

## Part IIB syllabuses; links to on-line resources

### Index

- [Group A: Energy, Fluid Mechanics and Turbomachinery](#)
- [Group B: Electrical Engineering](#)
- [Group C: Mechanics, Materials and Design](#)
- [Group D: Civil, Structural and Environmental Engineering](#)
- [Group E: Management and Manufacturing](#)
- [Group F: Information Engineering](#)
- [Group G: Bioengineering](#)
- [Group I: Imported Modules](#)
- [Group M: Multidisciplinary Modules](#)

Note that all modules are assessed by 100% Coursework, or 100% Examination, or 75% Examination and 25% Coursework. In all cases, the definitive form of assessment is given in the Faculty Board's [Modules & Sets](#) document. The Faculty Board also publish an [outline of the coursework requirements for Part IIB 100% coursework modules](#) but you should see the module syllabus pages for further details.

[Interactive booklists for Part IIB are available on Moodle.](#)

### [Group A: Energy, Fluid Mechanics and Turbomachinery](#)

| Module   |                                                    | Term<br>(set) | Form of<br>assessment  | Prerequisites |          | On-line<br>resources   | Leader                                 |
|----------|----------------------------------------------------|---------------|------------------------|---------------|----------|------------------------|----------------------------------------|
| Cod<br>e | Title (linked to syllabus)                         |               |                        | Assumed       | Useful   |                        |                                        |
| 4A2      | <a href="#">Computational fluid dynamics</a>       | M(1)          | Coursework             | 3A1, 3A3      |          | <a href="#">Moodle</a> | <a href="#">Dr T.P. Hynes</a>          |
| 4A3      | <a href="#">Turbomachinery</a>                     | M(4)          | Exam and<br>coursework | 3A1, 3A3      |          | <a href="#">Moodle</a> | <a href="#">Dr N.R. Atkins</a>         |
| 4A7      | <a href="#">Aerodynamics</a>                       | M(8)          | Coursework             | 3A1, 3A3      |          | <a href="#">Moodle</a> | <a href="#">Dr J. Jarrett</a>          |
| 4A9      | <a href="#">Molecular thermodynamics</a>           | M(7)          | Exam                   |               | 3A1, 3A5 | <a href="#">Moodle</a> | <a href="#">Dr A. J. White</a>         |
| 4A1<br>0 | <a href="#">Flow instability</a>                   | L(11)         | Exam                   | 3A1           |          | <a href="#">Moodle</a> | <a href="#">Prof. G. Hunt</a>          |
| 4A1<br>2 | <a href="#">Turbulence and vortex<br/>dynamics</a> | L(3)          | Exam                   | 3A1           | 3A3      | <a href="#">Moodle</a> | <a href="#">Prof. P.<br/>Davidson</a>  |
| 4A1<br>3 | <a href="#">Combustion and IC engines</a>          | L(5)          | Exam                   |               | 3A5, 3A6 | <a href="#">Moodle</a> | <a href="#">Prof N<br/>Swaminathan</a> |
| 4A1<br>5 | <a href="#">Aeroacoustics</a>                      | M(6)          | Exam                   | 3A1           |          | <a href="#">Moodle</a> | <a href="#">Dr A Agarwal</a>           |

### [Group B: Electrical Engineering](#)

| Module   |                                                            | Term<br>(set) | Form of<br>assessment | Prerequisites    |          | On-line<br>resources   | Leader                                 |
|----------|------------------------------------------------------------|---------------|-----------------------|------------------|----------|------------------------|----------------------------------------|
| Cod<br>e | Title (linked to syllabus)                                 |               |                       | Assumed          | Useful   |                        |                                        |
| 4B2      | <a href="#">Power microelectronics</a>                     | M(6)          | Exam                  |                  | 3B3, 3B5 | <a href="#">Moodle</a> | <a href="#">Prof. F. Udrea</a>         |
| 4B1<br>1 | <a href="#">Photonic systems</a>                           | M(5)          | Exam                  |                  | 3B6      | <a href="#">Moodle</a> | <a href="#">Prof. T.<br/>Wilkinson</a> |
| 4B1<br>3 | <a href="#">Electronic sensors and<br/>instrumentation</a> | L(1)          | Exam                  | 3B1              |          | <a href="#">Moodle</a> | <a href="#">Dr P A<br/>Robertson</a>   |
| 4B1<br>9 | <a href="#">Renewable electrical power</a>                 | M(2)          | Exam                  | 3B3, 3B4,<br>3B6 |          | <a href="#">Moodle</a> | <a href="#">Dr T. Flack</a>            |

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|----------|-------------------------------------------------------------|---------------|------------------------|------------------|----------|------------------------|--------------------------------------|
| Cod<br>e | Title (linked to syllabus)                                  |               |                        | Assumed          | Useful   |                        |                                      |
| 4B2<br>1 | <a href="#">Analogue integrated circuits</a>                | M(3)          | Exam                   | 3B1, 3B2,<br>3B5 | 3B3, 3B6 | <a href="#">Moodle</a> | <a href="#">Dr S Sambandan</a>       |
| 4B2<br>2 | <a href="#">Flexible and Stretchable Electronics</a>        | L(5)          | Exam                   |                  | 3B5, 4B5 | <a href="#">Moodle</a> | <a href="#">Dr F Torrisi</a>         |
| 4B2<br>3 | <a href="#">Optical Fibre Communication</a>                 | L(2)          | Exam and<br>coursework |                  | 3B6, 3F4 | Moodle                 | <a href="#">Dr S J Savory</a>        |
| 4B2<br>4 | <a href="#">Radio frequency systems</a>                     | L(4)          | Exam and<br>coursework | 3B1              |          | Moodle                 | <a href="#">Dr M J Crisp</a>         |
| 4B2<br>5 | <a href="#">Embedded systems for the internet of things</a> | M(7)          | Coursework             |                  | 3B2      | <a href="#">Moodle</a> | <a href="#">Dr P Stanley-Marbell</a> |

### [Group C: Mechanics, Materials and Design](#)

| Module   |                                                           | Term<br>(set) | Form of<br>assessment  | Prerequisites |          | On-line<br>resources   | Leader                                |
|----------|-----------------------------------------------------------|---------------|------------------------|---------------|----------|------------------------|---------------------------------------|
| Cod<br>e | Title (linked to syllabus)                                |               |                        | Assumed       | Useful   |                        |                                       |
| 4C2      | <a href="#">Designing with composites</a>                 | M(3)          | Exam and<br>Coursework |               |          | <a href="#">Moodle</a> | <a href="#">Prof M.P.F. Sutcliffe</a> |
| 4C3      | <a href="#">Advanced Functional Materials and Devices</a> | M(8)          | Exam                   |               |          | <a href="#">Moodle</a> | <a href="#">Dr J H Durrell</a>        |
| 4C4      | <a href="#">Design methods</a>                            | M(2)          | Exam                   |               |          | <a href="#">Moodle</a> | <a href="#">Dr P O Kristensson</a>    |
| 4C5      | <a href="#">Design case studies</a>                       | L(4)          | Coursework             |               | 4C4      | <a href="#">Moodle</a> | <a href="#">Dr P Kristensson</a>      |
| 4C6      | <a href="#">Advanced linear vibrations</a>                | M(4)          | Exam and<br>Coursework | 3C6           |          | <a href="#">Moodle</a> | <a href="#">Dr H.E.M. Hunt</a>        |
| 4C7      | <a href="#">Random and non-linear vibrations</a>          | M(5)          | Exam and<br>Coursework |               | 3C6      | <a href="#">Moodle</a> | <a href="#">Prof. R. Langley</a>      |
| 4C8      | <a href="#">Vehicle Dynamics</a>                          | L(8)          | Exam and<br>Coursework |               | 3C5, 3C6 | <a href="#">Moodle</a> | <a href="#">Prof D Cebon</a>          |
| 4C9      | <a href="#">Continuum mechanics</a>                       | L(7)          | Exam                   | 3C7           | 3D7      | <a href="#">Moodle</a> | <a href="#">Dr G McShane</a>          |
| 4C1<br>5 | <a href="#">MEMS: design</a>                              | L(2)          | Exam and<br>Coursework |               |          | <a href="#">Moodle</a> | <a href="#">Prof A. Seshia</a>        |

### [Group D: Civil, Structural and Environmental Engineering](#)

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| Module   |                                               | Term<br>(set) | Form of<br>assessment  | Prerequisites |                      | On-line<br>resources   | Leader                              |
|----------|-----------------------------------------------|---------------|------------------------|---------------|----------------------|------------------------|-------------------------------------|
| Cod<br>e | Title (linked to syllabus)                    |               |                        | Assumed       | Useful               |                        |                                     |
| 4D4      | <a href="#">Construction engineering</a>      | L(4)          | Coursework             |               | 3D1,<br>3D2,<br>4D16 | <a href="#">Moodle</a> | <a href="#">Prof G Viggiani</a>     |
| 4D5      | <a href="#">Foundation engineering</a>        | L(5)          | Exam                   | 3D2           |                      | <a href="#">Moodle</a> | <a href="#">Dr G. Biscontin</a>     |
| 4D6      | <a href="#">Dynamics in civil engineering</a> | L(2)          | Exam and<br>Coursework |               | 3D2,<br>3D4, 3D7     | <a href="#">Moodle</a> | <a href="#">Prof. G. Madabhushi</a> |
| 4D7      | <a href="#">Concrete structures</a>           | M(4)          | Exam and<br>Coursework | 3D3           |                      | <a href="#">Moodle</a> | <a href="#">Prof. C. Middleton</a>  |
| 4D1<br>0 | <a href="#">Structural steelwork</a>          | M(3)          | Exam and<br>Coursework | 3D4           | 3D3                  | <a href="#">Moodle</a> | <a href="#">Prof. F A McRobie</a>   |
| 4D1<br>3 | <a href="#">Architectural engineering</a>     | M(8)          | Coursework             |               | 3D3,<br>3D4, 3D8     | <a href="#">Moodle</a> | <a href="#">Dr R Choudhary</a>      |

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| Module   |                                                                | Term<br>(set) | Form of<br>assessment | Prerequisites |        | On-line<br>resources   | Leader                           |
|----------|----------------------------------------------------------------|---------------|-----------------------|---------------|--------|------------------------|----------------------------------|
| Cod<br>e | Title (linked to syllabus)                                     |               |                       | Assumed       | Useful |                        |                                  |
| 4D1<br>4 | <a href="#">Contaminated land and waste containment</a>        | L(3)          | Exam and Coursework   |               | 3D8    | <a href="#">Moodle</a> | <a href="#">Prof A Al-Tabbaa</a> |
| 4D1<br>6 | <a href="#">Construction management (reintroduced 2018-19)</a> | L(1)          | Exam                  |               |        | <a href="#">Moodle</a> | <a href="#">Dr P Heffernan</a>   |

### [Group E: Management and Manufacturing](#)

| Module   |                                                                              | Term<br>(set) | Form of<br>assessment | Prerequisites |        | On-line<br>resources   | Leader                            |
|----------|------------------------------------------------------------------------------|---------------|-----------------------|---------------|--------|------------------------|-----------------------------------|
| Cod<br>e | Title (linked to syllabus)                                                   |               |                       | Assumed       | Useful |                        |                                   |
| 4E1      | <a href="#">Innovation and strategic management of intellectual property</a> | M(9)          | Coursework            |               |        | <a href="#">Moodle</a> | <a href="#">Dr F Tietze</a>       |
| 4E4      | <a href="#">Management of technology</a>                                     | M(9)          | Coursework            |               |        | <a href="#">Moodle</a> | <a href="#">Dr T. Minshall</a>    |
| 4E5      | <a href="#">International Business</a>                                       | L(9)          | Coursework            |               |        | <a href="#">Moodle</a> | <a href="#">Dr J.J. Kroezen</a>   |
| 4E6      | <a href="#">Accounting and finance</a>                                       | M(9)          | Coursework            |               |        | <a href="#">Moodle</a> | <a href="#">Dr O. Cole</a>        |
| 4E1<br>1 | <a href="#">Strategic management</a>                                         | L(12)         | Coursework            |               |        | <a href="#">Moodle</a> | <a href="#">Prof S. Ansari</a>    |
| 4E1<br>2 | <a href="#">Project management</a>                                           | L(9)          | Coursework            |               |        | <a href="#">Moodle</a> | <a href="#">Dr N. Oraiopoulos</a> |

### [Group F: Information Engineering](#)

| Module   |                                                           | Term<br>(set) | Form of<br>assessment | Prerequisites                         |               | On-line<br>resources                           | Leader                            |
|----------|-----------------------------------------------------------|---------------|-----------------------|---------------------------------------|---------------|------------------------------------------------|-----------------------------------|
| Cod<br>e | Title (linked to syllabus)                                |               |                       | Assumed                               | Useful        |                                                |                                   |
| 4F1      | <a href="#">Control system design</a>                     | M(5)          | Exam and Coursework   |                                       | 3F1, 3F2      |                                                | <a href="#">Prof M.C. Smith</a>   |
| 4F2      | <a href="#">Robust and nonlinear systems and control</a>  | L(7)          | Exam                  | 3F2                                   |               | <a href="#">Moodle</a>                         | <a href="#">Prof M.C. Smith</a>   |
| 4F3      | <a href="#">An optimisation based approach to control</a> | L(11)         | Exam                  |                                       | 3F1, 3F2      | <a href="#">Moodle</a>                         | <a href="#">Dr G Vinnicombe</a>   |
| 4F5      | <a href="#">Advanced information theory and coding</a>    | L(6)          | Exam                  | 3F7                                   | 3F1, 3F4      | <a href="#">Moodle</a>                         | <a href="#">Dr J. Sayir</a>       |
| 4F7      | <a href="#">Statistical signal analysis</a>               | L(8)          | Exam                  | 3F3                                   | 3F1, 3F8      |                                                | <a href="#">Dr S. Singh</a>       |
| 4F8      | <a href="#">Image processing and image coding</a>         | L(3)          | Exam                  | 3F1                                   | 3F3, 3F7      | <a href="#">Moodle</a>                         | <a href="#">Prof J Lasenby</a>    |
| 4F1<br>0 | <a href="#">Deep learning and structured data</a>         | M(6)          | Exam                  |                                       | 3F1, 3F3, 3F8 | <a href="#">Moodle</a>                         | <a href="#">Prof. M.J. Gales</a>  |
| 4F1<br>2 | <a href="#">Computer vision</a>                           | M(2)          | Exam                  |                                       |               | <a href="#">Moodle</a>                         | <a href="#">Prof. R. Cipolla</a>  |
| 4F1<br>3 | <a href="#">Probabilistic Machine Learning</a>            | M(1)          | Coursework            |                                       | 3F3           | <a href="#">Machine learning lecture notes</a> | <a href="#">Prof C. Rasmussen</a> |
| 4F1<br>4 | <a href="#">Computer Systems</a>                          | L(5)          | Exam and Coursework   | Part I Digital circuits and computing |               | <a href="#">Moodle</a>                         | <a href="#">Dr A H Gee</a>        |

### [Group G: Bioengineering](#)

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| Module   |                                                     | Term<br>(set) | Form of<br>assessment | Prerequisites |          | On-line<br>resources     | Leader                          |
|----------|-----------------------------------------------------|---------------|-----------------------|---------------|----------|--------------------------|---------------------------------|
| Cod<br>e | Title (linked to syllabus)                          |               |                       | Assumed       | Useful   |                          |                                 |
| 4G1      | <a href="#">Mathematical biology of the cell</a>    | M(7)          | Coursework            |               |          | <a href="#">Moodle</a>   | <a href="#">Dr T. Savin</a>     |
| 4G2      | <a href="#">Biosensors</a>                          | L(6)          | Coursework            |               |          | <a href="#">Moodle</a>   | <a href="#">Prof A. Seshia</a>  |
| 4G3      | <a href="#">Computational neuroscience</a>          | L(4)          | Coursework            |               | 3G2, 3G3 | <a href="#">Moodle</a>   | <a href="#">Prof M Lengyel</a>  |
| 4G6      | <a href="#">Cellular and molecular biomechanics</a> | L(11)         | Exam                  |               | 3C7      | <a href="#">Camtools</a> | <a href="#">Dr V. Deshpande</a> |

### Group I: Imported Modules

Note that these modules are all imported from other courses, and hence might be timetabled at unusual times and in unusual places, and have a different course structure to other IIB modules. Also, many of them have a cap on numbers. However, they do provide a tremendous opportunity to learn about a wider range of technology than the Engineering Tripos would otherwise provide.

| Module   |                                                     | Term<br>(set) | Form of<br>assessment | Prerequisites |        | On-line<br>resources   | Leader                         |
|----------|-----------------------------------------------------|---------------|-----------------------|---------------|--------|------------------------|--------------------------------|
| Cod<br>e | Title (linked to syllabus)                          |               |                       | Assumed       | Useful |                        |                                |
| 4I1      | <a href="#">Strategic valuation</a>                 | M(vac)        | Coursework            |               |        | <a href="#">Moodle</a> | <a href="#">Dr H. Jiang</a>    |
| 4I7      | <a href="#">Electricity and environment</a>         | L(6)          | Coursework            |               |        | <a href="#">Moodle</a> | <a href="#">Dr M Pollitt</a>   |
| 4I8      | <a href="#">Medical physics</a>                     | L(8)          | Exam                  |               | 3G4    | <a href="#">Moodle</a> | <a href="#">Dr G Treece</a>    |
| 4I10     | <a href="#">Nuclear reactor engineering</a>         | M(5)          | Exam                  | 4M16          |        | <a href="#">Moodle</a> | <a href="#">Dr E. Shwagerl</a> |
| 4I11     | <a href="#">Advanced fission and fusion systems</a> | L(8)          | Coursework            | 4M16          |        | <a href="#">Moodle</a> | <a href="#">Dr E. Shwagerl</a> |

### Group M: Multidisciplinary Modules

| Module   |                                                                        | Term<br>(set) | Form of<br>assessment | Prerequisites        |                    | On-line<br>resources   | Leader                            |
|----------|------------------------------------------------------------------------|---------------|-----------------------|----------------------|--------------------|------------------------|-----------------------------------|
| Cod<br>e | Title (linked to syllabus)                                             |               |                       | Assumed              | Useful             |                        |                                   |
| 4M1      | <a href="#">French</a>                                                 | L(10)         | Coursework            |                      |                    | <a href="#">Moodle</a> | <a href="#">Mr D. Tual</a>        |
| 4M3      | <a href="#">Spanish</a>                                                | M(10)         | Coursework            |                      |                    | <a href="#">Moodle</a> | <a href="#">Mr S. Bianchi</a>     |
| 4M9      | <a href="#">Surveying field course</a>                                 | long vac      | Coursework            | Surveying experience |                    |                        | <a href="#">Dr D Liang</a>        |
| 4M12     | <a href="#">Partial differential equations and variational methods</a> | L(1)          | Exam                  |                      |                    | <a href="#">Moodle</a> | <a href="#">Dr J.S. Biggins</a>   |
| 4M16     | <a href="#">Nuclear power engineering</a>                              | L(1)          | Exam                  |                      |                    | <a href="#">Moodle</a> | <a href="#">Dr G.T. Parks</a>     |
| 4M17     | <a href="#">Practical optimization</a>                                 | M(11)         | Coursework            | 3M1                  |                    | <a href="#">Moodle</a> | <a href="#">Dr G Vinnicombe</a>   |
| 4M19     | <a href="#">Advanced building physics</a>                              | M(2)          | Coursework            | 3D8                  |                    | <a href="#">Moodle</a> | <a href="#">Dr M. Overend</a>     |
| 4M20     | <a href="#">Robotics</a>                                               | M(8)          | Coursework            |                      | 3C5, 3C8, 3F2, 3F3 | <a href="#">Moodle</a> | <a href="#">Dr F Iida</a>         |
| 4M21     | <a href="#">Software engineering and design</a>                        | L(7)          | Exam                  |                      |                    |                        | <a href="#">Dr E. Punskeya</a>    |
| 4M22     | <a href="#">Climate change mitigation</a>                              | M(12)         | Coursework            |                      |                    |                        | <a href="#">Prof. J.M.Allwood</a> |

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