

Course Project Brief 2018

1. The Project

Students will have to identify a unique measurement application and then design, analyse and report on a suitable "smart" instrumentation measurement system with a bandwidth of at least 100Hz to be used in the transportation electrification application. Any type of ground electrified transportation system, this includes but not limited to electric vehicles, trains and electric buses. **There is a restriction of one student group per application.** A group is formed by two students. Any odd member shall be assigned by the lecturer to a random group to form a group of three. Components for the system may not include any used in any previous project undertaken for your degree. **(i.e. No components, sensors or microprocessors used for the third year project.)**

A measurement application is only uniquely yours after the proposal has been approved. You will be required to complete the following:

- Determine a suitable application.
- Submit a one A4 page giving all the requirements (including both static and dynamic specifications) of the application for approval. Approval for you to continue with the project will be given after your submission.
- Investigate currently used measurement systems for your application.
- Design a "Smart Transducer" measurement system [1], complex enough to contain all the elements contained in Bentley's generalised model of a measurement system [2, page:16].
- Analyse the system to enable a full specification of the system to be presented in your report.
- Must provide the detailed results of running tests from tools such as but not limited to Matlab, and PSpice
- Submit a report as described in section 2 by the due time and date as reflected on the **Key Dates** list.
- Upon Approval of Proposal a group will be assigned an Oral Presentation date; students are to be available at 08:00hrs on the date of their presentation and lateness is deemed as UNACCEPTABLE for assessment purposes.
- **All ECSA ELOs as outlined in the CB&O must be met in the Report and as well as the Oral.**

As stated, in the course brief and outline, "The main content of the lectures will be to discuss project related concepts and problems".

Each student group will be required to make a presentation on their particular measurement and measurement system.

2. The Report

Reports in a "paper" format must be no longer than five A4 sides **typed in 11 point typeface or larger**. The report must follow the guidelines given the booklet "Communication and the Engineer". If you have not got one . . . **GET ONE!!!**

Additional pages with only the complete circuit diagram of your system may be attached. Reports not conforming to specifications will be penalised.

The report must contain sections describing all the work as described in section 1 including:

- A table giving the static specifications of your system.

- A detailed plot of the dynamic response of the system.
- Not more than 20% of the references may be web or Internet articles.

Reports must be placed in the box at reception by the published deadline.

NB: Late reports: See School Policy on late reports

3. Project marks

The project will be marked in terms of the ECSA outcomes using the Course Project assessment forms. One third of the project marks shall be apportioned to the group Oral Presentation that shall be done during lectures.

Please Note: Unacceptable in any of the categories will result in failure of the project and also failure of the course. This means that if the Oral presentation which is part of the project assessment is unacceptable in any way then one of the categories of the project will have been failed and the course will also be failed. Late arrival for Presentation is deemed as unacceptable

4. Notes for students

The intention of the course project is not for the student to supply a shopping list of "off the shelf" systems and sub-systems but to design such systems to enable the required measurement. If in doubt, discuss this with the course lecturer, whose decision is final.

The specifications given are deliberately vague. You will have to visit the University's libraries to obtain information. You should consult with your lecturer, though he usually answers a question with a question. The length of the report has been chosen with care. It will require time to produce a short report. Use the guide. A total of 30 hrs is allocated to the project. The third allocated period, can be used to consult with the lecturer at your request.

References

- [1] M.V. Shuma-Iwisi and G.J. Gibbon. Smart transducers: A reconstructed definition and a link to microcontrollers. 1st African Control Conference (AFCON 2003), Cape Town, 2003.
- [2] J.P. Bentley. Principles of measurement systems. 4th Edition, Harlow, England: Pearson, 2005.