MAKERERE UNIVERSITY

COLLEGE OF ENGINEERING, DESIGN, ART AND TECHNOLOGY (CEDAT)

SCHOOL OF THE BUILT ENVIRONMENT

DEPARTMENT OF CONSTRUCTION ECONOMICS AND MANAGEMENT

REVISED POSTGRADUATE DIPLOMA IN CONSTRUCTION PROJECT MANAGEMENT (PGD CPM) PROGRAMME

DAY/EVENING PROGRAMME

PROPOSED START DATE: AUGUST 2011

MARCH 2011

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1 PREAMBLE

The training of construction professionals in Uganda has been going on within and outside Uganda for long. On the other hand, the need for specific knowledge over a wide range of issues for the professionals necessitates further training, which in turn requires time, commitment and resources. Many of those in the field find it difficult to pursue further studies, while remaining committed to work. But some of the skills needed require a shorter but more targeted approach. In order to meet these contradictory requirements, the Department of Construction Economics and Management executes a Postgraduate Diploma in Construction Project Management programme. The courses under the revised programme are synchronized with those offered under the proposed MSc Construction Management Programme, to enable students undertaking the postgraduate diploma to upgrade to Masters if they wish, by joining in the second year. The revised courses are a hybrid of previous courses and those under the MSc Civil Engineering and MEng Civil Engineering (Construction Management option). Table 1 below shows a comparison of the previous courses and the courses under the revised programme.

Table 1: A comparison of courses under the previous programme and the revised programme

Previous PGD Programme	**Revised PGD Programme**
Semester 1	**Semester I**
All Courses Compulsory	**Core Courses (Compulsory)**
DPM6101 Organisation Theory	CIV7101: Advanced Mathematics
DPM6102 Project Management	EMT7101: Computer Applications in Engineering
DPM6103 Total Quality Management and Construction Environment	CIV7102: Environmental Studies
DPM6104 Project Planning and Control	
DPM6105 Contract Law and Management	CMG7100: Project Management and Control
DPM6106 Human Resource Management	
	CMG7101: Construction Economics
Semester II	**Semester II**
All Core Courses	**Core Courses**
DPM6201 Site Management and Practice	UPD 7200: Research methodology and Scientific Writing
DPM6202 Investment Appraisal and Feasibility Study	CMG7200:Advanced Construction Technology
DPM6203 Project Development	CMG7201: Contracts Law and Management
DPM6204 Project	CMG7203: Construction Business Management
	CMG7204: Site Management and Practice
	Recess Term
	CMG 7301: Post Graduate Diploma Project Report

This revised programme is more market oriented and addresses major issues of concern in the management of construction projects in the practical world.

2 THE PROGRAMME

2.1 Programme Title

The title of the programme shall be **Post Graduate Diploma in Construction Project Management, abbreviated as PGD (CPM)**.

The programme will be housed in the College of Engineering Design Art and Technology, School of Built Environment, Department of Construction Economics and Management. The Post Graduate Diploma shall be awarded by Makerere University.

2.2 Programme Objectives

The overall objective of the programme is to produce highly skilled project management professionals in the construction industry with adequate knowledge to respond to the demands of the practical world. The specific objectives of the programme can be summarized as follows:

- To enable graduate students undergo a programme of upgrading and updating their technical knowledge in a specialized field of Construction Project Management;
- To promote acquisition of advanced practical and demand driven skills in construction;
- To equip professionals with expertise in the use of applied construction project management skills;
- To produce a Graduate who can be manager of construction processes and projects;
- To enable professionals to independently and effectively solve multi-faceted issues of the day to day activities in the construction field;
- Produce graduates who are capable of continuing with Graduate studies i.e. can advance to do a Masters degree.

2.3 Rationale/Justification

The need for the course arose out of the demand by practicing professionals in the construction industry to upgrade their project management skills and advance their careers. The thrust of the demand being targeted on focused short-time courses that are tailored to the demand-driven needs in practice. The availability of the market for this programme is evidenced by the number of professionals expressing desire for further training to meet the needs of the construction industry in

respect of managing construction projects. Currently, there is no other institution where such building industry oriented project management training is offered in Uganda. The courses offered are relevant and convenient for those in practice who may wish to have tailored knowledge of managing construction projects.

The College of Engineering, Design, Art and Technology, and Makerere University strategic visions, missions and plans emphasize the need for production of highly qualified human resources in existing, continuing and emerging areas in order to contribute to national development. Having construction professionals with focused knowledge in construction project management is in conformity with the strategic direction of the University and the nation.

2.4 Target Group

As mentioned in Section 1 above, the demand for Construction professionals is increasing in Uganda. Proper management of construction is required in all government departments, NGOs and the private sector. This programme targets people who need to do graduate level training in order to become good managers in construction and those who wish to advance their knowledge in construction management. The list includes: graduate civil engineers, architects, construction managers, quantity surveyors, land economists and physical Planners, defence (Armed) Forces-Engineers Brigade, Police and so on. The target is to have 30 students for the PGD Programme.

2.5 Graduate Profile

A graduate with a Postgraduate Diploma in Construction Project Management will be equipped with sufficient knowledge for management of small and large scale construction projects. The course prepares construction professionals to take on management responsibilities on construction projects, construction business organisations, and government departments engaged in construction related activities.

2.6 Nature of Programme

The PGD (CPM) programme will be run as a day/evening programme with privately sponsored students. The duration of the day/evening programme will be one year spanning through two semesters and a recess term. The course also encourages those who will have successfully obtained

a Post Graduate Diploma in Construction Project Management to continue within a period of 3 years of completing the Diploma and obtain a Master of Science degree in Construction Management.

2.7 Admission Requirements

To qualify for admission, a candidate must fulfill the general Makerere University entry requirements for Post Graduate Diploma, and in addition the candidate must be a holder of a bachelor's degree in a relevant discipline or equivalent, from a recognized university preferably combined with working experience in a relevant field. The relevant disciplines are: Construction Management, Civil Engineering, Architecture, Quantity Surveying, Land Economics, and Physical Planning. For other disciplines, the Graduate Studies and Research Committee will decide whether Construction Management forms an integral part so as to determine whether candidates from such disciplines qualify to be admitted to the PGD (CPM) Programme.

2.8 Upgrading Post Graduate Diploma to MSc (CMG)

When a student graduates with a Postgraduate Diploma in Construction Project Management (Lower Second Class, Upper Second Class or First Class), he/she can apply for the Master of Science in Construction Management to join second year . In such a scenario, the applicant is expected to either take on Plan A or Plan B. With Plan A, the applicant is expected to undertake research for one year which is equivalent to the second year (semesters III and IV) course load that is covered on the Master of Science in Construction Management. With Plan B, the student is expected to undertake the Semester III courses and a project in Semester IV as stipulated in the Masters of Science in Construction Management programme. The upgrading of the Post Graduate Diploma to the MSc (CMG) described above must be supported by the relevant academic documents attained from the Post Graduate Diploma of Makerere University. This must be done for purposes of analyzing the relevant academic courses that must have been attempted as per the current curriculum. Any courses that were not attempted by the applicant as per the first and second semesters' course load of the current curriculum must be undertaken.

2.9 Programme Duration

The minimum duration of the PGD (CPM) shall be one (1) year while the maximum shall be three (3) academic years.

2.10 Sequencing

The PGD (CPM) shall run on a semester system. In each of the two semesters, a number of courses will be conducted to broaden the knowledge of the students in the various sub-disciplines of Construction Project Management. The programme is based on taught courses with inbuilt field activities and then the students carry out individual Projects or Field work or Industrial Training during the recess term.

Year 1

Semester1:	5 Compulsory Courses
Semester 2:	5 Compulsory Courses
Recess Term:	Post Graduate Diploma Project/Fieldwork

2.11 Tuition Fees

Tuition fees payable by the students will be based on whether a student is a Ugandan or an International Student as determined by the University from time to time. The tuition for fees for Ugandans will be UGX3,787,500 while for others it will be US$3,300.

3 EXAMINATION REGULATIONS

3.1 Assessment of courses

(i). Each taught course will be assessed on the basis of 100 total marks with proportions as follows:

Course work	40%
Written examination	60%

(ii). Coursework consists of Progressive Assessment (Tests and Assignments) assessed at 40%.

(iii). A minimum of two coursework assignments/tests are required per course.

(iv). For the Post Graduate Diploma project, written documents (proposals and progress reports) and oral presentations will be marked. The oral presentations will attract 2 Credit Units.

3.2 Grading Courses

(i). Each course is graded out of a maximum of 100 marks and assigned appropriate letter grades and grade point averages as follows:

Table 2: Grading of Marks

Mark%	Letter Grade	Grade point	Interpretation
90-100	A+	5.0	Exceptional
80-89	A	5.0	Excellent
75-79	B+	4.5	Very Good
70-74	B	4.0	Good
65-69	C+	3.5	Fairly Good
60-64	C	3.0	Pass
55-59	D+	2.5	Marginal pass
50-54	D	2.0	Clear Fail
45-49	E	1.5	Bad Fail
40-44	E-	1.0	Qualified Fail
Below 40	E	0	Qualified Fail

(ii). These additional letters will be used where appropriate

W - Withdrawn from course

I - Incomplete

AUD - Audited courses only.

(iii). The pass grade per course is 3.0 (i.e. a pass mark of 60%).

3.3 Weighting System

The weighting unit is a Credit Unit (CU). A Credit Unit is equivalent to fifteen (15) contact hours per semester. A contact hour is equal to one lecture hour, or two practical hours.

3.4 Progression

Progression through the course shall be assessed in three ways:

(i) Normal Progress occurs when a student passes all courses taken.

(ii) Probation is a warning stage and occurs if:-

a) A student fails a core/compulsory course or

b) A student obtains GPA or CGPA of less than 3.0

Probation is removed when either of the conditions (a) and (b) no longer holds.

(iii) Discontinuation occurs if one of the following conditions obtains:-

a) A student accumulated three consecutive probations on the same core/compulsory course

b) A student accumulated three consecutive probations based on CGPA

3.5 Retaking a Course

There shall be no supplementary in any course of the programme. However, a student may retake any course when it is offered again in order to:

a) Pass, if the student had failed it before.

b) Improve the grade, if the first pass grade was low.

A student who does not wish to repeat a failed elective course shall be allowed to take a substitute elective.

3.6 Calculation of the Cumulative Grade Point Average

The cumulative grade point average at a given time shall be obtained by;

$$CGPA = \frac{\sum_{i=1}^{n} (GP_i x CU_i)}{\sum_{i=1}^{n} CU_i}$$

where GP_i is the Grade Point score of a particular course i; CU_i is the number of Credit Units of course i; and n is the number of courses so far done.

3.7 Post Graduate Diploma Project

Students are required to demonstrate their ability to independently formulate a detailed Project Proposal, as well as develop and demonstrate their Project thoroughly.

a) A candidate shall be allowed to formally start on the Project after the second semester.

b) A candidate shall submit a Project/Field study proposal to the School of Built Environment Graduate Studies and Research Committee during the second semester.

c) A candidate shall not be allowed to formally start on research/project/field report unless he/she has passed all the core courses.

d) The candidate shall execute the Project during the Recess Term.

e) Each candidate shall hand in three hard copies and one soft copy of the project/field report by the end of the Recess Term.

3.7.1 Passing of a Project

To pass the Project, the candidate shall satisfy the examiners in a written report and presentation.

3.7.2 Revised Project Report

A candidate, who fails to satisfy the examiners, shall re-submit a Revised Project Report in accordance with the standing University guidelines for the project examinations within a period of three months after notification.

3.8 Graduation Requirements

The PGD (CPM) shall be awarded to a candidate who fulfils both conditions below:-

a) Accumulated CU of not less than 39.

b) Should have passed all core (compulsory) courses

c) Passed the project/field report.

4 GENERAL PROGRAMME STRUCTURE

Semester I (5 Courses)				
Core Courses (Compulsory)				
Semester I	**LH**	**PH**	**CH**	**CU**
CIV7101: Advanced Mathematics	45	0	45	3
EMT7101: Computer Applications in Engineering	45	30	60	3
CIV7102: Environmental Studies	45	0	45	3
CMG7100: Project Management and Control	45	30	60	3
CMG7101: Construction Economics	45	0	45	3
Total Credit Units				**15**
Semester II				
Core Courses				
UPD7201: Research methodology and Scientific Writing	30	30	45	3
CMG7200:Advanced Construction Technology	45	0	45	3
CMG7201: Contracts Law and Management	45	0	45	3
CMG7202: Construction Business Management	45	0	45	3
CMG7203: Site Management and Practice	45	30	45	3

Total Credit Units				**15**
Recess Term				
CMG 7301: Post Graduate Diploma Project Report	0	300	300	5
Total Credit Units				**5**

5 DETAILED CURRICULUM FOR THE COURSES

CIV 7101 Advanced Mathematics

Hours Per Week			Hours per Semester	Weighted Total Mark	Weighted Exam Mark	Weighted Continuous Assessment	Credit Units
LH	PH	TH	CH	WTM	WEM	WCM	CU
3	0	3	45	100	60	40	3

Course Description

The course covers definition of statistical concepts, measures of location, measures of dispersion, presentation and summarization of data, probability distributions, sampling, tolerance and quality control.

Objectives/Aim

- To enable the student understand and use advanced statistical and mathematical tools in the construction management process and research.

Course Outline

1. Definition of elementary statistical concepts [5 CH]
2. Measures of location [5 CH]
   2.1 arithmetic mean,
   2.2 median,
   2.3 midpoint,
   2.4 midrange.
3. Measures of dispersion [5 CH]
   3.1 range,
   3.2 variance,
   3.3 standard deviation,
   3.4 coefficient of variation,
   3.5 standard error
4. Presentation and summarization of data [5 CH]
   4.1 frequency,
   4.2 histograms/bar charts
5. Probability, [5 CH]
   5.1 probability distributions,
   5.2 normal (Gaussian) distributions,
   5.3 exponential distributions,
   5.4 gamma distributions,
   5.5 beta distributions,
   5.6 other distributions.
6. Samples and populations [5 CH]
7. Tolerance and quality control. Confidence limits [5 CH]
8. The chi square distribution: Inference, comparison of means. [5 CH]

9. Method of least squares, regression, and correlation. [5 CH]

Learning Outcomes
The student will be able to:
- Understand and use advanced mathematics and statistical principles in research and management of construction processes and projects.

Method of Teaching/Delivery
The course will be conducted through lectures, tutorials and assignments. Basic lecture materials provided by the Lecturer will be supplemented by individual reading effort by students.

Assessment Method
Continuous assessment through assignments and tests, and final written examination. The final examination carry 60% of the total mark, while continuous assessment will carry a total of 40%.

Reading/ Reference Materials

1. Williams, A. S. (2006) ***Statistics for Business and Economics***; West
2. Upton G. and Cook I (1996) Understanding Statistics, Oxford University Press
3. Probability and Statistics. Addison – Wesley Publishing Company, London.

EMT 7101 Computer Applications in Engineering

Hours Per Week			Hours per Semester	Weighted Total Mark	Weighted Exam Mark	Weighted Continuous Assessment	Credit Units
LH	PH	TH	CH	WTM	WEM	WCM	CU
3	2	5	45	100	60	40	3

Course Description
The course covers relevant computer concepts, operating systems, software design and programming, and computer applications.

Objectives/Aim
- To enable the student understand and use Computer and Information Technology in the construction management projects and processes.

Course Outline
1. Advanced computer concepts [12CH]
   1.1. Representation of integers,
   1.2. Real values,
   1.3. Characters and instructions;
2. The operating system [12CH]
   2.1 Disk operating system
   2.2 Windows operating system
   2.3 Other operating systems
3. Software development [12CH]

4. Computer programming [12CH]
5. Computer applications for Construction Managers [12CH]

Learning Outcomes
The student will be able to:
- Understand and use Computer and Information Technology in the construction management process.

Method of Teaching/Delivery
The course will be conducted through lectures, tutorials, practical exercises and assignments. Basic lecture materials provided by the Lecturer will be supplemented by individual reading effort by students.

Assessment Method
Continuous assessment through assignments and practical tests, and final written examination. The final examination carry 60% of the total mark, while continuous assessment will carry a total of 40%.

Reading/ Reference Materials

1. Andrea diSessa (2000) ***Changing Minds: Computers, Learning, and Literacy***; The MIT Press
2. Luehrmann A. and Peckham H. (1984***) Computer Literacy: A Hands-On Approach***, First Apple Edition, Macmillan/Mcgraw-Hill School

CIV 7102 Environmental Studies

Hours Per Week			Hours per Semester	Weighted Total Mark	Weighted Exam Mark	Weighted Continuous Assessment	Credit Units
LH	PH	TH	CH	WTM	WEM	WCM	CU
3	0	3	45	100	60	40	3

Course Description
This course covers environmental considerations in planning, design and management of projects and health issues in a work environment.

Objectives/Aim
- To equip the student with knowledge of environmental and health matters in construction.

Course Outline

1. Environmental Sustainability and Human Values [5 CH]

A. Human Use of Earth
B. Human Values and Environmental Problems
C. Environmental Justice
D. An Overall Plan for Sustainable Living

2. Risk Analysis and Environmental Hazards [5 CH]

A. A Perspective on Risks
B. Environmental Hazards
C. Movement and Fate of Toxins

D. How We Determine the Health Effects of Pollutants
E. Precautionary Principle

3. Solid and Hazardous Waste: An Unrecognized Resource [5 CH]
A. Solid Waste
B. Reducing Solid Waste
C. Hazardous Waste
D. Managing Hazardous Waste

4. Air and Air Pollution [5 CH]
A. The Atmosphere
B. Types and Sources of Air Pollution
C. Effects of Air Pollution
D. Controlling Air Pollutants
E. Indoor Air Pollution

5. Freshwater Resources and Water Pollution [5 CH]
A. The Importance of Water
B. Water Resource Problems
C. Water Management
D. Water Pollution
E. Improving Water Quality

6. Nonrenewable Energy Resources [5 CH]
A. Energy Consumption
B. Coal
C. Oil and Natural Gas
D. Nuclear Energy
E. Decommissioning Nuclear Power Plants

7. Renewable Energy Resources [5 CH]
A. Direct Solar Energy
B. Indirect Solar Energy
C. Other Renewable Energy Sources
D. Energy Solutions: Conservation and Efficiency

8. Health and Safety in a Work Place [5 CH]

9. Environmental Impact Assessment [5 CH]

Learning Outcomes
The student will be able to:
- Understand environmental implications of construction processes and how their impacts can be mitigated.

Method of Teaching/Delivery
The course will be conducted through lectures, tutorials, practical exercises and assignments. Basic lecture materials provided by the Lecturer will be supplemented by individual reading effort by students.

Assessment Method

Continuous assessment through assignments and practical tests, and final written examination. The final examination carry 60% of the total mark, while continuous assessment will carry a total of 40%.

Reading/ Reference Materials

Robert Staib (2005) Environmental Management and Decision Making for Business; Palgrave Macmillan

Gary S. Thorpe (2011) Barron's AP Environmental Science

CMG 7100 Project Management and Control

Hours Per Week			Hours per Semester	Weighted Total Mark	Weighted Exam Mark	Weighted Continuous Assessment	Credit Units
LH	PH	TH	CH	WTM	WEM	WCM	CU
3	2	3	45	100	60	40	3

Course Description

The course covers management principles, operations research, construction contracts, and planning, scheduling and controlling of constriction projects.

Objectives/Aim

- To train the student in the application of modern management concepts, principles and tools in the management of construction projects.

Course Outline

1. Principals of management [9 CH]
   - 1.1. Organisation theory
   - 1.2. Evolution of management theory
   - 1.3. Scientific management theories
   - 1.4. The human relations approach
   - 1.5. System and contingency approaches
   - 1.6. Modern approaches to management

2. Construction Management Tools and Techniques [10 CH]
   - 2.1 Project Work Breakdown
   - 2.2 Work Scheduling
   - 2.3 Critical Path Method of Analysis
   - 2.4 Project Evaluation and Review Technique
   - 2.5 Precedence Network Analysis
   - 2.6 Manpower Scheduling
   - 2.7 Planning for Construction Materials
   - 2.8 Planning for Construction Equipment
   - 2.9 Construction Costs and Budgets
   - 2.10 Statistical Approach

2.11 Computer Applications

3. Operational research [9 CH]
   3.1 linear programming,
   3.2 probability theory,
   3.3 research and development,
   3.4 decision and game theory,
   3.5 queuing theory.

4. Construction contracts: [9 CH]
   4.1 construction commissioning
   4.2 systems of agreement,
   4.3 the role of the engineer
   4.4 documentation,
   4.5 tendering & bidding,
   4.6 management contracts,
   4.7 target contracts.
   4.8 sub-contracts,

5. construction site organization, [8 CH]
   5.1 personnel,
   5.2 documentation and regulations,
   5.3 accounting,
   5.4 execution of works,
   5.5 risk management,

6. Project failure [5 CH]

7. Project phasing and scheduling. [5 CH]

8. Project monitoring and appraisal. [5 CH]

Learning Outcomes
At the end of the course, the student will be equipped with management concepts in the context of construction projects, and will be in position to apply appropriate project management tools in the management of the construction projects and processes.

Method of Teaching/Delivery
The course will be conducted through lectures, tutorials and assignments. Basic lecture materials provided by the Lecturer will be supplemented by individual reading effort by students.

Assessment Method
Continuous assessment through assignments and tests, and final written examination. The final examination carry 60% of the total mark., while continuous assessment will carry a total of 40%.

Reading/ Reference Materials

Anbuvelan K. (2007). *Management Concepts for Civil Engineers*. Laxmi Publications, New Delhi

Cole G. A. (2004). *Management Theory and Practice*. (6th Ed.) Book Power, London

Chitkara K. K. (2004). *Construction Project Management. Planning, Scheduling and Controlling.* Tata McGraw-Hill Publishing Company Limited, New Delhi

Freeman B. G. & Balkwill J. (2005). *Management in Engineering: Principles and Practice.* (2nd Ed.) Prentice Hall of India PVT, New Delhi

Kwakye A. A. (1997). *Construction Project Administration in Practice.* Pearson Lomgman, Essex, UK.

Piésold D. A. (1991). *Civil Engineering Practice, Engineering Success by Analysis of Failure.* McGraw-Hill Book Company, London.

Sengupta B. & Guha H. (2004). *Construction Management and Planning.* Tata McGraw-Hill Publishing Company Limited, New Delhi.

CMG7101 Construction Economics

Hours Per Week			Hours per Semester	Weighted Total Mark	Weighted Exam Mark	Weighted Continuous Assessment	Credit Units
LH	PH	TH	CH	WTM	WEM	WCM	CU
3	0	3	45	100	60	40	3

Course Description

The course in geared at taking the student through estimating, economic resources, feasibility studies, cost benefit analysis; and supply and demand.

Objectives/Aims

- To enable the student understand estimation processes, inputs and outputs
- To help the student master the different ways of assessing the viability of construction projects
- To provide an understanding of supply and demand in the construction context

Course Outline

1. Estimating [10 CH]

1.1 The Process
1.2 Inputs and Outputs of Estimating process
1.3 Methods of estimating
1.4 Cash flows

2. Economic resources: identification and allocation [10 CH]

2.1 Economic resources
2.2 Reducible and irreducible factors
2.3 Priority analysis
2.4 Interest
2.5 Net Present Value, Equivalent Annual Cost, Payback Period, Profitability Index

3. Feasibility Studies **[10CH]**

3.1 Need for feasibility studies
3.2 Parties and processes in feasibility studies
3.3 Feasibility study reports

4 Cost benefit analysis **[5CH]**

4.1 Cost determination
4.2 Benefits and disbenefits
4.3 Cost benefit ratio analysis

5 Supply and demand **[10 CH]**

5.1 Supply analysis
5.2 Demand analysis
5.3 Using demand and supply in construction
5.4 Elasticity of demand and supply in construction
5.5 Price Mechanism and allocation of resources
5.6 The role of government in construction demand and supply

Learning Outcomes

The course will help the student to:

- Estimate for civil engineering projects
- Carry out economic assessment and choose projects
- Carry out feasibility studies and write reports
- Analyse the supply and demand in construction

Method of Teaching/Delivery

The course will be conducted through lectures, tutorials and assignments. Basic lecture materials provided by the Lecturer will be supplemented by individual reading effort by students.

Assessment Method

Continuous assessment through assignments and tests, and final written examination. The final examination carry 60% of the total mark., while continuous assessment will carry a total of 40%.

Reading/ Reference Materials

Shutt, R. C. (1989) Economics of the Construction Industry, 2nd ed. Longman.
Harris, F. and McCaffer, R. (2001) Modern Construction Management, 5th ed., Blackwell Science.
Brech, E. F. (1971) Construction Management in Principle and Practice, 1st ed., Longman.
Thompson, P. A. (1981) Organisation and Economics of Construction, 2nd ed., McGrawHill.
Sepulveda, J. A., Souder, W. E., and Gottried, B. S. (1984) Engineering Economics, 1st ed., McGrawHill.

UPD 7201 Research Methodology and Scientific Writing

Hours Per Week	Hours per Semester	Weighted Total Mark	Weighted Exam Mark	Weighted Continuous	Credit Units

						Assessment	
LH	PH	TH	CH	WTM	WEM	WCM	CU
3	30	3	45	100	60	40	3

Course description:
The course provides the theoretical insight and practical skills required to plan, implement, analyse and report a scientific findings in the area of urban planning and design. The main parts of the course are scientific methods of projects including research methodology, and ethics both theoretical and practical. It also includes scientific writing, reviewing, and presentation of texts.

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Objectives:

- The aim of the course is to give the students the theoretical and practical skills to conduct, analyze and present in written research tasks in the area of Plannin and design and to give insight and understanding of research methodology.

Learning outcomes:
Following this course a student should be able to:

- Explain and apply techniques for scientific writing and research methodology to prepare the writing of a scientific report.
- perform investigation using methods, explain and take position on the results as well as summarize related work
- Apply the knowledge in scientific writing and research methodology and use the knowledge to write a scientific report.

Delivery method:
The course is divided into three parts, where lectures and labs provide support for handling:

1. Research Methodology, which is motivating, and preparing as well as performing an
2. Evaluation, giving insights in evaluations for scientific research, and a
3. Scientific Report, reporting the outcome of the evaluation.

These three parts are examined by a project proposal (or project plan), a method description and a scientific report.

Assessment method:
This will be done through continuous assessment (including coursework and tests) and written examination at the end of the semester. Coursework and test will be assessed out of 40% and examinations, out of 60%.

Course content:

1.	Introduction to Research Methodology and Scientific Writing	4 CH
2.	Introduction to Scientific Genres - Proposals and technical reports	2 CH
3.	Scientific knowledge	2 CH
4.	Hypothesis testing	2 CH

5. Effective Writing Strategies, Paragraph structure, Cohesive devices, Information structure, and Conciseness 2 CH
6. Working with Texts, Digital resources, Working with original sources, Referencing systems, 4 CH
7. Reviewing and collaboration, Learning from model texts 2 CH
8. Introduction to research and data collection methods: both qualitative and quantitative 2 CH
9. Experiments 2 CH
10. Quantitative methods 2 CH
11. Proposals 2 CH
12. Ethics, Plagiarism 2 CH
13. Quantitative data collection methods, analyse, result 3 CH
14. Seminar 1 2 CH
15. Research articles 1: Introduction and Methods 4 CH
16. Qualitative methods 2 CH
17. Qualitative data collection methods 2 CH
18. Research articles 2: Results, discussion, title and abstract. 2 CH
19. Seminar 2 2 CH

Proposed staff: Dr. Allan Birabi, Dr. Ian Senkatuka

References:

1. Wayne C. Booth, Gregory G. Colomb, and Joseph M. Williams, The Craft of Research, 2nd edition (Chicago Guides to Writing, Editing, and Publishing), University Of Chicago Press; 1 edition (March 2003), paperback: 336 pages, ISBN-10: 0226065685, ISBN-13: 978-0226065687
2. Angelika H. Hofmann, Scientific Writing and Communication: Papers, Proposals, and Presentations, Oxford University Press, USA (December 16, 2009), Paperback: 704 pages, ISBN-10: 0195390059, ISBN-13: 978-0195390056

Peter Bock, Getting It Right: R&D Methods for Science and Engineering, Academic Press; 1 edition (September 13, 2001), 406 pages, ISBN-10: 0121088529, ISBN-13: 978-0121088521

CMG7200 Advanced Construction Technology

Hours Per Week			Hours per Semester	Weighted Total Mark	Weighted Exam Mark	Weighted Continuous Assessment	Credit Units
LH	PH	TH	CH	WTM	WEM	WCM	CU
3	0	3	45	100	60	40	3

Course Description

Construction involves different types and levels of technology that enable building structures of different magnitudes to be constructed. This course focuses on technologies, materials and methods employed in construction of building structures and other large building projects.

Objectives/Aims

- To impart knowledge on assembly and performance of building structures:
- To know the materials, false-works, components, plant and equipment required in construction of framed structures
- To appreciate service requirements and safety regulations in large building structures.

Course Outline

1. Construction technology concepts, [5 CH]
   1.1 Forms and design.
   1.2 Construction equipment.
   1.3 Building standards.
   1.4 Quality control.

2. Substructure construction [5 CH]
   2.1 Temporary support,
   2.2 Excavation,
   2.3 soil testing,
   2.4 foundations (shallow, deep, piles, retaining walls),
   2.5 underpinning.

3. Superstructure construction [5 CH]
   3.1 scaffolding,
   3.2 reinforced concrete, s
   3.3 teelwork, timber,
   3.4 prestressed concrete,
   3.5 steelwork,
   3.6 timber,
   3.7 composites,
   3.8 masonry,
   3.9 prefabs.

4. Horizontal and other structures [5 CH]
   4.1 hydraulic structures,
   4.2 bridges,
   4.3 off shore structures,
   4.4 pavements.

5. Secondary works [5 CH]
   5.1 finishing,
   5.2 doors and shutters,
   5.3 joinery and adhesives,
   5.4 access to sites,
   5.5 building envelops.

6. Functional services [5 CH]
   6.1 drainage,
   6.2 water supply,
   6.3 electrical fittings.

7. Construction monitoring and appraisal. [5 CH]

8. Demolition, repair, renovation and maintenance. [5 CH]

9. Safety and health regulations. [5 CH]

Learning Outcomes
Understanding of construction techniques, materials, and methods for framed structures and large building construction projects.

Method of Teaching/Delivery
The course will be conducted through lectures, tutorials, site visits, and assignments. Basic lecture materials provided by the Lecturer will be supplemented by individual reading effort by students.

Assessment Method
Continuous assessment through assignments and tests, and final written examination. The final examination will carry 60% of the total mark, while continuous assessment will carry a total of 40%.

Reading/reference materials

Chudley R. 1973 & 1974. Construction Technology, Vols. 1 and 2. Longman, London.

Rangwala, S, C (1978), Building Construction 4th Edn, Charotor Book Stall. Anand Press, India.

Barry R., (1979), The Construction of Buildings Vols 3 and 4. Crosby Lockwood Staples, London.

Harris ( ) Modern Construction Equipment and Methods

Seeley 1. (1980), Building Technology, Macmillan, London.

CMG7201 Contracts Law and Management

Hours Per Week			Hours per Semester	Weighted Total Mark	Weighted Exam Mark	Weighted Continuous Assessment	Credit Units
LH	PH	TH	CH	WTM	WEM	WCM	CU
3	0	3	45	100	60	40	3

Course Description
The course teaches the student Uganda and English legal systems, Contract law, law of tort, business law, construction contracts and labour law.

Objectives/Aims
- To teach the student law of contracts and tort
- To help the student analyse construction contracts

Course Outline

1. Introduction [10 CH]

1.1 Uganda and English legal systems
1.2 passive, reactive and proactive characters.

2. Contract law [10 CH]

2.1 Exportability of judgements,
2.2 jurisdiction on bases of domicile,
2.3 submission and propagation
2.4 international arbitration,
2.5 torts and trusts,
2.6 laizzare faire,
2.7 contract documentation,
2.8 negligence
2.9 FIDIC/ICE Conditions of contract,
2.10 liquidated damages,
2.11 extensions of time,
2.12 money claims, damages, restitution, abortive contracts, indemnity, and arbitration.

3. Business law [10CH]

3.1 Economic functions of companies,
3.2 Types of companies, incorporation, limited liability; corporate
3.3 Finance, raising capital; the stock exchange, insider dealing,
3.4 Corporate directors, take-overs, floating charges, insolvency.

4 Construction contracts, procedures and dispute resolution [5CH]

4.1 Contract promotion,
4.2 tendering procedures, (client, engineer and contractor)
4.3 Tender/contract documents; bills of quantities and methods of measurement
4.4 Design-build practice

5 Labour law [10 CH]

5.1 Forming contract of employment, employee's rights and obligations,
5.2 Dismissal, unfair dismissal, wrongful dismissal and redundancy/retrenchment
5.3 Industrial action and Trade Union policy Demand analysis

Learning Outcomes

The course will enable the student to:

- Use law principals in the construction context
- Draft documents with legal issues in mind

Method of Teaching/Delivery

The course will be conducted through lectures, tutorials and assignments. Basic lecture materials provided by the Lecturer will be supplemented by individual reading effort by students.

Assessment Method

Continuous assessment through assignments and tests, and final written examination. The final examination carry 60% of the total mark., while continuous assessment will carry a total of 40%.

Reading/ Reference Materials

W. V. H. ROGERS, ***Winfield & Jolowicz on Tort***, 16th Edition, London, Sweet & Maxwell, 2002/ 17th Edition, London, Sweet & Maxwell, 2006.

JOHN MURPHY, ***Street on Torts***, 12th Edition, Oxford University Press, Oxford, 2006.

GRAHAM STEPHENSON, ***Sourcebook on Torts***, 2nd Edition, Cavendish Publishing Ltd. 2000.

MARKESINIS B. S. & DEAKIN S.F., ***Tort Law***, 4th Edition, Claredon Press, Oxford, 1999.

JOHN G. FLEMMING, ***The Law of Torts***, 9th Edition, 1998.

CLERK & LINDSELL On Torts, The Common Law Library No.3, 17th Edition, London, Sweet & Maxwell, 1995.

E. VEITCH, ***East African cases on the Law of Tort***, London, Sweet & Maxwell, 1972.

HEYDON J. D., ***Economic Torts***, London, Sweet & Maxwell, 1973.

PAGE KEETON & RORERT KEETON, ***Tort Cases and Materials***, American Casebook Series, West Publishing Co.

MUNKMAN JOHN, ***Employer's Liability at Common Law***, 7th Edition, Butterworth 1971.

CMG7202 Construction Business Management

Hours Per Week			Hours per Semester	Weighted Total Mark	Weighted Exam Mark	Weighted Continuous Assessment	Credit Units
LH	PH	TH	CH	WTM	WEM	WCM	CU
3	0	3	45	100	60	40	3

Course Description

The course in geared at taking the student through the management of construction business. It covers the business nature, production function, personnel function, marketing function, and finance function.

Objectives/Aim

- To enable the student understand the construction business management process.

Course Outline

1. Business: [9 CH]
   - 1.1. Nature and purpose of business,
   - 1.2. scope of business.
   - 1.3. Business ownership: sole proprietorship, partnership and company
   - 1.4. private and public sectors;
   - 1.5. cooperatives,
   - 1.6. multinationals,
   - 1.7. business combinations.

2. The production function [9 CH]

2.1 meaning and factors of production,
2.2 plant and location layout;
2.3 production planning and control.

3. The personnel function; [9 CH]
   3.1 personnel selection,
   3.2 training,
   3.3 development and appraisal,
   3.4 employee remuneration;
   3.5 labour management relation.

4. Marketing function: [9 CH]
   4.1 product planning and development;
   4.2 pricing policies
   4.3 channels of distribution,

5. The finance function: [9 CH]
   5.1 the finance of a business
   5.2 capital structure,
   5.3 methods and sources of business finance;
   5.4 the business environment;
   5.5 financial markets

Learning Outcomes
The student will understand how to run construction businesses and their applicability.

Method of Teaching/Delivery
The course will be conducted through lectures, tutorials and assignments. Basic lecture materials provided by the Lecturer will be supplemented by individual reading effort by students.

Assessment Method
Continuous assessment through assignments and tests, and final written examination. The final examination carry 60% of the total mark., while continuous assessment will carry a total of 40%.

Reading/ Reference Materials

1. Allen L.A. (1977), ***Management and Organization***. Mc Graw-Hill, London.
2. Fremout E.K. and Rosenzweig E.J. (1985), ***Organization and Management A Systems and Contingency Approach***. Mac Graw-Hill, London.

CMG 7203 Site Management and Practice

Hours Per Week			Hours per Semester	Weighted Total Mark	Weighted Exam Mark	Weighted Continuous Assessment	Credit Units
LH	PH	TH	CH	WTM	WEM	WCM	CU
3	2	5	45	100	60	40	3

Course Description
Nature of construction projects. Effective and productive construction, the effect of technology. Site layout. Site documentation. Safety and health issues on site.

Objectives/Aim
- To enable the student understand and apply the principles of site management and practice.

Course Outline
1. Nature of construction projects. [12CH]
2. Effective and productive construction, the effect of technology [12CH]
3. Site layout [12CH]
4. Site documentation [12CH]
5. Safety and health issues on site [12CH]

Learning Outcomes
The student will be able to understand and use the principles of site management and practice.

Method of Teaching/Delivery
The course will be conducted through lectures, tutorials and assignments. Basic lecture materials provided by the Lecturer will be supplemented by individual reading effort by students.

Assessment Method
Continuous assessment through assignments and tests, and final written examination. The final examination carry 60% of the total mark., while continuous assessment will carry a total of 40%.

Reading/ Reference Materials
1. Seeley, I.H. (1996). Building Economics; Fourth Edition. Macmillan Press Limited.

CMG7301 Project Report

Hours Per Week			Hours per Semester	Weighted Total Mark	Weighted Exam Mark	Weighted Continuous Assessment	Credit Units
LH	PH	TH	CH	WTM	WEM	WCM	CU
0	20	20	60	100	100	0	5

Course Description
Each student will be required to submit a report on a supervised short project/field attachment/industrial training carried out.

Objectives/Aim
This Course aims to develop student's skills to develop study issues in management of construction projects, collect data from various sources, analyse and the present findings in a logical way.

Course Outline
Various topics are expected to be covered by participants, including designs, construction procedures, case studies, contract procedure, information technology, project management, estimating and cost control, structural failures, low cost construction, innovations in construction materials and technology, durability, vernacular materials, etc.

Learning Outcomes
The student will be able to:

- Analyse issues pertaining to construction management projects
- Write good logical reports on construction management

Method of Teaching/Delivery
The student interacts with two selected tutors on a regular basis to obtain guidance on the project/field report. The student will carry out the search on his own.

Assessment Method
The rules of assessment of project/field reports for Graduate students at Makerere University will apply. A student will prepare a research proposal in collaboration with a member of staff. The proposal will be presented and approved by the departmental research committee. The final report submitted and accepted will be marked according to the guidelines from the School of Graduate studies. will be required to submit a report on a supervised short project/field attachment/industrial training carried out and external examination shall be mandatory.

Reading/ Reference Materials
Varied depending on the topic.

APPENDICES

APPENDIX 1: MEMBERS OF STAFF AVAILABLE AT CEDAT

No.	NAMES	S	HIGHEST	POST	STUTUS	SPECIALISATION	Current Teaching Load (CU)	Proposed Teaching Load (CU)	Total load (CU)
1	KERALI Anthony Geoffrey	M	PhD	Associate Professor	Full Time	Construction	8	4	12
2	TINDIWENSI Dan	M	PhD	Senior Lecturer	Full Time	Construction Management	8	4	12
3	MWAKALI A. Jackson	M	PhD	Professor	Full Time	Research Methods and Structures	8	4	12
4	TAMALE Kiggundu Amin	M	PhD	Lecturer	Full Time	Research Methods	10	3	13
5	SSEMOGERERE Kenneth	M	PhD	Lecturer	Full Time	Architecture & Project Management	10	3	13
6	SENKATUKA Ian	M	PhD	Lecturer	Full Time	Architecture & Project Management	8	4	12
7	OKIDI-LATING, Peter	M	PhD	Lecturer	Full Time	Mathematics and Computer application	8	4	12
8	ALINAITWE Henry Mwanaki	M	PhD	Senior Lecturer	Full Time	Construction Management & Structures	8	4	12
9	BAGAMPADDE Umaru	M	PhD	Senior Lecture	Full Time	Highways and engineering materials	8	3	11
10	KULABAKO Robinah	F	PhD	Lecturer	Full Time	Environmental Engineering	8	3	11
11	NATURINDA Dans	M	MSc (On PhD)	Assist. Lecturer	Full Time	Construction Management	10	4	14
12	ADUBANGO Eunice.	F	MSc (On PhD)	Assist. Lecturer	Full Time	Project Management	10	4	14
13	KAKITAHI John	M	MSc (On	Assist.	Full Time	Construction	10	4	14

			PhD)	Lecturer		Management			
14	MWESIGE Godfrey	M	MSc (On PhD)	Assist. Lecturer	Full Time	Highways and Transportation	10	4	14
15	EKYALIMPA Ronald	M	MSc (On PhD)	Assist. Lecturer	Full Time	Construction Management	10	4	14

APPENDIX 2: EQUIPMENT AND FACILITIES

The following are available:

N	DESCRIPTION	UNITS	QTY
1	Staff Offices	m^2	300
2	Staff Meeting Room	m^2	50
3	Student Lecture Rooms	m^2	3,000
4	Laboratory (Materials Testing)	m^2	180
5	Computer Laboratory (30no. + Internet)	m^2	100
6	Text Books	no.	285
7	Library	m^2	100
8	Conference Hall	m^2	200
9	Transport Facilities	no.	2

APPENDIX 3: EXPECTED LOCAL ANNUAL INCOME AND EXPENDITURE

A. INCOME				
Item Description	**Quantity**	**Quantity Description**	**Unit Cost**	**Amount**
Tuition Fees	30	Students	3,787,500	113,625,000
Total Income				**113,625,000**

B. Expenditure	
Item Description	**Amount**
University Council (39%)	44,313,750
Teaching Expenses (40%)	45,450,000
Administrative Expenses (4%)	4,545,000
Office Expenses (2%)	2,272,500
Laboratory Materials (2%)	2,272,500
Library Materials (2%)	2,272,500
Utilities/Furniture (1%)	1,136,250
College Levy (3%)	3,408,750
Staff Development (3%)	3,408,750
Computer Laboratory (1%)	1,136,250
Visiting Professors Expenses (3%)	3,408,750
Total (100%)	**113,625,000**