**Detailed Design**

**5.0 Group Design and Business Part II: EE40148**

The EE40148 assessment schedule is provided in Section 3.0 above. The following sections explain the activities you will undertake in detail.

In this part of the Group Business & Design Project **the key deliverables are a report, an individual viva and a presentation at the Design exhibition.** The assessment table in Section 3.0 shows the activities in this unit, whether the activities are assessed as a group mark or as an individual mark, their relative contributions and the hand-in dates.

The Technical Detail Report should be not more than 10,000 words (excluding tables, figures and associated diagrams). A template for this report is given in Section 5.1.2.

**5.1 Technical detail design report**

The Technical Detail Report element of the Group Design and Business Project covers the detailed design and testing/verification of the design for the product or service you are considering. This is an individual assessment. Most products or services are quite sophisticated and beyond the capabilities of an individual to complete in a reasonable time scale. Generally, a 'hierarchical' approach is used where the overall system is divided into sub-systems. Each sub-system can then be designed and tested by an individual engineer, or small group of engineers. If the interfaces between the sub-systems have been defined well by the group overall, the sub-systems should work together in conjunction to make a working prototype of the product.

**5.1.1 Outline**

The objective of this exercise is for each member to submit a report that together forms set of Detailed Design Reports, each one covering the detailed design of a sub-system (or part) of the overall product or service. This should include details of the alternatives considered, how they were compared to identify the best option, and how the design is validated and tested. Each report needs to describe how the Group has divided the complete system into sub-systems, how the sub-systems interface with each other, and how the complete system is validated and tested.

An important part of this exercise is in developing the Target Specifications into the more definitive Design specification - the “Engineering Design” Section 6.0 may help in this. This includes defining the sub-systems and their interfaces. Only when this is done can the Design Specifications for the sub-systems be defined.

With the Design Specification in mind, alternative solutions should be sought and assessed/ranked in order to determine the best option for each sub-system. This option should then be validated, which could involve building prototype hardware and/or software depending on the type of project you are involved in. This validation process indicates to you, the Group, and perhaps the “customer”, that your design is working and meeting the required specifications.

In this process you should also produce Test Specifications. These define the tests to be made to show that the Design Specifications are being met, and the acceptable tolerances on the test measurements.

TITLE

EXECUTIVE SUMMARY [*What is the product or service being designed? What are the major design challenges addressed in this report? How successful has the design proved to be?*]

1. OVERVIEW

1. a) The product/service/device [*A description of the product/service/device as a whole.*]
2. b) The Design Task [*Describe how the whole system to be designed is to be divided into sub-systems. Define the interfaces between the whole system and the particular sub-system(s) that are the subject of this report by means of a Design Specification for the interface.*]

2. DESIGN SPECIFICATION

[*Bearing in mind the Target Specification for the complete product, and the way it has been divided into interfaced sub-systems, detail the design specification for the sub-system(s) you are to consider.*]

3. THE DESIGN ALTERNATIVES

1. a) Alternative designs or Options [*Describe the alternative designs that have been considered in order to meet the Design Specification for your sub-system.*]
2. b) Assessment of Alternatives [*Describe how the alternative design options for your sub-system were assessed and ranked against each other, and which one is the favoured option.*]
3. c) Design Validation [*Detail the simulations or measurements used to show that the design of the sub-system works. Detail the simulations or measurements the Group used to show that the complete system works.*]
4. d) Test Specification [*Detail the particular tests that are to be made in order to show that the sub-system design meets the Design Specification. Detail the particular tests that are to be made in order to show that the whole product meets the Design Specifications. Indicate the acceptable tolerances on the values to be tested.*]

4. THE FINAL DESIGN

[*Summarise the final design of the subsystem (components or parts list and detailed costing is probably better placed in an Appendix). Indicate how successfully the specifications have been met. Indicate if there are any points of concern - are some of the specifications hard to meet, in the light of this Design Study might a re-design of some parts yield a better and/or cheaper solution?*]

5. APPENDICES

[*As needed, but remember that the reader should be able to understand the main report without having to read the Appendices.*]