



Department of Civil Engineering
University of Moratuwa

M.SC in
CONSTRUCTION PROJECT MANAGEMENT
Handbook 2021/2022



1. Introduction

Welcome to the Department of Civil Engineering in the University of Moratuwa, Sri Lanka. We hope this handbook will give you the background information you need during your studies at the University. Please read it carefully and keep it for future reference. In this handbook you will find an outline of the programme of Master of Science (M.Sc.) in Construction Project Management.

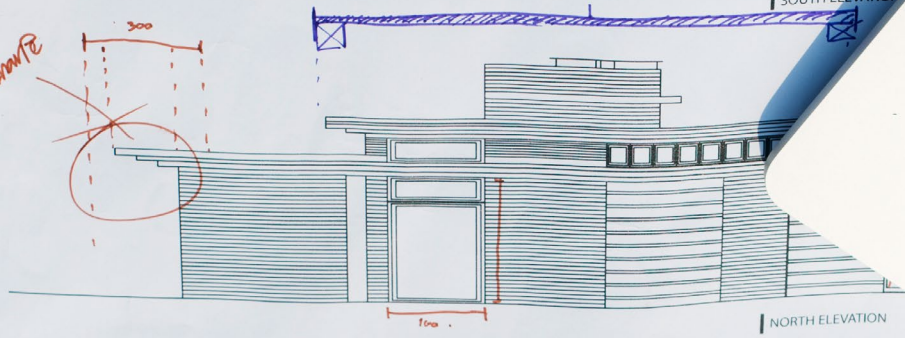
The Department of Civil Engineering believes that one of its responsibilities is to provide students with a framework, which helps them to achieve their full potentials and capabilities.

We abide by the University's teaching aims, i.e.

- To provide quality teaching that is invigorated by the research and experience of staff members.
- To engender a commitment in students to continue self-improvement and the development of their skills in order to facilitate their full contribution to the society in which they live.
- To sustain a culture of research and teaching that is able to foster both the free pursuit of truth and the impartial analysis of values as well as being responsible and responsive to anticipated social needs;
- To inoculate a sense of respect for the traditions of higher education and a commitment to the values of truth, tolerance and justice.

In pursuing these aims your learning programme in the Department of Civil Engineering will emphasise:

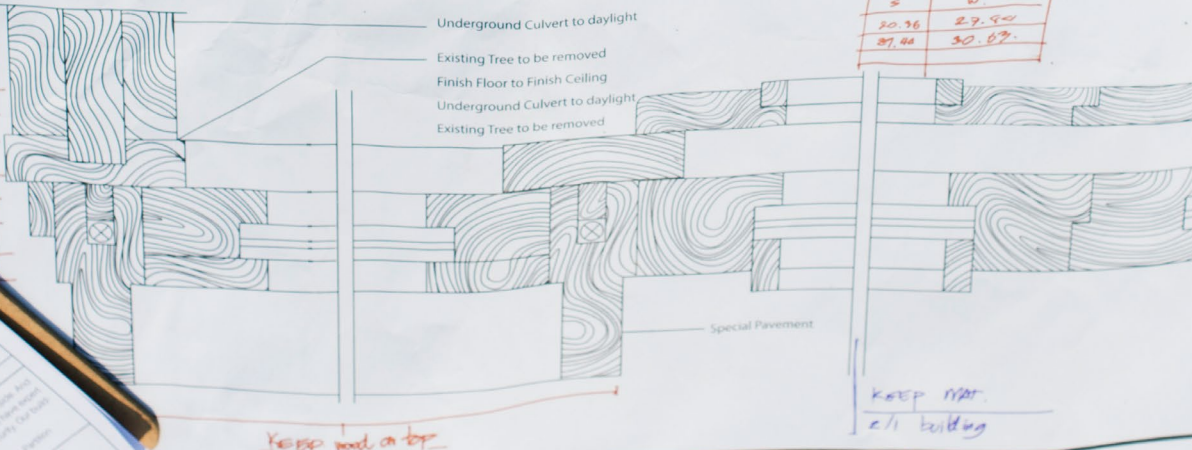
- Student-centred learning as the means of developing an appreciation of both the spirit and practice of enquiry
- Conceptual thinking as the key to understanding complex phenomena
- Awareness and understanding of empirical research
- Systematic development and assessment of students' personnel and transferable skills
- Skills development to create new knowledge through active learning and original research
- Systematic development of skills through new methods of teaching and learning to use new knowledge to prosper industry.



BUILDING CONCEPT

The term building design refers to design of building from a perspective of architectural this includes construction methods, robust detail design and how the building aspect is usually shown in the form of spacial, geometric and aesthetics. When undertaking a building design project the designer may also use the services of CAD daughters the way the building will be constructed. Building design projects are undertaken by a designer, typically this designer will have experience in architecture, building engineer specialists, engineers for robust detail calculations, surveyors, geotechnical engineers and manufacturers of the materials specified, it is very rare that a building design project is completed above have a role to play and must work together if they are to complete the design process as smoothly as possible, this usually means sharing information as well as skills.

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2. Department of Civil Engineering

Department of Civil Engineering in University of Moratuwa took responsibility in introducing education and training in Project Management and Construction Project Management in Sri Lanka. It is with this objective that the Construction Engineering and Management Division of the Department of Civil Engineering offers M.Sc. in Construction Project Management for a wider target group focusing on practising Engineers, Quantity Surveyors and Architects. These programmes draw upon specialist academic staff from the Department of Civil Engineering and other Departments within the University of Moratuwa. In order to promote multidisciplinary approaches, the programme utilizes specialist academic staff from other universities, institutions and the industry as well.

The Department is currently offering Construction Engineering and Management, Building and Structural Engineering, Geotechnical Engineering, Hydraulic Engineering, Transportation Engineering and Environmental Engineering related subjects for the Engineering undergraduate courses and hosting number of postgraduate research students. The department has introduced number of short-term training programmes for the industry and in working closely with centre of excellence in Project Management of University of Moratuwa.

Staff of the Construction Engineering and Management Division has diverse research interests which includes wider areas of Risk, Quality, Management of Information Systems, Innovative designs for Buildings, Effective Materials for Buildings, Energy Conservation, Low cost materials and construction methods, Stakeholder management, Infrastructure Assets management, Building economics, Procurement Management, Quality Management and General Management etc. Apart from teaching and research, staff members of the department undertake consultancy assignment and provide advisory services to the industry.



3. Structure of the M.Sc. Programme

M.Sc. in Construction Project Management (M.Sc. – CPM) is a Six Semester (approximately 24 months) part-time degree program consisting of Construction Project Management compulsory modules, electives and a compulsory M.Sc. research project.

Credits

60 credits required to complete M.Sc. in Construction Project Management

(1 credit = One hour of lectures or other classroom activity per week for one semester of approximately 14 weeks duration, or two hours of practical or project related work per week for one semester of approximately 14 weeks duration.)

3.1. Structure of the MSc Programme

Semester 1

- Project Management I
- Communication Skill Development
- Human Resource Management
- Procurement Management and Law

Semester 2

- Project Management II
- Construction Management
- Building Services and Asset Management
- Financial Management
- Quantitative Techniques & Research Methodology

Semester 3

- Management Information Systems
- Advanced methods in Building Construction
- Sustainable Design and Construction
- Economics and Development Finance

Semester 4

- Project Management Applications
- Road and Bridge Engineering
- Climate Change and Disaster Management
- Climate Change and Disaster Management

4. Subject Arrangement

4.1. Compulsory Core Modules for M.Sc. in CPM

Total Credits from Compulsory Modules for M.Sc. in CPM = 51 credits

Module Code	Module Title	Credits	Evaluation	
			CA	WE
CE 5251	Project Management 1	3.0	50%	50%
CE 5252	Project Management 2	3.0	50%	50%
CE 5253	Management Information Systems	3.0	50%	50%
CE 5254	Procurement Management and Law	3.0	50%	50%
CE 5255	Human Resource Management	3.0	50%	50%
CE 5256	Project Management Applications	3.0	60%	40%
CE 5257	Construction Management	3.0	50%	50%
CE 5258	Financial Management	3.0	50%	50%
CE 5259	Economics and Development Finance	2.0	50%	50%
CE 5260	Communication Skill Development	2.0	100%	
CE 5261	Quantitative Techniques & Research Methodology	3.0	50%	50%
CE5262	Research Project	20	100%	

CA – Continuous Assessment, WE – Written Examination

4.2. Elective Modules for M.Sc. in CPM

Minimum Credits from Elective Modules for M.Sc. in CPM = 9 credits

Module Code	Module Title	Credits	Evaluation	
			CA	WE
CE 5271	Advanced methods in Building Construction	3.0	50%	50%
CE 5272	Road and Bridge Engineering	3.0	50%	50%
CE 5273	Building Services and Asset Management	3.0	50%	50%
CE 5274	Sustainable Design and Construction	3.0	50%	50%
CE 5275	Climate Change and Disaster Management	3.0	50%	50%
CE 5276	Industrial and Commercial Law	3.0	50%	50%

CA – Continuous Assessment, WE – Written Examination

5. M.Sc. Course Fees, Registration, Course Administration and Penalties

5.1. Course fees

Tuition fee: Rs. 350,000/=

Registration fee: Rs. 2000/=

Library Deposit (refundable deposit): Rs. 2500/=

Exam fee: Rs. 1000/=

(All fees should be paid in the registration)

5.2. Registration, Course Administration and Penalties

- Applicants who are wishing to pursue the postgraduate programme can apply before the stipulated deadline.
- An interview and/or selection test will be held for the applicants. The selected students will be informed and given the registration details.
- A student can register at the Senior Assistant Registrar's (Examinations) Office by applying for registration using the specified form after making necessary payments for tuition, registration, examination and library fees at the University Accounts Division.
- On registration you will be issued a Student Record Book. After obtaining your Record Book from the Senior Assistant Registrar's (Examinations) you can register at the University Library by producing the Record Book. The Library registration will be arranged by the Course Coordinator together with a visit to the Library.
- A person who is currently registered as an internal/external student/candidate of any University or higher educational institution shall not be registered for the M.Sc. programme and a person registered for the M.Sc. programme may not register himself/herself concurrently as an internal or external student of any other University or Higher Educational Institution.
- The registration for M.Sc. shall be deemed to have lapsed at the expiry of its period of validity. A student whose registration had so lapsed may renew the registration for a further period, provided that the Faculty and the Senate on the recommendation of the Board of Study consider him eligible for such registration. However, no registration shall be renewed after the expiry of 12 semesters (4 years) from the first registration.

Note: These terms and conditions can be subjected to changes.

5.3. Additional Time to Complete the Course

The Original course fee covers registration for a period of two (2) years. If you wish to take leave, repeat examinations or transfer to/Complete with future batches, additional charges will be applied. Please consult the course coordinator in this regard.



MSc in Construction Project Management

Department of Civil Engineering
University of Moratuwa



6. The Academic Staff/ The Teaching Faculty

6.1. Subject Coordinators

Code	Module	Coordinator
CE 5251	Project Management 1	Dr. C.S.A. Siriwardana
CE 5252	Project Management 2	Dr. P. Perera
CE 5253	Management Information Systems	Dr. P. Perera
CE 5254	Procurement Management and Law	Prof. R.U. Halwatura
CE 5255	Human Resource Management	Dr. L.L. Ekanyake
CE 5256	Project Management Applications	Dr. C.S.A. Siriwardana
CE 5257	Construction Management	Dr. C.S.A. Siriwardana
CE 5258	Financial Management	Dr. L.L. Ekanyake
CE 5259	Economics and Development Finance	Dr. L.L. Ekanyake
CE 5260	Communication Skill Development	Prof. C. Jayasinghe
CE 5261	Quantitative Techniques & Research Methodology	Prof. C. Jayasinghe
CE 5262	M.Sc. Research Project	Dr. C.S.A. Siriwardana
CE 5271	Advanced methods in Building Construction	Dr. K. Kariyawasam
CE 5272	Road and Bridge Engineering	Dr. K. Kariyawasam
CE 5273	Building Services and Asset Management	Dr. K. Kariyawasam
CE 5274	Sustainable Design and Construction	Prof. C. Jayasinghe
CE 5275	Climate Change and Disaster Management	Dr. C.S.A. Siriwardana
CE 5276	Industrial and Commercial Law	Dr. L.L. Ekanyake

6.2. Resource Academic Staff

University of Moratuwa, Department of Civil Engineering

Prof. K.A.M.K. Ranasinghe

B.Sc. Eng. (Moratuwa), MSc (BrCol), PhD (BrCol), CEng, IntPE, FIE(SL), FNAS(SL)

Prof. A.K.W Jayawardane

B.Sc. Eng. (Moratuwa), MSc (Lough), PhD (Lough), CEng, FIE(SL), IntPE, MSSE(SL), FNAS(SL), FIPM(SL)

Prof. N.D. Gunawardena

B.Sc. Eng. (Moratuwa), MSc (Lough), PhD (Lough), CEng, MIE(SL)

Prof. A.A.D.A.J. Perera

B.Sc. Eng. (Moratuwa), CEng, MSc (Lough), PhD (Lough)

Prof. (Mrs.) C. Jayasinghe

B.Sc. Eng. (Moratuwa), MEng (Moratuwa), PhD (Moratuwa) CEng, MIE(SL), MSSE(SL)

Prof. R.U. Halwatura

B.Sc. Eng. (Moratuwa), PhD (Moratuwa), CEng, MIE(SL)

Dr. L.L. Ekanayake

B.Sc. Eng. (Moratuwa), MSc (NUS), GDBA, PhD (NUS), CEng, MIE(SL)

Dr. C.S.A. Siriwardana

B.Sc. Eng. (Moratuwa), MSc (Tokyo), PhD (Calgary)

Dr. Piyaruwan Perera

B.Sc. Eng. (Moratuwa), MSc (Moratuwa), MBA(S'Japura), PhD (UBC), EIT (B. Columbia), MLIT(SL)

Dr. K.K.G.K.D. Kariyawasam

B.Sc. Eng. (Moratuwa), PhD (Cambridge)

Prof. J.M.S.J. Bandara

B.Sc. Eng. (Moratuwa), PhD (Calgary), CEng, MIE(SL), FCILT

Prof. W.K.Mampearachchi

B.Sc. Eng. (Moratuwa), MSCE (South Florida), PhD (Florida)

Dr. S. Fernando

B.Sc. Eng. (Moratuwa), MSc (SL), MPhil (Moratuwa), PhD (Delft)

Dr. V. Adikariwattage

B.Sc. Eng. (Moratuwa), MSc (Moratuwa), PhD (Calgary)

Dr. P.T.R.S. Sugathadasa

B.Sc. Eng. (Hons) (Moratuwa), M.Sc. (Moratuwa), MBA (Colombo), PhD (Moratuwa), C Eng., PMP, CMILT, MIE (SL)

Visiting Staff

Mr. J. Kumarasinghe
B.Com (Colombo), MSc. (NUS), CMA (Australia)

Eng. R.K.U.I. Ranaweera
B.Sc. Eng. (Moratuwa), MBA (Colombo), CFA Level I

Mr. M.V. Jayasinghe
MBA, B.Sc., ACMA, MCPM

Mr. A.W.I. Mendis
MBA (Moratuwa), B.Sc. Eng. (Moratuwa), MASHRAE, MIET, AMIESL, MSLEMA

Mr. S. Jayakody
MSc. (Saitama), B.Sc. Eng. (Moratuwa), MBA (Colombo)

Eng. N.T.P.K.G.S. Nanayakkara
C Eng., M.Sc. (CS), B.Sc. Eng. (Hons), BIT, MBCS, MIET, MIEEE, MIsoc, MIE (SLO)

Mr. Prasanna Narangoda
B.Sc. Eng. (Hons) (Moratuwa.), M.Sc.(UOM), MIESL, ASHRAE, MLABSE

Mr. Deepal Fernando
M.Sc. (Mech) Eng. (U.S.S.R.), C.Eng., MIE (SL)

Dr. Asanga Gunawansha
PhD (NUS), LLM (Warwick), Attorney-at-Law (Sri Lanka)

Mr. H.D.J. Ashan Stanislaus
Master of Law (University of Colombo)

In addition to the above, there will be several Guest Lecturers from regional Universities and Special Speakers from the Industry.

7. Subject Outline

Module Code	CE 5251	Module Title	Project Management 1			
Credits	3.0	Hours/Week	Lectures	3.0	Pre-Requisites	None
			Lab/Assignments	-		

Learning Outcomes

On successful completion of this course module students will be able to:

- Prepare project management outputs mainly Project Charter, Project scope statement and work breakdowns structure.
- Prepare a Project Management plan using project management software.

Outline Syllabus

- Project Management Framework: Project Management Context, Project Management Process, Introduction to Project Management.
- Project Integration Management: Project plan development, Project plan execution, Overall change control.
- Project Scope Management: Initiation, Scope planning, Scope definition, Scope verification, scope change control
- Project Time Management: Activity definition, Activity sequencing, Activity duration estimation, Schedule development, Schedule control, Introduction to computer software (MS Project)
- Project Cost Management: Resource planning, Cost estimating, Cost budgeting and Cost controlling.

Module Code	CE 5252	Module Title	Project Management 2			
Credits	3.0	Hours/Week	Lectures	3	Pre-Requisites	None
			Lab/Assignments	-		

Learning Outcomes

On successful completion of this course module students will be able to:

- Prepare project cost estimates and budgets and to perform cost controlling.
- Prepare risk management plan, quality control system, resource breakdown structure and procurement plan.

Outline Syllabus

- Project Quality Management: Quality planning, Quality assurance and Quality control
- Project Communication Management: Communication planning, Information distribution, Performance reporting and Administrative closure.
- Project Risk Management: Risk identification, Risk quantification, Risk response development and Risk response control.
- Project Human Resource Management and Project Procurement Management
- Project Management Information Systems

Module Code	CE 5253	Module Title	Management Information Systems			
Credits	3.0	Hours /Week	Lectures	3	Pre-Requisites	None
			Lab/Assignments	0		

Learning Outcomes

On successful completion of this course module students will be able to:

- Select the management information systems for an organization.
- Start using appropriate technology and management information systems.
- To apply non-technical aspects related to information system in an organization.

Outline Syllabus

- Organizations, management, and the networked enterprise: Aspects of managing digital firm, information systems in enterprise, information systems, organizations, management and strategy, The Digital firm : Electronic business.
- Information Technology Infrastructure: Managing hardware and software assets, Managing data resources, Telecommunications and networks.
- Building Information systems in the digital firm: Redesigning the organizations with information systems, Understanding the business value of systems and managing change.
- Managing and organizational support systems for the digital firm: Managing knowledge and Enhancing management decision making.
- Managing information systems in the digital firm: Information systems security and control, Ethical and social impact of information systems, managing international information systems.

Module Code	CE 5254	Module Title	Procurement Management and Law			
Credits	3.0	Hours /Week	Lectures	3	Pre-Requisites	None
			Lab/Assignments	-		

Learning Outcomes

On successful completion of this course module students will be able to:

- Prepare tender documents
- Evaluate bids submitted by contractors.
- Assess aspects related to contracting
- Assess a situation such as an accident related to law of Sri Lanka

Outline Syllabus

General Principles of Law: Legal System in Sri Lanka, Courts. Law of Contract: General Principles of Contract Law, Formation of Contract, Remedies and Breach of Contract. Industrial law and law related industrial safety. Form of contracts (ICTAD), types of contracts and procurement methods, and. Evaluation of ICTAD conditions with respect to the NPA guideline. Conditions of contracts, important areas: General obligations; Materials and workmanship; Commencement time and delays: Alteration, additions and omissions; Measurement, certificates and payment: Nominated sub-contractors: remedies; Conditions of particular applications. Construction claims: Types of claims, claim situations, claim clauses; Claim procedure, Claim presentation; Arbitration procedure. Practice of Building and Engineering Contracts, Settlement of Disputes and Arbitration Procedures.

Module Code	CE 5255	Module Title	Human Resource Management			
Credits	3.0	Hours /Week	Lectures	3	Pre-Requisites	None
			Lab/Assignments	-		
Learning Outcomes						
On successful completion of this course module students will be able to:						
<ul style="list-style-type: none"> • Perform human resource management aspects in a construction organization. • perform human resource management using IT based systems 						
Outline Syllabus						
<ul style="list-style-type: none"> • Organization Structure: Organization Structure and Relationship, Classical approach, Human relations approach, System approach. • Individual in Organization: Self-awareness, Attitudes and values, Interpersonal skills, incompatibilities, Managing personal stress. • Communication and Problem Solving in Organizations: Supportive communication, Supportive listening, Creative problem solving. • Groups in Organizations: Group behavior, Group formation, Types of groups, Managing Groups, Conducting effective groups meeting. • Performance and change in Organizations: Ability. Motivation, Improving employee performance through motivation, implementing change, Managing change. • Leadership and Delegation in organizations: Approaches to leadership, Delegation. • Personnel and Conflict Management in Organizations: Personnel Management, Managing Conflict, Initiator, Respondent, Mediator Role. • Building the Team: Forming, Norming, Storming, Performing. 						

Module Code	CE 5256	Module Title	Project Management Applications			
Credits	3.0	Hours /Week	Lectures	3.0	Pre-Requisites	None
			Lab/Assignments	-		
Learning Outcomes						
On successful completion of this course module students will be able to:						
<ul style="list-style-type: none"> • perform project management using enterprise project management systems. • plan and perform career development related project management • use new project management concepts such agile project management 						
Outline Syllabus						
New methods of Project management – Agile project management, Prince 2 and other methods. Introduction to Project Management Institution and professional qualifications related to Project Management. Additional standards of Project Management Institutions such Safety related to construction industry. Project Management Systems such as Primavera, MS Project Server and Enterprise Resource Planning Systems (ERP).						

Module Code	CE 5257	Module Title	Construction Management			
Credits	3.0	Hours /Week	Lectures	3.0	Pre-Requisites	None
			Lab/Assignments	-		
Learning Outcomes						
On successful completion of this course module students will be able to:						
<ul style="list-style-type: none"> • apply critical construction management concepts, work study, activity sampling and incentives. • select and manage construction equipment. • prepare cost estimate and manage competitive bidding process. 						
Outline Syllabus						
<ul style="list-style-type: none"> • Work Study – Method study and work measurement. Activity sampling. • Incentives – Motivation theories, Principles of incentive scheme. • Cash flow forecast and cost control. • Equipment management- Equipment selection, hire rates, production outputs. • ICTAD specifications and construction methods. • Construction company organization and site management. • Estimating and Tendering – Material, labour and equipment rates, sub contract management and competitive bidding. Computer Aided Estimating. 						

Module Code	CE 5258	Module Title	Financial Management			
Credits	3.0	Hours /Week	Lectures	3.0	Pre-Requisites	None
			Lab/Assignments	-		
Learning Outcomes						
On successful completion of this course module students will be able to:						
<ul style="list-style-type: none"> • apply financial management concepts in management of construction projects. • assess the financial position of a construction organization. • set procedures related to finances in a construction project. 						
Outline Syllabus						
<ul style="list-style-type: none"> • Introduction to Financial accounting concepts. • Capital Employment: Combination of long and short term funds, Sources and cost of capital, Capital gearing, stock market and unlisted securities market. • Working Capital Management: Working capital requirements, Relationships between working and fixed capital, Cash management, Management of stocks and debtors. Company and personal taxation • Financial Investment Appraisal: Cash flow forecasting for discrete and continuous cash flows, Comparison of alternatives using net present worth (value), annual worth, rate of return analysis, Analysis of alternatives, Total project cost, Effects of inflation, Interest and tax, Sensitivity analysis, Risk analysis. • Company analysis: Financial statements, Analysis of company performance. • Computer aided Financial Management Systems. 						

Module Code	CE 5260	Module Title	Communication Skill Development			
Credits	2.0	Hours /Week	Lectures	2.0	Pre-Requisites	None
			Lab/Assignments	-		
Learning Outcomes						
On successful completion of this course module students will be able to:						
<ul style="list-style-type: none"> perform written communication in an organization to the level expected by professional institutes such as Institute of Engineers Sri Lanka and technical writing. Ability for effective verbal communication. Ability for effective use of modern tools for communication 						
Outline Syllabus						
<ul style="list-style-type: none"> Effective Writing: technical report writing, business report writing, letter writing, academic writing etc. Effective Presentation: Communication in committees, Communication to an audience with audio visual aids such as multimedia projector. ICTAD Construction Management Communication formats for a construction project. IT related communication methods such emails, blogs, group systems such as dropbox, Sharepoint server. In depth training on MS Powerpoint. 						

Module Code	CE 5261	Module Title	Quantitative Technique and Research Methodology			
Credits	3.0	Hours /Week	Lectures	3.0	Pre-Requisites	None
			Lab/Assignments	-		
Learning Outcomes						
On successful completion of this course module students will be able to:						
<ul style="list-style-type: none"> use quantitative techniques for construction projects use quantitative techniques for research work. write a research project proposal, to develop research methodology and analysis methods and to derive conclusions. 						
Outline Syllabus						
<ul style="list-style-type: none"> Statistics: Statistical Problems in Business and Economics, Descriptive and Inferential Statistics. Risk and Decision-making: Expected Utility, Utility Functions and Risk, Reducing Risk Continuous Probability Distributions: The Normal Distribution: Properties of Normal Distribution. Sampling: Population vs. Random Sample: Selection Bias, Non-response Bias. Types and Hypothesis Testing, Simulating the <i>F</i> Distribution Introduction to Regression Analysis: Single and Multiple Regression Model. Research methodologies: primary and secondary data collection. Structured and semi-structured interviews. The design and use of questionnaires. Analysis of quantitative and qualitative data. Literature search and review. Writing up: structure and style of dissertations. 						

Module Code	CE 5262	Module Title	Research Project			
Credits	20.0	Hours /Week	Lectures	-	Pre-Requisites	CE 5261
			Lab/Assignments	-		

Learning Outcomes

After completion of the module the student should be able to:

- Analyse an industry application with scientific validation based on theory and practical knowledge gained from the course, present the results in a logical manner and write a report.

Module Code	CE 5263	Module Title	Project			
Credits	4.0	Hours /Week	Lectures	-	Pre-Requisites	CE 5261
			Lab/Assignments	-		

Learning Outcomes

After completion of the module the students should be able to:

- analyse an industry problem with scientific validation and present results with a presentation and a report.

Module Code	CE 5271	Module Title	Advanced methods in Building Construction			
Credits	3.0	Hours /Week	Lectures	3.0	Pre-Requisites	None
			Lab/Assignments	-		

Learning Outcomes

On successful completion of this course module students will be able to:

- use new building construction methods.
- manage facilities related modern buildings.
- incorporate safety and other related aspects in tall building construction.

Outline Syllabus

- Tall building construction – Formwork methods, material storage and transportation.
- Design aspects of tall buildings.
- Facilities construction of tall buildings, lifts, central air-conditioning. Use of new materials in buildings
- Health and safety related to tall building construction
- Green buildings design and construction.

Module Code	CE 5272	Module Title	Road and Bridge Engineering			
Credits	3.0	Hours /Week	Lectures	3.0	Pre-Requisites	None
			Lab/Assignments	-		
Learning Outcomes						
On successful completion of this course module students will be able to:						
<ul style="list-style-type: none"> • apply road construction methods. • introduce new road construction methods. 						
Outline Syllabus						
<ul style="list-style-type: none"> • Different construction materials used in roads and bridge construction. • Different pavement types and pavement mix design. • Latest technology in pavement surface construction. • Alternative road construction, gravel and earth Roads, concrete roads, design and construction techniques, Pavement maintenance and management and also the methods in bridge construction. 						

Module Code	CE 5273	Module Title	Building Services and Asset Management			
Credits	3.0	Hours /Week	Lectures	3.0	Pre-Requisites	None
			Lab/Assignments	-		
Learning Outcomes						
On successful completion of this course module students will be able to:						
<ul style="list-style-type: none"> • incorporate and manage building services of modern building. • Ability design and specify the requirements of asset management system. 						
Outline Syllabus						
<ul style="list-style-type: none"> • The needs of the occupants, design and construction of the appropriate services. • Technological fundamentals of various services installations. • Measurement of building services, energy auditing and value management. • Appliances, Water supply, above and below ground water disposal and drainage. HVAC, electrical installation, fire safety, security, communication and computer networking, integration of services within the building structure and the fabric. • Building Management Systems for efficient and economical operation and promotion of maintainability within the building services. • Asset Management: Maintenance planning, management, and evaluation. Maintenance planning, management and designing an effective maintenance organization. Information systems organization and asset management. Evaluating maintenance performance. cost-benefit analysis. 						

Module Code	CE 5274	Module Title	Sustainable Design and Construction			
Credits	3.0	Hours /Week	Lectures	3.0	Pre-Requisites	None
			Lab/Assignments	-		

Learning Outcomes

On successful completion of this course module students will be able to:

- initiate green projects
- design and construction of green projects.

Outline Syllabus

- The knowledge on architectural, structural, renewable energy and sustainability aspects, inculcating an appreciation of the role played by the built environment in sustainable development by encouraging energy efficiency and resource optimization in the built environment. Students will also be able to familiarize the standards with the certification protocols that ensure sustainability of a built environment.
- The construction waste management and related aspects.
- The trends of green building research and applications.
- The requirements of Green Buildings, the already constructed green buildings and performance in Sri Lanka.

Module Code	CE 5275	Module Title	Climate Change and Disaster Management			
Credits	3.0	Hours /Week	Lectures	3.0	Pre-Requisites	None
			Lab/Assignments	-		

Learning Outcomes

On successful completion of this course module students will be able to:

- be prepared for climate change and disasters.
- manage a construction site during a disaster
- respond to disaster.

Outline Syllabus

- The climate change, the world main problem and its main aspects. The research and trends of climate change and its relevance to construction.
- Various agreements on climate change and current situation. The world cities and pressing challenges for planning, design and construction.
- The aspects of disaster situations and special aspects of post disaster projects. Emergency projects and medium term disaster recovery projects. Special aspects such as resource assessment, cost estimating, cost controlling and cost management, risk assessment in post disaster situations and quality assurance in disaster recovery projects.

Module Code	CE 5276	Module Title	Industrial and Commercial Law			
Credits	3	Hours/Week	Lectures	3.0	Pre-Requisites	None
			Lab/Assignments	-		
Learning Outcomes						
On successful completion of this course module students will be able to:						
<ul style="list-style-type: none"> • make initial managerial decisions related to law in construction organizations. • make a management of assessment related work of construction company. 						
Outline Syllabus						
<ul style="list-style-type: none"> • General Principles of Law: Sources of Law and Legal System in Sri Lanka, Courts' • Structure and Procedure, Administrative Tribunals and their scope - power - excesses - remedies - Judicial Review of Administrative decisions. • Law of Tort: Nature of Delictual Liability: trespass, nuisance, negligence, breach of statutory duties, Occupier's Liability; Professional Responsibilities and Liabilities. • Law of Contract, Company Law and Commercial Law: Company Law, companies Act and legal obligations. • Industrial Law, Commercial law and labour laws. 						





8. Individual and Group Assignments

8.1. Assessment of Course Work

Assessment of course work is an important part of the course. There will be clear guidelines from the module co-ordinator at the beginning of the module regarding the overall assessment process, the rubric of the examination and the purpose and nature of each coursework assignment within the overall assessment process. For each assignment you will be informed of title, maximum/minimum length, contribution to the overall assessment, deadline for the submission, explanatory rubric, ancillary materials and reading guidelines etc. Fair assessment of course work requires that the work submitted by a student is his or her alone, unless group working is explicitly authorised. Collusion and plagiarism in assessed work are serious offences under University Regulations and can lead to expulsion from the course. When submitting work students may be required to sign an undertaking to the effect that the work submitted represents only their own work. The structure, expected content and a sample cover page of the assignments are attached in Annex 2.

Assignments should be handed into the Department by the given deadline. If you feel that you are unable to submit your assignment by the given deadline, you must notify the Course Co-ordinator immediately. Medical evidence will normally be required to establish a valid reason for late submission. Unless an extension is agreed by the Module Co-ordinator, your work will be penalised by a deduction of one mark per day up to a maximum of 10 days, after which a mark of zero will be returned.

All sources should be referenced, and quotations should be acknowledged when work is submitted for assessment. If you wish to cite materials from the web, you must include in your bibliography the URL enabling the marker to find it, together with a brief explanation of why you feel the work has academic credibility. A Lecturer has the right to request you to produce a copy of the article as well as a reference to it.

8.2. Group Assignments

All students must accept the need for working in groups, and the benefits to be gained from the transfer of work experience and other practices through group working. The following procedure for group formation will take place unless otherwise agreed with the module co-ordinator.

Process

- Module Lecturers allocate student groups for assessed group assignments, not the students.
- Groups will be chosen by quasi-random selection, resulting in each group containing a mix of students differentiated as far as feasible by such factors as age, gender, level and type of experience.
- New groups should be formed for each different group-work.
- Students' preferences should only be granted where the teacher is satisfied that there is a logistical problem that threatens the functionality of the group.

When a group project is submitted, a separate section should be included in which each member of the group briefly describes his/her contribution to the project. If the group wishes to receive same marks for everybody or marks according to the contribution, it should be stated in the assignment.

8.3. Plagiarism and Presentation of Assignments

Always use a word processor to compile your reports and proof-read the final work before submission. Always paginate an assignment. It is your responsibility to keep a copy of every assignment.

The University Regulations require students to submit their own original work for essays, reports, exercises and examinations. Stress is laid on consequences of plagiarism and the use of other unfair means in assignments and examinations.

Some examples of plagiarism are:

- Asking someone else to write all or part of an essay.
- Copying all or part of someone else's essay, with or without the other person's knowledge.
- Using quotations or ideas from the works of others which are not acknowledged.
- Working jointly with another student on an essay and then copying it up for individual submission.
- Taking materials from the internet and passing it off as your own.
- Summarising a range of sources as if you had read them yourself, when in fact you are using someone else's references.

There is no objection to quoting materials from other sources. In fact, it is in academic writing to quote materials selectively from journals and even textbooks, but it is very important that you acknowledge and identify all source materials on which your assignment work is based. Of course, a piece of work that is made almost entirely of other people's ideas with little input from you is likely to be awarded a rather low grade.

Any quotations should always be attributed by means of quotation marks and a reference naming author and text. Remember that quotations and references should be used in support of an argument, or to make a point, and not to provide the substance or main part of the work to be submitted for assessment.

If you do not clearly identify your sources, you might be suspected of plagiarism. If an examiner finds that you have presented someone else's work as your own the consequences can be very serious.

9. M.Sc. Dissertation

The fifth and sixth semesters of this course are dedicated for the M.Sc. dissertation. This consists of a written report on an original and individual project undertaken by the student. Students are encouraged to think about research work early in the academic semesters for efficient execution of the project. Preparation for the dissertation begins with the module, Quantitative Techniques & Research Methodology in the second semester. The M.Sc. dissertation will be assessed by a panel of examiners.

In the fourth semester, course co-ordinator will circulate a list of possible supervisors and their areas of research interests. Afterwards, students can approach an appropriate supervisor to discuss their project proposals. Students who are wishing to undertake a project within a firm/ organization are responsible for organising their own placements. Course coordinator can issue a letter to facilitate the placement if it is requested by the student. Special forms relevant to the research dissertation will be issued during the fourth semester.

The format of the written report, sample cover page, sample first page and declaration can be found in Annex 3. Forms related to supervision, method of submission and expected content can also be found in Annex 3. All the mentioned pages must be included in the final submission of the dissertation

9.1. How to select an area for M.Sc. dissertation

Choosing a research area is often the most difficult part of research. It is important that you select an area that really interests you since you will spend a lot of time developing the proposal. Read some of the latest literature from major journals in your area of interest to determine what unanswered questions are raised by the paper(s), and determine what techniques could be employed to answer them. You will be given more information in selecting the research area in the module Research Project.

10. Performance Criteria

10.1. Performance Criteria for Post Graduate Diploma in Construction Project Management

Title of Award

Post Graduate Diploma in Construction Project Management

Speciality

Construction Project Management

Participation in the Academic Programme:

At least 80% attendance is normally required in lectures, tutorials and other group based activities to be eligible to sit for examinations.

Participation is compulsory, unless otherwise approved, in all prescribed seminars and assignments, such as: tutorials, term papers, case studies, project activities as envisaged in the course curriculum.

Pass in the Post Graduate Diploma

A candidate is deemed to have passed the Post Graduate Diploma if he/she has successfully completed the evaluation requirements in each of the components of the course content as given below:

- written examinations in all the subjects
- seminars
- assignments, term papers and other project-based activities
- final project

AND

Collected at least 41 credits at postgraduate level, offered according to the course curriculum approved by the Faculty and the Senate.

Note: Where the overall mark assigned for a subject consists of written examination marks as well as marks assigned for any subject related coursework, the candidate shall obtain at least 40% of the marks assigned for each such component of that subject.

If a student is unsuccessful in any of the subjects or components, the student may be re-examined. Normally, only one re-examination will be allowed, and this shall be at the next holding of the examination(s) assessment(s). No postponement shall be allowed without prior approval of the Senate.

Award of Subject Grades:

To pass a subject, student should obtain minimum marks (40%) in each component (i.e. the written examination and project based activities) of the subject and an overall minimum grade of C+ or above.

Grades of performance for the subjects shall be awarded as follows:

Guideline ¹ Percentage	Grade	Grade Point	Description
85 and above	A ⁺	4.2	Excellent
75 to 84	A	4.0	
70 to 74	A ⁻	3.7	
65 to 69	B ⁺	3.3	Good
60 to 64	B	3.0	
55 to 59	B ⁻	2.7	
50 to 54	C ⁺	2.3	Pass ^(a)
	I	0.0	Incomplete ^(b)
	F	0.0	Fail ^(c)

Grade C+ or above is required to pass a module and earn credit for it.

A candidate who has not obtained a grade of C+ in a subject but has obtained minimum marks for at least one component, receives an incomplete grade, I.

A candidate receiving an F grade must repeat all components.

The 'I' grade or 'F' grade can be improved to a C+ grade by repeating one or more components to satisfy the requirements for a pass in the subject. The maximum grade awarded for a course module after repeating one or more components will be a C+ and will be used for calculating the Grade Point Average.

Calculation of Grade Point Average:

The grade point average (GPA) is calculated from the grade points received by the student (GRADE POINT) and the credits assigned for each of the course units (CREDITS) by the formula:

$$GPA = \frac{\sum (GRADE\ POINT \times CREDITS)}{\sum CREDITS}$$

Release of Results:

Subject to confirmation by the Senate, results of a candidate at the written examinations shall be released after the Board of Examiners meeting, unless the Board of Examiners recommends withholding of the results for specific reasons.

Award of Post Graduate Diploma:

A candidate is eligible for the award of the Post Graduate Diploma if he/she, has obtained 31 credits from the Compulsory and 9 Credits from Elective modules

Date of Award:

The effective date of the Post Graduate Diploma shall be the first day of the month after the successful completion of all of the following, required to obtain the minimum credit requirement for the course:

- (a) Written examinations
- (b) Seminars
- (c) Assignments
- (d) Examination of the design project and oral presentations.

Duration of the Course:

PG Diploma – 15 months Part Time

All lectures, assignments, seminars, field visits etc. will be conducted normally on Fridays and Saturdays.

10.2. Performance Criteria for M.Sc. in Construction Project Management

Title of Award:

Master of Science in Construction Project Management

Speciality:

Construction Project Management

Participation in the Academic Programme:

A candidate must satisfy the requirements for the award of the Post Graduate Diploma in Construction Project Management.

A candidate must undertake an individual research project as assigned by the Department on a specific area.

Evaluation of the Research Project

This consists of examination of dissertation, evaluation of the seminar and oral examination of the candidate by a panel of examiners.

The grading for the research project will be A+, A, A-, B+, B, B-, C+, I, F. (Grading are as per the table 4.5.1).

All pass grades carry 20 credits for the research project

Award of the M.Sc. in Construction Project Management:

A candidate is eligible for the award of the M.Sc. in Construction Project Management, if he/she,

- (a). Has obtained 41 credits from the Post Graduate Diploma
- (b). Has successfully completed the research project and obtained 20 credits for the project

Date of Award

Date of award of the Post Graduate Diploma will be the first day of the month after the successful completion of the research project.

Duration of the Course:

M.Sc. - 2 Year Part Time

All lectures, assignments, seminars, field visits etc. will be conducted normally on Fridays and Saturdays.

Annex 1.

General Examination Regulations

- Strict silence is to be observed by candidates till the end of the examination.
- No Candidate shall have with him/her books, notes cellular phones, computers, programmable calculators other than those explicitly permitted for that examinations or any stationery or material other than those issues to him and if any such material has been brought into the examination hall by any candidate he/she shall hand them over to the invigilator immediately.
- That it is an examination offence to remove examination stationary, other than the question paper when allowed, out from the examination hall.
- 10 minutes prior to the scheduled time of closure of examination all writing including Index Numbers, Question Numbers etc. and tying up answer scripts to be completed entirely within the allocated time.
- Writing must stop on relevant announcement.
- No candidate is permitted to leave the examination hall during the first 30 minutes or last 30 minutes of the examination. Those who leave will not be allowed to return to the examination hall.

Annex 2.

2.a. Structure of Reports and Essays

In assignments requiring a report, student should always adopt the following common structure unless explicitly given an alternative structure by the lecturer.

- **Title Page:** keep the title short and punchy. Use a subtitle if necessary to explain the title.
- **Executive Summary:** The executive summary explains what the report is about (The aims and objectives are summarised, the methodology used, the major findings or results given and recommendation listed where relevant)
- **Contents: List of Figures & Tables:** The contents list must have a page number for each section. This is particularly important for long pieces of work.
- **Introduction:** The introduction gives the background to the work, and lays down the aims and objectives, the scope and boundaries, with reasons.
- **Main Body:** Keep the main body of the report readable and interesting. Try not to spoil the flow with statistics and tables which may be important and necessary but which does not add to the reader's understanding. Relegate them to the appendix. Analyse logically and critically. Point out conflicting arguments and inconsistencies from your readings with explanations where possible. Point out which readings are relevant and which are not to your particular situation. Draw any inferences from this.
- **Sections/Chapters:** Make the conclusions clear and sharp so that they follow logically from the analysis. Use bullet points if necessary. Make sure you have achieved your objectives, and where you have not, explain why not. Think carefully presentation of data. Make it simple and easy to understand. Tables of numerical data are often easier to use than graphs, but graphs have greater impact. Be sure to use the right type of graph for the data set.
- **Conclusions/Recommendations:** Do not afraid to express your own, informed opinions in the conclusions and recommendations. This is not assertion, provided you are backing it with reasoned arguments based on the literature and any other research you may have executed during the work. Explain how your findings might be applied.
- **References:** Standard referencing procedure should be followed.
- **Appendices:** Do not pad the report out with irrelevant materials in the appendices. Use them to prove your contribution and to assist understanding the subject.

2.b. Essay Type Assignment

Essays are more appropriate for discursive assignments. They also should have a structure. There is no prescribed structure as such, but there is a simple and effective way to structure an essay which you are advised to adopt:

- Interpret the title, explain alternative interpretations and explain why you are tackling the topic your way.
- Introduce and critically discuss the materials you have selected.
- Use your material to argue your points and draw your conclusions.
- Do not ramble aimlessly or introduce interesting but irrelevant materials.
- Try to be concise.
- Summarise your findings and make any consequent recommendations.
- References and Bibliography.

2.c. Cover Sheet for Assignment

Cover Sheet for Assignment	
Student Registration No:	
Title of Assignment:	
Assignment No:.....	
Group	Individual
<input type="checkbox"/>	<input type="checkbox"/>
Name with Initials:	
Subject Code:	
Subject:	
Lecturer:	
Student's Statement:	
I certify that I have not plagiarized the work of others or participated in unauthorized collusion when preparing this assignment.	
Signature:	
Date:	
Office use only:	
Deadline Met	Extension Given
Late Submission	
Signature:.....	
Marks Given:	

Annex 3.

3.a. Contents of the dissertation

i) Preliminaries

- **A Cover Page**, containing in block letters
 - ◇ The Title and any approved subtitle of the dissertation,
 - ◇ Author's name (as per registration)
 - ◇ University name
 - ◇ Date submitted for examination (Sample Cover Page is shown in Annex C)
- **A title page**, containing
 - ◇ The Title and any approved subtitle of the dissertation,
 - ◇ Author's Name (as per registration)
 - ◇ The words "This dissertation was submitted to the Department of Civil Engineering of the University of Moratuwa in partial fulfilment of the requirements for the Master of Science in Construction Project Management"
 - ◇ Name of the Department followed by University of Moratuwa, Sri Lanka and the Month and Year of submission. (Sample Title Page is shown in Annex D)
- **A declaration** by the candidate, certified by the supervisor, that the work included in the dissertation in part or whole, has not been submitted for any other academic qualification at any institution.
- **An Abstract**, of length not exceeding 300 words, summarising the contents.
- **Acknowledgement**, in which the author should acknowledge the Authorities, sources of information and finding, and any others who helped in carrying out of the research and preparation of the dissertation.
- **A table of contents**, including the page numbers.
- **List of Figures**
- **List of symbols, notations, abbreviations and acronyms** used in the dissertation, giving their definitions or extended versions.

ii) Body of the Dissertation

The dissertation should contain material relevant to the research topic, written mainly in text form, divided into chapters as necessary, and illustrated by figures, tables, photographs etc. as required.

The following Chapter breakdown is suggested but need not be strictly adhered to.

- **Chapter 1: Introduction** (5-8 pages)
 - ◇ The Background to the problem should be highlighted, indicating why the problem is important and why it warrants the proposed study.
 - ◇ Definition of the main problem/research question and identification of objectives. This should be then sub divided into several sub-research problems/questions.
 - ◇ A brief method of study adopted.
 - ◇ Brief review of the previous literature attempts should be made to highlight similarities and differences between the proposed work and previous studies.
 - ◇ This should then be followed by the researcher's expected results from the study.

- **Chapter 2:** Literature Review (20-30 pages)
 - ◇ Detailed Literature review should be included.
- **Chapter 3:** Methodology of study (20-30 pages)
 - ◇ Detailed analysis of the methodology adopted for the study with frequent references to the research problems/ questions identified in chapter one.
 - ◇ Reasons for choosing the current methods of study should be discussed.
- **Chapter 4:** Analysis and Discussion of Results. (20-30 pages)
 - ◇ Discuss the findings of the study in detail.
- **Chapter 5:** Conclusions and Recommendations (2-5 pages)
 - ◇ This chapter should contain an overall summary with the conclusions drawn from the work. In the conclusions section a reference should be made to the problems identified in Chapter One indicating the extent to which these questions have been answered in the dissertation and should suggest directions for future research.

iii) List of References

All sources cited in the body of the dissertation must be appropriately referenced. It is customary to range the reference list in alphabetical order according to author. The Harvard system of referencing should be followed.

iv) Appendixes

You need to ensure that all the necessary and relevant information to your study is put in the body of the dissertation. Generally in an appendix any supporting evidence, such as tables, original questionnaires or tests that have been used are included.

3.b. Page Numbering, Figures and Tables

All pages preceding the dissertation should have a separate sequence of numbering, in roman numerals whereas Dissertation should have a separate sequence of numbering, in Arabic numerals at the bottom of the page.

All tables and figured should be numbered sequentially in Arabic numerals. Separate number sequences must be used for tables and figures. The caption should appear at the bottom of the table, figure.

3.c. Dissertation Format

- i) The dissertation should be in size A4, and the contents should be word processed, leaving a 38 mm margin on the left hand side and at least 25mm margin on right hand side, top and bottom. The text should 12pt or 11pt Times New Roman font (which is used normally for official documents) with 1.5 line spacing.
- ii) Colours should be avoided in the contents wherever possible, to allow black and white reproduction. In graphs and drawings, colour may be used provided that the different coloured sections may be identified on a black and white copy, using the key. If colour is used, (in graphs, diagrams or photographs) the words 'original is in colour' should be included on the same page.
- iii) Page borders, page headings and other type of art work should be avoided.

3.d. Printing and Submission

- i) Three (03) properly soft bound copies of the final draft dissertation approved by the supervisor should be submitted to the department. The colour of the cover should be, blue.
- ii) Three hardbound copies of the corrected dissertation approved by the panel should be submitted to the department. The colour of the cover should be, blue.
- iii) On the spine of the final dissertation, the following should be printed downwards, so that it can be read when the book lays flat, face upwards.
 - ◇ Students surname with initials
 - ◇ Degree and
 - ◇ Year

N.B: Further Information/Guidelines related to the research dissertation/report such as Supervision, layout, format, submission, etc will be provided during the module ***Skills for Research Project***.

3.e. Dissertation Cover Page

TITLE OF THE DISSERTATION

(TIMES NEW ROMAN/ FONT SIZE 18/ CENTERED/ BOLD)

MASTER OF SCIENCE

IN

CONSTRUCTION PROJECT MANAGEMENT

(TIMES NEW ROMAN/ FONT 16/ CENTERED/ BOLD)

Name of the Author

Department of Civil Engineering

University of Moratuwa

December 2016

(Times New Roman/ Font Size 14/ Centred)

3.f. Dissertation First Page (Inside)

TITLE OF THE DISSERTATION

(TIMES NEW ROMAN/ FONT SIZE 18/ CENTERED/ BOLD)

BY

Name of the author

Supervised by

Supervisor's name

“This dissertation was submitted to the Department of Civil Engineering of the University of Moratuwa in partial fulfilment of the requirements for the Master of Science in Construction Project Management” (Times New Roman/ Font Size 14/ Justified)

Department of Civil Engineering

University of Moratuwa

December 2016

(Times New Roman/ Font Size 14/ Centred)

3.g. Declaration

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university to the best of my knowledge and believe it does not contain any material previously published, written or orally communicated by another person or myself except where due reference is made in the text. I also hereby give consent for my dissertation, if accepted, to be made available for photocopying and for inter library loans, and for the title and summary to be available to outside organizations.

.....

Signature of Candidate

.....

Date

The above particulars are correct, to the best of my knowledge.

.....

Signature of Supervisor

.....

Date

3.h. Dissertation Supervision

Name of Student:

Name of Supervisor:

Objective/ Purpose	Comments	Deadline set	Date Completed	Signature
1) Agreement to the strategy for producing dissertation plan				
2) Acceptance and agreement to the dissertation plan				
3) Agreement of aims, objectives, methodology and schedule. Completion of the First Research Seminar				
4) Review of the literature and revision of the objectives and research plan where necessary				
5) Completion of Second Research Seminar				
6) Review research, agree further work and finalize research methodology				
7) Completion of Third Research Seminar				
8) Data collection				
9) Completion of Fourth Research Seminar				
10) Discussion of the findings, analysis, conclusions, recommendations and implications for future researchers				
11) Completion of the Final Research Seminar and discussion of the final deliverables				
12) Receive and review the final draft. Advise of issues and areas for improvement				
13) Submission of dissertation to Research Coordinator				
14) Oral Examination				

