

Engineering Tripos Part IIB, 4D13: Architectural Engineering, 2020-21

Module Leader (Engineering)

[Dr R Foster](#) [1]

Module Leader (Architecture)

[Dr M Ramage](#) [2]

Lecturer

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Timing and Structure

Michaelmas term. 8 afternoons. Assessment: 100% coursework

Prerequisites

[3D3, 3D4, 3D8] useful

Aims

The aims of the course are to:

- Teach architects and engineers to work together to solve design problems at the intersection of their disciplines.

Objectives

As specific objectives, by the end of the course students should be able to:

- Operate and communicate effectively in multidisciplinary design teams of architects and engineers, and present solutions to and derive useful, actionable feedback from various stakeholders (e.g. client, peers and co-professionals, constructors)
- By reflecting on and through improved understanding of the collaborative design process, apply appropriate management strategies to design innovative efficient solutions to a client's design brief
- Appreciate the principles of architectural engineering through investigation, critical appraisal and selection of appropriate structural systems, materials, and construction techniques relevant to architectural and engineering design, and assessing the e
- Demonstrate proficiency in specialized design subject matter which integrates with the team's design solution, such as timber engineering, resource efficient design, designing for well-being, reciprocity of context and design.

Content

This module is run in conjunction with the Department of Architecture. CUED students who elect to do this module will work together one full afternoon per week with final year students from the Department of Architecture. The

module involves an architectural engineering design exercise, with students working in mixed groups of architects and engineers.

The course focuses on integrating architecture and engineering to produce new designs. Developing an understanding of the challenges and opportunities presented by multidisciplinary teamwork is integral to the course.

Projects vary considerably from year to year. The Michaelmas 2019 project was to design a tall timber building over an underground station in London. This year's project will be quite different.

The teaching format will be unconventional. Each afternoon will usually begin with a short talk by one of the lecturers or by an external speaker. For the remaining class time, students will work in groups on developing their design project(s) with regular 'studio' style consultation sessions with teaching staff and/or guest speakers to provide feedback on design development. Depending on the covid19 restrictions prevailing at the time of the course, some, or perhaps all, of this 'class' time may be virtual. This presents us with some new challenges, but we hope that in overcoming them we may also find some new opportunities. This year's project has been carefully designed with these challenges in mind.

Towards the end of the course each group will make a presentation of its design to a review panel of architectural, structural, environmental experts.

Course Schedule

All classes will be 2.00-5.00pm on Thursdays.

Week 1: Thursday 8th October

- **Course introduction**
- Groups will be allocated and teams will be built

Weeks 2-5: Thursday 15th October – Thursday 5th November

- **Talks on key skills or elements of the design process relevant to the project at hand.**
- Group work and 'studio' time with teaching staff supporting project development.

Week 6: Thursday 12th November

- **Presentations and design review**
- Groups will present their designs to a panel of expert reviewers and receive feedback

Week 7-8: Thursday 19th November - Thursday 26th November

- **Talks on key skills or elements of the design process relevant to the project at hand.**
- Group work and 'studio' time with teaching staff to refine designs in response to reviewer feedback and progress to production of the final group design submission.

Coursework

All coursework submissions are to be uploaded to relevant folder on the course moodle page. Detailed instructions will be provided on the course moodle page. There will be no hardcopy submissions.

Coursework	Form
Group Presentation and Design Review Each group will present their design proposal through a prepared video of 3-4 minutes, then get feedback from the jury	Group Presentation (Non-graded) (Name of group, the
Group Design Submission Each group will submit a digital copy of their design, including fabrication drawings, and a short video (refinement of the previous) detailing the project and design process.	Group Design Submission (Non-graded)
Individual Report A short report developing and extending one or more aspects of the group design (40%). The report should also include a critical reflection on the collaborative, multi-disciplinary nature of the design process, and how, given your experience, you might improve the design process in the future (20%).	Individual Report (Non-graded)

Booklists

Please refer to the Booklist for Part IIB Courses for references to this module, this can be found on the associated Moodle course.

Examination Guidelines

Please refer to [Form & conduct of the examinations](#) [4].

UK-SPEC

The [UK Standard for Professional Engineering Competence \(UK-SPEC\)](#) [5] describes the requirements that have to be met in order to become a Chartered Engineer, and gives examples of ways of doing this.

UK-SPEC is published by the Engineering Council on behalf of the UK engineering profession. The standard has been developed, and is regularly updated, by panels representing professional engineering institutions, employers and engineering educators. Of particular relevance here is the ['Accreditation of Higher Education Programmes' \(AHEP\) document](#) [6] which sets out the standard for degree accreditation.

The [Output Standards Matrices](#) [7] indicate where each of the Output Criteria as specified in the AHEP 3rd edition document is addressed within the Engineering and Manufacturing Engineering Triposes.

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Links

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[3] <mailto:rmf41@cam.ac.uk>, mhr29@cam.ac.uk, dus20@cam.ac.uk

[4] <http://teaching.eng.cam.ac.uk/content/form-conduct-examinations>

[5] <http://www.engc.org.uk/ukspec.aspx>

[6] <http://www.engc.org.uk/standards-guidance/standards/accreditation-of-higher-education-programmes-ahep/>

[7] <http://teaching.eng.cam.ac.uk/content/output-standards-matrices>