

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. |

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 | Climate Change Mitigation | c | |
| Christmas Vacation | | | | |
| IIBCV | 4I1 | Strategic Valuation (TPE6) | c | Christmas vacation module. Cap=14 |

IIB Sets Lent Term 2018-19

| 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 |