# MASTER OF PHILOSOPHY
# Field: SOFTWARE ENGINEERING

## PROGRAMME SPECIFICATIONS

The Master of Philosophy, Field: Software Engineering is offered on a full-time basis. The full-time programme is offered only at the UTM Main Campus in Johor Bahru. The duration of study for the full-time programme is subjected to the student's entry qualifications and lasts between two (2) years to a maximum of four (4) years.

The programme is offered on full-time basis and is based on a 2-Semester per academic session. This is a full research programme. The candidate is supervised by a lecturer. The directed research work introduces candidates to the process by which new knowledge is developed and applied accordingly. Assessment is done by examining first assessment reports (research proposal), each semester's progress reports, and thesis examination (viva-voce).

## General Information

| | | |
|---|---|---|
| 1. | Awarding Institution | Universiti Teknologi Malaysia |
| 2. | Teaching Institution | Universiti Teknologi Malaysia |
| 3. | Programme Name | Master of Philosophy |
| 4. | Final Award | Master of Philosophy |
| 5. | Programme Code | MCSQA3AJA |
| 6. | Professional or Statutory Body of Accreditation | Ministry of Higher Education |
| 7. | Language(s) of Instruction | English |
| 8. | Mode of Study (Conventional, distance learning, etc) | Conventional |
| 9. | Mode of operation (Franchise, self-govern, etc) | Self-governing |
| 10. | Study Scheme (Full Time/Part Time) | Full Time |
| 11. | Study Duration | Minimum :  2 yrs (4 semesters) Maximum  : 4 yrs (8 Semesters) |

| Type of Semester | No. of Semesters | | No of Weeks/Semester | |
|---|---|---|---|---|
| | Full Time | Part Time | Full Time | Part Time |
| Normal | 4 | - | 8 | - |
| Short | | - | | - |

**Course Classification**

| No. | Classification | Credit Hours | Percentage |
|---|---|---|---|
| i. | University Courses | 3 | 33% |
| ii. | Core Courses | 6 | 67% |
| iii. | Research | 0 | 0% |
| | **Total** | **9** | **100%** |
| **Total Credit Hours to Graduate** | | **9 credit hours** | |

**COURSE MENU**

Master of Philosophy students are required to register and pass the following courses before their first assessment (proposal defence).

  i.   One University Elective Course (course code U*** ***3).
  ii.  Software Engineering Research Methodology
  iii. Advanced Software Engineering

| YEAR 1: SEMESTER 1 | | | |
|---|---|---|---|
| Code | Course | Credit | Pre-requisite |
| UCCM1263 | IT Project Management | 3 | |
| UHAP6013 | Seminar on Development, Economics and Global | | |
| UICW 6023 | Philosophy Science and Civilization | | |
| UHAZ 6123 | Malaysian Society and Culture | | |
| MCSQ1103 | Software Engineering Research Methodology | 3 | |
| MCSQ1203 | Advanced Software Engineering | 3 | |
| MCSQ 1100 | *Research | 0 | |
| | **TOTAL CREDIT** | **9** | |
| | **CUMULATIVE CREDITS** | **9** | |

| YEAR 1: SEMESTER 2 | | | |
|---|---|---|---|
| Code | Course | Credit | Pre-requisite |

| MCSQ 1200 | *Research | 0 | |
|---|---|---|---|
| | **TOTAL CREDIT** | 0 | |
| | **CUMULATIVE CREDITS** | 9 | |

* Research (course code MCSQ **00), to be taken every semester until the submission of thesis. The progress of a candidate in any particular semester is assessed through research progress reports submitted at the end of each semester. It is important for the students to know that the submission of the progress report needs to be done by the student themselves via GSMS website http://spsapp3.utm.my:8080/gsmsv4/.

**RESEARCH CODE**

| Semester | Research Course Code |
|---|---|
| 1 | MCSQ 1100 |
| 2 | MCSQ 1200 |
| 3 | MCSQ 2100 |
| 4 | MCSQ 2200 |
| 5 | MCSQ 3100 |
| 6 | MCSQ 3200 |
| 7 | MCSQ 4100 |
| 8 | MCSQ 4200 |

**Programme Educational Objectives (PEO)**
After having exposed to 3 to 5 years working experience, our graduates should become professionals who demonstrate the following competencies:

| Code | Intended Educational Objectives |
|---|---|
| PEO1 | Competent in software engineering and digital industry and contribute to national development. |
| PEO2 | Has character and ethics, as well as high professionalism and contributes to current and future needs. |
| PEO3 | Creative, innovative, entrepreneurial and able to become leader or team member in an organisation and society. |

**Programme Learning Outcomes (PLO)**
After having completed the programme, graduates should be able to demonstrate the following competencies:

| Code | Intended Learning Outcomes |
|---|---|
| PLO1 | Ability to integrate and acquire in-depth knowledge in professional practices for the benefits of Software Engineering discipline. |
| PLO2 | Ability to formulate hyphotesis, design and perform scientific research in Software Engineering using appropriate methods and |

| | | tools. |
|---|---|---|
| PLO3 | | Ability to evaluate and make decision taking into consideration social responsibilities related to organization, society and individual to fulfill needs of mankind. |
| PLO4 | | Ability to demonstrate behaviours that are consistent with the code of Professional Ethics and Responsibilities. |
| PLO5 | | Ability to communicate technical solutions and research findings to a range of audience orally and in writing. |
| PLO6 | | Ability to explore in solving scientific problem to produce an innovative software solution. |
| PLO7 | | Ability to adapt current knowledge and manage information effectively through the life long learning process. |
| PLO8 | | Ability to identify commercial value in software solution. |

## GRADUATION CHECKLIST

To graduate, students must pass all the stated courses in this checklist. It is the responsibility of the students to ensure that all courses are taken and passed. Students who do not complete any of the course are not allowed to graduate.

| NO. | CODE | COURSE | CREDIT EARNED (JKD) | CREDIT COUNT-ED (JKK) | TICK (√) IF PASSED |
|---|---|---|---|---|---|
| **CORE COURSES (6 CREDITS)** | | | | | |
| 1 | MCSQ1103 | Software Engineering Research Methodology | 3 | 3 | |
| 2 | MCSQ1203 | Advanced Software Engineering | 3 | 3 | |
| **TOTAL CREDIT OF CORE COURSES (a)** | | | **6** | **6** | |
| **UNIVERSITY ELECTIVE COURSES** | | | | | |
| 1 | UCSM1263 | IT Project Management | 3 | 3 | |
| | UHAP6013 | Seminar on Development, Economics and Global | | | |
| | UICW 6023 | Philosophy Science and Civilization | | | |
| | UHAZ 6123 | Malaysian Society and Culture | | | |
| **TOTAL CREDIT of UNIVERSITY GENERAL COURSES (b)** | | | 3 | 3 | |
| **TOTAL CREDIT TO GRADUATE (a + b)** | | | 9 | 9 | |
| **RESEARCH** | | | | | |

| 1 | Hard-Bound Thesis endorsed by supervisor – 3 copies | |
|---|---|---|
| 2 | Copy of CD for Each Thesis – Extra 1 unit | |
| 3 | Copy of All Semester Results (Pre-Transcript) | |
| 4 | Copy of Registration Slip (current semester) | |
| 5 | Abstract and Title Page Approval Form (original copy) | |
| 6 | Course Checklist (endorsed by coordinator) | |
| 7 | Copy of IC (local student) / first page of Passport (international student) | |
| 8 | Fee Release Letter (UTM Bendahari) | |
| 9 | Exit Survey | |
| 10 | Submission of Thesis Form – 3 copies | |
| 11 | Verification of Graduate Information Form – 1 copy | |

## COURSE SYNOPSIS

## CORE COURSES

### MCSQ1103 - Software Engineering Research Methodology

This course explores the roles of empiricism in software engineering research, and prepares students for advanced research in software engineering by examining how to plan, conduct, and report on empirical investigations. The course covers all of the principal methods applicable to SE: controlled experiments, case studies, surveys, archival analysis, action research, and ethnographies, and relates these methods to relevant meta-theories in the philosophy and sociology science. The course critically reviews published examples of work that use each of the principal methods, both from within SE and from other disciplines. The course also covers techniques applicable to each of the steps of a research project, including formulating research questions, theory building, data analysis (using both qualitative and quantitative methods), building evidence, assessing validity, and publishing. Having successfully completed the module, students will be able to demonstrate knowledge and understanding on the process of creating engineering and scientific knowledge.

### MCSQ1203 - Advanced Software Engineering

This course will expose students to the concepts, principles, and state-of-the-art methods and approaches in the main knowledge areas in software engineering. It includes software process, software quality, domain & requirements engineering, architectural & detailed design, software measurement & testing, and software maintenance & evolution. It also provides opportunities for the students to explore and systematically evaluate the currently available approaches.

# UNIVERSITY ELECTIVE COURSES

## UCSM 1263 - IT Project Management
This course presents a hands-on perspective to Information Technology project management. This course will assist post-graduate students to plan and implement their post-graduate projects as well as other IT projects effectively. The subject is organized into three main sections, that covers I) Basic concepts, life cycle and framework of project management II) Detailed description of each project management knowledge areas under the Project Management Institute (PMI) Body of Knowledge (PMBOK) and its applications, and III) Real Project Initiation, Planning, Executing, Monitoring and Closing. The Project Management areas include – project integration, scope, time, cost, quality, human resource, communications, risks and procurement management. Students are expected to perform real projects with teams and achieve agreed Key performance Indicators (KPI)

## UHAP 6013 - Seminar on Development, Economics and Global
Discussion on this subject includes issues related to globalization and development, economic and social crisis that has become a global concern. It aims in developing skills in understanding and analyzing global issues and recommending relevant solutions. Issues will be discussed in details.

## UICW 6023 - Philosophy Science and Civilization
This course is offered to international students in advanced scholar and doctoral programs from Malay societies such as Indonesia, Brunei, South Thailand and Malay-Singapore. This course contains two sections. This subject discusses the world view of its role and importance in shaping the culture of life and civilization; The concepts of revelation, science, humanity, nature and happiness; and Comparative Studies in the Philosophy of Science: Epistemology, Ontology and Axiology in Education. Discussions on current issues and challenges, among others; the challenge of civilization between the West and the East; Development and the environment; Economy and trade; National administration and management; Scientific research; Communication and information technology; Ethics and morals; Crime and violence; and Family education.

## UHAZ 6123 - Malaysian Society and Culture
This course is designed for international postgraduates from countries of non-Malay origins. Students will be exposed to various aspects of the Malaysian culture such as belief system, religious festivals, customs and etiquettes of different ethnic groups in Malaysia. Emphasis will be given to the Malay culture as it makes the core for the Dasar Kebudayaan Kebangsaan. Students will also be briefly introduced to basics of Malay language as the national language of Malaysia.