Biosensors and Bioelectronics	c	
IIBM4	4A3	Turbomachinery I	p+c	
	4C6	Advanced Linear Vibrations	p+c	
	4D7	Concrete and Prestressed Concrete	p+c	
	4G7	Control and Computation in Living Systems	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	4A4	Aircraft Stability and Control	c	
	4B2	Power Microelectronics	p	
	4F10	Deep Learning and Structured data	p	
	4G10	Brain machine Interfaces	c	
IIBM7	4A9	Molecular Thermodynamics	p	
	4G1	Mathematical Biology of the Cell	c	
IIBM8	4A7	Aircraft Aerodynamics and Design	c	
	4C3	Advanced Functional Materials and Devices	p	
	4D5	Deep Foundations and Underground Construction	p	
	4M24	Computational Statistics and Machine Learning	p+c	
IIBM9	4E1	Innovation and Strategic Management of Intellectual Property	c	
	4E3	Business Innovation in a Digital Age	c	
	4E6	Accounting and Finance	p	
IIBM10	4M3	Spanish	c	

IIBM11	4B5	Quantum and Nano technologies	p	
	4M17	Practical Optimization	c	
	4M22	Climate Change Mitigation	c	
IIBM12	4D13	Architectural Engineering	c	
Christmas Vacation				
IIBCV	4I1	Strategic Valuation (TPE25)	c	Numbers capped at 5 CUED students

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Set	Unit	Title	Mode	Notes
IIBL1	4B13	Electronic Sensors and Instrumentation	p	
	4M12	Partial Differential Equations & Variational Methods	p	Shared with Part IIA.
	4M16	Nuclear Power Engineering	p	Shared with Part IIA.
IIBL2	4C11	Data-driven and Learning Based Methods in Mechanics and Materials	c	3C7 assumed, 3D7 useful. Numbers capped to 30?
	4D6	Dynamics in Civil Engineering	p+c	
	4F8	Image Processing and Image Coding	p+c	
	4B23	Optical Fibre Communication	p+c	
IIBL3	4A12	Turbulence and Vortex Dynamics	p	
	4D2	Advanced Structural Design	c	
	4M26	Algorithms and Data Structures	p	
IIBL4	4A10	Flow Instability	p+c	
	4B24	Radio Frequency Systems	p+c	
	4C5	Design Case Studies	c	
	4G3	Computational Neuroscience	c	
IIBL5	4A13	Combustion and Engines	p	
	4D9	Offshore Geotechnical Engineering	p	
	4F14	Computer Systems	p+c	
	4G6	Cellular and Molecular Biomechanics	p	
IIBL6	4F5	Advanced Information Theory and Coding	p	
	4M23	Electricity and Environment (TPE22)	c	
IIBL7	4B25	Embedded Systems for the Internet of Things	c	
	4C9	Continuum Mechanics	p	
	4F2	Robust and Nonlinear Control	c	
	4M21	Software Engineering and Design	p	
IIBL8	4C8	Vehicle Dynamics	p+c	
	4G5	Materials and Molecules: Modelling, Simulation and Machine Learning	c	
	4I8	Medical Physics	p	
	4B27	Internet of everything		
	4I11	Advanced Fission and Fusion Systems	c	
IIBL9	4E5	International Business	c	
	4E12	Project Management	c	
IIBL10	4M1	French	c	
	4M2	German	c	
	4A15	Acoustics	p	

IIBL11	4D4	Construction Engineering	c	3D1, 3D2, 4D16 useful
	4F3	An Optimisation Based Approach to Control	p	
	4G9	Biomedical Engineering	c	

IIBL12	4E11	Strategic Management	c	