Unit 1: Major Project

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

Aim

This unit aims to give learners the skills needed 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 complex and interrelated problems.

This will enable learners to major on a sector-specific project reflecting their discipline and pathway. For example, learners on the construction and the built environment pathway will develop a separate project dealing with a complex construction issue, whereas those on the civil engineering pathway may choose a design project using Building Information Modelling (BIM). Learners on the building services engineering pathway may select a commissioning issue. The project must address innovation, sustainability, contracts, health, welfare and safety, and their coordination and integration into a real construction activity.

This will give learners an opportunity to undertake a sustained, rigorous and independent investigation of some aspect of professional practice within the sector specific pathways. The project must relate to the learner's work, organisation, and field of study or the learner's professional association.

The project must consist of original work. It should be informed by the theoretical knowledge and expertise developed through other units related to professional development. The project should focus on a theme, topic or problem which is relevant to the professional association and the personal interests of the learner and organisation. Research findings must be presented and interpreted. Learners must critically evaluate the research design and methodology used and identify the research outcomes in terms of actual or planned developments and changes.

In addition, it is intended that the experience of carrying out the research and authoring the results will give learners opportunities to:

- demonstrate their capability for analysis and reflection on practice
- develop the skills and knowledge necessary for lifelong professional development
- acquire the confidence and capability to progress on completion, to a Masters level programme.

Unit abstract

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

- an in-depth investigation and study arising from a construction project
- the development of a product, design, management or systems approach to meet employer requirements
- a project which supports a tutor's or employer'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. They 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, e.g. 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: e.g. materials, equipment, personnel, computing, software, any costs (set-up costs, operating costs, research costs, travel costs, time on project)

Project schedule: e.g. 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: e.g. 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, e.g. interviews with sector stakeholders

Collect and collate primary data: quantitative research, e.g. questionnaires, interviews, surveys; qualitative research, e.g. 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, e.g. application of current practice and theory (including from the wider sector context), application of technology (specialist software), production of prototype; Building Information Modelling (BIM)

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: e.g. 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, e.g. formal written format, by *viva voce* or oral presentation, diagrammatic or graphical figures; critique of selected topic, 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

Essential requirements

There are no special resources needed for this unit.

Delivery

It is essential that tutors provide sufficient support and guidance to enable the learners to select an appropriate and viable project proposal that can be developed into the required major project.

It may also be useful to deliver lectures on dissertation and research methodologies, referencing, data and analysis in the first few weeks of the unit. Centres could 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 their progress and ensure completion of the project to time.

The project must be themed on a complex issue of design, legislation, procurement, contracts, construction or asset management. It must also be focused on the learner's chosen pathway.

Below is an indicative list of attributes learners should demonstrate within the major project.

Personal skills:

- selection and effective use of:
  - appropriate written, oral, technical language and presentation skills
  - appropriate range of numerical methods for calculating, checking and presenting solutions to problems
  - a range of IT applications for data analysis, preparation and presentation of information
  - appropriate research methods and collect, organise, analyse, evaluate data and present findings
- encourage constructive working relationships
- work effectively in teams through interpersonal relationships and group dynamics to agree goals and plans and review and evaluate progress
- define, investigate and analyse problems of a non-routine and unfamiliar nature
- apply judgement to devise practical and creative solutions
- self-assessment of learning needs and resources
- undertake personal development and evaluate achievements against targets.

Technical knowledge:

- planning, legislation, design, procurement, contracts, maintenance, commissioning, health, welfare and safety and development in the construction industry
- current and innovative procurement processes
- integrated teams
- client and user requirements
- factors affecting development and design fitness for purpose
- construction technology
- design information development and communication, particularly Building Information Modelling (BIM)
- project planning, auditing and monitoring
- quality management
- commissioning and handover
- facilities management
- sustainable construction
- knowledge economy
- building maintenance management and reuse of property, structures and services.

Professional knowledge:

- ethics and values in the construction industry
- professional judgement and duty of care
- sustainable development
- environmental legislation
- energy management
- environmental impact
- legal frameworks, contracts
- statutory control
- health, safety and welfare legislation
- risk management
- succession planning
- economic principles
- management and business operation
- commercial risk
- social, political and cultural issues
- community social responsibility.

Referencing to comply with the Harvard System of Referencing*:*

- in-text citations (citing the author's work)
- detailed references.

Indicative project content

Applied research methodology: *literature review;* quantitative and qualitative research; referencing (Harvard, cited text, (in-text citations); detailed references; complete bibliography; analytical techniques (numeric, statistical, graphic, extrapolation, verification, risk, primary sources, secondary sources); ethical; formal; informal; sources (government (national, international), industrial, manufacturer), accelerated testing, code of practice, European standards, research and development, professional bodies); references, (authoritative, reputable, credible, published, unpublished).

Research proposal: rationale e.g. topic, theme or problem for investigation; research methodology; formulated research design (problem or topic identified, methods, highlights any potential constraints or likely problems, feasible plan of work, timetable); scope of proposed investigation.

Viva: oral presentation (supervisor, employer, colleagues, argumentation).

Conduct of the research: data collection (systematic, rigorous, research methods appropriate, ethically sound); analysis and interpretation of data (research questions, hypotheses identified in the rationale, additional research issues, emerged issues, risks, authoritative); critical evaluation of research design and methodology used; abstract, bibliography.

Project structure: word count **–** 10,000 words (+ or – 5%); formatted chapters; industrial style; chapters are completed in consecutive order; inclusive non-discriminatory language; conclusion (potential or actual applications of the research findings, potential constraints on effective application, potential opportunities for further research in the subject area); critical review; bibliography of a minimum of 15 sources.

Assessment

To pass this unit learners 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 assessors to understand the context of the project?
- Are the aims and objectives of the project stated clearly 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, for example theory and/or practice elsewhere?
- Are the methods used, the results and the outcomes described clearly?
- 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 their 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 their 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 to the final project report, which should be in the region of 7,000 to 10,000 words.

Suggested marking grid

Criteria		Maximum mark weighting	Indicative performance for pass
Introduction	Abstract	10%	Basic summary
	Statement of research		Introduction clear and concise but narrow
	Aims		Achievable Timescale realistic
	Objectives		Coherent Positive Hierarchical
Relevant discipline knowledge	Technical terms and language	25%	Industrial language accurate Terms interpreted correctly Reading age Target audience language maintained Basic scientific terms and theories used
	Literature search		Basic coverage of project focus Currency Few authoritative sources Credible literature
	Integration and coherence		Aim themed throughout Knowledge sound but basic Coherent development of aims and objectives
	Evaluation		Basic coverage Some reflective learning Critical awareness of issues Broad overview and impact
	Industrial context		Strong value to sector discipline Applications explained clearly Correct inferences Considerable employer involvement

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Research method	Appropriate	15%	Reasoned selection for available methods Fit for purpose Degree of accuracy defined Validity of aims and objectives
	Authoritative		Published research Currency Research base Industrially-respected views Credibility challenged
	Ethics statement		Correct Published Notified
Results and analysis	Write up	15%	Technical language accurate Industrially accepted formats and units of measurement Reading age Reflective learning Augmentation challenged
	Results analysis		Interpretation accurate Within permitted tolerances Units of measurement correct Risk analysis Containment
	Achievement of aims		Majority achieved or captured
	Credibility of analysis		Validity check Self-review Critical review
Conclusion and recommendation	Conclusion	15%	Reasoned and assured conclusion Clarity Fit for purpose Valid Realistic
	Recommendation		Industrial value defined Clarity of recommendations Impact analysis Risk defined Sustainable

Structure and layout	Contents list	15%	
	Chapter layout and format		
	References Literary skill		Harvard referencing accurate Primary and secondary sources Reference credibility check Fluent writing style Appropriate industrial language
	Grammar		No basic errors
	Clarity of text		Fluent Terms Context Augmentation
	Clarity of graphics		Suitability Relevance Clarity Include and supported by text
	Further development		Impact analysis Training needs Gap analysis Value engineering
Viva	Oral presentation	5%	Clear speech Posture Body language Confident, knowledgeable performance
	Realistic aims achieved		Clear explanation Review and change Realistic timeframes Resource implications
	Objectivity about aims and objectives		Confident approach Logic development Reviews
	Action planning		Timescales realistic Measured Monitor Critical review Programme of activity fit for purpose
		100%	

Resources

Books

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

Farrell P – *Writing a Built Environment Dissertation Practical Guidance and Examples* (Wiley-Blackwell, 2011) ISBN 978-1405198516

Fellows R F, Anita M M Lui – *Research Methods for Construction* 3rd Edition (Wiley, 2009) ISBN 978-140517790

Fielding N, Lee R – C*omputer Analysis and Qualitative Research* (Sage, 1998) ISBN 978-0803974838

Hart C – *Doing a Literature Review: Releasing the Social Science Research Imagination* (Sage Publications, 1999) ISBN 978-0761959755

Hewson C, Yule P, Laurent D and Vogel C – *Internet Research Methods* (Sage Publications, 2003) ISBN 978-0761959203

Knight A, L Ruddock – *Advanced Research methods in the Built Environment* (Wiley-Blackwell, 2008) ISBN 978-1405161107

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

Mann T – *The Oxford Guide to Library Research*. Revised and updated ed. 3rd Edition (Oxford University Press, 2005) ISBN 978-0195189988

Miles M B, Huberman A M – *Qualitative Data Analysis* 2nd Edition (Sage, 1994) ISBN 978-080396565400

Naoum S – *Dissertation research and writing for construction students* 2nd Edition (Taylor and Francis Ltd, 2007) ISBN 978-0750682640

Ritchie J, Lewis J – *Qualitative Research Practice* (Sage, 2003) ISBN 978-0761971108

Robson C – *How to do a Research Project: A guide for undergraduate students* (Oxford Blackwells, 2007) ISBN 978-1405114905

Walliman N – Your Research Project: A Step-by-step Guide for the First-time Researcher (Sage, 2005) ISBN 978-8178295404