EEU33C09  ANALOGUE CIRCUIT DESIGN PROJECT [5 credits]

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Module organisation
Semester 2: One three hour laboratory session per week.

Module description, aims and contribution to programme
The main purpose of the analogue design project is to develop students’ practical knowledge of the design, implementation, and testing of analogue electronic circuits. This exercise affords students the opportunity to apply the principles learned in lectures to a practical, in-vivo problem by designing an analogue circuit to accomplish the task specified. The circuit is built and tested on breadboard to ensure it is fully functional and meets the performance requirements outlined in the project description.

Learning outcomes
After the successful completion of this module students should be able to:
1. Interpret a problem and establish a circuit design task from a project description
2. Design an analogue electronic circuit to accomplish a specified task
3. Construct an electronic circuit on breadboard using standard components
4. Test and debug an electronic circuit to verify its performance
5. Write a comprehensive technical report outlining the design and test procedure.

Module content
Students will work in small groups of two to carry out the analogue circuit design project. The project will be given as a description of an instrumentation-based problem which is to be solved by the use an analogue circuit. Students will be expected to interpret the problem as defined and propose a circuit based solution to the problem. They will then design an analogue circuit using the principles learned in lectures to implement the proposed solution and construct this circuit on breadboard using standard commercially available components which will be supplied in the laboratory. Laboratory test equipment will then be used to test and debug the circuit which will be modified or redesigned as required to meet the performance requirements. Each student will write up an individual technical report which will be submitted as part of the project on its completion.

Teaching strategies
The students will be expected to work largely on their own initiative in pairs. The member of academic staff responsible for the project will be in attendance, supported by demonstrator assistance. They will circulate among groups to see how students approach the problem and implement a design solution. Advice and guidance will be offered on their progress and to keep them on track towards a realistic and viable circuit design. They will also be given the technical support needed with the use of test equipment in verifying the functionality of their circuits on breadboard. However, students will be encouraged to think for themselves and come up with their own ideas and solutions to problems.
**Assessment**

The Analogue Circuit Design Project will be marked entirely by continuous assessment. Marks will be awarded for attendance and in-laboratory performance as well as for the final technical report submitted. Students will only be awarded a final mark for the module if they attend laboratory sessions and submit a project report. Students who attend laboratory sessions but do not submit a project report will receive a zero mark, as will students who do not attend the laboratory sessions but submit a report. The accrued mark will form 100% of the module mark at the Annual Examinations. Failing students who are required to take a Supplemental Examination in this module will be asked to attend the laboratory and carry out all aspects of the project, including the report in the week preceding the written Supplemental Examinations in Michaelmas term.

**Required textbook**

None specifically recommended. Lecture notes from other circuit analysis and design related courses will prove useful.

**Further information**

http://www.tcd.ie/Engineering/undergraduate/baiyear3/