MSc Software Engineering Projects and Management - E562 (Subject to Approval)

1. Introduction

Available in both full and part-time mode, the MSc Software Engineering Projects and Management programme will provide graduates from IT and related fields with the necessary skills to lead and manage software development projects in a manner consistent with current standards. This programme is a response to the increasing need for leaders who can manage people and processes, who communicate well and who are knowledgeable about the best software development practices in industry. The course has been designed to permit a high degree of flexibility in that students may take varying combinations of modules.

2. Aims and Objectives

The programme aims at developing skills in managing the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software. The successful graduate will be a competent manager who can communicate well and who can train and lead software developers in producing products that meet quality, schedule, and budget objectives.

3. General Entry Requirements

Successful completion of an undergraduate degree with at least a Second Class or 50%, whichever is applicable, or a GPA not less than 2.5 out of 4 or equivalent, from a recognised Higher Education Institution, or alternative qualifications acceptable to the University of Mauritius.

4. Programme Requirements

Any undergraduate degree in Computer Science or other related areas.

5. Programme Duration

The normal duration of the programme will be as detailed below.

<table>
<thead>
<tr>
<th></th>
<th>Full time (yrs)</th>
<th>Part Time (yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Maximum</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

However students wishing to exit earlier, with a Postgraduate Diploma, can do so subject to their meeting the requirements specified in item 6.

The programme will be run on a semester system, where an academic year consists of two semesters. A semester is of 15 weeks duration (excluding Exam Period).

6. Minimum Credits Required for Award of:

Master’s Degree : 36
Postgraduate Diploma : 24

Breakdown as follows:

<table>
<thead>
<tr>
<th></th>
<th>Minimum Core Taught Modules</th>
<th>Dissertation</th>
<th>Electives Optional Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master’s Award</td>
<td>18 credits</td>
<td>12 credits</td>
<td>6 credits</td>
</tr>
<tr>
<td>Postgraduate Diploma</td>
<td>18 credits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. **Assessment**

All modules are of 45 hours duration and carry equal weightage [i.e. of 3 credits] except for CSE 6000.

All modules will carry 100 marks and will be assessed as follows (unless otherwise specified).

- A written examination of 3 hours and
- Continuous assessment carrying a range of 30% to 40% of total marks.
  Continuous assessment may be based on laboratory works, and/or assignments and tests but
  should include at least 2 assignments/tests per module.
- A minimum of at least 30% should be attained in each of continuous assessment and Written
  Examination, with an overall total of 40% for a candidate to pass a module.

Students are required to register for modules which they intend to follow in a given semester on date(s) specified by the Faculty.

**Submission Deadlines for Project:**

<table>
<thead>
<tr>
<th></th>
<th>Full time</th>
<th>Part Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
<td>January – Level I</td>
<td>January – Level 2</td>
</tr>
<tr>
<td>Submission</td>
<td>Last working day of August – Post Level 1</td>
<td>Last working day of August – Post Level 2</td>
</tr>
</tbody>
</table>

8. **List of Modules**

**CORE MODULES**
- CSE 6209 - Software Project Management
- CSE 6075 - Requirements Engineering and Management
- CSE 6076 - Software Verification and Validation
- CSE 6011 - Software Quality Management
- ENGG 6101 - Principles of Project management
- MGT 5212 - Human Resources and Quality Management
- CSE 6000 - Project

**ELECTIVE MODULES**

**Group A**
- CSE 6078 - Software Metrics (3L)
- CSE 6080 - ERP & Change Management (2L + 2P)
- CSE 6027 - Enterprise Applications Development (2L + 2P)
- CSE 6077 - Software Engineering Tools (2L + 2P)

**Group B**
- ACT 5112 - Project Economics and Finance (3L)
- ENGG 6305 - Procurement Management (3L)
- LAW 7000 - Legal Aspects of Project Management (3L)
- MGT 6011Y - Marketing management (3L)

**Note:** Students will take six core modules and two electives (one elective from group A, one from group B).
9. Programme Plan – MSc Software Engineering Projects and Management

(Full time)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Module Code</th>
<th>Module</th>
<th>Hrs/WK L + P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester I</td>
<td>CSE 6075</td>
<td>Requirements Engineering and Management</td>
<td>3+0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CSE 6011</td>
<td>Software Quality Management</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ENGG 6101</td>
<td>Principles of Project management</td>
<td>3+0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CSE 6076</td>
<td>Software Verification and validation</td>
<td>3+0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective 1</td>
<td>(See section 8)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Semester II</td>
<td>CSE6209</td>
<td>Software Project Management</td>
<td>3+0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MGT5212</td>
<td>Human Resources and Quality Management</td>
<td>3+0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CSE 6000</td>
<td>Elective 2</td>
<td>(See section 8)</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Project</td>
<td></td>
<td>12</td>
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</tbody>
</table>

(Part time)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Module Code</th>
<th>Module</th>
<th>Hrs/WK L + P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester I</td>
<td>CSE 6075</td>
<td>Requirements Engineering and Management</td>
<td>3+0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CSE 6011</td>
<td>Software Quality Management</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ENGG 6101</td>
<td>Principles of Project management</td>
<td>3+0</td>
<td>3</td>
</tr>
<tr>
<td>Semester II</td>
<td>CSE 6209</td>
<td>Software Project Management</td>
<td>3+0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MGT 5212</td>
<td>Human Resources and Quality Management</td>
<td>3+0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective 1</td>
<td>(See section 8)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Semester III</td>
<td>CSE 6076</td>
<td>Software Verification and validation</td>
<td>3+0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective 2</td>
<td>(See section 8)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Semester IV</td>
<td>CSE 6000</td>
<td>Project</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

Note 1: An elective will be provided only if sufficient number of students have opted for it and depending on availability of resources.

Note 2: Some courses may be run during/after office hours depending on availability of resources.
10. Outline Syllabus

CSE 6209- SOFTWARE PROJECT MANAGEMENT

CSE 6075 – REQUIREMENTS ENGINEERING AND MANAGEMENT
Issues of the early stages of systems development; explores different approaches that can be used to identify, record and manage requirements within the systems lifecycle; architectural requirements, model business context into which information systems must fit, Requirement change management issues, Requirement traceability issues, AGILE Modeling

CSE 6076 - SOFTWARE VERIFICATION AND VALIDATION
The three interdisciplinary thematic blocks: Software inspection (verification metrics, requirements, design and code inspection); Software testing (levels, methods and types of test, informal and formal validation, test planning, validation metrics) AND Software reliability engineering (reliability predictions, operational profiles, test efficiency deployment, software reliability models, step-by-step process implementation). All three blocks will cover the history (background), concepts (techniques) and applications, and applied usage of at least one technique from each theme respectively. Framework for V&V (providing a crude systematic review of V&V) and improvements

CSE 6077 - SOFTWARE ENGINEERING TOOLS
Select appropriate software engineering tools for different situations; develop a strategy for introducing tools into an organisation; and get hands-on experience of a modern integrated development environment (increasingly adopted by software engineers who want to improve software productivity as well as quality).

ENGG 6101 - PRINCIPLES OF PROJECT MANAGEMENT

MGT 5212 - HUMAN RESOURCES AND QUALITY MANAGEMENT

CSE 6080 - ERP & CHANGE MANAGEMENT
Based on CSE3008: ERP Systems, Core Business Processes, System Thinking, Transition from MRP to ERP, Basic ERP model, Benefits and Challenges of ERP, BPR, ERP System Selection, ERP Design, ERP Implementation, ERP Standards, ERP Bolt-ons, ERP System Maintenance, Technology and International Considerations, Change Management, ERP and Supply Chain.CSE

6027 - ENTERPRISE APPLICATIONS DEVELOPMENT
CSE 6078 - SOFTWARE METRICS
Fundamentals of measurement: The need for measurement, scope of software metrics; Measurement theory: scales, validation, and meaningfulness; Goal-Question-Metric paradigm; Measurement data collection and analysis; A classification of software metrics; Software measures: Internal Product Attributes; External Product Attributes; Resource; Measurement; ISO 9126 software product quality characteristics; Software measurement process: Measurement process models; ISO/IEC 15939: Software; Measurement Process; CMMI’s measurement requirements

CSE 6011 – SOFTWARE QUALITY MANAGEMENT
Software Quality Factors, Metrics & Models, Estimation Techniques, Benchmarking, Quality Assurance Activities, Measurement Tracking, Statistical Quality Assurance, Data Quality Control, ISO Standards Requirements & Certification, TickIt, Quality Ethics, CMM & CMMI.

ACT 5112 - PROJECT ECONOMICS AND FINANCE

ENGG 6305 - PROCUREMENT MANAGEMENT

LAW 7000  - LEGAL ASPECTS OF PROJECT MANAGEMENT

MGT 6011Y - MARKETING MANAGEMENT
The module introduces the foundation of marketing management and its key concepts: the Marketing Concept, Customer Satisfaction and Customer Value. Topics covered will include: evolution in Marketing Management philosophy; the marketing environment (Internal and External environment); the marketing research process; Consumer and Business buying behaviour; Market segmentation, positioning and targeting; The Marketing mix: product, price, promotion and distribution strategy of firms; Social Responsibility and green marketing.

CSE 6000 - PROJECT
Student research project. Includes appropriate research methods training

June 2009