Part IIB syllabuses; links to on-line resources

Published on CUED undergraduate teaching (http://teaching.eng.cam.ac.uk)

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

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Title (linked to syllabus)</th>
<th>Term (set)</th>
<th>Form of assessment</th>
<th>Prerequisites Assumed</th>
<th>Usefull</th>
<th>On-line resources</th>
<th>Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>4A2</td>
<td>Computational fluid dynamics</td>
<td>M(1)</td>
<td>Coursework</td>
<td>3A1, 3A3</td>
<td></td>
<td>Moodle</td>
<td>Dr P. Hynes</td>
</tr>
<tr>
<td>4A3</td>
<td>Turbomachinery</td>
<td>M(4)</td>
<td>Exam and coursework</td>
<td>3A1, 3A3</td>
<td></td>
<td>Moodle</td>
<td>Dr N. R. Atkins</td>
</tr>
<tr>
<td>4A4</td>
<td>Aircraft stability and control</td>
<td>M(7)</td>
<td>Coursework</td>
<td>3A1, 3A3</td>
<td></td>
<td>Moodle</td>
<td>Dr W. R. Graham</td>
</tr>
<tr>
<td>4A7</td>
<td>Aerodynamics</td>
<td>M(8)</td>
<td>Coursework</td>
<td>3A1, 3A3</td>
<td></td>
<td>Moodle</td>
<td>Dr J. Jarrett</td>
</tr>
<tr>
<td>4A9</td>
<td>Molecular thermodynamics</td>
<td>M(5)</td>
<td>Exam</td>
<td>3A1, 3A5</td>
<td></td>
<td>Moodle</td>
<td>Dr A. J. White</td>
</tr>
<tr>
<td>4A10</td>
<td>Flow instability</td>
<td>L(11)</td>
<td>Exam</td>
<td>3A1</td>
<td></td>
<td>Moodle</td>
<td>Prof. G. Hunt</td>
</tr>
<tr>
<td>4A11</td>
<td>Turbulence and vortex dynamics</td>
<td>L(3)</td>
<td>Exam</td>
<td>3A1, 3A3</td>
<td></td>
<td>Moodle</td>
<td>Prof. P. Davidson</td>
</tr>
<tr>
<td>4A12</td>
<td>Combustion and IC engines</td>
<td>L(5)</td>
<td>Exam</td>
<td>3A5, 3A6</td>
<td></td>
<td>Moodle</td>
<td>Prof. S. Hochgreb</td>
</tr>
<tr>
<td>4A13</td>
<td>Aeroacoustics</td>
<td>M(6)</td>
<td>Exam</td>
<td>3A1</td>
<td></td>
<td>Moodle</td>
<td>Dr A. Agarwal</td>
</tr>
</tbody>
</table>

Group B: Electrical Engineering

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Title (linked to syllabus)</th>
<th>Term (set)</th>
<th>Form of assessment</th>
<th>Prerequisites Assumed</th>
<th>Usefull</th>
<th>On-line resources</th>
<th>Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>4B2</td>
<td>Power microelectronics</td>
<td>M(6)</td>
<td>Exam</td>
<td>3B3, 3B5</td>
<td></td>
<td>Moodle</td>
<td>Prof. F. Udrea</td>
</tr>
<tr>
<td>4B6</td>
<td>Solid state devices and chemical/biological sensors</td>
<td>L(3)</td>
<td>Exam</td>
<td>3B5, 3B6</td>
<td></td>
<td>Moodle</td>
<td>Prof. D. Chu</td>
</tr>
<tr>
<td>4B10</td>
<td>Photonic systems</td>
<td>M(5)</td>
<td>Exam</td>
<td>3B6</td>
<td></td>
<td>Moodle</td>
<td>Prof. T. Wilkinson</td>
</tr>
<tr>
<td>4B11</td>
<td>Electronic sensors and</td>
<td>L(1)</td>
<td>Exam</td>
<td>3B1</td>
<td></td>
<td>Moodle</td>
<td>Dr P. A</td>
</tr>
</tbody>
</table>

Page 1 of 5
<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Code</th>
<th>Title (linked to syllabus)</th>
<th>Form of assessment</th>
<th>Prerequisites</th>
<th>On-line resources</th>
<th>Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4B1</td>
<td>instrumentation</td>
<td>M(2) Exam</td>
<td>3B3, 3B4, 3B6</td>
<td>Moodle</td>
<td>Robertson</td>
</tr>
<tr>
<td>4B2</td>
<td>2</td>
<td>Flexible Electronics</td>
<td>L(5) Exam</td>
<td>3B5</td>
<td>Moodle</td>
<td>Dr F Torrisi</td>
</tr>
<tr>
<td>4B2</td>
<td>3</td>
<td>Optical Fibre Communication</td>
<td>L(2) Exam and coursework</td>
<td>3B6, 3F4</td>
<td>Moodle</td>
<td>Dr S J Savory</td>
</tr>
<tr>
<td>4B2</td>
<td>4</td>
<td>Radio frequency systems</td>
<td>L(4) Exam and coursework</td>
<td>3B1</td>
<td>Moodle</td>
<td>Dr M J Crisp</td>
</tr>
<tr>
<td>4B2</td>
<td>5</td>
<td>Embedded systems for the internet of things</td>
<td>M(7) Coursework</td>
<td>3B2</td>
<td>Moodle</td>
<td>Dr P Stanley-Marbell</td>
</tr>
</tbody>
</table>

**Group C: Mechanics, Materials and Design**

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Code</th>
<th>Title (linked to syllabus)</th>
<th>Form of assessment</th>
<th>Prerequisites</th>
<th>On-line resources</th>
<th>Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>4C2</td>
<td></td>
<td>Designing with composites</td>
<td>M(3) Exam and coursework</td>
<td></td>
<td>Moodle</td>
<td>Dr A Markaki</td>
</tr>
<tr>
<td>4C3</td>
<td></td>
<td>Electrical and nano materials</td>
<td>M(8) Exam</td>
<td></td>
<td>Moodle</td>
<td>Dr J H Durrell</td>
</tr>
<tr>
<td>4C4</td>
<td></td>
<td>Design methods</td>
<td>M(2) Exam</td>
<td></td>
<td>Moodle</td>
<td>Dr J. Cullen</td>
</tr>
<tr>
<td>4C5</td>
<td></td>
<td>Design case studies</td>
<td>L(4) Coursework</td>
<td>4C4</td>
<td>Moodle</td>
<td>Dr P Kristensson</td>
</tr>
<tr>
<td>4C6</td>
<td></td>
<td>Advanced linear vibrations</td>
<td>M(4) Exam and coursework</td>
<td>3C6</td>
<td>Moodle</td>
<td>Prof. J. Woodhouse</td>
</tr>
<tr>
<td>4C7</td>
<td></td>
<td>Random and non-linear vibrations</td>
<td>M(5) Exam and coursework</td>
<td>3C6</td>
<td>Moodle</td>
<td>Prof. R. Langley</td>
</tr>
<tr>
<td>4C8</td>
<td></td>
<td>Vehicle Dynamics</td>
<td>L(8) Exam and coursework</td>
<td>3C5, 3C6</td>
<td>Moodle</td>
<td>Prof D Cebon</td>
</tr>
<tr>
<td>4C9</td>
<td></td>
<td>Continuum mechanics</td>
<td>L(7) Exam</td>
<td>3C7, 3D7</td>
<td>Moodle</td>
<td>Dr G McShane</td>
</tr>
<tr>
<td>4C1</td>
<td></td>
<td>MEMS: design</td>
<td>L(2) Exam and coursework</td>
<td></td>
<td>Moodle</td>
<td>Prof A. Seshia</td>
</tr>
</tbody>
</table>

**Group D: Civil, Structural and Environmental Engineering**

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Code</th>
<th>Title (linked to syllabus)</th>
<th>Form of assessment</th>
<th>Prerequisites</th>
<th>On-line resources</th>
<th>Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>4D4</td>
<td></td>
<td>Construction engineering</td>
<td>L(4) Coursework</td>
<td>3D1, 3D2, 4D16</td>
<td>Moodle</td>
<td>Dr I Brilakis</td>
</tr>
<tr>
<td>4D5</td>
<td></td>
<td>Foundation engineering</td>
<td>L(5) Exam</td>
<td>3D2</td>
<td>Moodle</td>
<td>Dr G. Biscontin</td>
</tr>
<tr>
<td>4D6</td>
<td></td>
<td>Dynamics in civil engineering</td>
<td>L(2) Exam and coursework</td>
<td>3D2, 3D4, 3D7</td>
<td>Moodle</td>
<td>Prof. G. Madabhushi</td>
</tr>
<tr>
<td>4D7</td>
<td></td>
<td>Concrete structures</td>
<td>M(4) Exam and coursework</td>
<td>3D3</td>
<td>Moodle</td>
<td>Prof. C. Middleton</td>
</tr>
<tr>
<td>4D8</td>
<td></td>
<td>Pre-stressed Concrete</td>
<td>L(1) Exam</td>
<td>3D3, 3D4</td>
<td>Moodle</td>
<td>Prof T J Ibell</td>
</tr>
<tr>
<td>Module Code</td>
<td>Module Title (linked to syllabus)</td>
<td>Term (set)</td>
<td>Form of Assessment</td>
<td>Prerequisites Assumed</td>
<td>Useful</td>
<td>On-line Resources</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------</td>
<td>------------</td>
<td>--------------------</td>
<td>-----------------------</td>
<td>--------</td>
<td>------------------</td>
</tr>
<tr>
<td>4D10</td>
<td>Structural steelwork</td>
<td>M(3)</td>
<td>Exam and Coursework</td>
<td>3D4</td>
<td>3D3</td>
<td>Moodle</td>
</tr>
<tr>
<td>4D13</td>
<td>Architectural engineering</td>
<td>M(8)</td>
<td>Coursework</td>
<td>3D3, 3D4, 3D8</td>
<td></td>
<td>Moodle</td>
</tr>
<tr>
<td>4D14</td>
<td>Contaminated land and waste containment</td>
<td>L(3)</td>
<td>Exam and Coursework</td>
<td>3D8</td>
<td>Moodle</td>
<td>Prof A Al-Tabbaa</td>
</tr>
</tbody>
</table>

**Group E: Management and Manufacturing**

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Title (linked to syllabus)</th>
<th>Term (set)</th>
<th>Form of Assessment</th>
<th>Prerequisites Assumed</th>
<th>Useful</th>
<th>On-line Resources</th>
<th>Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>4E1</td>
<td>Innovation and strategic management of intellectual property</td>
<td>M(9)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr F Tietze</td>
</tr>
<tr>
<td>4E3</td>
<td>Business innovation in a digital age</td>
<td>M(9)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr S Pachidi</td>
</tr>
<tr>
<td>4E4</td>
<td>Management of technology</td>
<td>M(9)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr T. Minshall</td>
</tr>
<tr>
<td>4E5</td>
<td>International Business</td>
<td>L(9)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr J.J. Kroezen</td>
</tr>
<tr>
<td>4E6</td>
<td>Accounting and finance</td>
<td>M(9)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr O. Cole</td>
</tr>
<tr>
<td>4E11</td>
<td>Strategic management</td>
<td>L(9)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Prof S. Ansari</td>
</tr>
<tr>
<td>4E12</td>
<td>Project management</td>
<td>L(9)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr N. Oraiopoulos</td>
</tr>
</tbody>
</table>

**Group F: Information Engineering**

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Title (linked to syllabus)</th>
<th>Term (set)</th>
<th>Form of Assessment</th>
<th>Prerequisites Assumed</th>
<th>Useful</th>
<th>On-line Resources</th>
<th>Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>4F1</td>
<td>Control system design</td>
<td>M(7)</td>
<td>Exam and Coursework</td>
<td>3F1, 3F2</td>
<td></td>
<td>Moodle</td>
<td>Dr I Lestas</td>
</tr>
<tr>
<td>4F2</td>
<td>Robust and nonlinear systems and control</td>
<td>L(7)</td>
<td>Exam</td>
<td>3F2</td>
<td>Moodle</td>
<td>Dr F F Forni</td>
<td></td>
</tr>
<tr>
<td>4F5</td>
<td>Advanced communications and coding</td>
<td>L(6)</td>
<td>Exam</td>
<td>3F1, 3F4,3F7</td>
<td>Moodle</td>
<td>Dr J. Sayir</td>
<td></td>
</tr>
<tr>
<td>4F7</td>
<td>Statistical signal analysis</td>
<td>M(4)</td>
<td>Exam</td>
<td>3F3</td>
<td>3F1, 3F8</td>
<td>Moodle</td>
<td>Dr S. Singh</td>
</tr>
<tr>
<td>4F8</td>
<td>Image processing and image coding</td>
<td>L(3)</td>
<td>Exam</td>
<td>3F1</td>
<td>3F3, 3F7</td>
<td>Moodle</td>
<td>Dr J Lasenby</td>
</tr>
<tr>
<td>4F10</td>
<td>Deep learning and structured data</td>
<td>M(6)</td>
<td>Exam</td>
<td>3F1, 3F3, 3F8</td>
<td></td>
<td>Moodle</td>
<td>Prof. M.J. Gales</td>
</tr>
<tr>
<td>4F12</td>
<td>Computer vision</td>
<td>M(2)</td>
<td>Exam</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Prof. R. Cipolla</td>
</tr>
<tr>
<td>4F13</td>
<td>Probabilistic Machine Learning</td>
<td>M(1)</td>
<td>Coursework</td>
<td>3F3</td>
<td></td>
<td>Machine learning lecture notes</td>
<td>Prof C. Rasmussen</td>
</tr>
<tr>
<td>4F14</td>
<td>Computer Systems</td>
<td>L(5)</td>
<td>Exam and Coursework</td>
<td>Part I Digital circuits and computing</td>
<td>Moodle</td>
<td>Dr A H Gee</td>
<td></td>
</tr>
</tbody>
</table>
## Group G: Bioengineering

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Title (linked to syllabus)</th>
<th>Term (set)</th>
<th>Form of assessment</th>
<th>Prerequisites Assumed</th>
<th>Useful</th>
<th>On-line resources</th>
<th>Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>4G1</td>
<td>Mathematical biology of the cell</td>
<td>M(11)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr T. Savin</td>
</tr>
<tr>
<td>4G2</td>
<td>Biosensors</td>
<td>L(6)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Prof A. Seshia</td>
</tr>
<tr>
<td>4G3</td>
<td>Computational neuroscience</td>
<td>L(4)</td>
<td>Coursework</td>
<td>3G2, 3G3</td>
<td></td>
<td>Moodle</td>
<td>Prof M Lengyel</td>
</tr>
<tr>
<td>4G4</td>
<td>Biomimetics</td>
<td>L(11)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr M L Oyen</td>
</tr>
</tbody>
</table>

## 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.

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Title (linked to syllabus)</th>
<th>Term (set)</th>
<th>Form of assessment</th>
<th>Prerequisites Assumed</th>
<th>Useful</th>
<th>On-line resources</th>
<th>Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>4I1</td>
<td>Strategic valuation</td>
<td>M(vac)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr H. Jiang</td>
</tr>
<tr>
<td>4I7</td>
<td>Electricity and environment</td>
<td>L(6)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr M Pollitt</td>
</tr>
<tr>
<td>4I8</td>
<td>Medical physics</td>
<td>L(8)</td>
<td>Exam</td>
<td>3G4</td>
<td></td>
<td>Moodle</td>
<td>Dr G Treece</td>
</tr>
<tr>
<td>4I10</td>
<td>Nuclear reactor engineering</td>
<td>M(5)</td>
<td>Exam</td>
<td>4M16</td>
<td></td>
<td>Moodle</td>
<td>Dr E. Shwageraus</td>
</tr>
<tr>
<td>4I11</td>
<td>Advanced fission and fusion systems</td>
<td>L(8)</td>
<td>Coursework</td>
<td>4M16</td>
<td></td>
<td>Moodle</td>
<td>Dr E. Shwageraus</td>
</tr>
</tbody>
</table>

## Group M: Multidisciplinary Modules

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Title (linked to syllabus)</th>
<th>Term (set)</th>
<th>Form of assessment</th>
<th>Prerequisites Assumed</th>
<th>Useful</th>
<th>On-line resources</th>
<th>Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>4M1</td>
<td>French</td>
<td>L(10)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Mr D. Tual</td>
</tr>
<tr>
<td>4M2</td>
<td>German</td>
<td>L(10)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Mr A Bleistein</td>
</tr>
<tr>
<td>4M3</td>
<td>Spanish</td>
<td>M(10)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Mr S. Bianchi</td>
</tr>
<tr>
<td>4M9</td>
<td>Surveying field course</td>
<td>long vac</td>
<td>Coursework</td>
<td>Surveying experience</td>
<td></td>
<td>Moodle</td>
<td>Mr A.L. Johnson</td>
</tr>
<tr>
<td>4M12</td>
<td>Partial differential equations and variational methods</td>
<td>L(1)</td>
<td>Exam</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Prof. P. Davidson</td>
</tr>
<tr>
<td>4M14</td>
<td>Sustainable development</td>
<td>M(17)</td>
<td>Coursework</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr K MacAskill</td>
</tr>
<tr>
<td>4M16</td>
<td>Nuclear power engineering</td>
<td>L(1)</td>
<td>Exam</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr G.T. Parks</td>
</tr>
<tr>
<td>4M17</td>
<td>Practical optimization</td>
<td>M(11)</td>
<td>Coursework</td>
<td>3M1</td>
<td></td>
<td>Moodle</td>
<td>Prof R. Sepulchre</td>
</tr>
<tr>
<td>4M18</td>
<td>Present and future energy systems</td>
<td>M(3)</td>
<td>Exam</td>
<td></td>
<td></td>
<td>Moodle</td>
<td>Dr P. Palmer</td>
</tr>
<tr>
<td>Module Code</td>
<td>Title (linked to syllabus)</td>
<td>Term (set)</td>
<td>Form of assessment</td>
<td>Prerequisites</td>
<td>On-line resources</td>
<td>Leader</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------</td>
<td>------------</td>
<td>--------------------</td>
<td>---------------</td>
<td>-------------------</td>
<td>-----------------------</td>
<td></td>
</tr>
<tr>
<td>4M19</td>
<td>Advanced building physics</td>
<td>M(2)</td>
<td>Coursework</td>
<td>3D8</td>
<td>Moodle</td>
<td>Dr. M. Overend</td>
<td></td>
</tr>
<tr>
<td>4M20</td>
<td>Robotics</td>
<td>M(8)</td>
<td>Coursework</td>
<td>3C5, 3C8, 3F2, 3F3</td>
<td>Moodle</td>
<td>Dr. F. Iida</td>
<td></td>
</tr>
<tr>
<td>4M21</td>
<td>Software engineering and design</td>
<td>L(7)</td>
<td>Exam</td>
<td></td>
<td></td>
<td>Dr. E. Punskaya</td>
<td></td>
</tr>
</tbody>
</table>

**Source URL (modified on 19-03-18):** http://teaching.eng.cam.ac.uk/content/part-iib-syllabuses-links-line-resources