

Engineering Tripos Part IIA Project, SC1: Automotive Suspension, 2020-21

Leader

[Dr D J Cole](#) [1]

Timing and Structure

Fridays 9-11am plus afternoons, and Tuesdays 11-1pm

Prerequisites

None

Aims

The aims of the course are to:

- To introduce the requirements and constraints associated with the design of an automotive suspension.
- To perform relevant design calculations to predict and optimise the performance of particular components of the assembly.
- To understand the importance of selecting appropriate materials, manufacturing processes and standard parts.
- To prepare detail design information necessary for manufacture.

Content

This project involves the design of components of an automotive suspension assembly for a Formula Student race car. Tasks include conceptual, embodiment and detail design, all performed individually. The project should appeal to students interested in mechanical design and automotive engineering.

FORMAT

Lectures will be given on automotive suspension systems and mechanical design. Demonstrators will be available at other timetabled sessions to discuss individual design work. Students work individually, but discussion of ideas will be encouraged. Work takes place in the Dyson Centre in week 1, and in the DPO during weeks 2-4.

ACTIVITIES

Week 1: Review existing design solutions. Identify the key design requirements and constraints. Perform a material selection exercise for several components of a suspension assembly. Write a short report.

Week 2: Select a design concept. Perform calculations to estimate the forces in the suspension assembly. Select standard parts. Write a short report.

Week 3: Select component geometries, materials and manufacturing processes. Optimise the design to satisfy the requirements and constraints. Prepare a design arrangement drawing and parts list.

Week 4: Prepare a dimensioned and toleranced detail drawing of one component of the assembly. Write final report.

Coursework

Coursework	Due date	Marks
Interim report 1	Thu 20 May 2021	15
Interim report 2	Thu 27 May 2021	15
Final report	4pm Fri 11 June 2021	50

Examination Guidelines

Please refer to [Form & conduct of the examinations](#) [2].

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Links

[1] <mailto:djc13@cam.ac.uk>

[2] <https://teaching23-24.eng.cam.ac.uk/content/form-conduct-examinations>