

## **Engineering Tripos Part IIA Project, SC1: Automotive Suspension, 2018-19**

### **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 the components and 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 automotive suspension components 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, constraints and functions. Generate and evaluate design solutions and select one for embodiment/detail design. Write a short report.

Week 2: Perform design calculations and refine the design solution. Select standard parts. Write a short report.

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

Week 4: Prepare dimensioned and toleranced detail drawings of selected components. Prepare manufacturing instructions. Write final report.

**Coursework**

Coursework	Due date	Marks
Interim report 1	Thu 16 May 2019	15
Interim report 2	Thu 23 May 2019	15
Final report	4pm Fri 7 June 2019	50

**Examination Guidelines**

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

Last modified: 03/10/2018 10:18

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**Links**

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

[2] <https://teaching22-23.eng.cam.ac.uk/content/form-conduct-examinations>