Unit T1:   Major Project

Unit code:	Y/503/7221
QCF level:	6
Credit value:	30

Aim

This unit aims to give learners the skills required to undertake a major project relevant to sector practice. The major project will assess learners' ability to apply their knowledge of the sector, use appropriate analytical skills to investigate a sector-related topic and solve problems.

Unit abstract

Learners will be required to formulate a project proposal related to an area of engineering that interests them and which will contribute to their professional development. The major project may be:

● a design study arising from a real engineering application

● the development of a product or hardware to meet employer requirements

● a project which supports a tutor's research interests.

Learners will carry out an initial critical review of key secondary sources of knowledge for the project proposal. Learners will select and justify an appropriate research methodology for their project proposal, and present the proposal, before undertaking the project. Learners will collect and analyse research data using appropriate established techniques, use established techniques to address their project requirements, critically evaluate the project outcomes and make justified recommendations for further study.

Learners must obtain approval for their project topic from the tutor before they begin developing their project proposal.

Learning outcomes

On successful completion of this unit a learner will:

1 be able to produce a project proposal relevant to a sector

2 be able to plan and manage the project

3 be able to implement the project to address identified requirements

4 be able to critically evaluate the project outcomes

5 be able to present the project outcomes.

Unit content

1 Be able to produce a research proposal relevant to a sector

Project aims and objectives: terms of reference; duration and milestones; rationale for selection; methodology for data collection and analysis; type of research; relevance/importance of the proposal to the sector

Review of key information sources: secondary sources; qualitative research sources, eg sector stakeholders

Critical analysis of research findings: credibility, validity, reliability of sources and findings

Methodology: research and select most relevant type(s) for project; pure or applied research, developmental, longitudinal, survey, questionnaire, case study

Presenting justification: professional delivery format; use of appropriate media; use of appropriate terminology

2 Be able to plan and manage the project

Strategy: project design; procedure; work breakdown; methods of investigation, methods of data collection

Resource implications: eg materials, equipment, personnel, computing, software, any costs (set up costs, operating costs, research costs, travel costs, time on project)

Project schedule: eg Gantt chart (main tasks, sub-tasks and dates by which tasks/deliverables are to be completed), use of computer-based project-management tools, contingency planning

Monitoring project progress: eg periodic meetings with supervisor, Gantt chart review

3 Be able to implement the project to address identified requirements

Critical review of key body of knowledge: credibility, validity, reliability of secondary research sources; frequency of references and esteem of publications in the sector; review qualitative research sources, eg interviews with sector stakeholders

Collect and collate primary data: quantitative research, eg questionnaires, interviews, surveys; qualitative research, eg case study, observation, interviews; selection and use of appropriate primary research instruments; systematic recording; methological problems (bias, variables and their control, validity and reliability); pre and/or post-implementation primary research

Established techniques: research analysis (primary and secondary data, qualitative and quantitative data analysis such as interpreting transcripts, coding techniques, statistical tables, comparison of variables, trends, forecasting); other techniques, eg application of current practice and theory (including from the wider sector context), application of technology (specialist software), production of prototype

Benefits and limitations: 'bluesky' thinking for sector; confirming/disagreeing with sector knowledge; conflict/agreement with recognised authorities

4 **Be able to critically evaluate the project outcomes**

Critical evaluation of project outcomes: objectives, focus, benefits, methodology difficulties; aims and objectives, evidence and findings (validity, reliability, benefits, difficulties), conclusion(s) (including how the work relates to a wider context such as theory and/or practice elsewhere)

Critical evaluation of own performance: overview of success or failure of project planning/management, independence, initiative, research/implementation skills

Recommendations for further study: eg significance of project investigation, application of research results, implications and importance to the sector, limitations of the investigation, improvements, recommendations for the future, areas for future research

5 **Be able to present the project outcomes**

Presentation: professional delivery format in media appropriate to the audience, eg formal written format, by *viva voce* or oral presentation, diagrammatic or graphical figures; critique of topic selected, secondary sources reviewed, methods used, own learning, procedures and techniques, drawing arguments together to reach conclusions on research findings

Learning outcomes and assessment criteria

Learning outcomes On successful completion of this unit a learner will::	Assessment criteria for pass The learner can:
LO1 Be able to produce a project proposal relevant to a sector	1.1 Formulate realistic aims and objectives for the project 1.2 Undertake an initial critical review of key information sources for the project 1.3 Critically analyse initial findings to inform the viability and structure of the project 1.4 Present a clear justification of the methodology for the project
LO2 Be able to plan and manage the project	2.1 Develop a realistic strategy for undertaking the project 2.2 Specify the resource implications for completion of the project 2.3 Develop a detailed schedule for the proposed project 2.4 Monitor progress of the project against agreed milestones and timelines
LO3 Be able to implement the project to address identified requirements	3.1 Undertake a coherent critical review of the key body of knowledge relevant to the project requirements 3.2 Collect and collate primary data relevant to the project requirements 3.3 Use established techniques to address the project requirements 3.4 Analyse the benefits and limitations of the project findings
LO4 Be able to critically evaluate the project outcomes	4.1 Critically evaluate the project outcomes in terms of the original project proposal 4.2 Critically evaluate own performance in undertaking the project 4.3 Make justified recommendations for further study
LO5 Be able to present the project outcomes	5.1 Present the project outcomes coherently in an agreed format

Guidance

Delivery

This unit will need to be delivered throughout the entire learning programme in learning outcome order. It is essential that sufficient tutor support and guidance is provided to enable the learner to select an appropriate and viable project proposal which can be developed into the required substantial project. It may also be useful to deliver lectures on methodology, referencing, data and analysis in the first few weeks of the unit. Centres may wish to give learners a project guide covering methodology, referencing, data, analysis and format for presentation of the project proposal and the project report.

Once the project proposal has been approved, it is essential that the learner has regular tutorials to monitor progress and ensure completion of the project to time.

Assessment

In order to pass this unit the learner must meet all the assessment criteria. In assessing the research project report, the following performance themes will also be considered:

- presentation of information

- applications of methods/knowledge/techniques to achieve solutions

- the depth/breadth of knowledge and/or understanding shown

- deployment of judgemental, critical, analytical or creative skills.

For example:

- Is there sufficient background for the assessors to understand the context of the project?

- Are the aims and objectives of the project clearly stated and realistic?

- Is there a clear relationship between the literature review and the project aims and objectives?

- How does the work relate to a wider context, eg theory and/or practice elsewhere?

- Are the methods used, the results and the outcomes clearly described?

- Is there clear presentation of relevant information and evidence to support the learner's arguments/conclusions?

- Has the learner shown originality, and how well have they used their own experience and material gleaned from elsewhere (theories, case studies etc) to back up the thrust of the argument?

- How well does the project draw together the arguments presented to reach conclusions?

- Were the methods chosen appropriate with hindsight?

- Was the extent/coverage of the topic adequate?

- Has the learner presented a coherent critical evaluation of thier performance?

As a guide, it is suggested that a research proposal will be in the region of 1,000 to 1,500 words. The 1,000 to 1,500 words can be incorporated in the final project report which should be in the region of 7,000 to 10,000 words.

Resources

Books

Bell J – *Doing Your Research Project*, 5th Edition (Open University Press, 2010) ISBN 978-0335235827

Kumar R – *Research Methodology: A Step-by-Step Guide for Beginners*, 3rd Edition (Sage Publications Ltd, 2010) ISBN 978-1849203012

Truss L – Eats, Shoots and Leaves: The Zero Tolerance Approach to Punctuation (Gotham Books, 2009) ISBN 978-1592404889