



UNIVERSITY OF
BATH

Master of Science and Postgraduate
Diploma in Façade Engineering
(Full-time and part-time)

**Programme Handbook
Section One**

2009/2010

**Department of Architecture and Civil Engineering
University of Bath**

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1.0 Introduction

This document outlines the Master of Science and Postgraduate Diploma programmes in facade engineering. These are offered in two modes:

Full-time 12 months

Part-time 24 months up to a maximum of 48 months

Study on part of the MSc programme may lead to the award of a Diploma in façade engineering or a Postgraduate certificate of attendance.

The programme is run by The Department of Architecture and Civil Engineering (A&CE) at the University of Bath.

2.0 Programme aims

The general aims of the programme are stated below followed by the specific aims of each part of the programme.

2.1 General aim

The main aim of the programme is to provide students with a broad understanding and knowledge of facade engineering. This is to ensure that they will have the skill, knowledge and understanding to design, manufacture and construct building facades and cladding. The units are intended to broaden students from their original disciplines to have an understanding of all aspects of the building envelope.

2.2 Secondary aims

Structural engineering and integrity

To provide a sound structural engineering knowledge relevant to facade engineering.

To develop an understanding of how to enclose and seal buildings.

To introduce concepts of performance specification.

Building physics

To give a holistic view of the design of buildings.

To develop an understanding of comfort in buildings.

To provide a knowledge of the energy balance and energy efficiency in buildings

Materials and design

To develop concepts of durability and life cycle costs.

To give knowledge of facade construction and manufacture and of facade materials.

Management

To give knowledge of contract law and contract management.

To develop concepts of quality within the design and supply process.

To provide knowledge of the industry structure and culture.

Research methods

To give an understanding of information sources.

To develop an understanding of critical review.

To develop an ability to write scientific and technical reports.

Dissertation

To show the ability to undertake technical or business research and the ability to write a dissertation.

2.3 Learning Outcomes

On successful completion of the programme, students will have demonstrated the following.

| | |
|--------------------------------------|---|
| Knowledge and understanding | <p>Knowledge and understanding in the following areas:</p> <ul style="list-style-type: none"> • Structural performance of facades and glass structures; • Sealing and integrity of facades; • Hygrometrics and energy efficient facades; • Façade control systems; • Materials used in facades; • Manufacturing and construction methods; • Management, programming and legal aspects of façade contracting. |
| Intellectual Skills | <ul style="list-style-type: none"> • Have equipped themselves to handle change and innovation and be able to evaluate and implement new technologies; • Have gained a variety of skills in analysis, engineering concepts and methods, decision making, risk assessment and problem solving; • Have gained an understanding of the many different roles involved in façade engineering and the interdisciplinary team working required. |
| Professional Practical Skills | <p>Graduates of this programme should:</p> <ul style="list-style-type: none"> • Be able to successfully participate as a full member of the design-construct team for the largest and most complex building enclosures; • Have attained the skills and knowledge necessary to examine critically the prevailing technical, economic and political issues, laws and statutes and environmental issues of this sector of the construction industry; • Have an understanding of safety issues and the responsibilities of designers to the public. • |
| Transferable/Key Skills | <p>Graduates of this programme should:</p> <ul style="list-style-type: none"> • Have the necessary skills and vision to think, plan and act strategically; • Be able to synthesise and critically review information and to make effective decisions from the available information; • Be able to communicate ideas, analyses, designs and conclusions in writing and orally in a way appropriate to a given audience; |

3.0 Programme structure

The programme is offered as a modular programme comprising 10 out of 14 units in total each worth 6 credits. The programme may be studied full-time over a period of twelve months for the MSc or nine months for the Diploma. In part-time mode the Diploma and MSc must be completed in a maximum period of 48 months. Units may also be undertaken separately solely for the purpose of CPD.

Students enrolled on the MSc programme will be required to study the 8 core units (acquiring 48 credits), 2 optional units from a choice of 6 (acquiring 12 credits) and a dissertation (acquiring 30 credits). The taught Units are common to both MSc and PG Diploma. Students cannot study more than 60 taught credits. Students studying units for CPD can choose whether or not to be assessed. Assessment will be required for CPD students seeking a 'Certificate of attendance'

Individual units may be studied as part of an individual's programme of continuing professional development (CPD). The successful completion of a single unit leads to the award of a postgraduate certificate of attendance. Progression to the Diploma or MSc may be granted on completion of the appropriate 8-core and 2-optional units with an average mark > 50%.

The programme is based on semesters and is modularised in line with the University's guidelines.

3.1 Teaching Units and Prerequisites

The teaching Units offered are:

| Core units | | | |
|-------------------|------------------------------------|----------------|----------------------|
| Unit Code | Unit Title | Credits | Prerequisites |
| AR50372 | Introduction to façade engineering | 6 | |
| AR50373 | Façade materials and components | 6 | AR50372 |
| AR50377 | Glass and glazing | 6 | |
| AR50376 | Weathertightness | 6 | AR50372 |
| AR50351 | Thermal performance of facades | 6 | |
| AR50375 | Structural integrity | 6 | AR50372 |
| AR50374 | Façade construction | 6 | AR50372 |
| AR50378 | Façade procurement | 6 | AR50372 |

| Optional units (Select two from below) | | | |
|---|----------------------------------|----------------|----------------------|
| Unit Code | Unit Title | Credits | Prerequisites |
| AR50347 | Daylight and shading | 6 | |
| AR50349 | Natural ventilation in buildings | 6 | |
| AR50382 | Contract management | 6 | AR50372 + AR50378 |
| AR50379 | Thermal analysis of facades | 6 | AR50372 + AR50351 |
| AR50381 | Structural analysis of facades | 6 | AR50372 + AR50375 |
| AR50380 | Acoustics & Fire | 6 | |

| | | |
|---------|-----------------------------|----|
| AR50247 | Dissertation (MSc students) | 30 |
|---------|-----------------------------|----|

The dissertation is in the region of 20,000 words or word equivalents.

Units are delivered on alternate weeks each comprising four consecutive days' attendance, preparatory work beforehand, and/or assessments afterwards, amounting to 100 hours of study. Students will be assessed during the unit or by work submitted immediately after each unit. Part-time students will be encouraged to establish a regular pattern of attendance such as attending every second or third unit over a period of two or three years to maintain the group dynamic of a cohort.

The PgD/MSc programme commences in early October each year and this is the preferred start date of the primary pre-requisite unit, AR50372, Introduction to Façade Engineering. Those who choose to commence in January will only have a restricted menu of units, which do not require prerequisite units.

All core units can be studied independently following the first introductory unit. For the Dissertation, completion of all eight Core and two Optional Units is necessary.

3.2 Teaching Schedule

It is possible to take the part-time mode in several sequences as long as pre-requisites are adhered to. The Unit deliver schedule for the 2009-10 academic year is shown below.

| Wk | Dates | Code | Title | Status |
|----|--------------|---------|-------------------------------------|----------------------|
| 2 | 12-16 Oct 09 | AR50372 | Introduction to Façade Engineering* | Core |
| 4 | 27-30 Oct 09 | AR50373 | Façade materials and components | Core |
| 6 | 10-13 Nov 09 | AR50377 | Glass and glazing | Core |
| 8 | 24-27 Nov 09 | AR50376 | Weathertightness | Core |
| 10 | 7-10 Dec 09 | AR50351 | Thermal performance of facades | Core |
| 15 | 12-15 Jan 10 | AR50375 | Structural integrity | Core |
| 17 | 26-29 Jan 10 | AR50374 | Façade construction | Core |
| 19 | 9-12 Feb 10 | AR50347 | Daylight and shading | Optional |
| 21 | 22-25 Feb 10 | AR50349 | Natural ventilation in buildings | Optional |
| | 26 Feb 2010 | AR50247 | <i>Research methods</i> | Part of Dissertation |
| 24 | 15 Mar 2010 | | | |
| | 16-19 Mar 10 | AR50378 | Façade procurement | Core |
| 25 | 26 Mar 10 | AR50247 | <i>Research methods</i> | Part of Dissertation |
| 28 | 13-16 Apr 10 | AR50379 | Thermal analysis of facades | Optional |
| 30 | 26 Apr 2010 | AR50247 | Research methods | Part of Dissertation |
| | 27-30 Apr 10 | AR50381 | Structural analysis of facades | Optional |
| 32 | 11-14 May 10 | AR50380 | Acoustics & Fire | Optional |
| 34 | 25-28 May 10 | AR50382 | Contract management | Optional |

* Includes 1-day introduction to programme

3.3 Programme unit assessment

All elements of the programme are assessed by a variety of means (on-line assessment, written examinations, design projects and essays or dissertation). The type of assessment for each Unit is described in the following Table.

| Unit Code | Unit Title | Credits | Assessment |
|-----------|------------------------------------|-----------|--|
| AR50372 | Introduction to Façade Engineering | 6 | 2 x Essays (2,000 words each): 2 x 50% |
| AR50373 | Façade materials and components | 6 | Presentation: 10% Preparatory exercise: 10% Essay (2,000 words): 40% FMEA Exercise: (40%) |
| AR50377 | Glass and glazing | 6 | Preparatory workshop: 10% Preparatory exercise: 10% Design study: (40%) Risk analysis: (40%) |
| AR50376 | Weathertightness | 6 | Preparatory workshop: (10%) Exercise, secondary defence system: (45%) Prepare test specification: (45%) |
| AR50351 | Thermal performance of facades | 6 | Preparatory exercise: (20%) Essay: (40%) Calculation exercise: (40%) |
| AR50375 | Structural integrity | 6 | Preparatory exercises: (2 x 10%) Wind loading calculations: (40%) Stress and deflection exercises: (40%) |
| AR50374 | Façade construction | 6 | Preparatory exercise: (20%) Essay (2000 words): (40%) Prep. technical report (1,500 words): (40%) |
| AR50347 | Daylight and shading | 6 | Preparatory exercise: (20%) Daylighting calculations: (20%) Daylighting design exercise: (20%) Essay (2,000 words): (40%) |
| AR50349 | Natural ventilation in buildings | 6 | Preparatory exercise: (20%) Nat-Vent calculations: (20%) Nat-Vent design exercise: (20%) Essay (2,000 words): (40%) |
| AR50378 | Façade procurement | 6 | Preparatory report & workshop: 20% Essay, value engineering: 40% Essay, supply chain: 40% |
| AR50379 | Thermal analysis of facades | 6 | Preparatory exercise: 20% Thermal analysis calculations: 40% Dynamic modeling specification: 40% |
| AR50381 | Structural analysis of facades | 6 | Written preparation for discussion groups (1,000 words): 2 x 20% Essay (3,000 words): 60% |
| AR50380 | Acoustics & Fire | 6 | Preparatory exercise: (20%) Technical acoustic appraisal: (40%) Design conflict exercise: (40%) |
| AR50382 | Contract Management | 6 | Evaluate method statement: (50%) Essay: (50%) |
| AR50247 | Research dissertation | 30 | Dissertation (100%) |
| | Total credits | 90 | |

* Assessment of each Unit includes preparatory work in advance of attendance, along with work in residence and/or work afterwards.

3.4 Teaching Staff

All teaching is conducted within the Department of Architecture and Civil Engineering by academic staff, experienced lecturers from CWCT and the visiting lecturers listed below:

Centre for Window cladding Technology (CWCT):

| | |
|----------------------|-------|
| Dr Stephen Ledbetter | (SRL) |
| Alan Keiller | (APK) |
| David Metcalfe | (DWM) |

Department of Architecture and Civil Engineering:

| | |
|----------------------|--------|
| Dr Mike Barron | (MB) |
| Dr Steve Lo | (SNGL) |
| Dr Dina D'ayala | (DFDA) |
| Dr Sukumar Natarajan | (SN) |
| Dr Andy Shea | (AS) |

Visiting lecturers:

TBC

4.0 Programme content**CORE UNITS****AR50351: Thermal performance of facades**

(Unit Coordinator: DMW)

Aims:

To provide a comprehensive understanding of how the different elements of a façade work separately and when combined as a whole building envelope to control energy flows in to and out of a building.

Learning Outcomes:

On successful completion of this unit students will have demonstrated the ability to systematically evaluate the thermal performance of façade elements and building envelopes and a comprehensive understanding of the underlying principles behind innovative materials and components.

Skills:

Independent, systematic investigation and evaluation of new materials/technologies, analytical skills for the assessment of whole building thermal performance, group working across disciplines to understand the drivers for, and constraints to, change.

Content:

Principles of heat flow through complex structures, evaluation of element performance, new materials and technologies, drivers for improved performance, regulations and rating schemes, condensation risk analysis and vapour control.

AR50372: Introduction to façade engineering

(Unit Coordinator: SRL)

Aims:

To provide an introduction to façade engineering including the multi-functional nature of the building envelope and the need for holistic design.

Learning Outcomes:

Upon successful completion of the Unit the students should be able to:

1. Specify the performance of facades in terms of weathertightness, structural integrity, environmental performance, quality and appearance.
2. Understand the role of different professionals in the design and construction process.

Skills:

Critical assessment of the different drivers of façade design, understanding of the design conflicts and ability to resolve these with other building professionals. Written and oral communications. These skills are facilitated and assessed.

Content:

The role of the façade engineer, function of the façade, drivers of design including buildability, appearance, weathertightness and appearance. Role of specification and verification of performance.

AR50373: Façade materials and components

(Unit Coordinator: APK)

Aims:

To provide an understanding of the through life performance of the many materials used in façade construction.

Learning Outcomes:

Upon successful completion of the Unit the students should be able to:

1. Understand the primary performance of the many façade materials and their performance when used together and incorporated in complex assemblies.
2. Evaluate, specify and verify the performance of materials.

Skills:

Selection of materials and design of appropriate assembly, mounting and other detailing. Critical evaluation of through life performance in practice.

Content:

Overview of materials including: metal, ceramic, polymeric, timber and fabric. Forming and assembly processes. Durability and processes of degradation. Methods for assessing performance including FMEA.

AR50374: Façade construction

(Unit Coordinator: APK)

Aims:

To provide an understanding of the principles and methods of façade construction.

Learning Outcomes:

Upon successful completion of the Unit the students should be able to:

1. Design and specify facades that meet the fundamental requirements of a wall.
2. Evaluate through life performance of a façade.

Skills:

Holistic review of façade detailing in a whole building context. Critical assessment of facade detailing. Written and oral communications. These skills are facilitated and assessed.

Content:

Forms of façade construction, support systems and interface design, building and cladding movement, sealing building envelopes, fire performance, access, maintenance and refurbishment.

AR50375: Structural integrity

(Unit Coordinator: SRL)

Aims:

To provide an understanding of the structural performance of façades.

Learning Outcomes:

Upon successful completion of the Unit the students should be able to:

1. Specify the structural performance of façades.
2. Understand the structural design criteria for façades.

Skills:

Analysis of façade structures. Evaluation of structural performance.

Content:

Role of structural analysis, structural materials, structural systems composite sections, structural design criteria, applied and induced loads.

AR50376: Weathertightness

(Unit Coordinator: SRL)

Aims:

To provide an understanding of the principles, design and testing of the sealing of building envelopes.

Learning Outcomes:

Upon successful completion of the Unit the students should be able to:

1. specify weathertightness criteria and appropriate testing.
2. Design joints and seals.
3. Analyse the movement of moisture within walls.

Skills:

Critical assessment of the different methods of sealing building envelopes. Ability to conduct tests for the assessment of constructed walls.

Content:

Air, water and wind environment, Gaskets, joints and interface design, weathertightness testing, moisture movement in walls.

AR50377: Glass and glazing

(Unit Coordinator: SRL)

Aims:

To provide an understanding of the performance of glass for appearance, integrity, safety and environmental control.

Learning Outcomes:

Upon successful completion of the Unit the students should be able to:

1. Specify the performance of glass.
2. Critically evaluate the performance of glass and resolve design conflicts.

Skills:

Critical assessment of design objectives and achieved performance for glazed constructions.

Content:

Glazing materials, glass strength, structural glazing, fire resistance, environmental control glasses, extreme loadings.

AR50378: Façade procurement

(Unit Coordinator: SRL)

Aims:

To provide an understanding of the procurement of façades in terms of supply chain, specification, risk management and value engineering.

Learning Outcomes:

Upon successful completion of the Unit the students should be able to:

1. Evaluate the robustness of different design and procurement processes.
2. Communicate the design, performance and construction requirements for a façade.

Skills:

Critical assessment of the effect of different procurement routes. Communication of design intent and project objectives.

Content:

The cladding industry, procurement methods, supply chain management, value engineering, quality management.

OPTIONAL UNITS**AR50347: Daylight and shading**

(Unit Coordinator: SNGL)

Aims:

To provide a comprehensive theoretical grounding that will enable students to tackle the range of lighting calculations likely to be encountered in practice in relation to the control of natural light through the building envelope.

Learning Outcomes:

Upon successful completion of the Unit students will have demonstrated advanced knowledge of lighting theory and use of shading to reduce solar gain; a comprehensive understanding of the quality of light within buildings; the ability to independently assess and calculate the transmittance of shading devices and illuminance derived from a conceptual understanding of the underlying theory.

Skills:

Appropriate analytical skills, interpreting diagrammatic information, communication skills. These skills are taught, facilitated and assessed.

Content:

Light as a form giver for architecture, vision and units to measure light, daylight factor calculations, natural light as a working illuminant, role of shading to reduce solar gain, design of windows and advanced glazing.

AR50349: Natural ventilation in buildings

(Unit Coordinator: AS)

Aims:

1. To develop a comprehensive knowledge of advanced principles and role of NV in buildings.
2. To develop a critical awareness of the architectural consequences of NV on building design.
3. To comprehensively explore the latest techniques, strategies and experiences of NV in buildings.

Learning Outcomes:

On successful completion of this module, students will have demonstrated the ability to:

1. Comprehensively understand advanced principles and practices of NV
2. Select and systematically employ appropriate and advanced NV strategies to different building types and complex contexts
3. Creatively integrate these with other passive design strategies
4. Critically evaluate the NV performance of design options
5. Systematically diagnose the NV performance of existing buildings and recommend sound retrofit solutions if necessary.

Skills:

1. Independent research and clear communication of design information and analysis in writing.
2. Ability to apply advanced Natural Ventilation concepts in the design and detailing of buildings.
3. Ability to critically diagnose the Natural Ventilation performance of existing buildings.

Content:

1. Natural ventilation, air quality and indoor climate
2. Driving forces of Natural Ventilation
3. Application of Natural Ventilation
4. Building design for Natural ventilation
5. Detail design for Natural ventilation
6. Analysis/Design tools
7. Regulation requirements
8. Control/management in use
9. Evaluation/Diagnostic tools & techniques
10. Mixed mode - Integration of Natural with Mechanical Ventilation
11. Natural ventilation and Mixed Mode ventilation case studies.

AR50379: Thermal analysis of façades

(Unit Coordinator: DWM)

Aims:

To provide an ability to analyse and evaluate the thermal performance of façades.

Learning Outcomes:

Upon successful completion of the Unit the students should be able to:

1. Analyse energy transfer through complex façades.
2. Interpret the thermal performance of façades.

Skills:

Analysis and appraisal of the hygrothermal performance of complex facades.
Presentation of complex results.

Content:

Heat transfer through complex assemblies and cavities, thermal performance of different forms of construction, performance of walls in warm and humid climates, interpretation of results.

AR50380: Acoustics and Fire

(Unit Coordinator: SRL/MB)

Aims:

To provide a theoretical grounding that will enable students to strengthen the link between theory and design of acoustics and fire in buildings.

Learning Outcomes:

Upon successful completion of the Unit the students should be able to:

- Demonstrate an understanding of the analytical methods and practical techniques for the acoustic design of buildings and external noise environment.
- Demonstrate a knowledge of the fire performance of buildings and the role of façade design in achieving fire safety in and around buildings

Skills:

- Ability to analyse and modify the internal acoustic environment (taught, facilitated and assessed).

- Ability to select appropriate design strategies and components to produce facades that do not impair fire safety in buildings.

Content:

1. Room acoustics: introduction to the decibel, sound propagation, sound in rooms, absorption, reverberation time and room acoustic design.
2. External noise environment
3. Noise control: sound insulation by partitions, cavity constructions in masonry, glass and light-weight materials, acoustics properties of building envelopes, practical solutions and current legislation.
4. Principles of fire engineering.
5. Fire resistant construction.
6. Reaction of facades to fire.

AR50381: Structural analysis of façades

(Unit Coordinator: SRL)

Aims:

To provide an understanding of the principles of structural engineering applicable to façade engineering.

Learning Outcomes:

Upon successful completion of the Unit the students should be able to:

- * analyse thin walled structures, plates and shells.
- * specify and undertake testing of façade structures.

Skills:

Analysis and appraisal of the structural performance of complex facades. Presentation of complex results.

Content:

Shear and torsion, buckling, thin walled structures, plates and shells, methods of analysis and testing.

AR50382: Contract management

(Unit Coordinator: SRL)

Aims:

To provide an understanding of management of the construction process.

Learning Outcomes:

Upon successful completion of the Unit the students should be able to:

- * plan and manage a façade construction contract.
- * understand the roles of the many parties to a façade construction contract.

Skills:

Planning and coordination of complex construction operations. Written and oral communications. These skills are facilitated and assessed.

Content:

Project planning, construction operations, method statements, communication, health and safety, contract law.

AR50247: Research dissertation

(Unit Coordinator: SNGL)

The research dissertation is described in more detail in Appendix B.

5.0 Assessment regime

All elements of the units are assessed, by written examination, continuous assessment or dissertation. **Assignments should be submitted electronically to the Unit co-ordinator via Moodle within 14 days of the completion of its respective taught unit.**

6.0 Progression

The taught units are common to both programmes with a common entry to the MSc and Diploma programmes.

Students who choose not to prepare a research dissertation will be awarded a Diploma provided that they achieve a pass mark in all parts of the Diploma programme.

Students may progress to prepare a research dissertation provided they achieve a mark of 50 per cent taken as an aggregate over all taught units.

Full details of progression, including arrangements to re-sit examinations are given in the examination regulations for the programme ([Appendix A](#)).

7.0 Entrance requirements

Places on the programmes are normally offered to applicants with:

- A first degree at 2.1 or above
- A first degree below 2.1 with several years relevant industry experience
- An HND or equivalent with 10 years relevant industry experience

Applicants with other qualifications and backgrounds may be considered.

Applicants whose first language is not English are also required to satisfy the University's current requirement for an English language qualification.

Students on the programme include structural engineers, civil engineers, architects, surveyors and building engineers. Candidates from some disciplines may be required to demonstrate an acceptable ability in mathematics.

8.0 Teaching methods

The programme is taught through lectures, tutorials, practical work and project work. Time is allocated for self-study.

Tutorials include problem-solving classes, discussion seminars and case study work. Practical work includes computer methods, laboratory work and site visits. Students have access to the resources of the Centre for Window and Cladding Technology for periods of private study.

9.0 Research dissertation

The research dissertation may be based on work carried out in the University or where a suitable opportunity exists it may be based on work at the students industrial work place. The work is undertaken during the summer for full-time students. Part-time students may take longer to complete the research dissertation.

The work may be computer based, laboratory based or a case study. The emphasis is on individual and original work. The work is defined in consultation with a member of staff and possibly the student's employer during semester 2.

Further information on the research dissertation is given in [Appendix B](#).

10.0 People, Committees and procedures

For each Unit of the course there is a Unit Coordinator. Students should feel able to address any enquiries to lecturers and Unit coordinators.

10.1 Director of studies

The Director of Studies is Dr Steve Lo and is responsible for all organisational aspects of the programme. He is assisted by Tutors responsible for each of the units.

The Director of Studies is also personal tutor to all students on the programme.

Students are encouraged to use the tutors for problems with the specific programmes. All other inquiries and problems should be raised with the Director of Studies.

Students undertaking the research dissertation will be assigned a personal tutor who is familiar with their field of work.

11.0 CWCT Facilities

Centre for Window and Cladding Technology

Students have access to the CWCT library during the hours 9.15 to 5.15 Monday to Friday. Students must notify their presence to the Administrative Officer on arrival. Bags must not be taken into the library

CWCT library

Students may borrow a maximum of four books from the CWCT library for one week at a time. All books must be signed out, and in on their return, by a member of CWCT staff and no bags or coats may be taken into the library.

Appendix A

Programme regulations

Department of Architecture & Civil Engineering University of Bath

MSc in Facade Engineering: Assessment regulations

- 1 These regulations supplement the University Examination Regulations.
- 2 Candidates must achieve a minimum mark of 40 per cent to pass a taught Unit.
- 3 At the discretion of the Board of Examiners, candidates who fail to achieve a pass mark of 40 per cent at the first assessment of a taught unit may be allowed to be assessed on that failed unit on one further occasion.
- 4 Marks awarded at second assessment will be capped at 40 per cent.
- 5 Candidates who fail more than two units at the first assessment will be ineligible for the Diploma or the MSc.
- 6 Candidates who pass a taught unit, and do not pass to the Diploma or MSc, will be eligible for the award of a Postgraduate Certificate for the passed unit or units.
- 7 Candidates who pass all taught units at first assessment will be eligible for the Diploma in Facade Engineering.
- 8 Candidates who fail no more than two taught units at first assessment, but go on to pass the failed taught units on re-assessment will be eligible for the Diploma in Façade Engineering.
- 9 Candidates who pass all taught units at first assessment and achieve an aggregate average mark of 50 per cent or more will be allowed to progress to the dissertation.
- 10 Candidates who fail no more than two taught units at first assessment, but go on to pass the failed taught units on re-assessment and achieve an aggregated average mark of 50 per cent or more on all taught units will be allowed to progress to the dissertation.
- 11 To be eligible for the award of a MSc degree in Facade Engineering, Candidates must pass both the taught elements of the programme and the dissertation.
- 12 Candidates who achieve a mark of 40 per cent or more for the dissertation will be eligible for the award of MSc in Facade Engineering.
- 13 Candidates who fail to achieve a mark of 40 per cent for their dissertation at first submission may, at the discretion of the Board of Examiners, be allowed to re-submit the dissertation on one occasion for re-assessment.

Marks at re-assessment will be capped at 40 per cent. Candidates who re-submit the dissertation and achieve a mark of 40 per cent will be eligible for the award of MSc in Facade Engineering.
- 14 Candidates who achieve an average mark of 70 per cent or above in each taught unit and achieve a mark of 70 per cent or above in the dissertation, will be eligible for the award of MSc in Façade Engineering with distinction.

Appendix B

Research dissertation programme

Dissertation supervision, preparation and writing

A 1 Introduction

Dissertation preparation and writing takes place during weeks 8 to 14 of Semester two and the summer although students may commence reviewing potential topics at any time following consultation with Dr Steve Lo, the Director of Studies and dissertation co-ordinator.

A 2 Dissertation topic

As the dissertation is part of a taught MSc programme, rather than an element of a MSc obtained by research, it should not be seen as a research thesis. However, it should reflect scholarship and critical, innovative thought.

During dissertation preparation you will be required to develop a detailed dissertation proposal, identify suitable reading, and hold meetings with the Director of Studies. During these meetings agree your final topic and take advice on reading before an appropriate supervisor is appointed.

Dissertations should be student-led. That is, the student should decide how the dissertation proceeds. The supervisor should act as a 'sounding-board' rather than a director, helping to ensure that the topic is neither too narrow nor too broad and that the student is thinking deeply about the topic. The dissertation topic is decided by the student with the approval of the Director of Studies and their supervisor.

Dissertations should reflect the content and philosophy of the programme. That is, as far as possible the technical, process and business implications of the topic should be investigated. Clearly, the emphasis may fall in only one of these areas, but the others should not be completely ignored.

It is recommended that you contact your supervisor as soon as your dissertation proposal is completed to the satisfaction of the Director of Studies.

A 3 What is assessed

A good dissertation is one that is focused and that demonstrates scholarship and critical, innovative thought. In assessing the dissertation we will bear in mind the following considerations:

- Do you demonstrate a good knowledge of the literature on the chosen topic and closely related topics? To what extent have you understood the literature? Is the factual material accurate?
- To what extent is there a logical arrangement of an argument throughout the dissertation? We are looking here at the arrangement and structure of the dissertation rather than detailed arguments within it.
- To what extent are you able to look critically at other people's arguments and published 'facts'? Here, the presentation of detailed argument is important.
- To what extent are you able to evolve original criticism of other people's work and make original constructive comments of your own? Here, also, the presentation of detailed argument is important.

- Is the dissertation written in good grammatical English? Are your arguments as clearly written as possible? Are the statistical tables and diagrams relevant and do they explain the verbal text? Try to present statistical tables of your own and do not copy or photocopy them from a book or article where they have been published for a purpose quite different from your own.
- Finally your presentation: get your spelling right, sensible paragraphs, give correct references and bibliographical information.

A 4 Presentation

The dissertation will not exceed 20,000 words in length. If it does considerably exceed this length you run the risk of being required to reduce its length to 20,000 words.

You **must** provide a word count (of text only: that is, do not include in the word count figure and table legends or bibliography).

The dissertation should be typed in double spacing on A4 paper with a 2-inch left-hand margin to permit binding. References should follow the Harvard System (details of this system were provided as part of the research methods). The library also produces a useful description of this system in a handout. Footnotes should be kept to a minimum and be placed at the end of chapters. Statistical tables may be placed in Appendices or in the text as desired. All citations in the text should consist solely of the author's surname followed by the year of publication in brackets. The dissertation should commence with an abstract and conclude with a Reference List arranged alphabetically by author's surname.

The completed dissertation cannot be accepted unless it is in a form suitable for the Library. Poor word processing or typing, bad spelling and untidy statistical tables are not acceptable. You must allow yourself time to proof read the typed script and have it corrected before submission.

A 5 Marking

Each dissertation will be marked by the supervisor and by one other assessor working independently. Selected viva voce examinations with the external examiner are held in late October or November.

The pass mark is 40 per cent. A student receiving a mark of 70 per cent or over for their dissertation will receive a Distinction if he/she also obtained an average of at least 70 per cent for the taught units of the programme. If a dissertation is unsatisfactory, the student may be requested to resubmit/revise it. A period of 6 weeks will usually be permitted for resubmission/revision, this period commencing the day after the Board of Examiners' meeting. If a resubmitted dissertation is adequate for the award of an MSc, a pass mark (40 per cent) will be assigned to it unless the Board of Examiners has agreed to recommend to the Board of Studies that there are exceptional circumstances for awarding the dissertation a higher mark. However, if revision, rather than re-submission, is requested and if the revisions have been completed satisfactorily, the Board of Studies will be asked to assign a mark to the dissertation which has been agreed by the Board of Examiners.

Marks are awarded on the following basis:

Presentation of the Dissertation (20 per cent)

Is the dissertation written in good grammatical English (bearing in mind that English may not be the first language of the student)?

Are the statistical tables, diagrams and accompanying legends clear and informative?

Are references and bibliographical information presented correctly?

Literature Review (20 per cent)

Does the student demonstrate a good knowledge of the literature?

Has the student understood the literature?

Is the factual material accurate?

Arrangement/Structure of the Dissertation (20 per cent)

Is there a logical arrangement of arguments throughout the dissertation?

Are the arguments presented clearly? (We are looking here at the arrangement and structure of the dissertation rather than detailed arguments within it).

Detailed Argument (20 per cent)

Has the student been sufficiently critical with respect to other people's arguments and published 'facts'?

Is the presentation of the arguments balanced?

Are the statistical tables and diagrams relevant and do they explain the verbal text?

(Here, the presentation of detailed argument is important).

Originality (20 per cent)

To what extent has the student been able to evolve original criticism of other people's work and make original constructive comments of his/her own?

A 6 Dissertation Milestones

The dissertation must be, and be seen to be, your own work. Consequently, most contact between you and your supervisor will take place during the first part of the dissertation period, that is, during the Summer term (which ends on Friday 30 May). After this, you should not expect or need frequent contact. It is important to note that many supervisors will not be available for parts of the undergraduate summer vacation period due to research and conference commitments and family holidays, etc.

By **Friday 14th May 2010**: a dissertation proposal must be completed, signed by your supervisor and submitted to the Director of Studies. This synopsis should be 1-3 pages long and should comprise a summary of the arguments and issues that will be investigated, aims, objectives with associated research methodologies and an outline of the structure of the contents with an indicative bibliography.

By **Friday 13th June 2010**: one or two draft chapters should be submitted to the supervisor for guidance on style and presentation. The supervisor will not read the whole draft of the dissertation before submission. To repeat what was said above, the dissertation must be, and be seen to be, your own work.

By **Friday 10th September 2010**: submit final dissertation title to Stephen Lo, (Department of Architecture and Civil Engineering).

By **Friday 17th September 2010**: submit three **unbound** copies and **one electronic copy** of the dissertation to **Brenda Apted** at the Centre for Window and Cladding Technology by 3.00-pm (1500 hours). CWCT will then arrange for covers to be put on the dissertations. The three copies should be in a state suitable for binding (i.e. pages not stapled, margins correct width, pages numbered and in the right order, etc.).

Note: *No dissertation will be accepted later than the submission date unless accompanied by a medical certificate indicating that illness has prevented the candidate from submitting on time, or for other valid reasons. Moreover, **late submission must always be discussed with the Director of Studies prior to the submission date.** In such cases, the acceptance of a dissertation that is submitted late will be at the discretion of the Director of Studies. It is therefore crucial that you set yourself a personal deadline several days earlier than the official deadline, so that any last-minute*

problems (e.g. with printing) do not prevent you submitting on time.

Late October/November: **Viva Voce Examination** (with **Professor Ray Ogden**, the External Examiner). Please note that although not all students may be asked to attend a viva voce, *if you are asked to attend you must do so*. Viva lists will not be known until a day or so before the vivas, after the dissertations have been marked. It is probable that each examination will be of a least 20 minutes duration. Professor Ogden is Deputy Head of Department, Department of Architecture, School of the Built Environment, Oxford Brookes University.