London South Bank University

UNIT GUIDE: 2004/2005

Major Project 3

DEN-3-317

LONDON SOUTH BANK UNIVERSITY CENTRAL TO YOUR SUCCESS

Unit Title:	Major project
Unit Reference Number:	DEN-3-317
Level:	Three
Credit value:	2 Units, 30 CAT points
Semesters:	One and Two
Student Study Hours:	300 hours total study time which includes 3 hours one to one supervision time
Pre-requisites:	Pass an appropriate number of level 2 units
Assessment Method:	100% coursework
Unit Co-ordinator:	Stephen Dance; Room G31; Tel: 020 7815 7013 email: dances@lsbu.ac.uk web: www.whyverne.co.uk Building Services, Intranet
Course:	B Eng (hons) Building Services Engineering BSc Building (hons) Services Engineering
Teaching Team:	Staff from all the above courses

INTRODUCTION.

For this unit you are required to select a project, either design based or research based and work individually under the guidance of your tutor. The project must be approved by your appointed tutor before you will be allowed to proceed. The details of the project you will be required to undertake will depend upon the course you are doing and are described in Appendix 1 separately below.

The work is carried out over the two semesters and it culminates in a written report.

The assessment is based on the report and a verbal presentation on the work done.

AIMS

To provide a flexible vehicle through which you can demonstrate your ability to integrate and apply the information, knowledge and skills acquired during the course.

LEARNING OUTCOMES.

Incorporated Engineer	Chartered Engineer
• *Know-how led with appropriate knowledge and understanding* • *Top class applications engineer*	• *Knowledge / Understanding lead with appropriate know-how* • *Top class innovative engineering*

Accordingly, the learning outcomes of this unit are differentiated:

On successful completion of this unit, you will be able to:

Incorporated Engineer	Chartered Engineer
• Manage effectively a complex project • *Apply a wide range of theory and engineering techniques to a design* • Communicate in a concise and intelligible manner	• Manage effectively a complex project • *Apply a wide range of Engineering technique to investigate the best solution to a design problem* • Communicate in a concise and intelligible manner

You will find some useful information relevant to learning outcomes in Appendix 3.

KEY AND COGNITIVE SKILLS.

You will be expected to demonstrate the following skills:

- Planning of work and time management
- Investigative skills in researching the topics relevant to the project
- Communication skills in communicating ideas to the tutor
- Report writing and presentation skills
- Information technology skills in researching topics on the world wide web,
- Knowledge of appropriate software packages used to model the performance of systems.
- Appropriate numerical skills to enable system performance to be calculated and investigated.
- Ability to critically analyse results from calculations and performance of system
- Report writing
- Presentation skills

THE PROGRAMME OF TEACHING , LEARNING AND ASSESSMENT

Introduction to studying the unit.
The unit is an applications unit and it is based on a self centred study mode under the supervision of your tutor.

Teaching and Learning outcome
By regular one-to-one meetings with your tutor. Your tutor, who will be allocated by the unit co-ordinator, will not necessarily have any expertise in the chosen area of work but will advise on the general expectations of the major project and agree the direction/emphasis

It is essential that you will submit a proposal for the work that you intend to carry out and that you will get it approved by your tutor. You tutor will guide you on the preparation of the proposal. The purpose of the approval procedure is to provide you with safeguards as to the acceptability and feasibility of your project. **You will not be permitted to start your project until written permission has been obtained.**

For *design* projects, following agreement of the brief with your project tutor, you must submit to him/her a completed proposal form for approval. The University reserves the right to disclose all projects submitted to third parties. Where building drawings have been provided by other than the University, you are required to obtain written permission for their use and possible disclosure. Failure to do so could result in you being unable to submit your work.

For *investigative* projects, proposal forms must be submitted to the unit co-ordinator. Approval will only be given when the unit co-ordinator believes that you are capable of undertaking the task (taking into account your academic achievements to date); that adequate facilities and supervision are available; that the project is feasible in the time available and that it meets the requirements of this unit.

A copy of the proposal form must be included in your final project report.

Monitoring.

The Student is required to meet with his/her tutor regularly at intervals agreed with the tutor. By the times specified in the programme, the student and tutor must together complete the student coursework progress report forms (copy appended). These reports must be included in your final project report.

The purpose of monitoring is to encourage you to work steadily throughout the duration of the unit; to bring to your tutor's attention any problems which may jeopardise your achievement; to provide formal feedback from your tutor regarding your progress; to provide additional Information to the second assessor.

You will find some useful information on how to tackle the project in Appendices 1 and 3.

PROGRAMME

Introduction to the unit	w/c 27th September
1st progress report	w/c 25th October submit Proposal 29th Oct
2nd progress report	w/c 6th December
3rd progress report	w/c 7th February
4th progress report	w/c 28th March
Submission deadline	4pm Friday 13th May
Viva voce examination	During the period 13th to the 27th June

ASSESSMENT PROGRAMME

Your report will be assessed both by your tutor and a second assessor from the school or a specialist from outside the University where appropriate. Following their reading and preliminary assessment, you will be required to attend a viva voce examination after which the two assessors will finalise the mark to be submitted to the examination board. In the event of the two assessors failing to reach a decision, the project will assessed by the Course Director, unit co-ordinator or by some other person(s) appointed by the Course Director.

Marking Scheme

10% Project proposal.(submitted for the attention of S. Dance at the Faculty Office)

90% Main project.

The project will be assessed in accordance with the learning outcomes specified at the front of this unit guide.

However, these learning outcomes are intentionally general in nature to allow a wide range of project types of varying content and style to be accommodated.

It is essential therefore that you agree with your tutor the detailed marking scheme which will be used to assess your work. This will ideally be developed in conjunction with your project brief.

A sample marking scheme is appended. This is typically what is expected in a *design* project. If you do not include an agreed marking scheme in your report then this will be used, possibly to your disadvantage.

It is essential that *Investigative* projects be provided with an agreed marking scheme.

Guidance on the preparation of the report is given in Appendix 2.

LEARNERS SUPPORT MATERISL

"Apache", Building Services Simulation software, Facet.
"Hevacomp", Mechanical and Electrical Building Services Design software
"Autocad" drawing package
"Powerpoint" OHP transparencies production software, Microsoft Office

INDICATIVE BOOK LIST

J. Bell, *Doing your research project*, Open University Press, 1987
R. Barnes, *Successful study for degrees*, Routledge, 1992
Study Survival Skills, South Bank University

APPENDIX 1.

B Eng (hons) and BSc (hons)Building Services Engineering

DESIGN PROJECTS

You will be provided with a set of outline building drawings by the project co-ordinator. However, availability is limited and you will not normally be offered a choice. Part time students will be strongly encouraged to acquire a set of drawings from their employer.

In either case, you must agree a brief with your tutor. Your tutor will also act (in a limited capacity) as an Architect with whom construction details etc and any proposed changes you may make regarding the building must be agreed.

Students providing their own project drawings should realise that the requirements for this unit is likely to be substantially different from projects you may have worked on in industry.

The project is the culmination of the course and you will be expected to demonstrate the skills developed and acquired during the whole of this time, but especially in the **final stages**.

BSc students should aim to cover the main building services deign. The services to be designed should be agreed with the tutor. A sample of pipe, duct and cable sizing as well as heat loads should be provided, together with schematic diagrams of the systems designed.

BEng students are expected to carry out a conceptual design rather than detail design.
A literature search pertinent to your project will be needed. The literature review will be presented in the form of discussion (not description). This must be adequately referenced. This should concentrate on the key features of your project. For example, if your project is based on a hospital and you wish to concentrate on the service requirements of the operating theatre, your literature review should focus on this and not hospitals generally. Above all, do not generalise - everything you write should be project specific.

The range of services to be designed must be selected carefully to allow you to demonstrate better in-depth engineering skills. A design for all of the building and its services might be impossible in the time available which then lead to superficial design. It is preferred that you provide a conceptual overview and then concentrate on one or two of the more challenging aspects that can more fully demonstrate your capabilities. Discuss and agree this with your tutor. Your choice of where to concentrate your project may reflect the route you have elected to follow through the course. However, it is NOT acceptable to confine the analysis and design entirely to your specialist route.

Even so, a holistic approach is expected throughout the project but especially with respect to integrating the design of building and building services. Due consideration must be given to energy and environmental matters as well as functionality. Budget constraints will not normally be applied,

though cost benefit analysis may form a part of the decision making process.

Your tutor will act in a limited capacity as architect (unless you have been able to secure the co-operation of one), and will expect you to make (justified) recommendations on changes to the proposed building which s/he may accept or reject.

Detailed drawings are not normally required. You should concentrate on schematics which clearly show the design philosophy and control strategy and sketches which show major plant location and service routes. Include any useful architects drawings/sketches. All drawings should be fully referenced and folded to A4. A3 drawings are particularly convenient. Do not include manufacturers' drawings or literature unless it conveys information essential to your report and which would otherwise need to be reproduced.

Basic and routine calculations should only be provided in samples. Concentrate on the more demanding or unusual aspects which will allow you to demonstrate level 3 work.

Where possible, commercial software should be used to determine, for example, daylight levels and cooling loads. A sample only of the result sheets should be appended. You will be assessed on your ability to intelligently use such software, not in the amount of calculations performed.
You must clearly and concisely discuss the reasoning behind your major decisions. Credit will be given for the decision making process. It is recommended that you use a rigorous and objective strategy for decision making, such as the weighted matrix method used in earlier units.

Students with industrial experience of design projects should be aware that the requirements for this unit are usually substantially different to those of the workplace and should be vigilant against applying industry accepted practices without question. This is not to say that such experience is not valuable, but your aim is to demonstrate compliance with the learning outcomes of this unit. Part time students will be encouraged to provide their own building plans, but the brief must be agreed with your tutor. **Do not write the report in the style of a specification.**

INVESTIGATIVE PROJECTS

These might include, for example, laboratory based research, mathematical modelling or energy monitoring. You should discuss any proposals you may have for such projects with the unit co-ordinator.

These projects can be very fulfilling and useful but are by their nature less predictable and more difficult to control than design projects. It is essential therefore that you keep your tutor fully informed of your progress. The brief and detailed learning outcomes must be agreed with your tutor . It is against these learning outcomes that your project will be assessed.

Investigative projects must contain some originality, either in your approach or the results it produces. This should be clearly discussed in your report. You will be expected to present the aims of your

research in the context of Energy Engineering/ Building Services, showing why it is important and how it will benefit future research, the industry or society . Research reports have a somewhat unique and rigid style. You may find it useful to read a selection of research journals.

All investigate projects must include a literature review, properly referenced and with the emphasis on discussion in the context of your particular project.

Where University laboratory facilities are to be used the Head of Research will need to be consulted regarding availability of equipment and technician staff. Regulations regarding Health and Safety must be observed.

Where experiments are carried out, the scientific rationale behind the design of the experiment is required together with an analysis of accuracy.

Projects comprising the development of a mathematical model must demonstrate a deep understanding of the science involved and of the mathematical techniques employed. They must also address the problem of validation.

Projects involving energy audits will require a clear and justified plan which ensure that adequate and appropriate data can be collected in the time available; a rigorous and scientific analysis of the data; a comprehensive set of technical recommendations addressing economic, environmental and practical issues. You will be expected to demonstrate a good understanding of building and plant operation and performance

APPENDIX 2.

SUBMISSION REQUIREMENTS

1. **Project Proposal**.

This will provide:
a. Students name
b. Students Course title
c. The title of the project.
d. Brief Description of the project
e. Key Objectives
f. Sources required and
g. Any unforeseen difficulties.

A form is attached to your unit guide giving the format to which the proposal must be prepared and submitted. The text must be word processed in Times, size 12 font.

The proposal must be approved and countersigned by your tutor before submission.
Late submissions will not be accepted.

2. Main report

The project must be presented in the form of a report. TWO copies must be submitted by the published deadline to the school office. **Late submissions will not be accepted unless previously agreed by the course director** and request for late submission form completed.

The report must be in the format of a conventional technical report and be word-processed. (A4 with Times Roman 12-point font). As a guideline, the report should not exceed 10,000 words and be contained in a single volume. Both copies must be securely bound, though not necessarily with a hard cover. Spiral bound reports with acetate covers are preferred. Ring binders are NOT acceptable. The flysheet (copy attached) must be used.

The structure of the report should be agreed with your tutor.

Calculations and extensive tables etc must be placed in an appendix. Calculations need not be word-processed; hand-written calculations are sufficient provided they are legible. However, all calculations must be referenced in the text. Only sample copies of print outs from computer software should normally be included.

Do not include manufacturers' literature.

Schematic drawings should be no more than A3 size so that they can be easily bound into the document, but specific requirements for drawings should be agreed with your tutor.

Your report must contain fully completed copies of you project proposal and project progress report forms and preferably an agreed marking scheme.

Following the viva voce examination, one copy of your report will normally be returned to you. One copy will be retained by the University for the external examiner and may be made available to third parties including other students.

APPENDIX 3.
GUIDANCE NOTES

General:

This is a double unit. You are expected to spend about 300 hours working on it. This is a considerable amount of time. It is also a level 3 unit. Your report should reflect both the time and depth of studied required.

Your tutor will be best able to provide you with details as to what is required of a major project and guidance as to how this can best be achieved. Your tutor is there to help you complete the project: see him/her regularly. Should you experience any difficulties, let your tutor know in good time. The onus is upon you to make appointments with your tutor.

Should you experience problems with your tutor, you should discuss the matter with the unit co-ordinator tutor or Course Director without delay.

The procedures you are required to follow are for your benefit. Please follow them.

Learning outcomes:

Remember that one of the aims of your project is to convince the assessors that you have developed the skills etc specified in *Learning Outcomes* and expanded upon in your agreed marking scheme. Check regularly that you are meeting these requirements and that your effort is commensurate with the weightings you have agreed.

As one of the learning outcomes is being able to manage a complex project effectively, this must be apparent in your report. Your proposal and progress report forms will be of benefit, but assessors will want to see further proof of your project management skills. A Gantt chart may be useful, provided it has actually been used. Keep notes of any meetings with your tutor(s) and collaborating architects etc.

A second learning outcome is being able to apply a wide range of engineering theory and skills to a project. This implies that you will be aware of good engineering practice.

BSc students must demonstrate this by the correct selection of systems and sizing.

BEng students must be able to demonstrate their skills in finding a novel solution to a design problem. This will involve a literature search and review on a design problem followed with the solution.

This is an Engineering Degree and you are expected to be able to apply Mathematics, Science

and Engineering principles. All your decisions must be justified. Standard solutions used by industry and equations from books may be appropriate but unless you can justify them you will not have demonstrated this second learning outcome. In particular, it is important that your report is "project specific". Do not include long descriptions of well documented subjects – you are merely repeating what you have read. Instead you should *discuss* any special implications relevant to your particular project.

However, you need to use some judgement to how far this can be taken; you cannot go back to first principles with everything if you are going to finish on time! It is suggested that (as this is a level three unit) you concentrate your work at areas in which you can demonstrate an application of work done in other level 3 and possibly level 2 units.

The third learning outcome is about ability to communicate concisely and intelligibly. The report word-count is meant as a guide only. You may wish to produce a substantially longer (or shorter) report. However, the assessors will be looking for quality rather than quantity and you may be penalised for producing an unnecessarily long report.

Above all, your report must communicate what you have set out to do, what you have done and how and why you have done it. This requires a clear rational structure.

Calculations should normally be confined to an appendix. These must be fully referenced. Not all calculations need be included, particularly where there is considerable repetition or they are of a very basic nature. Hand-written calculations are acceptable, but in any event must be presented in a logical order and annotated.

Spelling, grammar, style and organisation are important features of a report. You may find it useful to let a colleague proof read it.

Plagiarism:

University rules on plagiarism should be familiar to you. If they are not then you should ensure they become so: penalties for plagiarism are strict and can involve disqualification from the course.

Take care not to inadvertently commit plagiarism. All work in the report is deemed to be your own including all text, ideas, calculations, tables, graphs and diagrams. If they are not, then you must clearly indicate this using standard referencing methods and acknowledgements. For appropriate referencing consult information on the Harvard system of referencing or the Vancouver system with either footnotes or endnotes. One of these systems must be used consistently.

Viva Voce Examination:

Your assessors will use the viva to ensure that you have understood what you have written (and that the work submitted is entirely your own). They may also be seeking to determine your knowledge and understanding of areas related to your project which you have not discussed in your report. The viva is your opportunity to gain further marks.

Vivas normally start with a brief presentation – no longer than five minutes. Consider rehearsing it with colleagues. The presentation should provide an introduction to the project and a summary of the main points. Your tutor and assessor will already have read and made an initial assessment; they will not welcome a long, detailed presentation. You may wish to use suitable visual material to support and illustrate your verbal presentation. Discuss this with your tutor beforehand. Any such material must be restricted to information contained in your report.

Personal Summary:

For your own benefit, please write below the main points of this unit and what you must do to maximise your mark:

1.

2.

3.

4.

5.

6.

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