

**DOCTOR OF PHILOSOPHY  
FIELD: INFORMATICS ENGINEERING**

**PROGRAMME SPECIFICATIONS**

The Doctor of Philosophy, Field: Informatics 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 three (3) years to a maximum of eight (8) 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**

| <b>1. Awarding Institution</b>                          |                  | <b>Universiti Teknologi Malaysia</b>          |                      |           |
|---|------------------|---|----------------------|-----------|
| 2. Teaching Institution                                 |                  | Universiti Teknologi Malaysia                 |                      |           |
| 3. Programme Name                                       |                  | Doctor of Philosophy                          |                      |           |
| 4. Final Award  |                  | Doctor of Philosophy                          |                      |           |
| 5. Programme Code                                       |                  | PCSA3AJA                                      |                      |           |
| 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                                     |                      |           |
| 11. Study Duration                                      |                  | Minimum : 6 semesters<br>Maximum:12 semesters |                      |           |
| Type of Semester  | No. of Semesters |   | No of Weeks/Semester |           |
|   | Full Time        | Part Time                                     | Full Time            | Part Time |
|   |                  |   |                      |           |

|        |   |   |    |   |
|--------|---|---|----|---|
| Normal | 6 | - | 12 | - |
| Short  | - | - | -  | - |

### Course Classification

| No.                                   | Classification     | Credit Hours          | Percentage  |
|---------------------------------------|--------------------|-----------------------|-------------|
| i.                                    | University Courses | 3                     | 100%        |
| ii.                                   | Core Courses       | 0                     | 0%          |
| iii.                                  | Research           | 0                     | 0%          |
|                                       | <b>Total</b>       | <b>3</b>              | <b>100%</b> |
| <b>Total Credit Hours to Graduate</b> |                    | <b>3 credit hours</b> |             |

### COURSE MENU

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

- iii. Research Methodology course (course code UCSP0010).
- iv. One University Elective Course (course code U\*\*\* \*\*3).

| YEAR 1: SEMESTER 1 |  |          |               |
|--------------------|--|----------|---------------|
| Code               | Course                                       | Credit   | Pre-requisite |
| UCSM1263           | IT Project Management                        | 3        |               |
| UHAP6013           | Seminar on Development, Economics and Global |          |               |
| UICW 6023          | Philosophy Science and Civilization          |          |               |
| UHAZ 6123          | Malaysian Society and Culture                |          |               |
| UCSP0010           | Research Methodology                         | 0        |               |
| MCSS 1100          | *Research                                    | 0        |               |
|                    | <b>TOTAL CREDIT</b>                          | <b>3</b> |               |
|                    | <b>CUMULATIVE CREDITS</b>                    | <b>3</b> |               |

| YEAR 1: SEMESTER 2 |                           |          |               |
|--------------------|---------------------------|----------|---------------|
| Code               | Course                    | Credit   | Pre-requisite |
| MCSS 1200          | *Research                 | 0        |               |
|                    | <b>TOTAL CREDIT</b>       | <b>0</b> |               |
|                    | <b>CUMULATIVE CREDITS</b> | <b>3</b> |               |

\* Research (course code PCSI \*\*00), to be taken every semester until the submission of thesis. The progress of a candidate in any 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        | PCSI 1100            |
| 2        | PCSI 1200            |
| 3        | PCSI 2100            |
| 4        | PCSI 2200            |
| 5        | PCSI 3100            |
| 6        | PCSI 3200            |
| 7        | PCSI 4100            |
| 8        | PCSI 4200            |

### RESEARCH AREAS

- Information Systems Application and Development
- Information Retrieval
- Data Mining and Knowledge Discovery
- Text Mining and Sentiment Analysis
- Web Mining
- Natural Language Processing
- Information and Knowledge Management
- Database Management
- Business Intelligence Application and Development
- Data Engineering
- Social Media Analytics
- Enterprise Information Systems

### Programme Educational Objectives (PEO)

This programme is aimed to produce computer science experts who have a skill and knowledge to apply and research the state-of-the-art computer science and informatics techniques, methods and tools. These skills are important to support a research and development towards the development of a novel informatics & computer science solution(s), either for local use or export that can generate national income.

After having exposed to a number of years working experience, our graduates should become professionals who demonstrate the following competencies:

| Code | Intended Educational Objectives   |
|------|---|
| PEO1 | Competent in computer science and digital technologies that foster research and development of new knowledge in specific areas.     |
| PEO2 | Has good character, ethics and high integrity and demonstrate behavior that is consistent to professional ethics.                   |
| PEO3 | Has promote the technological, social and cultural progress in a knowledge based society in the academic and professional contexts. |

### 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 identify various computer science theories suitable for particular research context, and justify and verify the proposed solution using computer science theories creatively |
| PLO2 | Ability to conduct computer science research in a systematic and scientific way independently   |
| PLO3 | Ability to give suggestion on computer science solutions to the society   |
| PLO4 | Ability to demonstrate behaviour that is consistent with the Code of Professional Ethics and Responsibilities   |
| PLO5 | Ability to defend critically technical solutions and research findings to a range of audience orally and in writing   |
| PLO6 | Ability to identify and analyse real problems critically related to organisational, governmental and social   |
| PLO7 | Ability to undertake lifelong learning and actively participate in change   |
| PLO8 | Ability to turn ideas into innovative computer science solution to meet the real world needs  |

| 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                          |  |

### 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 |
|---|-----------|--|---------------------|-----------------------|--------------------|
| <b>CORE COURSES (0 CREDITS)</b>                       |           |  |                     |                       |                    |
| 1   | UCSP0010  | Research Methodology                         | 0                   | 0                     |                    |
| <b>TOTAL CREDIT OF CORE COURSES (a)</b>               |           |  | <b>0</b>            | <b>0</b>              |                    |
| <b>UNIVERSITY ELECTIVE COURSES</b>                    |           |  |                     |                       |                    |
| 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                |                     |                       |                    |
| <b>TOTAL CREDIT of UNIVERSITY GENERAL COURSES (b)</b> |           |  | <b>3</b>            | <b>3</b>              |                    |
| <b>TOTAL CREDIT TO GRADUATE (a + b)</b>               |           |  | <b>3</b>            | <b>3</b>              |                    |

## **COURSE SYNOPSIS**

### **CORE COURSES**

#### **UCSP0010 - Research Methodology**

This course covers the general principles of Research Methodology that are applicable to any discipline. It discusses the fundamental process in conducting an academic research. The theoretical and practical aspects of preparing a research proposal presented. Amongst topics that will be covered are introduction to research and its philosophy, problem formulation and research objective, literature review, research methodology and design, data collection procedures, data analysis, research proposal and thesis preparation and research management.

### **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.