

**FINAL YEAR PROJECT/
PROJEK SARJANA MUDA (PSM)
HANDBOOK**

PSM Committee

**FACULTY OF COMPUTING
UNIVERSITI TEKNOLOGI MALAYSIA**

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LIST OF ABBREVIATIONS

PSM Projek Sarjana Muda

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CHAPTER 1

INTRODUCTION

1.1 What is the Projek Sarjana Muda (PSM)?

Projek Sarjana Muda (PSM) is a course whereby each undergraduate student must undertake and pass in order to graduate. It aims to equip students with knowledge and skills in problem solving/programming technique through appropriate academic and research activities. It is undertaken in two semesters each for PSM1 and PSM2 respectively.

1.2 The Objectives

The objectives of PSM are to evaluate the students on:

- i. PSM1
 - Identifying relevant information pertaining to project needs from a variety of resources.
 - Explaining and applying project development methodologies appropriate to the project.

- Designing, planning and proposing a project according to user requirements.
- ii. PSM2
 - Coding and developing project according to the proposed plan and design.
 - Verifying and validating developed modules following industrial standard practices.
 - Communicating project ideas and final product through technical report and presentation.
 - Proposing future improvement based on project outcomes

1.3 PSM Announcement Platforms

CSC department has provided a PSM website (www.csc.fsksm.utm.my/v1/psm) where student can access all the necessary information and documents relating to PSM:

- i. Latest news
- ii. PSM Calendar
- iii. PSM Presentation Schedule
- iv. Past Project Titles
- v. Forms
- vi. The list of lecturers and their area of expertise (refer Appendix).

Besides the website, the department also provides two bulletin boards, for PSM1 and PSM2. Some printed information and memos will be posted on these boards. Students are strongly advised to regularly check for updates and news from the website as well as the bulletin boards.

1.4 The Phases of PSM

PSM is undertaken in two phases over the period of two (2) semesters and it is named as PSM1 and PSM2. The phrase of each of the PSM is as explained in the following sections.

1.4.1 PSM1

PSM1 carries two (2) credits and is done in the second semester of the third year. It is a prerequisite for PSM2. This means that students must undertake and pass PSM1 before they can register for PSM2. A detailed implementation of PSM1 is described in Section 1.6.

1.4.2 PSM2

PSM2 carries four (4) credits and is done in the second semester of the final year. A detailed implementation of PSM2 is described in Section 1.7.

1.5 The Committee

The Departmental PSM Committee (JKPSM) handles the day-to-day running of PSM and is responsible to ensure smooth operation throughout the length of PSM. The committee members are listed in the PSM website and these are the go-to person for any questions or problems relating to PSM.

1.6 Introduction to PSM1

In the process of PSM1 (i.e. Project 1) execution, there is a set of procedures that need to be followed by the students, the supervisors and the evaluators. This section outlines all the major tasks/procedures related to the execution of PSM1, which include the procedures that need to be followed if the students need to change their project title.

1.6.1 PSM1 Execution Procedure

The processes involved in PSM1 are illustrated in Figure 1.1. In general, it begins with students' registration at the beginning of the semester, followed by a discussion with the supervisor(s) to propose suitable project topics. Once, the title has been approved by the departmental committee, the students need to regularly meet and discuss with the supervisor(s) on matters related to the execution of the project and get themselves ready for project presentation and evaluation at the end of the semester.

The detailed processes involved in PSM1 execution procedure are discussed in the following sub-sections.

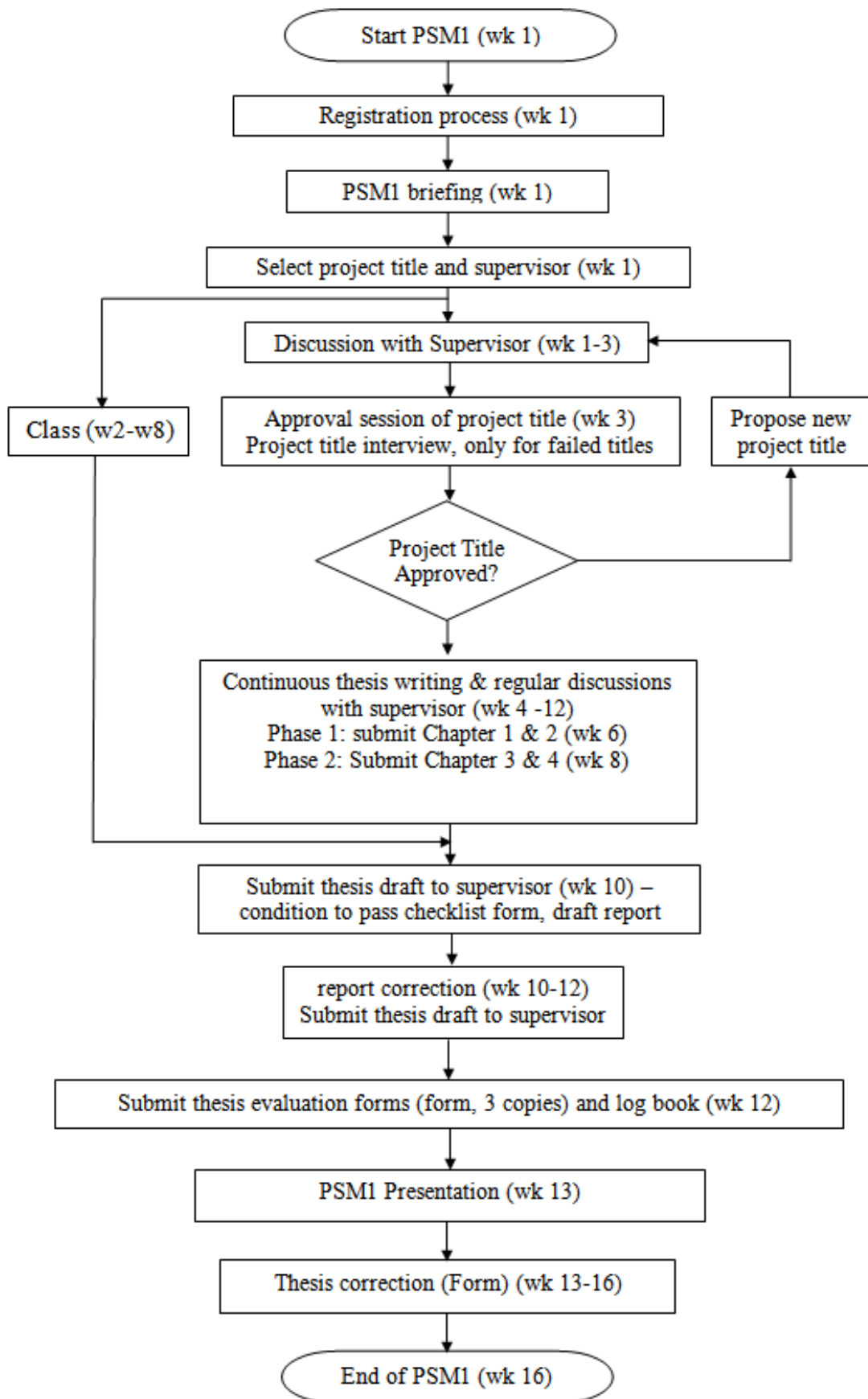


Figure 1.1: PSM1 Execution Procedure

1.6.2 Registration

Only final year students are allowed to register to undertake PSM1. The registration could be done either during the pre-registration week (usually at the end of previous semester) or during the normal registration week (usually a week before semester opens). It is very important for students to remember that they have to register the correct SUBJECT CODE for CSC department, which is **SCR 3032**.

1.6.3 Project/Research Areas Briefing

Each department has its own research areas that differentiate them from the others. At the beginning of the semester, Departmental PSM1 Coordinator will brief the students on suitable topic areas related to the department. Also included in the briefing are the departmental lecturers' areas of interests, which could be very useful for students in the process of selecting the project title, supervisor and co-supervisor, if necessary.

1.6.4 Supervisor Appointment

Students are responsible to find a supervisor to supervise them in the execution of their project. The appointed supervisor will supervise the student's project for both PSM1 and PSM2. Students, in appointing a supervisor, could use the following tips.

- i. Have a discussion with a few lecturers before appointing, in order to identify:
 - a. A supervisor who has sufficient knowledge on the intended project.
 - b. A supervisor who has the same interest on the intended project.
 - c. Co-supervisor, if the intended project is a cross discipline area.

- ii. DO NOT appoint a supervisor at the last minute. If possible, appoint one before the semester opens.
- iii. Each student must get the supervisor's agreement to supervise them. Ensure to get the supervisors signature in the Project Proposal Form (at PSM Website) before submitting the form to the departmental committee.
- iv. Check the list of CSC lecturers and their areas of interests at the PSM website.

1.6.5 Project Proposal Submission

Project topics can be a product of students own ideas or it can be a suggestion from a prospective supervisor. Upon finding a title that suits you, put together a basic information search, discuss with your supervisor and prepare a basic proposal. Complete the Project Proposal Form and submit it to the PSM committee.

1.6.6 Project Proposal Interview and Approval

Upon the submission of the project proposal, students with a conditional pass project proposal status will be interviewed to ensure that:

- i. There is no duplication with previous projects in terms of the objectives and scopes for a particular problem domain.
- ii. Students are clear on the objectives and scopes of their projects.
- iii. Students meet the minimum requirements in terms of technologies to be applied in their projects.

Interview sessions are held in the third week (W3) of the semester. Students with rejected proposals must submit another proposal within 3 days of receiving the interview result.

1.6.7 Weekly Supervision Meeting and Log Book

Regular review from supervisors will ensure that students execute their project according to the faculty's procedure and standards, as well as the project objectives and aims. Student must arrange a minimum of six (6) formal meetings with their supervisors before receiving permission to submit and present their project. However, students are strongly advised to arrange a weekly meeting with the supervisors to address issues related to project execution. All meetings must be recorded in a logbook and the supervisor's signature of approval of each meeting is required. The logbook form is available at the PSM website.

1.6.8 Lectures and Presentation Week Briefing

A series of lectures will be conducted over an eight week period. These lectures will explain all topics listed in the course outline as in Table 1.1.

Table 1.1: PSM1 Weekly Lecture Plan

Week	Topics
1	<ul style="list-style-type: none"> • Faculty level briefing
2	<ul style="list-style-type: none"> • Departmental project/research areas briefing
3	<ul style="list-style-type: none"> • Identifying problem statements, objectives, and scopes of the project. • Project planning via logbook and Gantt chart.
4	<ul style="list-style-type: none"> • Literature review skills • Referencing techniques
5	<ul style="list-style-type: none"> • Project methodology • Data collection • User/system requirements analysis
6	<ul style="list-style-type: none"> • Project design
7	<ul style="list-style-type: none"> • Project implementation, coding, testing
8	<ul style="list-style-type: none"> • Project discussion and conclusions
9	<ul style="list-style-type: none"> • Project presentation (do's and don'ts)

1.6.9 PSM1 Report Submission

Towards the end of the PSM1 cycle, each student is required to submit their project report for evaluation. Students must get their supervisors' approval before submitting the report to the departmental committee along with several important forms. The required forms are:

- i. Project Evaluation Form (3 copies) – Refer Appendix
- ii. Draft Report Submission Form (1 copy) – Refer Appendix
- iii. PSM1 Report (3 copies)

1.6.10 Presentation Week

Students are required to present their PSM1 progress and the results achieved for evaluation. The evaluation panel consists of two evaluators. The presentation is held over a few days during the presentation week and is open for everyone to attend. Guidelines and procedures related to PSM1 presentation are described in Section 1.7.

1.6.11 PSM1 Report Correction

Students are required to do correction based on the comments given by the evaluators. The comments are available on feedback forms provided to evaluators during presentation. Students are urged to discuss all comments with their supervisor and take appropriate actions. Corrections made to the report must be endorsed by both supervisor and evaluators in Section D of PSM1 Evaluation form.

1.6.12 PSM1 Evaluation

At the end of the semester, each student's project is evaluated to determine that the objectives and scope are adequate and are aligned with project aim. A passing grade in PSM1 is a requirement for PSM2. Details on the evaluation criteria and the evaluation forms are explained in Chapter 9.

1.6.13 Project Presentation

Thirty (30) minutes is allocated to each student for presentation, with 20 minutes for slides presentation and 10 minutes for the question and answer session. It

is advisable for the students to include only important points in the slide to ensure that the presentation time is not exceeded. As a rule of thumb, one slide is equivalent to one minute of presentation time. However, the whole presentation should contain the following items:

- i. An introduction to introduce presenter, the project title, as well as the supervisor
- ii. An overview of the overall presentation (i.e. structure of the presentation, outline)
- iii. Project background, aim, objectives, and scopes of the project (this should be enough to cover what has been written in Chapter 1 of the project's report)
- iv. Summary of literature review (as explained in Chapter 2 of the project's report)
- v. Summary of research/system development methodology. This may include the data collection techniques such as survey, organization visits, etc.
- vi. List of software and hardware that are required to develop the project
- vii. Summary of initial findings during PSM1. For instance, analysis of data collected from survey, or perhaps initial interface design of the proposed system
- viii. Discussion on PSM2 execution plan
- ix. Conclusion of the presentation.

Students are advised to follow the subsequent good practices for their projects' presentations:

- i. Arrive early for the presentation.

- ii. Limit the use of text in slides and make sure there is no spelling error.
- iii. Include more figures, pictures, charts, etc.
- iv. Have eye contact with the audience.
- v. Dress according to the UTM's student dress code.
- vi. Speak clearly. Do not mumble.
- vii. Manage the presentation time so that there is ample time for Q&A session.
Practice beforehand.
- viii. Do not forget to thank the audience for listening.

1.6.14 Procedure to Change Project Title

In some cases, students need to change their project title due to inevitable reasons. The procedure to change the project title is shown in Figure 1.2 below. However, this change is not encouraged as it may affect PSM2 planning scheduled in PSM1 report.

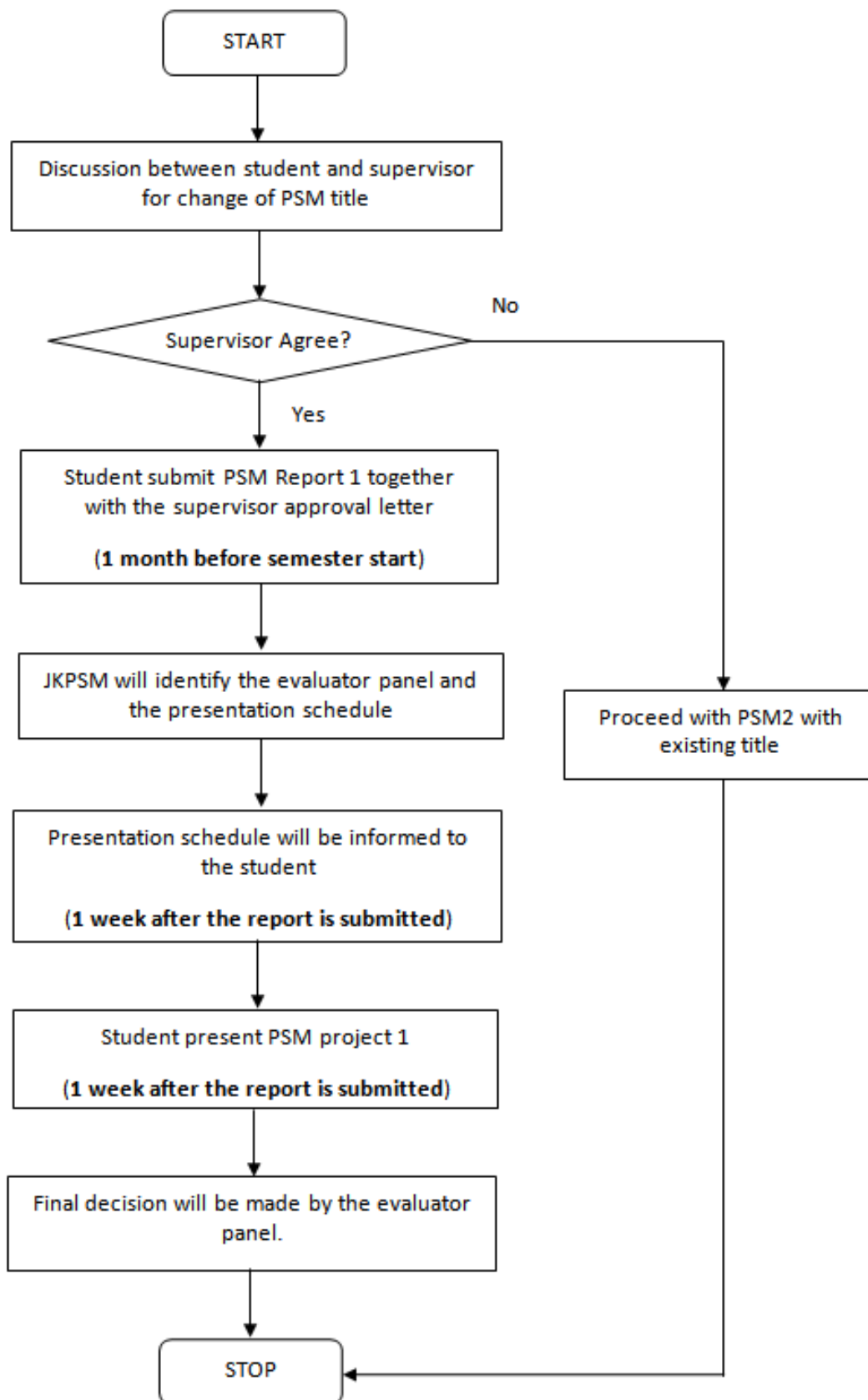


Figure 1.2: Change of PSM1 Title Procedure

1.7 Introduction to PSM2

This section outlines the execution procedure of PSM2 and highlights some of the important deliverables or outputs that need to be presented by students to the supervisors as well as the evaluators in order to get a good grade.

1.7.1 PSM2 Execution Procedure

As in PSM1, PSM2 procedure begins with the students' registration to undertake PSM2. Figure 1.3 outlines PSM2 execution procedure.

1.7.2 Registration

It is important to mention here that students are not automatically registered to undertake PSM2 even though they have completed and passed PSM1. Normal pre-registration or registration procedure still applies and the failure to register will result in disqualification to undertake PSM2.

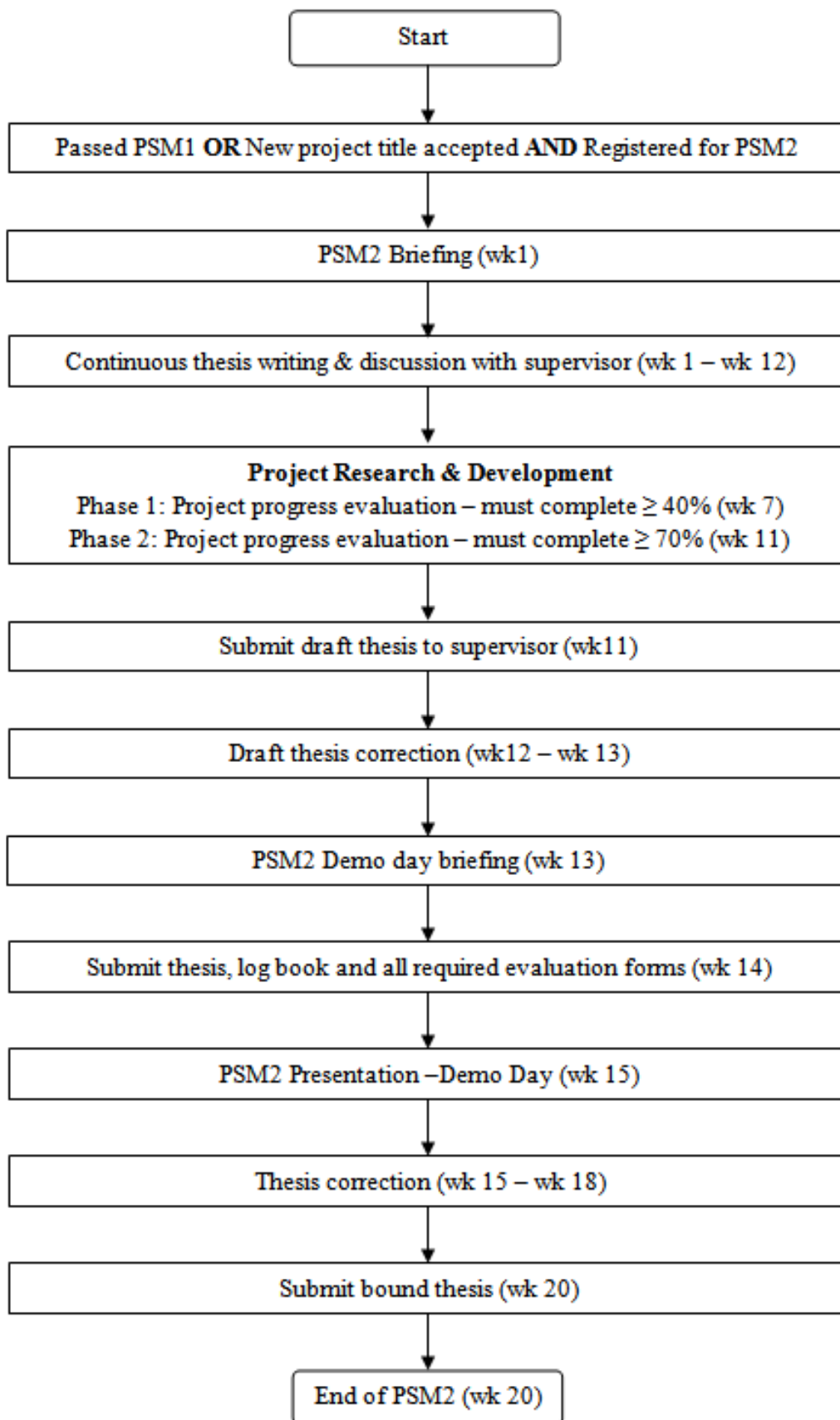


Figure 1.3: PSM2 Execution Procedure

1.7.3 PSM2 Pre-Assessment (Demo 1 and 2)

Students are required to regularly demonstrate their project development updates to their supervisors. These series of demos (Demo 1 and Demo 2) are compulsory and are evaluated as part of PSM2 grade. These demos also act as a benchmark for the supervisor to decide whether the students will proceed with the final presentation.

1.7.4 Final Report

The final report is essential to PSM2. The early chapters, Chapters 1,2 and 3, are similar to PSM1. It must be reminded that the tenses in Chapter 3 must be changed. In PSM1, Chapter 3 presents the plan, while in PSM2 it presents actions already taken. Consequently, the past tense must be used in PSM2.

As part of their progress, students are required to submit drafts of Chapters 4 and 5 to their supervisors for evaluation. Corrections must be done as required. It is hoped that the quality of the student's project report is improved by having the on-going report assessments.

Three (3) copies of final reports have to be submitted to the departmental committee following the submission dates in the PSM schedule. The reports will be distributed to the supervisor and two evaluators.

1.7.5 Presentation/Demo Day

Once the final report has been submitted, students need to prepare themselves for the presentation and demo day.

Unlike PSM1 the presentation for PSM2 is only 20 minutes (15 minutes for slides presentation and 5 minutes for the question and answer session). Only include important points in the slide to make better use of the allocated time. The presentation should contain the following items:

- i. An introduction to introduce presenter, the project title, as well as the supervisor.
- ii. An overview of the overall presentation (i.e. structure of the presentation, outline).
- iii. Project background, aim, objectives, and scopes of the project (Chapter 1).
- iv. Summary of literature review and research/system development methodology (Chapter 2 and Chapter 3).
- v. An overview of requirement analysis and design (for system based projects); research development and implementation (for research based projects) (Chapter 4).
- vi. Summary of system implementation and testing (for system based projects); result and analysis (for research based projects) (Chapter 5).
- vii. Conclusion of the project (Chapter 6).

Please refer to Section 1.7 for presentation good practices.

After the presentation, the students are required to demonstrate (demo) their projects. The aim of the demo is to evaluate the functionalities of the prototype for system based project or to verify the findings of a research based project. Related questions will be asked by the evaluators during the demo session. Students are also

required to prepare an A3-sized poster of their project to be displayed during the demo session.

1.7.6 Report Submission

The final hard-bound thesis should be prepared after all the corrections based on comments by evaluators and the supervisors are done. Please ensure that the endorsement forms are completed and submitted.

Students must prepare at least four (4) copies of hard-bound thesis (1 each for student, supervisor, faculty's library, and PSZ library) and 4 sets of DVD/CDs. The DVD/CDs must contain the following:

- i. Thesis document (format: doc, text etc)
- ii. Thesis document (format: pdf)
- iii. Abstract (format: pdf)
- iv. Poster
- v. Prototype
- vi. Source code
- vii. Application software (used during development)

The failure to submit the thesis along with the DVD/CDs will result in the suspension of the students' results.

1.8 Summary

The implementation of PSM consists of two phases, PSM1 and PSM2. This chapter describes the process flow and guidelines for both of these phases. A PSM1 process flow includes supervisor selection, title proposal, supervision process, report writing and presentation. Besides having some similar processes to PSM1, PSM2 have several extra processes such as Demos 1 and 2, demonstration day and thesis submission.

CHAPTER 2

PROJECT CATEGORIES

2.1 Introduction

There are 2 types of project which are: System Development and Research-based.

i. System Development

This type of project is based on developing an application, software or embedded systems. The undertaken project must include programming elements with appropriate users's complexity and meets PSM scope. This type of project gives the students an opportunity to conduct exercise as a project developer in the area of computer networking, computer security and embedded system.

Examples of applications that have been developed in this area are web based application, RFID-based project, sensor, PDA-based application, mobile phone application including SMS, .NET application and TINI based systems.

ii. Research-based

This type of project is based on a research application that includes data analysis, comparative studies or enhancement of techniques or algorithms. Similar to project based, programming elements must be included in the research project. It also emphasizes on analysis as well as technical writing of the report. Students are

expected to read few technical papers and able to digest with the help from the appointed supervisors.

This type of project aims at grooming the students with research skills in the area of computer networking, computer security and embedded system. It is suitable for students who are interested in Research and Development (R&D) careers such as academic professionals and researchers.

Examples of research-based projects that have been developed in this area are application of statistical technique in analyzing network data, new technique in parallel cryptography, comparative study of IDS performance, implementation of soft computing technique in solving security and network problems.

2.2 Project Domains

There are different main fields of study under each department in Faculty of Computing. Each course will have its own field of study as shown by Table 2.1.

Table 2.1: Topics under different courses

COMPUTER SCIENCE DEPARTMENT (SCSR)	INFORMATION SYSTEM DEPARTMENT (SCSD)
Computer Security (Cryptography, Steganography, Access Control, Security Technology) Grid/Parallel/Distributed Mobile Computing Computer Networking Collaborative virtual environment Embedded Systems Artificial Intelligent *Optimization *Data analysis *System Development	Information Systems Information Systems Development Decision Support Systems Project management Database Information Retrieval Decision Support System (DSS) Customer Relationship Management (CRM) Knowledge management *System Development

SOFTWARE ENGINEERING DEPARTMENT	
a) (SCSJ)	b) (SCSV)
Soft computing Software Evolution Software Design/ Architecture Software Quality, Software Modelling and Process Software Testing Software Requirement Software Reusability Embedded Real-time Software, Requirement Traceability Artificial Intelligence (Neural network, Genetic Algorithm, Support Vector Machine, Fuzzy Logic) Planning and Scheduling Automata and Formal Language Business Rules and Design Pattern Web-based Application Human Computer Interaction (HCI) Expert System	Image Processing and Pattern Recognition Human Computer Interaction Computer Games Visualization\Object Modeling Virtual Environment * Artificial Intelligence Speech Processing Web Technology *System Development
c) (SCSB)	
Computational Systems Biology High Performance Computing, Cancer classification Remote Homology, Gene Ontology Remote Homology, Protein Structure Prediction Protein Structure Biological Modeling, Synthetic Biology Protein Docking Biodiversity, Biological Science	<i>* applied in the related field</i>

For example in the Department of Computer Science there are:

- i. Computer security
- ii. Computer networking
- iii. Embedded system

Though computer security and computer networking are the thrust fields, interdisciplinary projects are also encouraged. Interdisciplinary means, the project is a mixture between two different fields example Malware Detection Using Artificial Neural Networks. It is a security field but using the tools from Software Engineering domain. No matter which field the project belongs to, students can do it either in system development or research-based projects. Each project types will differ in terms of problem, goal, methodology and design.

2.2.1 Sample CS Field 1: Computer Security

The scope of computer security projects include implementation or application of any security techniques such as cryptography, biometric, steganography, watermarking, and authentication. Examples of data and computer security projects are shown in Table 2.1 below:

Table 2.2: Examples of projects in the area of data and computer security

Project Based	Research Based
Cryptography Teaching Tools	Comparative Study on IDS Performance
Anti copy Software Protection Tools	Malware Detection Analysis
Anti web Defacement System	K-mean Clustering for Anomaly Intrusion Detection
Digital Watermarking Software	
Secondary Window Security Using Bluetooth Technology	

2.2.2 Sample CS Field 2: Computer Networking

Computer networking is a broad area and its application could range from wired to wireless applications. Some of the areas include traffic analysis, network performance, and quality of service. Examples of technologies related to this area are mobile networks, Bluetooth, wireless networks, and satellite and GPS applications. Examples of projects under networking field are given in Table 2.2 below:

Table 2.3: Examples of projects in the area of Networking

Project Based	Research Based
Wi-Fi Network Manager	Characteristic of User Network Traffic
Network Monitoring System Based on OpenNMS	Study on GPRS Multiclass Traffic Using Partial Buffer Sharing
Group Discussion using VOIP Technology	Study on GPRS Multiclass Traffic Using Random Early Detection
Bluetooth Software Controller	
Bus Speed Monitoring System Using GPS	
Network Simulation Using OPNET	

2.2.3 Sample CS Field 3: Embedded System

An embedded system is designed to do specific tasks often with real-time computing constraints. It is usually controlled by one or more main processing cores that are typically either microcontrollers or digital signal processors (DSP). Examples of projects in this area are as follow:

- i. Home storage inventory system (HSIS) using PDA, Embedded Server and RFID

- ii. Smart Student Room Allocation System
- iii. Student Loan & Scholarship System
- iv. Smart Gate System
- v. Smart Traffic Light System

2.3 Searching for Project Title

Faculty provides a database of existing publications including past years projects which can be accessed from the faculty website i.e. <http://ir.fsksm.utm.my/>. Besides, university also provides UTM e-prints which contain publications from all faculties. To get titles of completed projects, students can refer to the department's website at <http://www.csc.fsksm.utm.my/v1/psm>. Students are encouraged to look up to these portals to get basic ideas of what can be proposed for project titles.

To get an overview of the whole thesis, students should read the abstract since it is a synopsis of the whole thesis. Besides abstract, Chapter 1 is equally important as it describes about the problem, purpose, objectives and scopes of the projects.

2.4 Summary

This chapter has described project types, fields of studies, techniques and some examples of project titles. Besides, it also provides a brief discussion on sources where some useful information on project titles can be found.

CHAPTER 3

REPORT WRITING AND FORMAT

3.1 Introduction

Students undertaking PSM1 and PSM2 courses must submit a written report at the end of the semester, according to the schedule prepared by the PSM Committee. The report is the result of the project work that has been conducted and will be assessed by panel of evaluators. Evaluators will only award credit for good quality writing. Therefore students should produce clear and concise reports. Relevant notations, terminology and computer science knowledge should be used throughout the report.

This chapter outlines the thesis writing guideline for both courses. It serves as a main reference for students in conducting their projects. However, students must also refer to the UTM Thesis Guideline (Panduan Tesis UTM, <http://sps.utm.my/sps/academic-resources.html>), in preparing their final report.

3.2 Report Structure

Basically a report structure will contain three important components:

- i. Preliminary pages

- ii. List of contents titles and subtitles, figures, tables, abbreviations and appendices
- iii. Report content

The preliminary pages for both PSM1 and PSM2 reports are listed in Table 3.1.

Table 3.1: Preliminary pages of the report

PSM1	PSM2
<p>Front Page Format (1<i>coverPage</i>)</p> <p>Acknowledgement Page Optional. (5<i>DeclarationOriginality</i>) Written in one page to acknowledge gratitude to contributing persons/parties</p> <p>Abstract (7<i>abstract</i>) Bahasa Melayu English Language</p>	<p>Front Page Format (1<i>coverPage</i>)</p> <p>Declaration of the Status of Thesis (2<i>thesisStatusDeclaration</i>)</p> <p>Thesis Status Validation Letter Included only if thesis status is confidential or limited access</p> <p>Supervisor’s Declaration (3<i>supervisorDeclaration</i>)</p> <p>Collaborative Agency Validation Included only if project has a formal collaboration with an outside agency. UTM Thesis Writing Guide – Appendix C2</p> <p>Title Page (4<i>titlePage</i>)</p> <p>Thesis Motivation Form UTM Thesis Writing Guide – Appendix E</p> <p>Admission/Declaration Page (5<i>DeclarationOriginality</i>)</p> <p>Dedication Page (6<i>DedicationAcknowledgment</i>) Optional. Must be simple, not more than one paragraph and does not include any numbers, charts or images.</p> <p>Acknowledgement Page (6<i>DedicationAcknowledgment</i>) Optional. Written in one page to acknowledge gratitude to contributing persons/parties</p> <p>Abstract (7<i>abstract</i>) Bahasa Melayu English Language</p>

The listing component is tabulated in Table 3.2 and it is applicable for both PSM1 and PSM2 reports.

Table 3.2: List structure

Content Page	Page numbering format can be either unnumbered, small Roman or Arabic. Title and page number must be equivalent to the thesis text. <i>(8contents)</i>
List of Tables Page	Includes title of all tables and the page number where the table can be found in the text. <i>(9listFiguresTables)</i>
List of Figures Page	Figures include diagrams, photographs, screen shots, graphs, charts, code snippets and etc. Includes title of all figures and the page number where the figure can be found in the text. <i>(9listFiguresTables)</i>
List of Abbreviations Page	Lists abbreviations used within the text. Listed in alphabetical order. <i>(91abbreviationsSymbols)</i>
List of Terms Page	Lists terminologies used within the text. Listed in alphabetical order. <i>(91abbreviationsSymbols)</i>
List of Appendices Page	Lists all appendices used within the text. Appendices are given names such as Appendix A, Appendix B and so on with specific titles. Listed in alphabetical order. <i>(92Appendices)</i>

Project content is the main component of the report. Its structure is listed in Table 3.3.

Table 3.3: Project content structure

PSM1	PSM2
Chapter 1: Introduction	Chapter 1: Introduction
Chapter 2: Literature Review	Chapter 2: Literature Review
Chapter 3: Methodology	Chapter 3: Methodology
Chapter 4: Proposed System Design (System Development Based) / Experimental Setup (Research Based)	Chapter 4: System Design (System Development Based) / Experimental Setup (Research Based)
	Chapter 5: Results, Testing and Discussion (System Development Based) / Results, Analysis and Discussion (Research Based)
Chapter 5: Conclusion	Chapter 6: Conclusion
References	References
Appendixes A scheduling of all activities of PSM1 within the semester, as well as projected plan for PSM2. Uses a Gantt Chart (one Gantt Chart per project per page). Any of these can be included accordingly: Organizational Chart Sample of Interview Sample of Questionnaire Activity Diagram Use Case Diagram Sequence Diagram Collaboration Diagram Entity Relational Diagram Database Design Diagram Testing Cases Every appendix must have a title.	Appendixes A scheduling of all activities of PSM1 and PSM2. Uses a Gantt Chart (one Gantt Chart per project per page). Any of these can be included accordingly: Organizational Chart Sample of Interview Sample of Questionnaire Activity Diagram Use Case Diagram Sequence Diagram Collaboration Diagram Entity Relational Diagram Database Design Diagram Testing Cases User Manual Every appendix must have a title.

The general guideline for thesis writing is as follows:

- i. Do not cut and paste information from original sources. Instead students must use their own words in restating statements from books or general/public information.
- ii. Write in a concise and clear manner that is easily understood. Refrain from long running sentences.
- iii. Use words and sentences that convey exact meanings; and refrain from ambiguous statements.
- iv. Every abbreviation must be written in its complete form in the abbreviation list. In the text, the first usage of the group of words to be abbreviated must be written clearly and in full, followed by the abbreviation in brackets as shown in example below.
The Unified Modeling Method (UML) is used...
On subsequent usage, the abbreviation may be used on its own.
- v. Sections and sub-sections should be written in a logical sequence.
- vi. Ensure continuity of sentences, paragraphs, sections and the overall report.
- vii. Figures and tables are numbered in sequence following the chapters, not sections. As an example, for Chapter 3, figures should be numbered starting with Figure 3.1, followed by Figure 3.2, Figure 3.3 and so on. Tables for Chapter 3 will follow the same sequence, Table 3.1, Table 3.2, Table 3.3 and so on.
- viii. Main information and analysis are put in the body of the report, while supportive information and analysis are added as appendix.
- ix. The maximum number of pages for the report, excluding appendix, is 50 for PSM 1 and 100 for PSM2. Permission must be granted by the departmental PSM committee if this maximum is exceeded.

To construct the title of a project:

- i. Must mirror the content
- ii. Must reflect problem solution
- iii. Usage of technology name in title only needed if technology is novel

3.3 Reference Format

The project is such an essential component of the degree program and it is important that detection of any form of plagiarism in project work will be taken very seriously. Students will be faced with severe consequences for their degree if they are discovered to have copy the work of other researchers. To safeguard, all text taken from other articles must be cited and the information of the articles must be listed in the List of References.

References are detailed description of items from which information were obtained in preparing the thesis. Every data, information, quotation, figure, table or anything taken from another source must be cited in the report. Citation must be done within the report and also in the reference list at the end of the report. The references can be written either alphabetically (Harvard System) or numerically (Number System). References shall come from sources such as journals, articles and books. References from internet (i.e. citations from websites) are not encouraged.

3.3.1 Harvard System

The references cited in the text should be indicated using the last name of the author and the year of publication. Examples are as follow:

- i. If the name of an author is written as part of a sentence, the year published should be written in parentheses. If there are two authors for a cited reference, both names should be written.

“Preneel (2003) noted that the process of replacing the old algorithms with new ones is time consuming and cumbersome.”

“Lenstra and Verheul (2001) proposed a model that formulates a set of assumptions as a guideline for selecting adequate key size for practical security.”

- ii. If the name of an author is not written as part of a sentence, both the name and year published should be written in parentheses.

“Small block size is also vulnerable as it is prone to dictionary attack (Canniere *et al.*, 2006).”

- iii. If there are more than three authors for a cited reference, use *et al.* after the name of the first author.

“Small block size is also vulnerable as it is prone to dictionary attack (Canniere *et al.*, 2006).”

- iv. If more than one reference materials by the same author in a same year are cited, use small letter alphabets (a, b, c, and so on) to distinguish them.

“Some of the basic principles widely used by many researchers are Lagrange-Euler (LE) equations (Uicker, 1965; Bejczy and Paul, 1981), Newton-Euler (NE) equations (Luh *et al.*, 1980a) and d’Alembert (GD) equations (Lee *et al.*, 1983).”

“Luh *et al.* (1980b) presented an example of an acceleration control of robot arm/manipulator.”

All references cited should be listed in the List of References whereby it is listed alphabetically. If more than one published materials by the same author are cited, these materials should be listed chronologically. For example, an article by Preneel published in 2001 should be listed before the one published in 2003.

Generally authors' names are listed using surname followed by their initials. The followings are examples of writing style according to the name of the author. If there are two or more authors, all the names should be written separated by commas:

i. Single and multiple authors

Yeung, M. and Mintzer, F. (1998). Invisible Watermarking for Image Verification. *Journal of Electronic Imaging*. Vol. 7, pp. 578-591.

Soderstrom, T., and Stoica, P. (1989). *System Identification*. United Kingdom: Prentice Hall International Ltd.

Luh, J. Y. S., Walker, M. W., and Paul, R. P. (1980b). Resolved-Acceleration Control of Mechanical Manipulators. *IEEE Trans. Automatic Control*. 25(3): 468-474.

ii. Corporate author/editor

Engineers Joint Council (1969). *Thesaurus of Engineering and Scientific Terms*. New York: Engineers Joint Council.

Students frequently refer to different types of publication materials in a thesis. Some of the style of writing details on common cited publication in the List of References should be as shown in Table 3.4.

Table 3.4: References format based on Harvard System

Resource	Format and Example
Book	Author (Year). <i>Title</i> . (Edition). Place published: Publisher. <i>Example:</i> Stallings, W. (2003). <i>Cryptography and Network Security: Principles and Practices</i> . (3 rd ed.). Upper Saddle River, New Jersey: Prentice Hall.
Article in a book	Author of the article (Year). <i>Title of the article</i> . In author or editor of the book. <i>Title of the book</i> . (page). Place published: Publisher. <i>Example:</i>

Resource	Format and Example
	Hussein, S. B., Jamaluddin, H., Mailah, M. and Zalzal, A. M. S. (2000). An Evolutionary Neural Network Controller for Intelligent Active Force Control. In Parmee, I. C. (Ed.) <i>Evolutionary Design and Manufacturing</i> (pp. 351 –362). London: Springer-Verlag.
Journal articles	Author (Year). Title of the article. <i>Title of the Journal</i> . Volume (Issue no.), page. <i>Example:</i> Lenstra, A.K. and Verheul E.R. (2001). Selecting Cryptographic Key Sizes. <i>Journal of Cryptology</i> . 14(4), 255-293.
Conference articles	Author (Year). Title of the article. <i>Name of the conference</i> . Date of the conference. Place, page. <i>Example:</i> Sheta, A. F. and De Jong, K. (1996). Parameter Estimation of Nonlinear Systems in Noisy Environments Using Genetic Algorithms. <i>Proceedings of the 1996 IEEE International Symposium on Intelligent Control</i> . 15-18 September. Dearborn, Michigan: IEEE, 360 - 365.
Thesis	Author (Year). <i>Title of the thesis</i> . Thesis award. Place published. <i>Example:</i> Rijmen, V. (1997). <i>Cryptanalysis and Design of Iterated Block Ciphers</i> . Ph.D. Thesis, Katholieke University Leuven, Belgium.
Legislations	Name of the country (year). <i>Title of the legislation</i> . Legislation number. <i>Example:</i> Malaysia (1983). <i>Perintah Monumen Lama dan Tapak Tanah Bersejarah</i> . P.U.(A)41 1983.
Standards	Name of the institution (Year). <i>Standard number</i> . Place published: Publisher <i>Example:</i> British Standards Institution (1990). <i>B.S. 764</i> . London: British Standards Institution.
Patent	Print format Author (Year). <i>Patent number</i> . Place published: Official source. <i>Example:</i> Smith, I. M. (1988). <i>U.S. Patent No. 123, 445</i> . Washington DC: U.S. Patent and Trademark Office. Electronic format Author (Year). <i>Patent number</i> . Retrieved on date, year, from URL address of the patent database. <i>Example:</i> Ulrich, K. (2001). <i>European Patent No. EP1162184</i> . Retrieved on March 7, 2002, from ftp://ep.espacenet.com/
Brochure	Name of organization (Year). <i>Title [Brochure]</i> . Place published: Publisher. <i>Example:</i>

Resource	Format and Example
	Research and Training Center (1993). <i>Guidelines for Reporting and Writing About People with Disabilities</i> . [Brochure]. Lawrence, KS: Macmillan
Measured drawings	Author (Year). <i>Title</i> . [Measured drawing]. Name of organization: Place published. <i>Example:</i> Salim Man (1989). <i>Pengisi Sekam ke Dalam Kontena Penyimpan: Pandangan Isometrik</i> . [Lukisan Teknik]. Universiti Teknologi Malaysia: Skudai.
Unpublished materials	Author (Year). <i>Title</i> . Unpublished note, Name of organization.
Newspaper article	<p><u>Print format</u> No author Title of article. (Year, date). <i>Name of newspaper</i>, page. <i>Example:</i> Gearing up to meet new challenges. (2000, February 22). <i>The Star</i>. p. 2.</p> <p><u>Author</u> Author. (Year, date). Title of article. <i>Name of newspaper</i>, page. <i>Example:</i> Izatun Shari (2000, April 18). K-economy: draft out in October. <i>New Straits Times</i>. p. 2-4.</p> <p><u>Electronic format</u> Author. (Year, date). Title of article. <i>Name of newspaper</i>, Retrieved date, year, from URL address of the newspaper. <i>Example:</i> Rosmawati Mion (2006, June 17). Sindiket judi haram tumpas. <i>Utusan Malaysia</i>. Retrieved June 19, 2006, from http://www.utusan.com.my</p>
Magazine	Author. (Year). Title of article. <i>Name of magazine</i> , Volume/Issue no., page <i>Example:</i> Smith, B. L. (1994). Biofeedback. <i>Science</i> , 62, 673 – 675.
CD-ROM	Author. (Year). Title of article. [CD-ROM]. <i>Title of Journal</i> , Volume, page, Publisher. <i>Example:</i> Ivry, R. B. (1995). Perception and production of temporal intervals across a range of durations. [CD-ROM]. <i>Journal of Experimental Psychology</i> , 21, 3-18. American Psychological Association.

3.3.2 Number System

All references cited in the text must be assigned numbers using Arabic numeric. The first cited reference should be assigned with number 1. Subsequent cited references should be given consecutive numbers. One of the methods below can be used when citing:

- i. If the name of an author is written as part of a sentence, the reference number should be inserted in parenthesis or square brackets or superscript after the author's name, for example:

“Zhao *et al.* [1] proposed algorithms which can be used in tracking applications. An information utility measure is used to select which sensors to query and to dynamically guide data routing. The method maximizes the information gain and minimizes the latency and the bandwidth consumption. Huang *et al.* [2] proposed spatiotemporal multicast for tracking applications in which a message can be delivered to a mobile zone for information collection or sensor wake-up.”

[1] Zhao, F., Shin, J., and Reich, J. Information-driven dynamic sensor collaboration for tracking applications. *IEEE Signal Process. Mag.* 19, 2 (Mar.), 61–72, 2002.

[2] Huang, Q., *et al.*,. Spatiotemporal multicast for sensor networks. In *ACM SenSys '03*. Los Angeles, CA, 2003.

- ii. If the name of an author is not part of a sentence, the reference number should be inserted in parenthesis or square brackets or superscript at the appropriate location; for example:

“Wireless Sensor Networks has gained popularity for its potentially low-cost solution to a variety of real-world challenges such as monitoring of natural habitats [1, 2], volcanic activity [3], or building structures [4].”

- [1] W. Hu, *et al.*, “The design and evaluation of a hybrid sensor network for cane-toad monitoring,” in *Proceedings of Information Processing in Sensor Networks (IPSN 2005/SPOTS 2005)*, Los Angeles, April 2005.
- [2] R. Szewczyk, *et al.*, “An analysis of a large scale habitat monitoring application,” in *Proceedings of the Second ACM Conference on Embedded Networked Sensor Systems (SenSys)*, Baltimore, November 2004.
- [3] G. Werner-Allen, *et al.*, “Monitoring volcanic eruptions with a wireless sensor network,” in *Proceeding of 2nd European Workshop Wireless Sensor Networks*, Istanbul, January 2005.
- [4] N. Xu, *et al.*, “A wireless sensor network for structural monitoring,” in *Proceedings of the Second ACM Conference on Embedded Networked Sensor Systems (SenSys)*, Baltimore, November 2004.

In the list of references, the numbers assigned to the source of references cited in the text are listed in incremental order. The style of writing details on cited publication in the List of References are shown in Table 3. 5.

Table 3.5: References format based on Number System

Resource	Format and Example
Book	Author. <i>Title of the book</i> . Edition (if not the first). Place published: Publisher. Year <i>Example:</i> Mather T., et al., <i>Cloud Security and Privacy</i> . O'Reilly Media. 2009.
Journal articles	Author. Title of the article. <i>Title of the Journal</i> . Year. Volume (number):page. <i>Example:</i> M. Foad Rohani et al., Uncovering Anomaly Traffic Based on Loss of Self-Similarity Behavior Using Second Order Statistical Model. <i>IJCSNS International Journal of Computer Science and Network Security</i> , vol 7(9), September 2007, pp. 116-122.
Conference articles	Author. Title of the article. <i>Name of the conference</i> . Date of the conference. Place published: Publisher. Year. page. <i>Example:</i> R. Szewczyk, et al., “An analysis of a large scale habitat monitoring

	application,” in <i>Proceedings of the Second ACM Conference on Embedded Networked Sensor Systems (SenSys)</i> , Baltimore, November 2004.
Thesis	Author. <i>Title of the thesis</i> . Thesis award. Name of Institution; Year <i>Example:</i> Adnan bin Hassan. <i>On-line Recognition of Developing Control Chart Patterns</i> . Ph.D. Thesis. Universiti Teknologi Malaysia; 2002
Standards	Name of the Institution. <i>Title of the standard</i> . Place published, Standard number. Year <i>Example:</i> British Standards Institution. <i>Tongued And Grooved Software Flooring</i> . London, BS 1297. 1987

3.3.3 References from Internet

Although internet provides a large source of references, the information from internet are not permanent and up-dated periodically. Thus these are unreliable sources of reference. Internet should only be used to retrieve primary sources of reference. If necessary, only a minimal amount of internet references are allowed. Internet references should be written as follows:

Example:

Organization/author (year). Title of article. URL address. Available online day month, year.

ISO 17799 (2006). Establishing Information Classification Criteria. ISO 17799 Newsletter, Issue 9. <http://www.molemag.net/issue9.htm>. Available online 12 June, 2007.

EPIC (2005). Census and Privacy. <http://www.epic.org/privacy/cencus/>. Available Online February, 15, 2005.

3.4 Tools for Technical Writing

There are several tools available for preparing thesis and technical paper writing. Students are encouraged to use LaTeX + BibTeX (<http://code.google.com/p/utmthesis>) or Microsoft Word + EndNotes packages for preparing the thesis. Students can manage references easily by using these tools. It can generate the list of references automatically.

For students who will write their thesis in English, PSZ also provides a software called StyleWriter to proofread your thesis. For further information student may refer to UTM Thesis Manual (2007 edition) published by School of Postgraduate Studies. The manual can be downloaded from SPS website at <http://sps.utm.my/sps/academic-resources.html>.

3.5 Tips

- i. Before starting to write the report, always plan its structure by creating a contents outline and get the supervisor to review the outline.
- ii. It is a good practice to consult with the supervisor every now and then as to get their feedback. This will aid in producing a good and relevant report.
- iii. It is not the task of the supervisor to be the editor or proof-reader and therefore do not anticipate that the supervisor will fully examine everything and comment in detail on the drafts.
- iv. Do not start writing on the last minute as it will only result with poor quality report for most of the time.

3.6 Summary

This chapter has outlined structures for both PSM1 and PSM2 reports. In order to produce a quality report, student must follow the report writing guidelines as discussed in this chapter.

CHAPTER 4

PROBLEM FORMULATION AND LITERATURE REVIEW

4.1 Introduction

Problem formulation is a process to identify a problem, based on limitations or weaknesses of current systems or approaches. It involves review of literature and investigations of the problem domain. This chapter provides a guideline on how to identify problem and conduct literature review. It addresses chapters 1 and 2 of the PSM report.

4.2 Content of the Introduction Chapter

Chapter 1 of the PSM report is an important chapter because it outlines the whole project and outcome. This is the first chapter that the evaluators will read; hence giving a solid first impression is vital. A well written chapter will clearly describe the flow of the project. To have a well written chapter, a good understanding of the ground work is necessary. Table 4.1 shows the outline of Chapter 1 of the PSM report.

Table 4.1: Outline of Chapter 1 of the PSM report

System Development Based Project	Research Based Project
<p>Chapter 1: Introduction</p> <p>1.1 Introduction</p> <p>1.2 Problem Background</p> <ul style="list-style-type: none"> • Example: Explain why current technology T is underperforming environment Z. <p>1.3 Project Aim</p> <ul style="list-style-type: none"> • A single sentence statement. • Explaining the key target of the project. • Example: To develop a system X using technology Y to be employed in environment Z. <p>1.4 Objectives</p> <ul style="list-style-type: none"> • A minimum of three objectives and a maximum of four. • Must be measurable <p>1.5 Scope</p> <ul style="list-style-type: none"> • Describes in detail tasks to be executed. • Constraints regarding any part of the project development (e.g. size of system and technology). • What will and will not be done as part of the project. <p>1.6 Importance of the project</p> <p>1.7 Report organization</p>	<p>Chapter 1: Introduction</p> <p>1.1 Introduction</p> <p>1.2 Problem background</p> <ul style="list-style-type: none"> • Problem statement • Example: Algorithm X is inefficient in environment Z. <p>1.3 Research aim</p> <ul style="list-style-type: none"> • Example: Comparing performance between to algorithms, X and Y, in environment Z <p>1.4 Objectives</p> <ul style="list-style-type: none"> • A minimum of three objectives and a maximum of four. • Must be measurable <p>1.5 Scope</p> <ul style="list-style-type: none"> • Research domain • Experimental setup (e.g. Tools used) • Case study used • Data used • Constraints and limit of research (if any) <p>1.6 Research Contribution</p> <p>1.7 Report organization</p>

4.3 How to identify the problem?

Identifying problems is a crucial process in a PSM project. The following exercise will show a step by step guide in identifying the problem.

Step 1: Find the problem that needs solving, as such:

- i. Problem given by the lecturer. The lecturer will provide the basic problem and perhaps some ideas for a possible solution. The students can proceed from here.
- ii. If the problem is not presented in a neat package, students themselves need to identify the problem domain. For example, *Mental Hospital XYZ*– how it works? How are the patients tracked currently? Can student propose an improved system? Do student think the new system would be better?
- iii. Real world problem. There are problems that exist in the real world. It could be related to an organization, a community, a process or a procedure. The trick is to find it. Be open to suggestions and be inquisitive.

Now that the problem is identified, let's move on to the next step.

Step 2: Decide on what to do as this will determine the scope of the project.

Option 1: Do the student wants to develop a new enhanced system? If yes, follow the system development track

Option 2: Do the student think that the current possible solutions in the market are not enough, and want to research a new way? If yes, follow the research track

Now follow the option that is selected. Refer to Table 4.2 for the exercise.

Table 4.2: Example of Formulating a Problem

System Development Based Project	Research Based Project
<ul style="list-style-type: none"> • Study the current system and procedure in implementation at the mental hospital in Johor (for example) • Study the available systems and procedure in other mental hospitals • Study similar tracking systems that are available (e.g. UPS tracking of parcels). • How to study? These methods (or instruments) may be followed: <ul style="list-style-type: none"> ○ Document analysis ○ Interview ○ Observation ○ Survey • Proposing currently available technologies? Which will be best suited for the aim of the project (i.e. tracking the patients) <ul style="list-style-type: none"> ○ RFID ○ Chain them to the bedpost ○ Sensors ○ Buddy System • Say that RFID is chosen. The possible questions that need to be addressed: <ul style="list-style-type: none"> ○ Why RFID? How does RFID help with solving this problem? ○ How does RFID function? ○ What are the hardware and software requirement? 	<ul style="list-style-type: none"> • Study the current system and procedure in implementation at the mental hospital in Johor (for example) • Study the available systems and procedure in other mental hospitals • Study similar tracking systems that are available (e.g. UPS tracking of parcels). • How to study? These methods (or instruments) may be followed: <ul style="list-style-type: none"> ○ Document analysis ○ Interview ○ Observation ○ Survey • Are the currently available technologies having flaws? <ul style="list-style-type: none"> ○ RFID – can be torn off, or the algorithm is weak/not optimized ○ Chain patient to the bedpost – too cruel/sadistic ○ Sensors – too expensive, not accurate ○ Buddy System – not effective and unreliable • Let's say that two ways can provide a better solution to the problem, that is: <ul style="list-style-type: none"> ○ Enhance the RFID algorithm ○ Use embedded technology and embed a chip under the patient skin • Choose one: Enhance the RFID algorithm. • What now? Find the related issues. <ul style="list-style-type: none"> ○ Analyze the current algorithm ○ Analyze the available algorithm ○ What are the issues? <ul style="list-style-type: none"> ▪ Performance ▪ Security ▪ Management • Choose one issue (Remember: PSM cannot solve ALL the problems in the given time)

- Step 3:** Formulate the scaffold of the problem solving by identifying the following points:
- i. Problem background
 - ii. Problem statement: (where needed, you can have: hypothesis, research question)
 - iii. Objective
 - iv. Scope and assumption
 - v. Significance of project/research

4.4 Literature Review Chapter Content

In Chapter 2, all the results and findings of the review of literature are presented. Literature review provides a sound basis for a good problem formulation and planning of project. From the literature review, student will be able to build the basic understanding of the project. Table 4.3 shows the outline of Chapter 2 of the PSM report.

4.4.1 How to Start the Literature Review?

The process of starting a literature review is fairly simple if a strong understanding of project problem domain exists. The process can be grouped into these four major steps.

- Step 1:** Study the problem domain. Explain the area in which you are going to construct the project. Example:
- What is the objective or business of the organizations
(example: What is the objective, purpose of the mental hospital)
 - Organization Chart

Table 4.3: Outline of Chapter 2 of the PSM report

System Development Based Project	Research Based Project
<p>Chapter 2 : Literature Review</p> <p>2.1 Introduction</p> <p>2.2 Inter-organisation Case Study (if any)</p> <ul style="list-style-type: none"> • To identify user requirements <p>2.3 Current system analysis (e.g.: product/prototype/software/tools)</p> <ul style="list-style-type: none"> • Characteristics of the system <p>2.4 Compare between existing systems</p> <ul style="list-style-type: none"> • Ensure strength and weakness between systems <p>2.5 Literature review on technology used</p> <p>2.6 Chapter summary</p>	<p>Chapter 2: Literature Review</p> <p>2.1 Introduction to case study</p> <p>2.2 Problem formulation</p> <ul style="list-style-type: none"> • Study of domain from general to specific • Related studies • A description of the identified problem • Study of theory/algorithm/method that can contribute towards solving the problem. • Justification of chosen theory/algorithm/method • Every sub-topic within the domain must have a review <p>2.3 Suggestions to solve identified problems</p> <p>2.4 Chapter summary</p>

- Step2:** Study the current system and procedure in implementation at the mental hospital in Johor, study the available systems and procedure in other mental hospitals, study similar tracking systems that are available (e.g. UPS). Some approach can be:
- i. Document analysis
 - Read papers, journals, articles, previous thesis, product catalog, books etc
 - Take note: comparison, list the features and characteristics, list the issues and etc.
 - ii. Interview
 - Interview the responsible person (e.g. mental hospital manager)

- Outline the questions to ask, take notes of answers, analyze later
- iii. Observation
- Observe the implementation of the current system in practice, observe the process and procedure
 - Take notes and analyze later
- iv. Survey
- Outline the questions to ask; ask simple, straightforward questions
 - Choose the appropriate respondents
 - Collect and analyze later

Step 3: Study the existing solution to the problem. For example, developing a system using RFID is chosen then the study should include:

- Why RFID? How does RFID help with solving this problem?
- How does RFID work? Configuration, reading/writing
- Active tags against Inactive tags?
- Identify the software and hardware required.
- Study existing systems that uses RFID for tracking (advantages and disadvantages, limitations).

Step 4: If there exist a need for integration within the project, study how the integration is to be done. Study the available application/software, Application Programming Interface (API) and Software Development Kit (SDK) that can best work together to achieve the aim of the project.

Example:

- Integration between RFID reader/writer and database
- Integration between RFID reader/writer and the web application

4.5 Additional Guideline for System Development

Objectives must be measurable and focused to the project. Measurable means that the outcome is clear. For example, if the objective is “*to study*”; the outcome will be a comparison table of several technologies. An example of an objective that

cannot be measured is “to help”. *Help* is very subjective, and it is difficult to detect the level that help has been given. Even the explanation is confusing, so this is not a good choice for an objective.

A generic example for the objectives is as follows, and it should be linked with the project:

- i. Identify and study the problem domain; current and available technologies/system
- ii. Design and implement the proposed solution/system
- iii. Test the developed solution/system for system performance and user acceptance

Table 4.4 list examples of good objectives and examples of common mistakes that students often do when writing the objectives of their projects.

Table 4.4: Example of bad and good objectives statements for system development based project

Bad Objective	Good Objective
<ul style="list-style-type: none"> i. To study RFID tracking ii. To understand methods of RFID tracking <p>Comment: Both of above objectives are not measurable.</p>	<ul style="list-style-type: none"> i. To compare the methods of RFID tracking; current and available technologies/system ii. To design and implement the proposed solution/system iii. To test the developed solution/system for system performance and user acceptance
<ul style="list-style-type: none"> i. To use C language in developing the system. (This statement is a scope) ii. To improve the speed of the overall system performance. (This statement is an aim of the project) 	<ul style="list-style-type: none"> i. To design (database/interface) using (technology/algorithm/method) – can be more than one design of subcomponents of system X. ii. To develop a system based on the design. (Example: System, server, client, integration.)

Importance of the project describes the justification of importance of a project. In essence, it is to explain why this project should be done and how it will solve the problem, while contributing to the targeted audience or domain.

4.6 Additional Guideline for Research Project

Objectives must be measurable and focused to the project (please refer Section 4.4 for explanation). A generic example for the objectives is as follows, and it should be linked with the project undertaken:

- i. Study the problem domain and identify possible solutions
- ii. Design and implement the proposed solution to the problem – example if the study is a comparison, then design HOW to compare.
- iii. Analyze results and document findings

Table 4.5 list examples of good objectives and examples of common mistakes that students often do when writing the objectives of their projects.

Table 4.5: Example of bad and good objectives statements for research based project

Bad Objective	Good objective
i. To use RFID in tracking the patient in the hospital. (This is not an objective but a scope). ii. To help the hospital management for patient tracking using RFID (This statement is a goal, not an objective.)	i. To study the transmitting techniques for RFID tracking. ii. To design and implement the proposed transmitting technique. iii. To analyse the performance of the proposed transmitting technique.

4.7 Summary

This chapter looked into the steps of problem formulation and the ensuing literature review. Both are essential steps and are the building blocks of a good project, both system development and research.

CHAPTER 5

WRITING THE METHODOLOGY: A GUIDELINE

5.1 Introduction

The methodology chapter of the PSM report (Chapter 3) describes the way or method of implementing the project. The chapter is crucial in planning the project to ensure a successful implementation. This guideline given here will provide essential help for students to have a well-written Methodology chapter of the PSM report.

5.2 The Methodology Chapter Content

Methodology describes the overall approach and framework chosen for research and system development. The content for the methodology chapter of the PSM report can hold methods, techniques or approach that is used (PSM2) or will be used (PSM1) during design and implementation of the project. In addition, this chapter also justifies the choice of methods or approach, as well as hardware and software requirements. It must be noted that the primary objective is not to explain the functions of each phase but rather the process that goes on within in. Table 5.1 shows the outline of Chapter 3 of the PSM report. This outline must be followed, although slight modifications that enhance understanding of the project are accepted

Table 5.1: Outline of Chapter 3 of the PSM report

System Development Track	Research Track
<p>Chapter 3: System Development Methodology</p> <p>3.1 Introduction</p> <p>3.2 Methodology choice and justification.</p> <p>3.3 Phases within the chosen methodology (traditional or modern)</p> <ul style="list-style-type: none"> • Describes activities and process in each phase • Design modelling (e.g. using UML) • Design tools (e.g. Rational Rose) • Gantt Chart for PSM 1 and PSM 2 <p>3.4 Describe briefly the technology or tools used to develop the system.</p> <p>3.5 System requirement analysis: hardware and software</p> <ul style="list-style-type: none"> • List and justify <p>3.6 Chapter summary</p>	<p>Chapter 3: Research Methodology</p> <p>3.1 Introduction</p> <p>3.2 Operational Framework/Research Workflow</p> <ul style="list-style-type: none"> • Details of each research phase of with regards to research objectives. • Gantt Chart for PSM 1 and PSM 2 <p>3.3 Justification</p> <ul style="list-style-type: none"> • Tools • Data • Technique <p>3.4 Performance Measurement</p> <p>3.5 Chapter summary</p>

5.3 Additional Guideline for System Development

A software development methodology refers to the framework that is used to structure, plan, and control the process of developing software. The framework of a software development methodology consists of:

- i. A software development approach that consists of systematic software development process
- ii. Software development models to assist in the software development process
- iii. Software development tools

Software development approach is divided into two categories: traditional and modern approach. Examples of the traditional approach are Waterfall and Prototyping, while an example of a modern approach is Rational Unified Process.

Any approach selected to be used in the project must be justified. For instance, a Waterfall model is suitable to be used for the following types of project:

- i. Project is for development of a mainframe-based or transaction-oriented batch system.
- ii. Project has clear objectives and solution.
- iii. Project requirements can be stated unambiguously and comprehensively.
- iv. Project requirements are stable or unchanging during the system development life cycle.

In some situation, a Waterfall system development approach is not suitable to be applied. The types of project are as follows:

- i. Large projects where the requirements are not well understood or are changing for any reasons such as external changes, changing expectations, budget changes or rapidly changing technology.
- ii. Real-time systems.
- iii. Event-driven systems.
- iv. Leading-edge applications.

Projects that are suitable to apply prototype system development approach are as follows:

- i. Project is for development of an online system, requiring extensive user dialog, or for a less well-defined expert and decision support system.
- ii. Project is large with many users, interrelationships, and functions, where project risk relating to requirements definition needs to be reduced
- iii. Project objectives are unclear.

However, the following projects might not be suitable to apply prototype system development approach:

- i. Mainframe-based or transaction-batch oriented system
- ii. Project objectives are very clear;

The following projects might want to consider applying RUP (i.e. modern system development approach):

- i. Large projects where requirements are not well understood or are changing due to external changes, budget changes or rapidly changing technology.
- ii. Web Information systems
- iii. Real-time or safety-critical systems
- iv. A high degree of accuracy is essential
- v. Computationally complex systems, where complex and voluminous data must be analyzed, designed and created within the scope of the project.
- vi. Leading edge applications

For software model, students could use traditional method such as Entity Relationship Diagram (ERD) or choose to use Unified Modeling Language (UML) to represent their proposed system. At least the following components must be presented in the report/thesis as part of project's requirement analysis:

- i. Use case diagram
- ii. Sequence diagram
- iii. Overall system architecture

5.4 Additional Guideline for Research

A research framework is a collection of interrelated steps or processes but not necessarily so well worked-out. The framework provides logical steps in guiding the research such as determining what things will be delivered, measured, what are the inputs to each steps and outputs of the research. An example of research framework is shown in Figure 5.1 below.

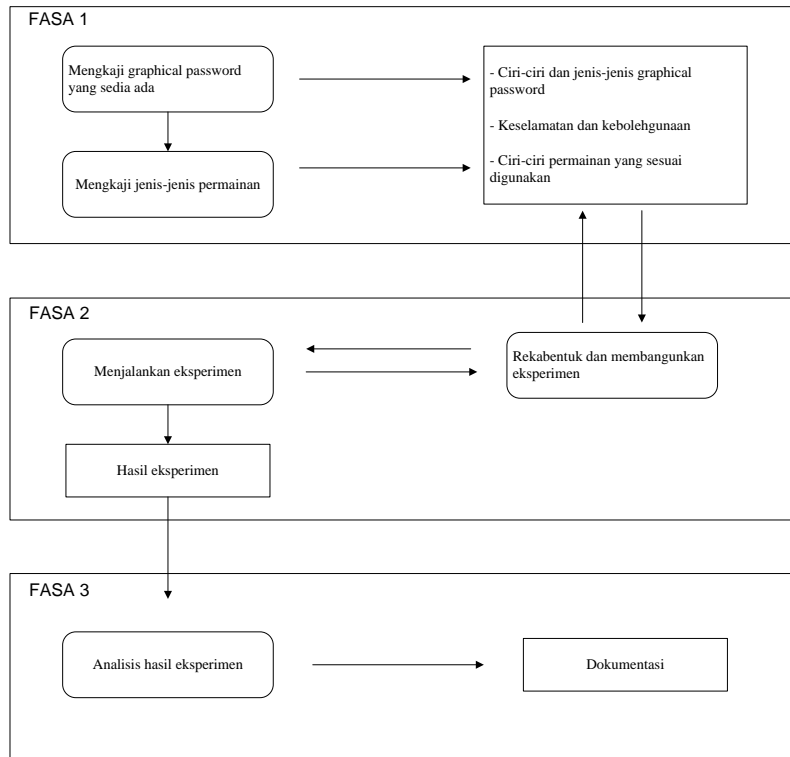


Figure 5.1: An example of research framework

Data analysis and measurement techniques basically depend on the research nature and the research question. Some examples of data analysis are finding the average, median, standard deviation and the distribution. The results from the analysis can be presented in form of graphs (pie graphs, bar graphs, line graphs and etc), tables (values, percentage), matrices and etc.

Performance measurement is used to benchmark the result of the work with other existing similar works. Examples include speed, overhead, recall, precision and accuracy. In some cases this can be used to indicate the success of the research.

5.5 Summary

This chapter described the guideline to write the methodology chapter of the PSM report (Chapter 3). It also includes additional information on certain aspects of the methods used in system development and research projects respectively.

CHAPTER 6

A GUIDELINE TO DESIGN

6.1 Introduction

This chapter focuses on the design chapter of the PSM report that is Chapter 4. The Chapter 4 of the PSM report has two different styles according the track of the project: system development or research. Design is important because it differentiates from one project to another, and a mishap in design will spell failure in achieving the project objectives. This guideline will serve the purpose to demystify the design process.

6.2 The Content of Design Chapter

Design will outline the flow and modules in research and system development respectively. A good design will aide in a successful implementation of the project. In PSM1 the design chapter will chart a provisional design that may require review as the project gets underway. In PSM2, the design chapter reports the design of the completed system. The content will include system architecture, interface design, database design, and the related/appropriate techniques and

algorithms. This chapter will also contain Data Flow Diagram (DFD), use case diagram, sequence diagram, class diagram, ERD and others, associated with the application development model chosen (structured or object-oriented). Table 6.1 shows the outline of Chapter 4 of the PSM report.

Table 6.1: Outline of Chapter 4 of the PSM report

System Development Track	Research Track
<p>Chapter 4: Requirement Analysis and Design</p> <p>4.1 Introduction</p> <p>4.2 Requirement analysis</p> <ul style="list-style-type: none"> • OOP (use case, sequence, and activity diagrams) or • Traditional (Software Development Life Cycle) <p>4.3 Design</p> <ul style="list-style-type: none"> • OOP class diagram, overall system architecture or • Traditional (DFD) <p>4.4 Database design (if any)</p> <ul style="list-style-type: none"> • ERD (for traditional methodology) • Normalized tables (to include primary key, foreign key, etc.) <p>4.5 Interface design</p> <ul style="list-style-type: none"> • Menu and screen design • System navigation and content design • For web page project to include page navigation <p>4.6 Chapter summary</p>	<p>Chapter 4: Research Design and Implementation</p> <p>4.1 Introduction</p> <p>4.2 Proposed Solution</p> <ul style="list-style-type: none"> • Explain possible solution <p>4.3 Experiment design</p> <ul style="list-style-type: none"> • Identify overall flow • Identify and explain test-bed/simulation setup <p>4.4 Parameter and testing methods</p> <ul style="list-style-type: none"> • Identify parameters involved • Identify parameters to be measured • Explain how testing is done <p>4.5 Chapter summary</p>

6.3 Additional Guideline for System Development

For interface design, apart from menu, screen, content, and system navigation design, students also need to illustrate page navigation design to assist readers in understanding the overall system workflow. Examples of use case, sequence, content and page navigation designs are as illustrated in Figures 6.1 to 6.4.

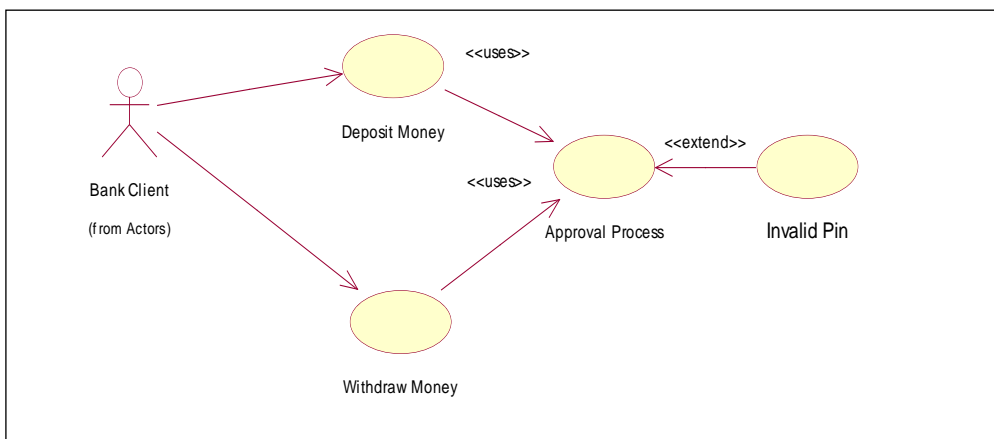


Figure 6.1: Use case diagram

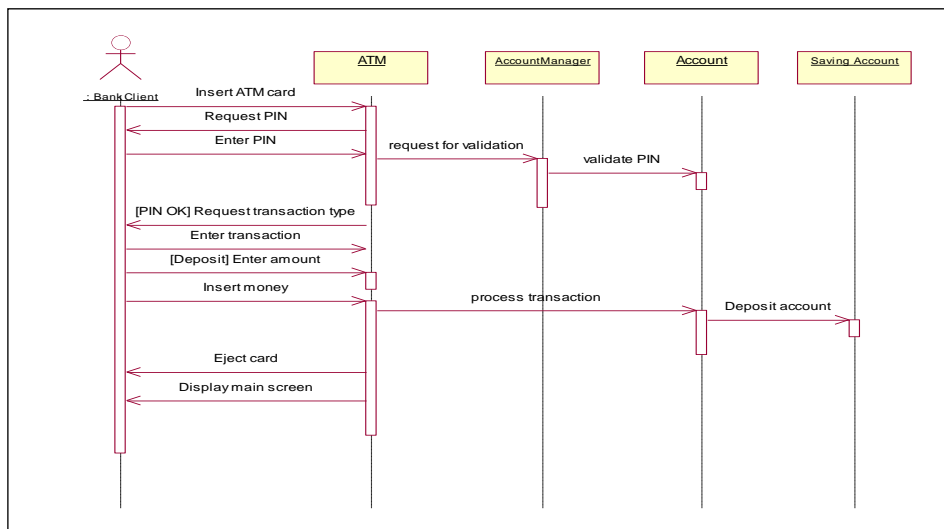


Figure 6.2: Sequence diagram

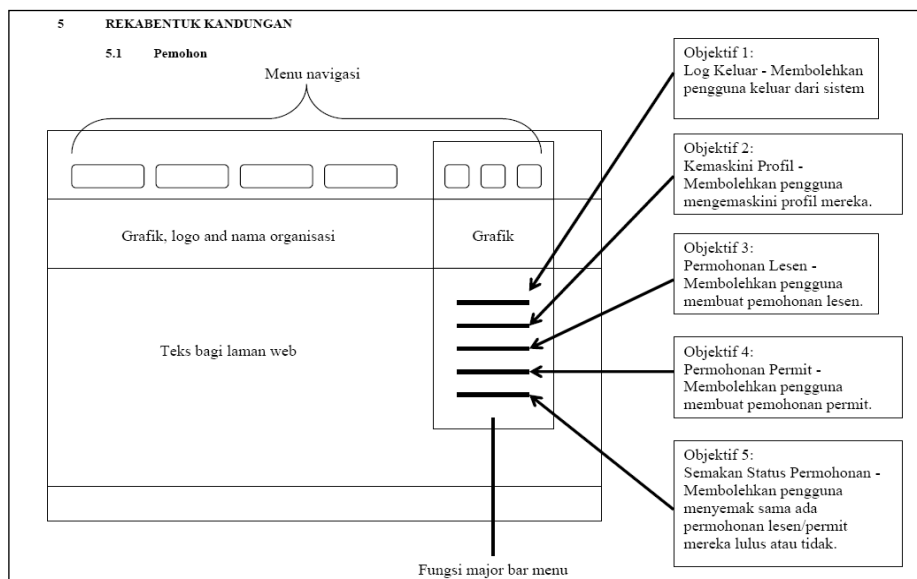


Figure 6.3: Content Design

6.4 Additional Guideline for Research

Experimental design involves elaboration on any algorithm or any instruments which may be used in the project.

All experiments were performed in a *Windows machine having configurations Intel (R) Pentium(R) 4, 1.70 GHz (over 1.72 GHz), 512 MB RAM*. We have used *RF version (R 2.2.0) in open source R-project* [19]. We have used the *KDD 1999 CUP labeled dataset* [6] so as to evaluate our approach. *Stolfo et al.* [8] defined higher level features that help in distinguishing normal connections from attacks. The *dataset contains 24 different types of attacks* that are broadly categorized in four groups such as probes, DoS (Denial of Service), U2R (User to Root) and R2L (remote to local). *Each instance of data consists of 41 features* which we have labeled as *f1, f2, f3, f4* and so forth. We only used DoS type of attacks, since other

attack types have very small number of instances so that they are not suitable for our experiments [15]. The dataset consists of training set and testing set. We randomly *split the set of labeled training set into two parts; learning set and validation set*. Learning set is used to adjust the parameters in RF. Validation set is used to estimate the generalization error of detection model. The generalization errors are represented as OOB errors in RF. In order to achieve both low generation errors, in other words, high detection rates, we have adopted *10-fold cross validation with 2000 samples*. Testing set is used to evaluate detection model built by learning set and validation set (Dong *et al.*, 2006).

Above is a description of experimental setup extracted from a technical paper. Generally it contains, equipments used in the experiments, description of the dataset used and what are the parameters used. In the case of a project which involves a survey, it is necessary to explain the design of the questionnaire and the objective or reason for each question being asked. Sometimes, research based project may deal with modification of an existing algorithm. Therefore, it is required to show the flowchart and the pseudo codes of the modified algorithm.

Parameters used in the experiment are essential as they may affect the performance of the simulation of the proposed approach/algorithm. Therefore, they must be clearly mentioned in this chapter. Besides, there are also parameters that will be measure, for example, parameter to be measured is bandwidth, while parameters that may be involved are number of packets and types of packets.

6.5 Summary

This chapter described the guideline to write the design chapter of the PSM report that is Chapter 4. The design approach is slightly different depending upon the type of project, either system development or research. It also includes additional information on certain aspects of design that can be employed in system development and research projects respectively.

CHAPTER 7

ANALYSIS AND DISCUSSION: A GUIDELINE

7.1 Introduction

This chapter discusses the process and writing of a very important chapter in the PSM2 Report that is *Results, Testing and Discussion* (Chapter 5). The discussion of results is vital as it relate with the importance and achievement of the project. It is expected that student will be able to write the chapter effectively with the guide provided in this chapter.

7.2 Results, Testing and Discussion Chapter Content

An effective discussion chapter will successfully explain all the results achieved through project coding, experiments and testing. The chapter may be expanded into more than one chapter according to the project. The results of the project implementation are discussed in detail here. Documents and proof of correctness of the project must be attached. Testing types and techniques, as well as testing results, must be stated. For research based projects; data analysis, model

development, summary and analysis of results must be reported in detail. Table 7.1 shows the outline of Chapter 5 of the PSM report.

Table 7.1: Outline of Chapter 5 of the PSM report

System Development Based Project	Research Based Project
<p>Chapter 5: Results, Testing and Discussion</p> <p>5.1 Introduction</p> <p>5.2 Coding of system's main functions</p> <p>5.3 Essential interfaces that show system's results and achievements</p> <p>5.4 Testing</p> <p> 5.4.1 Black box testing</p> <p> • System flow, input/output, error messages</p> <p> 5.4.2 White box testing</p> <p> 5.4.3 User testing</p> <p>5.5 Chapter summary</p>	<p>Chapter 5: Results, Analysis and Discussion</p> <p>5.1 Introduction</p> <p>5.2 Research results and analysis</p> <ul style="list-style-type: none"> • Discussion • Tables, Graph etc. <p>5.3 Chapter summary</p>

7.3 Additional guideline for system development

Software testing is one of important phases in a system development process. There are two common testing methods, which are White Box Testing and Black Box Testing. Section 7.3.1 and Section 7.3.2 briefly describes these two software testing methods, respectively.

7.3.1 White box testing

White-box testing is a method of testing application software. It tests the internal structures or the workings of an application, as opposed to its functionality. White-box testing examines the internal perspective or logic of the system. This method requires programming skills to design test cases. Different input data are chosen to exercise all possible paths through the code and to determine the appropriate outputs.

White-box test design techniques include:

- i. Control Flow testing / Branch Testing
- ii. Data flow testing (Data Tracking)
- iii. Path testing (Logic Testing)

White-box testing can be applied at the module, integration and system levels. It can test paths within a module, paths between modules during integration, and between subsystems during a system level test. Though this method of test design can uncover many errors or problems, it might not detect unimplemented parts of the specification or missing requirements.

7.3.2 Black box testing

Black-box testing is a method of software testing that tests the functionality of an application. Specific knowledge of the application's code/internal structure and programming knowledge in general is not required. Test cases are built around specifications and requirements that is what the application should suppose to do. It uses external descriptions of the software, including specifications, requirements, and designs to derive test cases. The test designer selects valid and invalid inputs and determines the correct output.

7.4 Additional guideline for research

Following the research method described in the Methodology chapter, discussion should include the analysis and discussion of the results. It is encouraged that discussions are accompanied with graphs, charts or tables for enhanced clarification. Below are some examples of result presentations and discussion of the result.

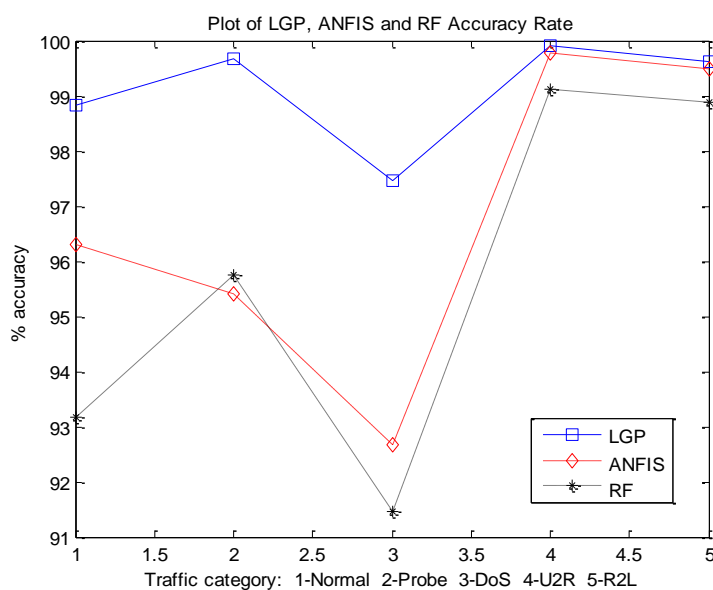


Figure 7.1: Example of a line graph

Performance Measure	Baseline(%)	RRA(%)	EA-IDS(%)
Overall Accuracy	96.764	98.845	99.144
FAR	16.082	5.591	2.453
Hit Rate	99.944	99.948	99.550

Figure 7.2: Example of a table

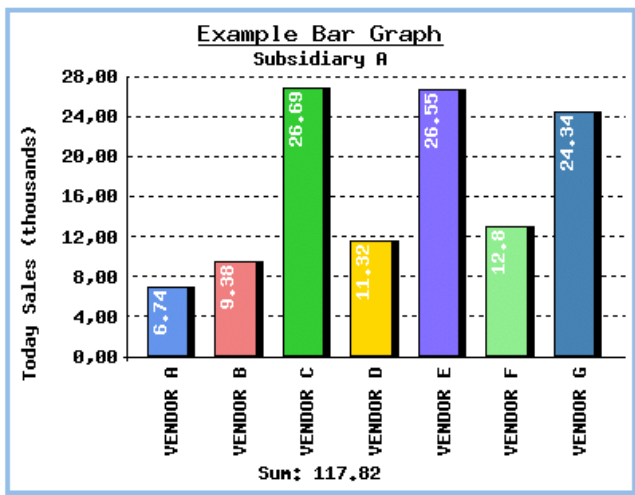


Figure 7.3: Example of a bar chart

Performance Measure	Baseline(%)	RRA(%)	EA-IDS(%)
Overall Accuracy	96.764	98.845	99.144
FAR	16.082	5.591	2.453
Hit Rate	99.944	99.948	99.550

Generally, the overall detection accuracy has improved from 96.764% (Baseline) to 99.144% (EA-IDS) and FAR was greatly reduced from 16.082% (Baseline) to 2.453. The hit rate remains stable which is almost reaching 100% correctly ability to segregate between attacks and normal.

Figure 7.4: Example of a table with its discussion.

7.5 Summary

This chapter presented guidelines for analysis and discussion chapter of the PSM thesis. This chapter is important as it presents the outcomes of the project or findings of the research.

CHAPTER 8

PSM CONCLUSION CHAPTER: A GUIDELINE

8.1 Introduction

This chapter focuses on the concluding remarks and appendices in the PSM report. Conclusion in PSM1 and PSM2 is handled differently. This guideline presents an effective way of concluding the PSM report.

8.2 The content of PSM Conclusion Chapter

PSM Conclusion Chapter (Chapter 6) summarizes the whole project undertaken by a student. It discusses results and achievements of the project as well as suggestions and future works. Project strength, weaknesses and suggestions to improve must be stated clearly and concisely. Table 8.1 shows an outline of Chapter 6 of a PSM report.

8.3 Appendices

Appendices provide supporting materials that will strengthen the explanation and review of the project. Listed below are some of the generic items that may be put into appendices (please be reminded that this list is not exhaustive).

- i. **User manual:** A comprehensive guide to the developed system. It should include installation guideline, screenshots, navigation explanations and anything else that will guide the user of the system. User manuals are not a requirement for research projects.
- ii. **Supporting documents:** Supporting documents can be in the form of graphs, figures, questionnaires, surveys, and interview excerpts. It is not advisable to put ALL of the questionnaires and surveys in the appendices. A better option is to put a random sample of a completed one.
- iii. **Data used in research:** For research-based projects, it is at times prudent that snippets of data or the datasets used for the research is shown in appendix.

Table 8.1: Outline of Chapter 6 of PSM report

System Development Based Project	Research Based Project
<p>PSM1</p> <p>Chapter 5: Conclusion</p> <p>5.1 Introduction</p> <ul style="list-style-type: none"> • Restate the project significance and objectives. <p>5.2 Achievements</p> <ul style="list-style-type: none"> • Briefly explain findings based on literature review • Briefly explain any objectives that has been concluded or partially concluded <p>5.3 Suggested plan for project implementation/execution (PSM 2)</p> <p>PSM2</p> <p>Chapter 6: Conclusion</p> <p>6.1 Introduction</p> <p>6.2 Achievement of project objectives</p> <ul style="list-style-type: none"> • Project contribution <p>6.3 Suggestions for future improvement</p>	<p>PSM1</p> <p>Chapter 5: Conclusion</p> <p>5.1 Introduction</p> <ul style="list-style-type: none"> • Restate the project significance and objectives. <p>5.2 Achievement/milestone achieved</p> <ul style="list-style-type: none"> • Briefly explain findings based on literature review • Briefly explain any objectives that has been concluded or partially concluded • Preliminary results (if any) <p>5.3 Suggested planning for PSM 2</p> <p>PSM2</p> <p>Chapter 6: Conclusion</p> <p>6.1 Introduction</p> <p>6.2 Achievement of project objectives</p> <ul style="list-style-type: none"> • Research Contribution (if any) <p>6.3 Suggestions for improvement and future works</p>

When labeling the figures and tables in the appendices, it is recommended that it begins with the name of the appendix. For example, figures in Appendix A will be labeled Figure A1, Figure A2 and so on; while tables in Appendix A will be labeled Table A1, Table A2 and so on. It is not advisable to continue the labeling from the main text, even if the appendix is an extension of the main text. For example, if Appendix C holds the database tables that are not put into the main text in Chapter 4 (Design), it must not be labeled as Figure 4.xx.

8.4 Summary

This chapter describes the final chapter of the PSM report, the Discussion chapter. It also describes the use of appendices and lists some general items that are usually found in appendices, as well as how to label them.

CHAPTER 9

PROJECT EVALUATION

9.1 Introduction

This chapter outlines evaluation criteria for both PSM1 and PSM2. Students must read the following evaluation criteria so that they are aware about the marking schemes and able to fulfill all the required criteria to get better marks. The evaluation criteria are divided into two types of PSM; System Development and Research.

9.2 PSM1 Evaluation

As for PSM1, there are six criteria that will be evaluated and they are:

- i. Supervision
- ii. Progress Report Phase 1
- iii. Progress Report Phase 2
- iv. Final Report
- v. System Design (System development based project)
- vi. Problem Formulation and Research Design (Research based project)
- vii. Presentation

Details about each criterion and the marking schemes are as explained in Table 9.1. These criteria will be assessed by supervisors as well as evaluators by using Evaluation Form PSM1 as in Appendix 1.

Table 9.1: Supervision and Progress Report Criteria and Marking Scheme for PSM1

(a) Supervision Criteria and Marking Scheme

	Category	0-2	3	4	5
Supervision	Log Book	<ul style="list-style-type: none"> • Inadequate entry • Does not reflect project progress 	<ul style="list-style-type: none"> • Entry every week • Somewhat reflect project progress 	<ul style="list-style-type: none"> • Meaningful entry every week • Reflects project progress 	<ul style="list-style-type: none"> • Meaningful entry every week • Reflects project progress • Include project planning
	Meeting Frequency	<ul style="list-style-type: none"> • Hardly meet • Less than 2 times 	<ul style="list-style-type: none"> • Meet less than 5 times 	<ul style="list-style-type: none"> • Meet 5 times 	<ul style="list-style-type: none"> • Meet more than 6 times
	Work Ethic	<ul style="list-style-type: none"> • Passive attitude • Unable to communicate with supervisor 	<ul style="list-style-type: none"> • Good attitude • Poor communication 	<ul style="list-style-type: none"> • Good attitude • Good communication • Good relation 	<ul style="list-style-type: none"> • Positive attitude • Good communications • Good relation with supervisor
	Self Reliance/ Independence	<ul style="list-style-type: none"> • Highly dependent on supervisor 	<ul style="list-style-type: none"> • Dependent on supervisor 	<ul style="list-style-type: none"> • Somewhat dependent • Able to solve problems with support 	<ul style="list-style-type: none"> • Able to work independently • Able to plan and solve problems independently

(b) Progress Report 1 Criteria and Marking Scheme

Progress Report 1				
Category	0-2	3	4	5
Completeness of Chapter 1	<ul style="list-style-type: none"> • Inherent spelling errors • Inherent grammatical errors • Chapter not complete 	<ul style="list-style-type: none"> • Several spelling errors • Several grammatical errors • Chapter contents somewhat complete 	<ul style="list-style-type: none"> • A few spelling errors • A few grammatical errors • Chapter contents complete 	<ul style="list-style-type: none"> • No spelling errors • Grammatically correct • Complete contents of Chapter 1
Completeness of Chapter 2	<ul style="list-style-type: none"> • Inherent spelling errors • Inherent grammatical errors • Chapter contents not complete 	<ul style="list-style-type: none"> • Several spelling errors • Several grammatical errors • Chapter contents somewhat complete 	<ul style="list-style-type: none"> • A few spelling errors • A few grammatical errors • Chapter contents complete 	<ul style="list-style-type: none"> • No spelling errors • Grammatically correct • Complete contents of Chapter 2
Writing Style and Format	<ul style="list-style-type: none"> • Does not follow thesis format • Figures and tables are not captioned and referred 	<ul style="list-style-type: none"> • Follow thesis format • Inappropriate use of figures and tables • Figures and tables are captioned but not referred 	<ul style="list-style-type: none"> • Follow thesis format • Inappropriate use of figures and tables • Figures and tables are captioned and referred 	<ul style="list-style-type: none"> • Follow thesis format • Appropriate use of figures and tables • All figures and tables are captioned and referred
Citation and References	<ul style="list-style-type: none"> • Facts and information are used but no citation • Direct translation 	<ul style="list-style-type: none"> • Facts and information are cited but very minimal • No direct translation 	<ul style="list-style-type: none"> • Facts and information are cited but not all and not clearly • No direct translation 	<ul style="list-style-type: none"> • All facts and information cited clearly declared/ showed • No direct translation

(c): Progress Report 2 Criteria and Marking Scheme

Progress Report 2				
Category	0-2	3	4	5
Completeness of Chapter 3	<ul style="list-style-type: none"> Inherent spelling errors Inherent grammatical errors Chapter not complete 	<ul style="list-style-type: none"> Several spelling errors Several grammatical errors Chapter contents somewhat complete 	<ul style="list-style-type: none"> A few spelling errors A few grammatical errors Chapter contents complete 	<ul style="list-style-type: none"> No spelling errors Grammatically correct Complete contents of Chapter 3
Completeness of Chapter 4	<ul style="list-style-type: none"> Inherent spelling errors Inherent grammatical errors Chapter not complete 	<ul style="list-style-type: none"> Several spelling errors Several grammatical errors Chapter contents somewhat complete 	<ul style="list-style-type: none"> A few spelling errors A few grammatical errors Chapter contents complete 	<ul style="list-style-type: none"> No spelling errors Grammatically correct Complete contents of Chapter 4
Writing Style and Format	<ul style="list-style-type: none"> Does not follow thesis format Figures and tables are not captioned and referred 	<ul style="list-style-type: none"> Follow thesis format Inappropriate use of figures and tables Figures and tables are captioned but not referred 	<ul style="list-style-type: none"> Follow thesis format Inappropriate use of figures and tables Figures and tables are captioned and referred 	<ul style="list-style-type: none"> Follow thesis format Appropriate use of figures and tables All figures and tables are captioned and referred
Citation and References	<ul style="list-style-type: none"> Facts and information are used but no citation Direct translation 	<ul style="list-style-type: none"> Facts and information are cited but very minimal No direct translation 	<ul style="list-style-type: none"> Facts and information are cited but not all and not clearly No direct translation 	<ul style="list-style-type: none"> All facts and information cited clearly declared/ showed No direct translation

(d): Final Report Marking Criteria and Marking Scheme – System Development

Final Report		0-2	3	4	5
Category					
Chapter 1: Problem Statements/ Aims/ Objective/ Scope	<ul style="list-style-type: none"> Contents are not complete and poorly written Mismatched understanding of project 	<ul style="list-style-type: none"> Contents are somewhat complete but not clearly written Contents fairly reflect student's understanding of the project 	<ul style="list-style-type: none"> Contents are complete but not clearly written Contents somewhat reflect student's understanding of the project 	<ul style="list-style-type: none"> Contents are complete and clearly written Contents reflect student's full understanding of the project 	
Chapter 2: Existing system/ technique/ hardware/ software	<ul style="list-style-type: none"> Limited/ no investigation of existing system/ technique/ hardware/ software Limited/ no supporting literature 	<ul style="list-style-type: none"> Incomplete investigation of existing system/ technique/ hardware/ software Insufficient number of supporting literature 	<ul style="list-style-type: none"> Complete investigation of existing system/ technique/ hardware/ software Satisfactory number of supporting literature but can be improved 	<ul style="list-style-type: none"> Complete investigation of existing system/ technique/ hardware/ software Literature is adequate and relevant; clearly support the project 	
Chapter 3: Methodology/ Gantt chart/ project phases	<ul style="list-style-type: none"> Incorrect selection of methodology Phases not clearly stated and does not reflect project progression 	<ul style="list-style-type: none"> Inappropriate selection of methodology Phases not clearly stated and lacking/ incomplete Confusingly described 	<ul style="list-style-type: none"> Appropriate selection of methodology Phases vaguely stated and not sufficient to support the overall objective of project 	<ul style="list-style-type: none"> Appropriate selection of methodology Phases clearly stated and well-defined adequately support the overall objective of project Clear and accurate explanation 	
Chapter 4: User requirement/ user interface/ design	<ul style="list-style-type: none"> Lacking user requirement and does not reflect the objective and scope of project Limited/ no project design and GUI 	<ul style="list-style-type: none"> User requirement somewhat complete but vaguely reflects the objective and scope of project Inappropriate and incomplete project design and GUI 	<ul style="list-style-type: none"> User requirement complete but does not clearly reflect the objective and scope of project Appropriate and complete project design and GUI 	<ul style="list-style-type: none"> User requirement complete and clearly reflects the objective and scope of project Appropriate and complete project design and GUI 	
Writing Styles and Format	<ul style="list-style-type: none"> Does not follow thesis format Figures and tables are not captioned and referred 	<ul style="list-style-type: none"> Follow thesis format Inappropriate use of figures and tables Figures and tables are captioned but not referred 	<ul style="list-style-type: none"> Follow thesis format Inappropriate use of figures and tables Figures and tables are captioned and referred 	<ul style="list-style-type: none"> Follow thesis format Appropriate use of figures and tables All figures and tables are captioned and referred 	
Citation and References	<ul style="list-style-type: none"> Facts and information are used but no citation Direct translation 	<ul style="list-style-type: none"> Facts and information are cited but very minimal No direct translation 	<ul style="list-style-type: none"> Facts and information are cited but not all and not clearly No direct translation 	<ul style="list-style-type: none"> All facts and information cited clearly declared/ showed No direct translation 	

(e): Final Report Marking Criteria and Marking Scheme – Research Based

Category	0-2	3	4	5
Chapter 1: Problem Statements/ Research Aims/ Research Objectives/ Scope (hypothesis/ assumptions**)	<ul style="list-style-type: none"> • Contents are not complete and poorly written • Mismatched understanding of project 	<ul style="list-style-type: none"> • Contents are somewhat complete but not clearly written • Contents fairly reflect student's understanding of the project 	<ul style="list-style-type: none"> • Contents are complete but not clearly written • Contents somewhat reflect student's understanding of the project 	<ul style="list-style-type: none"> • Contents are complete and clearly written • Contents reflect student's full understanding of the project
Chapter 2: Existing Research Problem/ technique/ variable research study	<ul style="list-style-type: none"> • limited/ no investigation of existing system/ technique/ hardware/ software • Limited/ no supporting literature 	<ul style="list-style-type: none"> • Incomplete investigation of existing system/ technique/ hardware/ software • Insufficient number of supporting literature 	<ul style="list-style-type: none"> • Complete investigation of existing system/ technique/ hardware/ software • Satisfactory number of supporting literature but can be improved 	<ul style="list-style-type: none"> • Complete investigation of existing system/ technique/ hardware/ software • Literature is adequate and relevant; clearly support the project
Chapter 3: Research Methodology/ Gantt chart/ Research phases	<ul style="list-style-type: none"> • Incorrect selection of methodology • Phases not clearly stated and does not reflect project progression 	<ul style="list-style-type: none"> • Inappropriate selection of methodology • Phases not clearly stated and lacking/ incomplete • Confusingly described 	<ul style="list-style-type: none"> • Appropriate selection of methodology • Phases vaguely stated and not sufficient to support the overall objective of project 	<ul style="list-style-type: none"> • Appropriate selection of methodology • Phases clearly stated and well-defined adequately support the overall objective of project • Clear and accurate explanation
Chapter 4: Research procedure -the architecture of how to implement the research/ enhance/apply	<ul style="list-style-type: none"> • Not sequential, most steps are missing or are confusing 	<ul style="list-style-type: none"> • Some of the steps are understandable, most are confusing and lack details 	<ul style="list-style-type: none"> • Most of the steps are understandable, some lack details or are confusing 	<ul style="list-style-type: none"> • Present easy to follow steps which are logical and adequately detailed
Writing Styles and Format	<ul style="list-style-type: none"> • Does not follow thesis format • Figures and tables are not captioned and referred 	<ul style="list-style-type: none"> • Follow thesis format • Inappropriate use of figures and tables • Figures and tables are captioned but not referred 	<ul style="list-style-type: none"> • Follow thesis format • Inappropriate use of figures and tables • Figures and tables are captioned and referred 	<ul style="list-style-type: none"> • Follow thesis format • Appropriate use of figures and tables • All figures and tables are captioned and referred
Citation and References	<ul style="list-style-type: none"> • Facts and information are used but no citation • Direct translation 	<ul style="list-style-type: none"> • Facts and information are cited but very minimal • No direct translation 	<ul style="list-style-type: none"> • Facts and information are cited but not all and not clearly • No direct translation 	<ul style="list-style-type: none"> • All facts and information cited clearly declared/ showed • No direct translation

(f): System Design Criteria and Marking Scheme (For System Development Only)

Category	0-2	3	4	5
System Flow and System Architecture	<ul style="list-style-type: none"> System flow does not reflect understanding of project System architecture is incorrect or not done Limited/no modules and I/O identified and connected 	<ul style="list-style-type: none"> System flow somewhat reflects understanding of project System architecture is correct Some modules and I/O identified and connected 	<ul style="list-style-type: none"> System flow reflects understanding of project System architecture is correct All modules and I/O identified and connected 	<ul style="list-style-type: none"> System flow reflects full understanding of project System architecture is correct All modules and I/O clearly identified and connected
Database Design	<ul style="list-style-type: none"> Database not complete and does not reflect project aims and objectives Does not follow database development standard No DFD 	<ul style="list-style-type: none"> Database fairly reflects project aims and objectives Somewhat follow database development standard Incomplete DFD 	<ul style="list-style-type: none"> Database reflects project aims and objectives Somewhat follow database development standard Complete DFD 	<ul style="list-style-type: none"> Database clearly reflects project aims and objectives Follow database development standard Complete DFD
UML Design	<ul style="list-style-type: none"> Actors are incorrectly identified No use case & sequence diagram & class diagram (or only 1 present) 	<ul style="list-style-type: none"> All actors are fully identified Incomplete use case & sequence diagram & class diagram (any 2 not present) 	<ul style="list-style-type: none"> All actors are identified Complete use case & sequence diagram & class diagram (any one not complete) 	<ul style="list-style-type: none"> All actors are fully identified Complete use case & sequence diagram & system architecture (all three)
Gantt Chart	<ul style="list-style-type: none"> Unorganized monthly planning All phases and activities are not complete or clearly outlined Milestones not identified Either PSM1 or 2 planning missing 	<ul style="list-style-type: none"> Clearly shows monthly planning All phases and activities are fairly complete and outlined Milestones not identified Have both PSM1 and 2 planning 	<ul style="list-style-type: none"> Clearly shows monthly planning All phases and activities are complete and clearly outlined Milestones not fully identified Have both PSM1 and 2 planning 	<ul style="list-style-type: none"> Clearly shows monthly planning All phases and activities are complete and clearly outlined Milestones clearly and fully identified Have both PSM1 and 2 planning
Interface Design	<ul style="list-style-type: none"> Limited/No GUI Does not reflect project aims and user requirements 	<ul style="list-style-type: none"> One of these designs are fully completed (screen/menu, content, system/page navigation) Somewhat reflects project aims and user requirements 	<ul style="list-style-type: none"> Two of these designs are fully completed (screen/menu, content, system/page navigation) Reflects project aims and user requirements 	<ul style="list-style-type: none"> All of these designs are fully completed (screen/menu, content, system/page navigation) Fully reflects project aims and user requirements

(g): Problem Formulation and Research Design Criteria and Marking Scheme (For Research Based Only)

Problem Formulation and Research Design		3	4	5
Category	0-2	3	4	5
Introduction/ Problem Background	<ul style="list-style-type: none"> Does not give any information about what to expect in the report Wrote questions which lacked a specific focus, were poorly stated, and not relevant to the assigned topic. 	<ul style="list-style-type: none"> Gives very little information Wrote questions which lacked focus, were poorly stated, and were not entirely relevant to the assigned topic. 	<ul style="list-style-type: none"> Gives too much information - more like a summary Wrote well-worded, specific questions that were relevant to the assigned topic. 	<ul style="list-style-type: none"> Present a concise lead in to the report Wrote thoughtful, creative, well-worded specific questions that were relevant to the assigned topic.
Research Problem/Question	<ul style="list-style-type: none"> Presented content which was unfocused, poorly organized, showed little thought or effort and lacked supporting evidence. Failed to select an appropriate format to communicate research findings. 	<ul style="list-style-type: none"> Presented content which failed to maintain a consistent focus, showed minimal organization and effort, and lacked an adequate amount of supporting evidence. Needed to select a more effective format to structure and communicate research findings. 	<ul style="list-style-type: none"> Presented most of the content with a logical progression of ideas and supporting evidence. Selected an appropriate format to structure and communicate research findings. 	<ul style="list-style-type: none"> Presented content clearly and concisely with a logical progression of ideas and effective supporting evidence. Selected an appropriate and effective format to creatively communicate research findings.
Organization and Synthesis	<ul style="list-style-type: none"> Unorganized monthly planning All phases and activities are not complete or clearly outlined Milestones not identified Either PSM1 or 2 planning missing 	<ul style="list-style-type: none"> Clearly shows monthly planning All phases and activities are fairly complete and outlined Milestones not identified PSM1 and PSM2 planning 	<ul style="list-style-type: none"> Clearly shows monthly planning All phases and activities are complete and clearly outlined Milestones not fully identified PSM1 and PSM2 planning 	<ul style="list-style-type: none"> Clearly shows monthly planning All phases and activities are complete and clearly outlined Milestones clearly and fully identified PSM1 and PSM2 planning
Research phases	<ul style="list-style-type: none"> The research design is inappropriate or has not been identified and or described using standard terminology. Limitations and assumptions are omitted. 	<ul style="list-style-type: none"> The research design is confusing or incomplete given the research questions and sampling strategy. Important limitations and assumptions have not been identified. 	<ul style="list-style-type: none"> The research design has been identified and described in sufficiently detailed terms. Some limitations and assumptions have been identified. 	<ul style="list-style-type: none"> The purpose, questions, and design are mutually supportive and coherent. Attention has been given to eliminating alternative explanations and controlling extraneous variables. Appropriate and important limitations and assumptions have been clearly stated.
Experiment Design/research procedure				

(h): Presentation Criteria and Marking Scheme

Presentation				
Category	0-2	3	4	5
Appearance	<ul style="list-style-type: none"> • In jeans/ slippers/ t-shirt/ sexy/ messy hair • Does not follow the UTM Smart Day dress code 	<ul style="list-style-type: none"> • Casually dressed • Sandals/ no tie/ no socks/ short skirts 	<ul style="list-style-type: none"> • Smartly dressed • Attire partly follows the UTM Smart Day dress code 	<ul style="list-style-type: none"> • Smartly dressed • Tie, socks, shoes are a must (for men) • Attire must follow the UTM Smart Day dress code
Mannerism	<ul style="list-style-type: none"> • Impolite • Does not greet • Picks a fight with evaluator 	<ul style="list-style-type: none"> • Polite • Passive attitude 	<ul style="list-style-type: none"> • Polite and well-mannered • Shows positive attitude 	<ul style="list-style-type: none"> • Polite and well-mannered • Greets evaluators • Shows positive attitude
Q & A	<ul style="list-style-type: none"> • Unable to answer questions • Does not even attempt to answer • Answers reflect lack of understanding of project 	<ul style="list-style-type: none"> • Able to answer a few questions • Answers are sometimes incorrect or irrelevant to project objectives 	<ul style="list-style-type: none"> • Able to answer most questions confidently and correctly • Think before answering • Answers reflect understanding of project 	<ul style="list-style-type: none"> • Able to answer all questions confidently and correctly • Think before answering • Answers reflect full understanding of project
Clarity of Presentation	<ul style="list-style-type: none"> • No slides handouts • Communication not clear • Presentation not organized 	<ul style="list-style-type: none"> • No slides handouts • Simple and somewhat clear communication • Presentation is not well organized 	<ul style="list-style-type: none"> • Slides handouts available and clear • Simple and clear communication • Presentation is not well organized 	<ul style="list-style-type: none"> • Slides handouts available and clear • Simple and clear communication • Presentation is well organized

9.3 PSM2 Evaluation

As for PSM2, there are seven criteria that will be evaluated and they are:

- i. Supervision
- ii. Progress Report
- iii. Demo 1
- iv. Demo 2
- v. Final Report (System Development Based project)
- vi. Final Report (Research Based project)
- vii. System or Research Output
- viii. Presentation

Details about each criterion and marking schemes are as explained in Table 9.2. These criteria will be assessed by supervisors as well as evaluators by using Evaluation Form PSM2 as in Appendix 1.

Table 9.2: Supervision and Progress Report Criteria and
Marking Scheme for PSM2

(a): Supervision Criteria and Marking Scheme

	Category	0-2	3	4	5
Supervision	Log Book	<ul style="list-style-type: none"> • Inadequate entry • Does not reflect project progress 	<ul style="list-style-type: none"> • Entry every week • Somewhat reflect project progress 	<ul style="list-style-type: none"> • Meaningful entry every week • Reflects project progress 	<ul style="list-style-type: none"> • Meaningful entry every week • Reflects project progress • Include project planning
	Meeting Frequency	<ul style="list-style-type: none"> • Hardly meet • Less than 2 times 	<ul style="list-style-type: none"> • Meet less than 5 times 	<ul style="list-style-type: none"> • Meet 5 times 	<ul style="list-style-type: none"> • Meet more than 6 times
	Work Ethic	<ul style="list-style-type: none"> • Passive attitude • Unable to communicate with supervisor 	<ul style="list-style-type: none"> • Good attitude • Poor communication 	<ul style="list-style-type: none"> • Good attitude • Good communication • Good relation 	<ul style="list-style-type: none"> • Positive attitude • Good communication s • Good relation with supervisor
	Self Reliance/ Independence	<ul style="list-style-type: none"> • Highly dependent on supervisor 	<ul style="list-style-type: none"> • Dependent on supervisor 	<ul style="list-style-type: none"> • Somewhat dependent • Able to solve problems with support 	<ul style="list-style-type: none"> • Able to work independently • Able to plan and solve problems independently

(b): Progress Report Criteria and Marking Scheme

Progress Report		0-2	3	4	5
Category					
Completeness of Chapter 4	<ul style="list-style-type: none"> Inherent spelling errors Inherent grammatical errors Chapter not complete 	<ul style="list-style-type: none"> Several spelling errors Several grammatical errors Chapter contents somewhat complete 	<ul style="list-style-type: none"> A few spelling errors A few grammatical errors Chapter contents complete 	<ul style="list-style-type: none"> No spelling errors Grammatically correct Complete contents of Chapter 4 	
Completeness of Chapter 5	<ul style="list-style-type: none"> Inherent spelling errors Inherent grammatical errors Chapter contents not complete 	<ul style="list-style-type: none"> Several spelling errors Several grammatical errors Chapter contents somewhat complete 	<ul style="list-style-type: none"> A few spelling errors A few grammatical errors Chapter contents complete 	<ul style="list-style-type: none"> No spelling errors Grammatically correct Complete contents of Chapter 5 	
Writing Style and Format	<ul style="list-style-type: none"> Does not follow thesis format Figures and tables are not captioned and referred 	<ul style="list-style-type: none"> Follow thesis format Inappropriate use of figures and tables Figures and tables are captioned but not referred 	<ul style="list-style-type: none"> Follow thesis format Inappropriate use of figures and tables Figures and tables are captioned and referred 	<ul style="list-style-type: none"> Follow thesis format Appropriate use of figures and tables All figures and tables are captioned and referred 	
Citation and References	<ul style="list-style-type: none"> Facts and information are used but no citation Direct translation 	<ul style="list-style-type: none"> Facts and information are cited but very minimal No direct translation 	<ul style="list-style-type: none"> Facts and information are cited but not all and not clearly No direct translation 	<ul style="list-style-type: none"> All facts and information cited clearly declared/showed No direct translation 	

(b) Progress Report 1 Criteria and Marking Scheme

P R O G R E S S R E P O R T				
Category	0-2	3	4	5
Completeness of Chapter 1	<ul style="list-style-type: none"> • Inherent spelling errors • Inherent grammatical errors • Chapter not complete 	<ul style="list-style-type: none"> • Several spelling errors • Several grammatical errors • Chapter contents somewhat complete 	<ul style="list-style-type: none"> • A few spelling errors • A few grammatical errors • Chapter contents complete 	<ul style="list-style-type: none"> • No spelling errors • Grammatically correct • Complete contents of Chapter 1
Completeness of Chapter 2	<ul style="list-style-type: none"> • Inherent spelling errors • Inherent grammatical errors • Chapter contents not complete 	<ul style="list-style-type: none"> • Several spelling errors • Several grammatical errors • Chapter contents somewhat complete 	<ul style="list-style-type: none"> • A few spelling errors • A few grammatical errors • Chapter contents complete 	<ul style="list-style-type: none"> • No spelling errors • Grammatically correct • Complete contents of Chapter 2
Writing Style and Format	<ul style="list-style-type: none"> • Does not follow thesis format • Figures and tables are not captioned and referred 	<ul style="list-style-type: none"> • Follow thesis format • Inappropriate use of figures and tables • Figures and tables are captioned but not referred 	<ul style="list-style-type: none"> • Follow thesis format • Inappropriate use of figures and tables • Figures and tables are captioned and referred 	<ul style="list-style-type: none"> • Follow thesis format • Appropriate use of figures and tables • All figures and tables are captioned and referred
Writing Style and Format	<ul style="list-style-type: none"> • Facts and information are used but no citation • Direct translation 	<ul style="list-style-type: none"> • Facts and information are cited but very minimal • No direct translation 	<ul style="list-style-type: none"> • Facts and information are cited but not all and not clearly • No direct translation 	<ul style="list-style-type: none"> • All facts and information cited clearly declared/ showed • No direct translation

(c): Demo 1 Criteria and Marking Scheme

Demo 1	Category	0-2	3	4	5
	Milestones Achieved	<ul style="list-style-type: none"> No/ minimal progress/ achievement 	<ul style="list-style-type: none"> Achieve 20-30% completion 	<ul style="list-style-type: none"> Almost achieve 40% completion 	<ul style="list-style-type: none"> Achieve more than 40% completion
	Project or Research Execution follow Planning	<ul style="list-style-type: none"> No/ very minimal progress 	<ul style="list-style-type: none"> Shows some progress but behind schedule 	<ul style="list-style-type: none"> Almost on track 	<ul style="list-style-type: none"> On track Beyond schedule
	Knowledge and Skill Improvement	<ul style="list-style-type: none"> No/ minimal new skills developed Unable to express/ show the new skills to the supervisor 	<ul style="list-style-type: none"> Able to show some improvement in skills and knowledge Unable to express the new skills to the supervisor 	<ul style="list-style-type: none"> Able to show several improvement in skills and knowledge Able to express the new skills to the supervisor but not clear 	<ul style="list-style-type: none"> Able to show significant improvement in skills and knowledge Able to clearly express the new skills to the supervisor

(d): Demo 2 Criteria and Marking Scheme

Demo 2	Category	0-2	3	4	5
	Milestones Achieved	<ul style="list-style-type: none"> No/ minimal progress/ achievement 	<ul style="list-style-type: none"> Achieve 50-60% completion 	<ul style="list-style-type: none"> Almost achieve 70% completion 	<ul style="list-style-type: none"> Achieve more than 70% completion
	Project or Research Execution follow Planning	<ul style="list-style-type: none"> No/ very minimal progress 	<ul style="list-style-type: none"> Shows some progress but behind schedule 	<ul style="list-style-type: none"> Almost on track 	<ul style="list-style-type: none"> On track Beyond schedule
	Knowledge and Skill Improvement	<ul style="list-style-type: none"> No/ minimal new skills developed Unable to express/ show the new skills to the supervisor 	<ul style="list-style-type: none"> Able to show some improvement in skills and knowledge Unable to express the new skills to the supervisor 	<ul style="list-style-type: none"> Able to show several improvement in skills and knowledge Able to express the new skills to the supervisor but not clear 	<ul style="list-style-type: none"> Able to show significant improvement in skills and knowledge Able to clearly express the new skills to the supervisor

(e): Final Report Criteria and Marking Scheme (For System Development Only)

Full Report System Development				
Category	0-2	3	4	5
Chapter 1: Introduction/ Problem Statements/ Aims/ Objectives/ Scope	<ul style="list-style-type: none"> Contents are not complete and poorly written Mismatched understanding of project 	<ul style="list-style-type: none"> Contents are somewhat complete but not clearly written Contents fairly reflect student's understanding of the project 	<ul style="list-style-type: none"> Contents are complete but not clearly written Contents somewhat reflect student's understanding of the project 	<ul style="list-style-type: none"> Contents are complete and clearly written Contents reflect student's full understanding of the project
Chapter 2: Existing system/ technique/ hardware/ software	<ul style="list-style-type: none"> Limited/ no investigation of existing system/ technique/ hardware/ software Limited/ no supporting literature 	<ul style="list-style-type: none"> Incomplete investigation of existing system/ technique/ hardware/ software Insufficient number of supporting literature 	<ul style="list-style-type: none"> Complete investigation of existing system/ technique/ hardware/ software Satisfactory number of supporting literature but can be improved 	<ul style="list-style-type: none"> Complete investigation of existing system/ technique/ hardware/ software Literature is adequate and relevant, clearly support the project
Chapter 3: Methodology/ Gantt chart/ project phases	<ul style="list-style-type: none"> Incorrect selection of methodology Phases not clearly stated and does not reflect project progression 	<ul style="list-style-type: none"> Inappropriate selection of methodology Phases not clearly stated and lacking/ incomplete Confusingly described 	<ul style="list-style-type: none"> Appropriate selection of methodology Phases vaguely stated and not sufficient to support the overall objective of project 	<ul style="list-style-type: none"> Appropriate selection of methodology Phases clearly stated and well-defined adequately support the overall objective of project Clear and accurate explanation
Chapter 4: System Design	<ul style="list-style-type: none"> Limited/ inappropriate/ incomplete project design Limited/ no explanation on the system flow Limited/ no explanation on network, hardware and database designs 	<ul style="list-style-type: none"> Somewhat complete project design Somewhat clear explanation on the system flow Somewhat clear explanation on network, hardware and database designs 	<ul style="list-style-type: none"> Fairly complete project design Fairly clear explanation on the system flow Fairly clear explanation on network, hardware and database designs 	<ul style="list-style-type: none"> Appropriate and complete project design System flow explained clearly Network, hardware and database designs are explained clearly (if any)
Chapter 5: Implementation and Testing	<ul style="list-style-type: none"> Limited/ no explanation on project implementation activities Limited/ no explanation on coding and interface design Limited/ no testing and validation strategies 	<ul style="list-style-type: none"> Somewhat clear explanation on project implementation activities Somewhat clear explanation on coding and interface design Somewhat clear testing and validation strategies 	<ul style="list-style-type: none"> Fairly clear explanation on project implementation activities Fairly clear explanation on coding and interface design Fairly clear testing and validation strategies 	<ul style="list-style-type: none"> Activities involved in project implementation are well explained Clear coding and interface design explanation Well defined testing and validation strategies
Chapter 6: Discussion and Analysis	<ul style="list-style-type: none"> Limited/ no discussion on project achievements and limitations Limited/ no suggestions and recommendations for future work Limited/ no discussion on contributions 	<ul style="list-style-type: none"> Somewhat clear discussion on project achievements and limitations Somewhat relevant suggestions and recommendations for future work Somewhat clear discussion on contributions 	<ul style="list-style-type: none"> Fairly clear discussion on project achievements and limitations Fairly relevant suggestions and recommendations for future work Fairly clear discussion on contributions 	<ul style="list-style-type: none"> Project achievements and limitations discussed clearly Relevant suggestions and recommendations for future work Clearly outlined contributions

(f): Final Report Criteria and Marking Scheme (For Research Based Only)

Category	0-2	3	4	5
Chapter 1: Problem Statements/ Research Aims/ Research Objective/ Scope	<ul style="list-style-type: none"> Contents are not complete and poorly written Mismatched understanding of project 	<ul style="list-style-type: none"> Contents are somewhat complete but not clearly written contents somewhat reflect student's understanding of the project 	<ul style="list-style-type: none"> Contents are complete but not clearly written Contents fairly reflect student's understanding of the project 	<ul style="list-style-type: none"> Contents are complete and clearly written Contents reflect student's full understanding of the project
Chapter 2: Existing Research Problem/ technique/ variable research study	<ul style="list-style-type: none"> Gathered information that lacked relevance, quality, depth and balance. 	<ul style="list-style-type: none"> Gathered information from a limited range of sources and displayed minimal effort in selecting quality resources 	<ul style="list-style-type: none"> Gathered information from a variety of relevant sources-(print and electronic) 	<ul style="list-style-type: none"> Gathered information from a variety of quality electronic and print sources, including appropriate licensed databases. Sources are relevant, balanced and include critical readings relating to the thesis or problem. Primary sources were included (if appropriate).
Chapter 3: Research Methodology/ Gantt chart/ Research phases	<ul style="list-style-type: none"> Incorrect selection of methodology Phases not clearly stated and does not reflect project progression 	<ul style="list-style-type: none"> Inappropriate selection of methodology Phases not clearly stated and lacking/incomplete Confusingly described 	<ul style="list-style-type: none"> Appropriate selection of methodology Phases vaguely stated and not sufficient to support the overall objective of project 	<ul style="list-style-type: none"> Appropriate selection of methodology Phases clearly stated and well-defined adequately support the overall objective of project Clear and accurate explanation
Chapter 4: Solution/Method/ Algorithm/ Implementation/ Experiment Design	<ul style="list-style-type: none"> Limited/ inappropriate/ incomplete research solution/ method/algorithm Limited/ no explanation on the research solution 	<ul style="list-style-type: none"> Somewhat complete research solution/ method/ algorithm Somewhat clear explanation on the research solution 	<ul style="list-style-type: none"> Fairly complete research solution/ method/ algorithm Fairly clear explanation on the research solution 	<ul style="list-style-type: none"> Appropriate and complete research solution/ method/ algorithm Research solution explained clearly
Chapter 5: Research Testing/ Data Analysis/ Result	<ul style="list-style-type: none"> Limited/ no explanation on Research Testing/ Data Analysis/Result activities 	<ul style="list-style-type: none"> Somewhat clear explanation on Research Testing/ Data Analysis/Result activities 	<ul style="list-style-type: none"> Fairly clear explanation on Research Testing/ Data Analysis/Result activities 	<ul style="list-style-type: none"> Activities involved in Research Testing/ Data Analysis/ Result are well explained
Chapter 6: Discussion and Conclusion	<ul style="list-style-type: none"> Limited/ no discussion on research achievements and limitations Limited/ no suggestions and recommendations for future work Limited/ no discussion on contributions 	<ul style="list-style-type: none"> Somewhat clear discussion on research achievements and limitations Somewhat relevant suggestions and recommendations for future work Somewhat clear discussion on contributions 	<ul style="list-style-type: none"> Fairly clear discussion on research achievements and limitations Fairly relevant suggestions and recommendations for future work Fairly clear discussion on contributions 	<ul style="list-style-type: none"> Research achievements and limitations discussed clearly Relevant suggestions and recommendations for future work Clearly outlined contributions

Full Report Research Based

(g): System Criteria and Marking Scheme (For System Development Only)

Category	0-2	3	4	5
Fulfill Aim, Objectives and Scopes	<ul style="list-style-type: none"> Does not fulfill aim, objectives and scopes of the project 	<ul style="list-style-type: none"> Somewhat fulfill aim, objectives and scopes of the project 	<ul style="list-style-type: none"> Fairly fulfill aim, objectives and scopes of the project 	<ul style="list-style-type: none"> Fulfill all the aim, objectives and scopes of the project
Programming/ Experiment	<ul style="list-style-type: none"> Does not follow coding standards Limited/ no experiments Limited/ no understanding of coding/ experiment 	<ul style="list-style-type: none"> Somewhat follow coding standards Somewhat amount of experiments - Somewhat understand coding/ experiments 	<ul style="list-style-type: none"> Fairly follow coding standards Fairly extensive experiments Fairly understand coding/ experiment 	<ul style="list-style-type: none"> Follow coding standards Extensive experiments Clearly understand the coding/ experiment
Completeness	<ul style="list-style-type: none"> Limited/ no modules function correctly and meet project requirements Limited/ no modules integration Limited/ no testing and validation 	<ul style="list-style-type: none"> Somewhat amount of modules function correctly and meet project requirements Somewhat modules integration Somewhat amount of testing and validation 	<ul style="list-style-type: none"> Fairly all modules function correctly and meet project requirements All modules fairly integrated Fairly complete testing and validation 	<ul style="list-style-type: none"> All modules function correctly and meet project requirements All modules fully integrated Complete testing and validation
Contribution to knowledge	<ul style="list-style-type: none"> Has no commercial value Does not have any effect on quality of service/ quality of life (individual/ society) 	<ul style="list-style-type: none"> Has commercial value Can increase quality of life Can better quality of service (any 1 of 3) 	<ul style="list-style-type: none"> Has commercial value Can increase quality of life Can better quality of service (any 2 of 3) 	<ul style="list-style-type: none"> Has commercial value Can increase quality of life Can better quality of service
Testing	<ul style="list-style-type: none"> manual or no testing done 	<ul style="list-style-type: none"> has one of the following tests (input, flow, error message) One of these designs are fully completed (screen/menu, content, system/page navigation) 	<ul style="list-style-type: none"> has two of the following tests (input, flow, error message) Two of these designs are fully completed (screen/menu, content, system/page navigation) 	<ul style="list-style-type: none"> has all of the following tests (input, flow, error message) All of these designs are fully completed (screen/menu, content, system/page navigation)
Creativity/ Interface	<ul style="list-style-type: none"> Limited/No GUI Does not reflect project aims and user requirements 	<ul style="list-style-type: none"> Somewhat reflects project aims and user requirements 	<ul style="list-style-type: none"> Reflects project aims and user requirements 	<ul style="list-style-type: none"> Fully reflects project aims and user requirements

System

(h): Research Output Criteria and Marking Scheme (For Research Based Only)

		Research Output		
Category	0-2	3	4	5
Research Problem/Question	<ul style="list-style-type: none"> Does not fulfill aim, objectives and scopes of the research The research design is inappropriate or has not been identified and or described using standard terminology. Limitations and assumptions are omitted. 	<ul style="list-style-type: none"> Somewhat fulfill aim, objectives and scopes of the research The research design is confusing or incomplete given the research questions and sampling strategy. Important limitations and assumptions have not been identified. 	<ul style="list-style-type: none"> Fairly fulfill aim, objectives and scopes of the research The research design has been identified and described in sufficiently detailed terms. Some limitations and assumptions have been identified. 	<ul style="list-style-type: none"> Fulfill all the aim, objectives and scopes of the research The purpose, questions, and design are mutually supportive and coherent. Attention has been given to eliminating alternative explanations and controlling extraneous variables. Appropriate and important limitations and assumptions have been clearly stated.
Research Design	<ul style="list-style-type: none"> Procedures /Process for treatments and gathering data were omitted. 	<ul style="list-style-type: none"> Procedures /Process (permissions, treatments, and data gathering) were confusing, incomplete, or lacked relevance to purpose, research questions, or sampling strategy. 	<ul style="list-style-type: none"> Procedures for implementing the study (permissions, treatments, and data gathering) were identified and described in a chronological and fashion. 	<ul style="list-style-type: none"> Procedures were thorough, manageable, coherent, and powerful for generating valid and reliable data. Procedures were chronological and replicable, with clear distinctions between researcher and participant actions. Clear and reasonable strategies were presented for seeking permissions and for the ethical treatment of human subjects.
Experiment/ Procedure/ Process	<ul style="list-style-type: none"> Data tables and/or graph missing information and are inaccurate. Analytical methods (descriptive, inferential test, and significance level) were missing or inappropriately aligned with data and research design. 	<ul style="list-style-type: none"> Both complete, minor inaccuracies and/or illegible characters. Descriptive or inferential methods were confusing, incomplete or lacked relevance to the research questions, data, or research design. 	<ul style="list-style-type: none"> Both accurate, ill-formed characters. Both descriptive and inferential methods were identified. Level of significance was stated. 	<ul style="list-style-type: none"> Data tables and graphs neatly completed and totally accurate. Analytical methods were sufficiently specific, clear, and appropriate given the research questions, research design, and scale of measurement, and type of distribution.
Research Results	<ul style="list-style-type: none"> Has no publication value Does not have any effect on quality of service/ quality of life (individual/ society) 	<ul style="list-style-type: none"> Has minor publication value Can increase quality of life Can better quality of service (any 1 of 3) 	<ul style="list-style-type: none"> Has publication value Can increase quality of life Can better quality of service (any 2 of 3) 	<ul style="list-style-type: none"> Significant publication value Can increase quality of life Can better quality of service
Result Analysis and Discussion				
Contribution to knowledge				

(i): Presentation Criteria and Marking Scheme

Category		0-2	3	4	5
Presentation	Appearance	<ul style="list-style-type: none"> • In jeans/slippers/ t-shirt/sexy/ messy hair • Does not follow the UTM Smart Day dress code 	<ul style="list-style-type: none"> • Casually dressed • Sandals/ no tie/ no socks/ short skirts 	<ul style="list-style-type: none"> • Smartly dressed • Attire partly follows the UTM Smart Day dress code 	<ul style="list-style-type: none"> • Smartly dressed • Tie, socks, shoes are a must (for men) • Attire must follow the UTM Smart Day dress code
	Mannerism	<ul style="list-style-type: none"> • Impolite • Does not greet • Picks a fight with evaluator 	<ul style="list-style-type: none"> • Polite • Passive attitude 	<ul style="list-style-type: none"> • Polite and well-mannered • Shows positive attitude 	<ul style="list-style-type: none"> • Polite and well-mannered • Greets evaluators • Shows positive attitude
	Q & A	<ul style="list-style-type: none"> • Unable to answer questions • Does not even attempt to answer • Answers reflect lack of understanding of project 	<ul style="list-style-type: none"> • Able to answer a few questions • Answers are sometimes incorrect or irrelevant to project objectives 	<ul style="list-style-type: none"> • Able to answer most questions confidently and correctly • Think before answering • Answers reflect understanding of project 	<ul style="list-style-type: none"> • Able to answer all questions confidently and correctly • Think before answering • Answers reflect full understanding of project
	Clarity of Presentation	<ul style="list-style-type: none"> • No slides handouts • Communication not clear • Presentation not organized 	<ul style="list-style-type: none"> • No slides handouts • Simple and somewhat clear communication • Presentation is not well organized 	<ul style="list-style-type: none"> • Slides handouts available and clear • Simple and clear communication • Presentation is not well organized 	<ul style="list-style-type: none"> • Slides handouts available and clear • Simple and clear communication • Presentation is well organized

9.4 Summary

The criteria for PSM1 and PSM2 evaluation are discussed in detailed. Students must be aware of the points that will be considered for the grade. Lacking in one area will affect the final grade.

APPENDIXES

Appendix A: PSM 1 Forms

Appendix B: PSM 2 Forms

Appendix C: Supervisor List of Expert

Appendix D: PSM Academic Calendar

Appendix E: UTM Grading System

APPENDIX A: PSM 1 Forms

- A.1 Project Supervision Consent Form (PSM.CI.02)**
- A.2 Project Proposal Form (PSM.CI.03)**
- A.3 Report Review and Approval Form (PSM.AI.02)**
- A.4 Project Proposal Report Submission Form (PSM.CI.05)**
- A.5 PSM 1 Evaluation Form (PSM.BI.01)**
- A.6 Chairperson Comment Form (PSM.CI.06)**
- A.7 Report Correction and Resubmission Form (PSM.CI.07)**
- A.8 PSM Project Log Book (PSM.CU.01)**

Appendix A.1: Project Supervision Consent Form (PSM.Cl.02)

 <b style="font-size: 24pt; font-weight: bold;">UTM <small>UNIVERSITI TEKNOLOGI MALAYSIA</small> <hr style="width: 50%; margin: 0 auto;"/> <small>RESEARCH UNIVERSITY</small>	FACULTY OF COMPUTING UNIVERSITI TEKNOLOGI MALAYSIA
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PSM 1 (SCR/SCJ/SCV/SCD/SCI 3032 & SCB 4042) PROJECT SUPERVISION CONSENT FORM

Session/Semester :

Instruction: Please complete Section A and Section B, then submit this form to your PSM Department Coordinator

SECTION A: STUDENT DETAILS

Name :

Year/Course :

No. : Matric No. :

KP/Passport

E-mel : No. Tel/HP :

Date : Signature :

SECTION B: SUPERVISOR AGREEMENT

I **agree/disagree** * to be an Undergraduate Supervisor for this student where he/she will develop a project with a title of:

Date: Signature :

Official Stamp

SECTION C: PSM 1 DEPARTMENT COORDINATOR APPROVAL

Approval Status:

Approved []

Not approved []

If not approved:

Supervisor's name suggestion:

Date: Signature :

Official Stamp

Objectives:

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Scopes:

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Project Requirements:

Software :

Hardware :

Technology/Technique/
Method/Algorithm :

.....

Project Type: *(Please tick one)*

- System Development
- Research

Project Area:

Area :

(e.g.: *Security – Cryptography*)

SECTION C: STUDENT ACKNOWLEDGEMENT

I confirm that this project is:

- My own idea
 Proposed by the supervisor.....

Date: Student Signature:

SECTION D: SUPERVISOR ACKNOWLEDGEMENT

I confirm that I
 have reviewed this student's project proposal and therefore agree for the proposal to be
 submitted for evaluation.

Date : Signature :
 Official Stamp

SECTION E: EVALUATION PANEL APPROVAL

Outcome:

- Full Approval
 Conditional Approval (Minor)
 Conditional Approval (Major)
 Fail

Notes (*Please state reasons for conditional or failed approval*)

.....

Evaluation Panel:

1.
 2.

Date: Signature:
 Name:

SECTION F: FOR FACULTY COMMITTEE ONLY

Date Received:

Signature : (Official Stamp)

Appendix A.3: Report Review and Approval Form (PSM.AI.02)

 UTM <small>UNIVERSITI TEKNOLOGI MALAYSIA</small> <small>RESEARCH UNIVERSITY</small>	FACULTY OF COMPUTING UNIVERSITI TEKNOLOGI MALAYSIA
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PSM 1 (SCR/SCJ/SCV/SCD/SCI 3032 & SCB 4042) REPORT REVIEW AND APPROVAL FORM

Session/Semester:

Instruction: [Student] Please complete Section A. [Supervisor] Please complete Section B and C. Then, student submits the completed form with the corrected Final Report for PSM 1 evaluation to the PSM 1 Department Coordinator. This form must be filled in ONE (1) copy.

SECTION A: STUDENT INFORMATION

Student Name :

Project Title :

Supervisor Name :

SECTION B: MEETING FREQUENCY

Guideline: Please fill in this section according to the meeting frequency of the student and the supervisor. Mark \surd in the appropriate box.

1. Meeting Frequency:

Sufficient (*at least once every TWO (2) weeks*)

Not Sufficient

2. If Not Sufficient:

Warning Letter I has been issued to student

Warning Letter II has been issued to student

SECTION C: SUPERVISOR DECLARATION AND REPORT

Guideline: Please state status of the student's project proposal (mark \surd in the appropriate box). You may provide written report if necessary.

1. I hereby declare that:

The student project proposal meets the PSM scope.
Student can do his/her PSM 1 presentation.

Pass	
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The student project proposal needs to be modified to meet the PSM scope. Student is allowed to do his/her presentation only if the conditions has been satisfied

Conditional Pass	
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The student project proposal did not meet PSM scope.
Student cannot do his/her presentation.

Fail	
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2. Supervisor Report
(Please provide attachment if any)

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3. Supervisor* Certification

I hereby certify that I have received a copy of the above mentioned student project proposal report and allow/not allow him/her to present.

Date : Signature :
Official Stamp

SECTION C: PSM 1 DEPARTMENT COORDINATOR

I hereby certify that I have received a copy of the above mentioned student project proposal report for his/her presentation.

Date : Signature :
Official Stamp

Notes: *Supervisor - please return this form to the student

Appendix A.4: Project Proposal Report Submission Form (PSM.CI.05)

 UTM <small>UNIVERSITI TEKNOLOGI MALAYSIA</small> <small>RESEARCH UNIVERSITY</small>	FACULTY OF COMPUTING UNIVERSITI TEKNOLOGI MALAYSIA
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PSM 1 (SCR/SCJ/SCV/SCD/SCI 3032 & SCB 4042) REPORT DRAFT SUBMISSION FORM

Session/Semester:

Instruction: Please complete Section A and Section B, and then submit this form together with all the documents as stated in Section C to the department coordinator at respective counter during report submission. This form need had to be filled in **TWO(2)** copies.

SECTION A: STUDENT DETAILS

Name :

Project Title :

Supervisor :

Year/Course :

No.KP/Passport : Matric No. :

E-mail : No. Tel/HP :

Date : Signature :

SECTION B: SUPERVISOR DECLARATION

I,declared that the student as mentioned in the above are allowed to submit reports and present project.

Date : Signature :

Official Stamp

SECTION C: DEPARTMENT COORDINATOR DECLARATION

I,declared had accepted:

- i. TWO copies of **Project Proposal Report** (corrected version) (for two Examiners)
- ii. TWO copies of **Project Proposal Report Submission Form** - (PSM.CI.05)
- iii. TWO copies of **PSM1 Evaluation Form** -(PSM.BI.01) (for two Examiners)
- iv. ONE copy of **Chairperson Comment Form** – (PSM.CI.06)

From the students as mentioned in the above.

Date : Signature :

Official Stamp

Appendix A.5: PSM 1 Evaluation Form (PSM.BI.01)

 <b style="font-size: 24pt; font-weight: bold;">UTM <small>UNIVERSITI TEKNOLOGI MALAYSIA</small> <small>RESEARCH UNIVERSITY</small>	FACULTY OF COMPUTING UNIVERSITI TEKNOLOGI MALAYSIA
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PSM 1 (SCR/SCJ/SCV/SCD/SCI 3032 & SCB 4042)

PSM 1 EVALUATION FORM

Session/Semester:

Instruction: This form needs to be filled in Three (3) copies (1 for Supervisor and 2 for Examiners). Student, please complete Section A and put each forms in proposal report for supervisor and examiners during submission for PSM 1 presentation evaluation.

SECTION A: STUDENT INFORMATION

Student Name :

Project Title :

Supervisor :

Examiner 1 :

Examiner 2 :

SECTION B: EVALUATION

	Section	Criteria/ Assessment	Marks					Section Mark	Total Mark / 100	
			0	1	2	3	4			5
Supervisor	B(1) Supervision (10%)	Log Book	0	1	2	3	4	5	/20	/10
		Meeting Frequency	0	1	2	3	4	5		
		Work Ethic	0	1	2	3	4	5		
		Self Reliance /Independent	0	1	2	3	4	5		
Supervisor	B(2) Progress Report 1 (10%)	Completeness of Chapter 1	0	1	2	3	4	5	/20	/10
		Completeness of Chapter 2	0	1	2	3	4	5		
		Writing Style and Format	0	1	2	3	4	5		
		Citation and References	0	1	2	3	4	5		

Supervisor	B(3) Progress Report 2 (10%)	Completeness of Chapter 3	0	1	2	3	4	5	/20	/10		
		Completeness of Chapter 4	0	1	2	3	4	5				
		Writing Style and Format	0	1	2	3	4	5				
		Citation and References	0	1	2	3	4	5				
Supervisor/Examiner	B(4) Final Report (30%)	Chapter 1	0	1	2	3	4	5	/30	/30		
		Chapter 2	0	1	2	3	4	5				
		Chapter 3	0	1	2	3	4	5				
		Chapter 4	0	1	2	3	4	5				
		Writing Styles and Format	0	1	2	3	4	5				
		Citation and References	0	1	2	3	4	5				
Supervisor/Examiner	B(5a) System Design (25%)	System Flow and Architecture	0	1	2	3	4	5	/25	/25		
		Database Design	0	1	2	3	4	5				
		UML Design	0	1	2	3	4	5				
		Gantt Chart	0	1	2	3	4	5				
		Interface Design	0	1	2	3	4	5				
	OR											
	B(5b) Problem Formulation and Research Design	Introduction/ Problem Background	0	1	2	3	4	5				
		Research Problem/ Question	0	1	2	3	4	5				
		Organization and Synthesis	0	1	2	3	4	5				
		Research phases	0	1	2	3	4	5				
Experiment Design/Research Procedure		0	1	2	3	4	5					
Examiner	B(6) Presentation (15%)	Appearance	0	1	2	3	4	5	/20	/15		
		Mannerism	0	1	2	3	4	5				
		Q&A	0	1	2	3	4	5				
		Clarity of Presentation	0	1	2	3	4	5				
TOTAL										/ 100		

Instruction guideline to fill in this form for a supervisor and an examiner

[Supervisor]:

* If student's project is a system development-based project, supervisor fill up: B(1), B(2), B(3), B(4) and B(5a)

* If student's project is a research-based project, supervisor fill up: B(1), B(2), B(3), B(4) and B(5b)

[Examiner]:

* If student's project is a system development-based project, examiner fill up: B(4), B(5a) and B(6)

* If student's project is a research-based project, examiner fill up: B(4), B(5b) and B(6)

SECTION C: COMMENTS

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Date:

Signature:

SECTION D: CORRECTION ENDORSEMENT

SUPERVISOR SIGNATURE:

EXAMINER SIGNATURE:

Appendix A.6: Chairperson Comment Form (PSM.CI.06)

 <p style="font-size: 24pt; font-weight: bold; margin: 0;">UTM</p> <p style="font-size: 8pt; margin: 0;">UNIVERSITI TEKNOLOGI MALAYSIA</p> <hr style="width: 50%; margin: 0 auto;"/> <p style="font-size: 8pt; margin: 0;">RESEARCH UNIVERSITY</p>	<p style="text-align: center; font-weight: bold; margin: 0;">FACULTY OF COMPUTING</p> <p style="text-align: center; font-weight: bold; margin: 0;">UNIVERSITI TEKNOLOGI MALAYSIA</p>
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**PSM 1 (SCR/SCJ/SCV/SCD/SCI 3032 & SCB 4042)
CHAIRPERSON COMMENT FORM**

Session/Semester:

Instruction: Please complete Section A and submit this form to the Department Coordinator. Complete this form in ONE(1) copy.

SECTION A: STUDENT DETAILS

Student Name :

Project Title :

.....

Chairman Name :

SECTION B: CHAIRMAN COMMENT'S CONCLUSION

Guidance: PSM Chairman has to fill in this space by listing all the comments from all the comments by the evaluator panel. Please give this form that had been completed to the student after presentation session.

Comment Conclusion: *Please use attachments if the space provided is not enough.*

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Date:

Chairman's Signature:

Appendix A.7: Report Correction and Resubmission Form (PSM.CI.07)

 UTM <small>UNIVERSITI TEKNOLOGI MALAYSIA</small> <small>RESEARCH UNIVERSITY</small>	FACULTY OF COMPUTING UNIVERSITI TEKNOLOGI MALAYSIA
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PSM 1 (SCR/SCJ/SCV/SCD/SCI 3032 & SCB 4042)
REPORT CORRECTION AND RESUBMISSION FORM

Session/Semester:

Instruction: Student - Please submit a completed form to the PSM1 Department Coordinator.

SECTION A: STUDENTS DETAILS *(to be completed by Student)*

Name :

Project Title :

Year/Course :

No.KP/Passport : Matric No. :

E-mel : No. Tel/HP :

Date : Signature :

SECTION B: EXAMINER DECLARATION *(to be completed by Examiner)*

I declared
 had reviewed the Project Report Suggestion Correction for the student as mentioned
 in the above.

Date: Signature:

Official Stamp

SECTION C: EXAMINER DECLARATION *(to be completed by Examiner)*

I declared
 had accepted and reviewed the Project Report Suggestion Correction also accepting
 the Log Book for this respective students as mentioned in the above.

Date: Signature:

Official Stamp

Appendix A.8: PSM Project Log Book (PSM.CU.01)



*FACULTY OF
COMPUTING*

**FINAL YEAR PROJECT (PSM)
STUDENT LOG BOOK**

PROJECT TITLE

.....
.....
.....
.....

STUDENT INFO

Name :

Student ID :

Email :

Mobile No :

Department : IS / SE / CS

SUPERVISOR INFO

Main Supervisor :

Email :

Co-Supervisor (if applicable):.....

STUDENT LOG BOOK NOTES

- 1) This log book need to be used by a PSM 1 and PSM 2 student for a purpose of reporting all progress of their PSM projects.
- 2) It is the responsibility of the student that this log book is **kept up to date** and that the student complies with the Supervisor's suggestions and recommendations as noted by the student in the log book and approved by the Supervisor.
- 3) Student **MUST** makes a regular meeting with a supervisor at least **ONCE** in **TWO WEEKS**. A minimum number of meetings for PSM student-supervisor meeting are 6 times per semester.
- 4) A PSM Department Coordinator and supervisor have a right for not to allow the student to present their project if this regulation is not complied.
- 5) This log book has to be submitted together with the proposal report (for PSM 1) and the final thesis report (for PSM 2) as stated in the PSM Activities Calendar.
- 6) The Faculty of Computing reserves right not to accept thesis for examination if this log book is not properly documented.



FACULTY OF COMPUTING
UNIVERSITI TEKNOLOGI MALAYSIA

PSM LOG BOOK

SEMESTER: TYPE: PSM 1 / PSM 2

Date :...../...../..... Meeting: 1 / 2 / 3 / 4 / 5 / 6 / 7

Student :
(Meeting Minute/
Achievements/
Activities)*
.....
.....
.....

Supervisor :
(Suggestion &
Comments)
.....
.....
.....
.....

Next Meeting :
Plan
.....
.....
.....
.....

Supervisor's
Signature
Date:

** Print this page to add more meeting reports*

APPENDIX B: PSM 2 Forms

- B.1 Evaluation Form (PSM.AII.03)**
- B.2 Report Review and Approval Form (PSM.AII.02)**
- B.3 Chairperson Comment Form (PSM.CII.06)**
- B.4 Report Submission Form (PSM.CII.05)**
- B.5 Report Correction and Resubmission Form (PSM.CII.07)**
- B.6 Thesis Submission Form (PSM.CII.08)**
- B.7 Declaration of Thesis Status (PSZ 19-16)**
- B.8 Thesis Submission Checklist**
- B.9 PSM 2 Guidelines for CD Format and Thesis Hardbound**

Appendix B.1: Evaluation Form (PSM.AII.03)

 UTM <small>UNIVERSITI TEKNOLOGI MALAYSIA</small> <small>RESEARCH UNIVERSITY</small>	FACULTY OF COMPUTING UNIVERSITI TEKNOLOGI MALAYSIA
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PSM 2 (SCR/SCJ/SCB/SCV/SCD/SCI 4134) EVALUATION FORM

Session/Semester:

Instruction: This form needs to be filled in Three (3) copies (1 for Supervisor and 2 for Examiners). Student, please complete Section A and gives the form to your supervisor for his/her evaluation (start Week 6 – for Project Progress 1). For examiners, submit during submission for final presentation.

SECTION A: STUDENT INFORMATION

Student Name :

Project Title :

Supervisor :

Examiner 1 :

Examiner 2 :

SECTION B: EVALUATION

	Section	Criteria/ Assessment	Marks					Section Marks	Total Marks / 100	
			0	1	2	3	4			5
Supervisor	B(1) Supervision (10%)	Log Book	0	1	2	3	4	5	/20	/10
		Meeting Frequency	0	1	2	3	4	5		
		Work Ethic	0	1	2	3	4	5		
		Self Reliance/Independent	0	1	2	3	4	5		
Supervisor	B(2) Progress Report (10%)	Completeness of Chapter 4	0	1	2	3	4	5	/20	/10
		Completeness of Chapter 5	0	1	2	3	4	5		
		Writing Style and Format	0	1	2	3	4	5		
		Citation and References	0	1	2	3	4	5		
Supervisor	B(3) Project Progress 1 (5%)	Milestone Achieved	0	1	2	3	4	5	/15	/5
		Project Execution Follows Planning	0	1	2	3	4	5		
		Knowledge and Skill Improvement	0	1	2	3	4	5		

Supervisor	B(4) Project Progress 2 (5%)	Milestone Achieved	0	1	2	3	4	5	/15	/5		
		Project Execution Follows Planning	0	1	2	3	4	5				
		Knowledge and Skill Improvement	0	1	2	3	4	5				
Supervisor/Examiner	B(5a) Final Report System Development (30%)	Introduction	0	1	2	3	4	5	/30	/30		
		Literature Review	0	1	2	3	4	5				
		Methodology	0	1	2	3	4	5				
		System Design	0	1	2	3	4	5				
		Implementation	0	1	2	3	4	5				
		Discussion and Analysis	0	1	2	3	4	5				
	OR											
	B(5b) Final Report Research Based (30%)	Introduction	0	1	2	3	4	5				
		Literature Review	0	1	2	3	4	5				
		Methodology	0	1	2	3	4	5				
		Research/Experiment Design	0	1	2	3	4	5				
		Research Testing and Analysis	0	1	2	3	4	5				
Discussion and Conclusion		0	1	2	3	4	5					
Supervisor/Examiner	B(6a) System (30%)	Fulfill Aims, Objectives and Scopes	0	1	2	3	4	5	/30	/30		
		Programming/Experiments and Analysis	0	1	2	3	4	5				
		Completeness	0	1	2	3	4	5				
		Contribution to Knowledge	0	1	2	3	4	5				
		Testing	0	1	2	3	4	5				
		Creativity/Interface	0	1	2	3	4	5				
	OR											
	B(6b) Research Output (30%)	Research Problem/ Question	0	1	2	3	4	5				
		Research Design	0	1	2	3	4	5				
		Experiment/ Procedure/ Process	0	1	2	3	4	5				
		Research Results	0	1	2	3	4	5				
		Result Analysis and Discussion	0	1	2	3	4	5				
Contribution to Knowledge		0	1	2	3	4	5					
Examiner	B(7) Presentation (10%)	Appearance	0	1	2	3	4	5	/20	/10		
		Mannerism	0	1	2	3	4	5				
		Q&A	0	1	2	3	4	5				
		Clarity of Presentation	0	1	2	3	4	5				

Instruction guideline to fill in this form for a supervisor and an examiner

[Supervisor]:

* If student's project is a system development-based project, supervisor fill up: B(1), B(2), B(3), B(4), B(5a) and B(6a)

* If student's project is a research-based project, supervisor fill up: B(1), B(2), B(3), B(4), B(5b) and B(6b)

[Examiner]:

* If student's project is a system development-based project, examiner fill up: B(5a), B(6a) and B(7)

* If student's project is a research-based project, examiner fill up: B(5b), B(6b) and B(7)

SECTION C: COMMENTS

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Date:

Signature:

Official Stamp

SECTION D: CORRECTION ENDORSEMENT

SUPERVISOR:

EVALUATOR:

Appendix B.2: Report Review and Approval Form (PSM.AII.02)

 <b style="font-size: 24pt; margin-left: 10px;">UTM <small>UNIVERSITI TEKNOLOGI MALAYSIA</small> <small>RESEARCH UNIVERSITY</small>	FACULTY OF COMPUTING UNIVERSITI TEKNOLOGI MALAYSIA
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PSM 2 (SCR/SCJ/SCB/SCV/SCD/SCI 4134) REPORT REVIEW AND APPROVAL FORM

Session/Semester:

Instruction: [Student] Please complete Section A of this form. [Supervisor] Please complete Section B and C. Then, student submits the completed form with the corrected Final Report for PSM 2 evaluation to the PSM 2 Department Coordinator. This form must be filled in (1) copy.

SECTION A: STUDENT INFORMATION

Student Name :

Project Title :

.....

Supervisor Name :

SECTION B: MEETING FREQUENCY

Guideline: Please fill in this section according to the meeting frequency of the student and the supervisor. Mark \surd in the appropriate box.

3. Meeting Frequency:

- Sufficient (*at least once every TWO (2) weeks*)
- Not Sufficient

4. If Not Sufficient:

- Warning Letter I has been issued to student
- Warning Letter II has been issued to student

SECTION C: SUPERVISOR DECLARATION AND REPORT

Guideline: Please state status of the student's final report (mark \surd in the appropriate box). You may provide written report if necessary.

1. I hereby declare that:

The student final report meets the PSM 2 scope.
Student can do his/her PSM 2 presentation.

Pass	
-------------	--

The student final report need to be modified
to meet the PSM 2 scope. Student is allowed
to present only if the condition are satisfied

Conditional Pass	
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The student final report did not meet PSM 2 scope.
Student cannot do his/her presentation.

Fail	
-------------	--

Appendix B.3: Chairperson Comment Form (PSM.CII.06)

 <p style="font-size: 24pt; font-weight: bold; margin: 0;">UTM</p> <p style="font-size: 8pt; margin: 0;">UNIVERSITI TEKNOLOGI MALAYSIA</p> <hr style="width: 100%; border: 0.5px solid black;"/> <p style="font-size: 8pt; margin: 0;">RESEARCH UNIVERSITY</p>	<p style="font-weight: bold; margin: 0;">FACULTY OF COMPUTING</p> <p style="font-weight: bold; margin: 0;">UNIVERSITI TEKNOLOGI MALAYSIA</p>
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**PSM 2 (SCR/SCJ/SCB/SCV/SCD/SCI 4134)
CHAIRPERSON COMMENT FORM**

Session/Semester:

Instruction: Please complete Section A and submit this form to the Department Coordinator. Complete this form in ONE(1) copy.

SECTION A: STUDENT DETAILS

Student Name :

Project Title :

.....

Chairman Name :

SECTION B: CHAIRMAN COMMENTS

Guidance: PSM Chairman has to fill in this space by listing all the comments from all the comments by the evaluator panel. Please give this form that had been completed to the student after presentation session.

Comment Conclusion: *Please use attachments if the space provided is not enough.*

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Date:

Chairman's Signature:

Appendix B.4: Report Submission Form (PSM.CII.05)

 <p style="font-size: 24pt; font-weight: bold; margin: 0;">UTM</p> <p style="font-size: 8pt; margin: 0;">UNIVERSITI TEKNOLOGI MALAYSIA</p> <hr style="width: 50%; margin: 0 auto;"/> <p style="font-size: 8pt; margin: 0;">RESEARCH UNIVERSITY</p>	<p style="text-align: center; font-weight: bold; margin: 0;">FACULTY OF COMPUTING</p> <p style="text-align: center; font-weight: bold; margin: 0;">UNIVERSITI TEKNOLOGI MALAYSIA</p>
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**PSM 2 (SCR/SCJ/SCB/SCV/SCD/SCI 4134)
REPORT SUBMISSION FORM**

Session/Semester:

Instruction: Submit the completed form to the PSM2 Department Coordinator.

SECTION A: MAKLUMAT PELAJAR

Name :

Project Title :

.....

Supervisor :

Year/Course :

NRIC : Student ID :

E-mail : Mobile Number :

Date : Signature :

SECTION B: SUPERVISOR CERTIFICATION

I hereby certify that I have received a copy of the above mentioned student final draft final year project report.

Date : Signature :

Official Stamp

SECTION C: PSM 2 DEPARTMENT COORDINATOR

I hereby certify that I have received a copy of the above mentioned student final draft final year project report.

Date : Signature :

Official Stamp

Appendix B.5: Report Correction and Resubmission Form (PSM.CII.07)

 UTM <small>UNIVERSITI TEKNOLOGI MALAYSIA</small> <small>RESEARCH UNIVERSITY</small>	FACULTY OF COMPUTING UNIVERSITI TEKNOLOGI MALAYSIA
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PSM 2 (SCR/SCJ/SCB/SCV/SCD/SCI 4134)
REPORT CORRECTION & RESUBMISSION FORM

Session/Semester:

Instruction: Please complete Section A, B and C then submit to the PSM 2 Department Coordinator

SECTION A: STUDENT DETAILS

Name :

Project Title :

Supervisor :

Year/Course :

NRIC : Student ID :

E-mail : Mobile Number :

Date : Signature :

SECTION B: CERTIFIED by EXAMINER/S

[Examiner 1]: I, certify that I have reviewed the correction of the Project Suggestion's Report of the student named above.

Date : Signature :

[Examiner 2 – if required]: I, certify that I have reviewed the correction of the Project Suggestion's Report of the student named above.

Date : Signature :

SECTION C: CERTIFIED by SUPERVISOR

I, certify that I have accepted and reviewed the correction and the PSM Log Book of the student named above.

Date : Signature :

(Official stamp)

Appendix B.6: Thesis Submission Form (PSM.CII.08)

 <b style="font-size: 2em; font-weight: bold;">UTM <small>UNIVERSITI TEKNOLOGI MALAYSIA</small> <hr style="width: 100%;"/> <small>RESEARCH UNIVERSITY</small>	FACULTY OF COMPUTING UNIVERSITI TEKNOLOGI MALAYSIA
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PSM 2 (SCR/SCJ/SCB/SCV/SCD/SCI 4134) THESIS AND CD SUBMISSION FORM

Session/Semester:

Instruction: Submit the complete form to the a) Supervisor, b) Department Coordinator and c) Faculty office.

SECTION A: STUDENT DETAILS

:

Name

Project Title :

:

Supervisor :

Year/Course :

NRIC : Student ID :

E-mail : Mobile Number :

Date : Signature :

SECTION B: SUPERVISOR CERTIFICATION

I hereby certify that I have received a copy of thesis AND a copy of CD from the above mentioned student.

Date : Signature :

Official Stamp

SECTION C: DEPARTMENT COORDINATOR CERTIFICATION

I hereby certify that I have received a copy of thesis AND a copy of CD from the above mentioned student.

Date : Signature :

Official Stamp

SECTION D: ACADEMIC OFFICE CERTIFICATION

I hereby certify that I have received a copy of thesis AND a copy of CD from the above mentioned student.

Date : Signature :

Official Stamp

Appendix B.7: Declaration of Thesis Status (PSZ 19-16)**UNIVERSITI TEKNOLOGI MALAYSIA****DECLARATION OF THESIS STATUS**

Author's full name : _____

Date of birth : _____

Title : _____

Academic Session : _____

I declare that this thesis is classified as:

- CONFIDENTIAL** (Contains confidential information under the Official Secret Act 1972)*
- RESTRICTED** (Contains restricted information as specified by the organization where research was done)*
- OPEN ACCESS** I agree that my thesis to be published as online open access (full text)

I acknowledged that Universiti Teknologi Malaysia reserves the right as follows:

1. The thesis is the property of Universiti Teknologi Malaysia.
2. The Library of Universiti Teknologi Malaysia has the right to make copies for the purpose of research only.
3. The Library has the right to make copies of the thesis for academic exchange.

Certified by:

*SIGNATURE OF STUDENT**SIGNATURE OF SUPERVISOR*_____
(NEW IC NO. /PASSPORT NO.)_____
NAME OF SUPERVISOR

Date:

Date:

NOTES: * If the thesis is CONFIDENTIAL or RESTRICTED, please attach with the letter from the organization with period and reasons for confidentiality or restriction.

Appendix B.8: Thesis Submission Checklist

 UTM <small>UNIVERSITI TEKNOLOGI MALAYSIA</small> <small>RESEARCH UNIVERSITY</small>	FACULTY OF COMPUTING UNIVERSITI TEKNOLOGI MALAYSIA
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PSM 2 (SCR/SCJ/SCB/SCV/SCD/SCI 4134) THESIS SUBMISSION CHECKLIST

Session/Semester:

Instruction: Please complete and submit this form to the PSM 2 Department Coordinator. A failure to submit items as listed in Section B will result in the suspension of the students' results.

SECTION A: STUDENT INFORMATION

Name :

Year/Course :

IC. No. : Matrix No. :

Project Title :

SECTION B: CHECKLIST

Three (3) copies of hard bound thesis. (*Note: Theses must follow UTM thesis format.*)

	CD or DVD that contains the following information: [√] <ul style="list-style-type: none"> _____ Thesis document (format: doc/tex) _____ Thesis document (format: Pdf) _____ Abstract (format: Pdf) _____ Poster (use FYP_Poster template) _____ Prototype _____ Source code _____ Application software (used during development)
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Supervisor Name :

Date : Signature :

Official Stamp

Appendix B.9: PSM 2 Guidelines for CD Format and Thesis Hardbound



PSM 2 (SCR/SCJ/SCB/SCV/SCD/SCI 4134) GUIDELINES FOR CD FORMAT and THESIS HARDBOUND

[SECTION A: COMPACT CD FORMAT]

Student is required to submit 3 copies of CD of different content:

- 1) **TWO copies of CD to be submitted to the Departmental FYP Coordinator and Supervisor along with your Hardbound Thesis with the following format:**
 - a) A **front cover** with the following details:
 - i. Title, Session & Semester, Department, Name, Supervisor Name, Supervisor Signature
 - ii. The content:
 - The developed software, source code & executable software (.exe)
 - Set up file
 - Soft copy of the thesis
 - User Manual
 - *Read Me* (guideline to use the CD)
 - b) A **back cover** with the following:
 - Abstract
 - Admin User ID: admin, Password: admin
 - User ID: user, Password : user
 - Source code directory organization:
 - //psm//database (state DNS and file name)
 - //psm//photo
 - c) Use **PINK** colored cover.
- 2) **ONE copy of CD to be submitted to the Faculty Academic Office (along with your Hardbound Thesis) for the library copy with the following format:**
 - a) A **front cover** with the following details:
 - Title, Session & Semester, Department, Name, Supervisor Name, Supervisor Signature
 - The content:
 - A copy of full thesis (refer Electronic Thesis (ET)* in the next page)
 - A copy of pre-access thesis (refer Electronic Thesis (ET)* in the next page)
 - b) A **back cover** with the following:
 - Abstract
 - c) Use PINK colored cover.

Electronic Thesis (ET)

1) ET Contents

a. Pre-Access File

Pre-access file is a file that contains information about the author and a brief content of the thesis. The pre-access file should include the contents listed in Table 1.

Table 1: Pre-Access File Contents

Page	Contents
i.	Thesis Full Title: Name: Degree: Faculty: Submission Date:
ii.	Declaration of Thesis Form PSZ 19:16
iii.	Student Declaration
iv.	Supervisor Declaration
v.	Acknowledgement
vi	Abstrak /Abstract
vii.	Table of Contents
viii.	Chapter 1

All information in Table 1 must be saved in one file.

b. Full thesis file

A full text file consists of all contents of the thesis that has been approved by the panel of examiners. This includes all preliminary pages, main contents of the thesis and all appendices as submitted to the panel of examiners and approved. The thesis must strictly written following the guideline and format in the UTM Thesis Manual. All the pages must be saved into one (1) file only.

2) Preparation Guideline

The following guidelines must be followed:

- The electronic version must be the same as the final bound thesis as approved by the Senate;
- Convert the thesis into PDF format. Use the latest version of Adobe Acrobat PDF Maker. **Do not set Document Security**;
- All pages which contain signatures of student and supervisor must be scanned;
- If the status of a thesis is CONFIDENTIAL or RESTRICTED, electronic version is still required but must be properly indicated in the Thesis Status Declaration form;
- Two files must be generated. The first file is for the purpose of pre-access that will be made accessible to the public. The second file is the full text file. The files should be named as follows code description:

`<name><matrixno><p><tt><ss><c>.pdf`

Code description:

`<name>` is the student's first name (without surname or father's name)

`<matrixno>` is the student's matrix card number

`<p>` is the university where the thesis was submitted

d – UTM

l – other than UTM

`<tt>` is the year approved

`<ss>` is the thesis status

su – confidential

[SECTION B: THESIS BINDING FORMAT]

Student is required to bind 4 copies of Hardbound Thesis:

- 1) **ONE copy to the Faculty Academic Office**
- 2) **ONE copy to the Departmental FYP Coordinator**
- 3) **ONE copy to the Supervisor**
- 4) **ONE for Student own copy**

a) Thesis Color: **Maroon** (for Faculty of Computing)

b) Thesis Front Page:

-site-	-front-
STUDENT NAME	THESIS TITLE
COURSE SIGN	STUDENT NAME
2013 UTM	UNIVERSITI TEKNOLOGI MALAYSIA

a) Course Sign at the site of the Thesis:

Course	Language*	Course Sign
SCR4134	Malay	Ijazah Sarjana Muda Sains Komputer (Rangkaian Komputer & Keselamatan)
	English	Bachelor of Computer Science (Computer Network & Security)
SCJ4134	Malay	Ijazah Sarjana Muda Sains Komputer (Kejuruteraan Perisian)
	English	Bachelor of Computer Science (Software Engineering)
SCB4134	Malay	Ijazah Sarjana Muda Sains Komputer (Bioinformatik)
	English	Bachelor of Computer Science (Bioinformatics)
SCD4134	Malay	Ijazah Sarjana Muda Sains Komputer (Pangkalan Data)
	English	Bachelor of Computer Science (Database)
SCI4134	Malay	Ijazah Sarjana Muda Sains Komputer (Pengkomputeran Industri)
	English	Bachelor of Computer Science (Industrial Computing)
SCV4134	Malay	Ijazah Sarjana Muda Sains Komputer (Grafik dan Perisian Multimedia)
	English	Bachelor of Computer Science (Graphics & Multimedia Software)

*Language – Use of sign depends on the writing language of your thesis

APPENDIX C: PSM Academic Calendar

C.1 PSM 1 Academic Calendar

C.2 PSM 2 Academic Calendar

Appendix C.1: PSM 1 Academic Calendar



FINAL YEAR PROJECT 1 (PSM 1) [SCR/SCI/SCJ/SCV/ SCD 3032 and SCB4042]

ACTIVITIES SCHEDULE (Semester 2 2013/2014)

	Activity	Date	Week	Actions
1.	Initial Briefing about PSM (Week 15 previous sem)	December 2013	Final week of last semester	Student, Lecturer
2.	PSM1 Seminar at Seminar Hall, N28a 1) Student make a decision which PSM Project Stream he/she wants to take: <ul style="list-style-type: none"> - For Research Stream – Enter *UROP class start at Week 2 - For System Development Stream – continue PSM 1 Course Class (e.g. SCR enter SCR3032 class) <i>*UROP – Undergraduate Research Opportunity Program</i> 2) Briefing on Business Model Canvas (BMC) by UTMTEC 3) List of Lecturer and their expertise is released by PSM 1 coordinator	11/2/14	1	Student, PSM 1 Lecturer
3.	Student choose PSM Project Supervisor.	9/2/14 – 20/2/14	1 - 2	Student, Lecturer /Supervisor
4.	BMC Workshop at Seminar Hall, N28a (compulsory to all PSM1 students)	18/2/14 (2 – 4 pm)	2	Student, PSM1 Coordinator/ Lecturers, UTMTEC Committee
5.	Student Submit to PSM1 coordinator i) ONE copy of Project Supervision Consent Form (PSM.CI.02) ii) ONE filled up copy of Project Proposal Form (PSM.CI.03)	23/2/14	3	Student, Supervisor, PSM1Coordinator
6.	List of Supervisor is released by PSM 1 coordinator	25/2/14	3	PSM1Coordinator
7.	Project Proposal Interview	26/2/14	3	Student, PSM1Coordinator Examiners

8.	List of Interview Result will be released by PSM1 Coordinator	27/2/14	3	PSM1Coordinator
9.	<i>(Only for students who FAIL, or PASSED WITH MAJOR CORRECTION – in the Phase 1)</i> a) Student submits to the Department Coordinator: i. ONE filled up of Project Proposal Form (PSM.CI.03) (Repeat) b) Project Proposal Interview (2 nd) c) List of Interview Result is released (2 nd)	2/3/14 3/3/14 4/3/14	4 4 4	Student, PSM1Coordinator
10.	BMC Competition at Seminar Hall, N28a	11/3/14 (2 – 4 pm)	5	Student, PSM1 Coordinator/ UTMTEC Committee
11.	Important: Deadline for Drop Subject (E Grade (Fail) will be given for an incomplete project)	10/4/14	9	Student
12.	Briefing on <u>PSM 1 Presentation Seminar Preparation</u> and Report Submission by FC PSM Coordinator <i>(Details venue will be announced through e-Learning)</i>	15/4/14 (2 pm)	10	Student, FC PSM Coordinator
13.	Student submits to Supervisor: i. ONE copy of Project Proposal Report Draft ii. ONE copy of Report Review and Approval Form – (PSM.AI.02)	20/4/14	11	Student, Supervisor
14.	1) Reviewing period of Project Proposal Report draft by Supervisor 2) PSM 1 Coordinator prepares PSM 1 Presentation Schedule	27/4/14 - 29/4/14	12	Supervisor PSM1Coordinator
15.	Supervisor: i. Submit the Report Review and Approval Form – (PSM.AI.02) to the Department Coordinator iii. Return the corrected Project Proposal Report Draft to students for correction.	30/4/14	12	Supervisor, PSM1Coordinator Student PSM1Coordinator
16.	Report correction period for Student based on Supervisor's comments	4/5/14 - 8/5/14	13	Student, Supervisor
17.	<u>PSM 1 Presentation Schedule</u> is released by PSM 1 Coordinator	8/5/14	13	PSM1Coordinator
18.	Student submits to the PSM1 Coordinator: i. THREE copies of Project Proposal Report a. Two for Examiners b. One for Supervisor ii. ONE copy of Project Proposal Report Submission Form - (PSM.CI.05) iii. ONE copy of PSM1 Evaluation Form - (PSM.BI.01) for Supervisor iv. TWO copies of PSM1 Evaluation Form - (PSM.BI.01) for Examiners a. Two for Examiners	11/5/14	14	Student, PSM1Coordinator

	v. ONE copy of Chairperson Comment Form – (PSM.CI.06) vi. ONE copy of PSM Log Book – (PSM.CU.01) for Supervisor			
19.	PSM 1 Presentation After presentation, Examiners and Chairperson can discuss their comments regarding student's Project Proposal Report or his/her project.	25/5/14 - 26/5/14	16	Student, PSM1Coordinator Supervisor, Examiners
20.	a) Examiners submit their PSM 1 Evaluation Forms (as stated in 18(i)) to a PSM 1 Coordinator b) Supervisor submits the PSM 1 Evaluation Form (as stated in 18(i)) to a PSM 1 Coordinator	29/5/14	16	Examiners, Supervisor, PSM1Coordinator
21.	Student makes correction to their report based on comments from Examiner I and II and Supervisor. <i>However, the marks given by supervisor and examiners are based on presentation week (Week 16)</i>	until 29/5/14	16	Student, Supervisor
22.	Student submits to the PSM 1 Coordinator: - ONE copy of Report Correction and Resubmission Form – (PSM.CI.07) - Collects the certified PSM Log Book – (PSM.CU.01) from a supervisor and continues use the log for reporting the PSM 2's progress.	3/6/14	17	Student, PSM1Coordinator
23.	PSM 1 Result Meeting a) Department Level b) Faculty Level	8/6/14 9/6/14	18	Supervisor, Examiners & PSM1Coordinator PSM Committee
24.	PSM 1 Coordinator submits the finalized PSM1 Result to the a) Academic Office and b) FC PSM Coordinator	15/6/14	19	FC PSM Coordinator
25.	Meeting of Senate's Standing Committee on Examinations/Results of Semester II, Session 2012/2013	23/7/14		
26.	Submission of a completed Project Proposal Report to the PSM 1 Coordinator (<i>Only for students whom wish to propose for a new project proposal</i>)	Before 5/7/14		Student, PSM1Coordinator

*Week 16 is a Study Week

* All these forms can be downloaded from <http://comp.utm.my/psm>

Appendix C.2: PSM 2 Academic Calendar



FINAL YEAR PROJECT 2 (PSM 2) [SCR/SCI/SCJ/SCV/SCD/SCB 4134]

ACTIVITIES SCHEDULE (Semester 2 2013/2014)

Bil	Activity	Date	Week	Action
1.	1) Briefing PSM 2 by FC PSM Coordinator 2) Student continues makes a report on PSM 2 progress by using the PSM Log Book (PSM.CU.01) from PSM 1	18/2/14 (2 pm)	2	Student & FC PSM Coordinator
2.	List of Students and Supervisors with PSM 2 Titles is released by PSM 2 Coordinator for review (through e-Learning) and PSM Board at each department	23/2/14	3	Student & PSM2 Coordinator
3.	<u>Project Progress Assessment (Phase 1)</u> <u>(40% Project Finish)</u> a) Student submits to the Supervisor: i. ONE copy of PSM2 Evaluation Form (PSM.AII.03) - Supervisor needs to fill up the Part Project Progress 1 only Along with b) Student submits Log Book to be revised by Supervisor: ii. PSM Log Book (PSM.CU.01)	16/3/14	6	Student & Supervisor
4.	a) Supervisor reports to the PSM2 Coordinator of their student/s Phase 1 progress. b) Department Coordinator issues a Warning Letter to student who failed to present their Phase 1 progress assessment.	18/3/14	6	Supervisor & PSM2 Coordinator
5.	Important: Deadline for Drop Subject (E grade (Fail) will be given for an incomplete project)	10/4/14	9	Student
6.	<u>Project Progress Assessment (Phase 2)</u> <u>(70% Project Finish)</u> a) Student presents Phase 2 progress: i. Supervisor continues use the same previous PSM2 Evaluation Form (PSM.AII.03) and fill up the Part Project Progress 2 only ii. Revise student's PSM Log Book (PSM.CU.01)	20/4/14	11	Student & Supervisor
7.	a) Supervisor reports to the PSM2 Coordinator regarding their student/s Phase 2 progress. b) FC PSM Coordinator issues a Warning Letter to a student who failed to present their Phase 2 progress assessment.	21/4/14	11	Supervisor & PSM2 Coordinator

8.	Student submits to Supervisor: iv. ONE copy of Project Final Report Draft v. ONE copy of Report Review and Approval Form	27/4/14	12	
9.	Reviewing period of Project Final Report Draft by Supervisor	27/4/14 - 1/5/14	12	Supervisor
10.	Supervisor: ii. Submits the Report Review and Approval Form – to the PSM2 Coordinator iii. Return the corrected Project Final Report Draft to students for correction.	4/5/14	13	Student, Supervisor, PSM2 Coordinator
11.	Report correction period for Student based on Supervisor's comments	Until 8/5/14	13	Student
12.	PSM 2 Project Presentation Seminar Preparation a) Briefing on PSM 2 Presentation & Demo Preparation by FC PSM Coordinator b) Schedule for PSM 2 Project Presentation Seminar is released by the PSM 2 Coordinator	6/5/14	13	Student & FC PSM Coordinator, PSM2 Coordinator
13.	Student submit to the Department Coordinator: i. THREE copies of Project Final Report a. Two for Examiners b. One for Supervisor ii. ONE copy of Report Submission Form - (PSM.CII.05) iii. TWO copies of PSM2 Evaluation Form - (PSM.AII.03) (for each examiner) iv. ONE copy of Chairperson Comment Form - (PSM.CII.06) v. ONE copy of the PSM Log Book (PSM.CU.01) (for supervisor)	11/5/14	14	Student & PSM2 Coordinator
14.	PSM 2 Presentation and Demo The Examiners return the Chairperson Comment Form and Project Final Report to student.	27/5/14 - 29/5/14	16	Student, PSM2 Coordinator, Examiners & Supervisor
15.	a) Examiners submit their PSM 2 Evaluation Forms (<i>as stated in 13(i)</i>) to a PSM 2 Coordinator b) Supervisor submits the PSM 2 Evaluation Form (<i>as stated in 13(i)</i>) to a PSM 2 Coordinator	2/6/14	17	Examiners, PSM2 Coordinator
16.	Student makes correction to their report based on comments from Examiner I and II and Supervisor. <i>However, the marks given by supervisor and examiners are based on presentation week (Week 16)</i> Student submit ONE copy of the revised Project Final Report to the : a) Examiners b) Supervisor	1/6/14	17	Student & Examiners
17.	Student submits to the PSM2 Coordinator: - ONE copy of Report Correction and Resubmission Form – (PSM.CII.07)	2/6/14	17	Student & PSM2 Coordinator
18.	Supervisor submits to the Department Coordinator: - ONE copy of PSM 2 Evaluation Forms (completed marks given)	2/6/14	17	Supervisor, Examiners & PSM2 Coordinator

19.	<p>For Thesis binding and CD Format preparation, refer “Guidelines For CD Format And Thesis Hardbound”. Hardbound Thesis and CD needs to be prepared for 4 COPIES :</p> <p>a) Submission to the Academic Office:</p> <p>i. ONE Hardbound Thesis</p> <p>ii. ONE copy of CD</p> <p>b) Submission to the PSM 2 Coordinator:</p> <p>i. ONE Hardbound Thesis</p> <p>ii. ONE copy of CD</p> <p>c) Submission to the Supervisor:</p> <p>i. ONE Hardbound Thesis</p> <p>ii. ONE copy of CD</p> <p>d) For Student copy (Optional):</p> <p>i. ONE Hardbound Thesis</p> <p>ii. ONE copy of CD</p> <p>Compulsory: University requirement - All PSM2 students are also requested to submit the FYP-One page Synopsis (by using a template which can be downloaded from PSM website). Burn the file into your CD.</p> <p><i>PSM Rule: TS (Tak Selesai/Not Finish) grade will be set as a student's grade if Hardbound Thesis is not submitted.</i></p>	11/6/14	18	Student, Supervisor, PSM2 Coordinator & Academic Office Clerk
20.	<p>PSM 2 Result Meeting</p> <p>a) Department Level</p> <p>b) Faculty Level</p>	8/6/14 9/6/14	18	Supervisor, Examiners & PSM Committee
21.	PSM2 Coordinator submit the finalized PSM2 Result to the a) Academic Office and b) FC PSM Coordinator	15/6/14	19	PSM2 Coordinator and FC PSM Coordinator
22.	The ICT Innovation and Exhibition (IDEAS 2014) Competition for undergraduate best selected projects	15/6/14	19	IDEAS committee, selected students, supervisors
23.	Meeting of Senate’s Standing Committee on Examinations/Results of Semester II, Session 2012/2013	23/7/14		

* All these forms can be downloaded from <http://comp.utm.my/psm>

APPENDIX D: Supervisor List of Experts

- D.1 Computer Science (CS) Department (Course SCSR)**
- D.2 Information System (IS) Department (Course SCSD)**
- D.3 Software Engineering (SE) Department
(Course SCSV, SCSB, SCSJ)**

Appendix D.1:
Computer Science (CS) Department (Course SCSR) – List of Expert

	Lecturer	EXPERTISE									
		Security	Grid/Parallel/ Distributed	Mobile Computing	Networking	Collaborative virtual environment	Systems/ Embedded	*Artificial Intelligent	*Optimization	*Data analysis	*System Development
1	Prof Dr. Aizaini Maarof	√									√
2	Prof Dr. Abdul Samad Ismail		√	√	√	√					
3	Prof. Dr. Habibollah Haron							√	√	√	√
4	Prof. Dr. Hanan Abdullah	√			√						√
5	Prof. Dr. Siti Mariyam Shamsuddin							√	√	√	√
6	PM Dr. Kamalrulnizam Abu Bakar	√	√	√	√						√
7	PM Dr. Mazleena Salleh	√			√						√
8	PM Dr. Md. Asri Ngadi	√		√	√						√
9	PM Dr. Salihin Ngadiman								√	√	√
10	PM Dr. Shafie Abd Latiff		√	√	√	√					√
11	PM Dr. Subariah Ibrahim	√									√
12	Dr. Anazida Zainal	√									√
13	Dr. Andri Mirzal							√	√	√	√
14	Dr. Antoni Wibowo							√	√	√	√
15	Dr. Dewi Nasien							√	√		√
16	Dr. Foad Rohani	√					√				√
17	Dr. Hasan Chizari			√	√		√	√	√		√
18	Dr. Ismail Fauzi Isnin	√		√						√	√
19	Dr. Maheyzah Md Sirat@Siraj	√					√	√	√		√
20	Dr. Majid Bakhtiari	√								√	√
21	Dr. Maznah Kamat			√	√						√

22	Dr. Mohamad Shukor Talib								√	√	√
23	Dr. Mohammad Abdur Razzaque		√	√	√						√
24	Dr. Mohd Soperi bin Mohd Zahid							√	√	√	√
25	Dr. Murtadha		√		√		√				√
26	Dr. Noorfa Haszlinna Mustaffa							√	√	√	√
27	Dr. Nor Azizah Ali							√	√	√	√
28	Dr. Nor Erne Nazira Bazin								√	√	√
29	Dr. Nor Haizan bt Mohamed Radzi							√	√	√	√
30	Dr. Norafida Ithnin	√									√
31	Dr. Raja Zahilah			√		√					√
32	Dr. Roselina Salleh							√	√	√	√
33	Dr. Sarina Sulaiman							√		√	√
34	Dr. Satria Mandala	√	√	√	√						√
35	Dr. Shukor Abdul Razak	√			√	√					√
36	Dr. Siti Hajar	√	√			√			√		√
37	Dr. Suhaila Mohamad Yusuf							√	√	√	√
38	Dr. Syed Zainudeen Mohd Shaid	√									
39	Dr. Yahaya Coulibaly				√					√	√
40	Ms. Azlina Kamarudin			√	√		√				√
41	Ms. Hazinah Kutty Mammi	√			√						√
42	Ms. Marina Md Arshad				√						√
43	Mr. Ahmad Fariz Ali									√	√
44	Mr. Firoz Yusuf Patel Dawoodi				√	√					
45	Mr. Hairudin Abdul Majid								√	√	√
46	Mr. Muhalim Mohamed Amin	√									√
47	Mr. Noh Abd Samad	√		√	√						√
48	Mrs. Lizawati Mi Yusuf		√					√	√	√	√

49	Mrs. Mazura Mat Din			√	√						√
50	Mrs. Rashidah Kadir	√									√
51	Mrs. Razana Alwee							√	√	√	√
52	Mrs. Suriati Sadimon										√
53	Mrs. Zuriahati Mohd Yunos							√		√	√
54	Mr. Tn. Syed Othmawi Abd. Rahman			√	√						√
Na	En. Mohamad Hafiz Mohamed				√						
Na	Mrs. Yusliza Yusoff										√
Na	Dr. Siti Sophiyati Yuhaniz							√	√	√	√
Na	En. Haswadi Hasan							√	√	√	√
Na	Dr. Azlan Mohd Zain							√	√	√	√
Na	Dr. Johan Mohamad Sharif	√		√	√		√				
Na	Dr. Azurah Abu Samah								√	√	√

**applied in the related field*

Appendix D.2:
Information System (IS) Department (Course SCSD) – List of Expert

NO.	LECTURER	Information Systems	Information Systems Development	Decision Support Systems	Project management	Database	Information Retrieval	DSS*	CRM**	Knowledge management
1	Ab Razak Che Husin, Dr	✓								
2	Alex Sim, Dr					✓	✓			
3	Aryati Bakri, Dr					✓		✓		
4	Azizah binti Abd Rahman, AP Dr									✓
5	Halina binti Mohd Dahlan, Dr			✓				✓		
6	Haslina Hashim, Miss	✓	✓							
7	Haza Nuzly Abdul Hamed, Dr		✓				✓			
8	Mahadi Bahari, Mr					✓				
9	Md Hafiz Selamat, Mr		✓		✓					
10	Mohd Iskandar bin Illyas, Mr								✓	✓
11	Mohd Nazir Bin Ahmad Sharif, Dr								✓	
12	Mohd Shahizan bin Othman, Dr					✓	✓			
13	Mohd Zaidi bin Abd Rozan, Dr				✓					
14	Naomie Salim, Prof Dr		✓				✓			
15	Nazmona Mat Ali, Dr	✓	✓							✓
16	Noorminshah binti A. Iahad, Dr		✓							✓
17	Nor Hawaniah binti Zakaria, Mrs									
18	Nor Hidayati Zakaria, Dr								✓	
19	Norasnita Ahmad, Mrs	✓	✓							
20	Othman bin Ibrahim, AP Dr	✓	✓		✓					✓
21	Roliana Ibrahim, Dr		✓			✓	✓			✓

22	Rose Alinda bt Alias, Prof Dr	✓	✓							
23	Rozilawati Dollah @ Md Zain, Mrs					✓	✓			
24	Suraya Miskon, Mrs	✓	✓							
25	Syed Norris Hikmi Syed Abdullah, Mr	✓	✓						✓	

**DSS - Decision Support System*

*** CRM - Customer Relationship Management*

Appendix D.3:
a) Software Engineering (SE) Department (Course SCSV) –
List of Expert

	Lecturer	EXPERTISE								
		Image Processing and Pattern Recognition	Human Computer Interaction	Computer Games	Visualization\ Object Modeling	Virtual Environment	*Artificial Intelligence	Speech Processing	Web Technology	*System Development
1	Prof. Dr. Ghazali Bin Sulong	√								√
2	Prof. Dr. Dzulkifli Bin Mohamad	√								√
3	Prof. Madya Nor Azman Bin Ismail		√							√
4	Prof. Madya Dr. Mohd. Shafry Bin Mohd Rahim	√		√	√	√				√
5	Prof. Madya Dr. Mohd. Shahrizal Bin Sunar	√		√		√				√
6	Datin Normal Binti Mat Jusoh		√	√						√
7	En. Farhan Bin Mohamed				√					√
8	Dr. Md. Sah Bin Hj. Salam	√					√	√		√
9	En. Jumail Bin Taliba	√					√		√	√
10	En. Mohd Razak Bin Samingan								√	√
11	En. Rosely Bin Kumoi								√	√
12	En. Nik Isrozaidi Bin Nik Ismail		√		√				√	√
13	Pn. Norhaida Binti Mohd. Suaib				√	√				√

**applied in the related field*

b) **Software Engineering (SE) Department (Course SCSB) –
List of Expert**



Prof. Dr. Safaai Deris
Computational
Systems Biology



**Assoc. Prof. Dr. Mohd Saberi
Mohamad**
High Performance Computing,
Cancer classification



Dr. Mohd Razib Othman
Remote Homology,
Gene Ontology



Dr. Rohayanti Hassan
Remote Homology,
Protein Structure Prediction



Dr. Zuraini Ali Shah
Protein Structure
Prediction,
Cancer classification



**Dr. Afnizanfaizal
Abdullah**
Computational
Systems Biology,
Biological Modeling,
Synthetic Biology



**Mrs. Hamimah Mohd
Jamil**
Protein Docking

Fellow Researchers



**Prof. Dr. Rosli Md.
Illias (FChE)**
Bioprocess








**Assoc. Prof. Dr.
Siti Zaiton**
Artificial Intelligence



**Assoc. Prof. Dr.
Shahir Shamsir
(FBME)**
Biodiversity,
Biological Science




c) **Software Engineering (SE) Department (Course SCSJ) –
List of Expert**






Lecturer	Field of Expertise
 <p data-bbox="347 748 671 846">Head of SE Department Dayang Norhayati Abg Jawawi, Assoc Prof, Dr.</p>	<ul style="list-style-type: none"> • Software Reuse, • Embedded Real-time Software, • Software quality and testing, • Software modeling and process
 <p data-bbox="347 1128 572 1193">Professor Safaai Deris, Dr.</p>	<ul style="list-style-type: none"> • Software Engineering • Artificial Intelligence • Bioinformatics • Planning and Scheduling • Genetic Algorithm, Case Base Reasoning, Neural Network, Support Vector Machine, Fuzzy Logic
 <p data-bbox="347 1469 611 1529">Associate Professor Ali Selamat, Dr.</p>	<ul style="list-style-type: none"> • Software engineering, • Software agents, • Web engineering, • Information retrievals, • Genetic algorithms, • Neural networks, • Soft-computing



	<ul style="list-style-type: none"> • Computer Science Education • E- Learning • Expert System • Knowledge-based System • Knowledge Management, • Intelligent software 	N28
	not available this sem	N28
	<ul style="list-style-type: none"> • Software Engineering • Software design, • knowledge management 	N28
	<ul style="list-style-type: none"> • Soft Computing Techniques and Applications (Neural Network, Genetic Algorithm, Fuzzy, Rough Set & PSO) • Intelligent System 	N28
	<ul style="list-style-type: none"> • Software Engineering • Wireless Sensors and RFID • Wireless and Cable Communications • Artificial Intelligence • Location Based Information Systems • Mobile Applications • Automata and Formal Languages 	N28

Associate Professor Dr.
Toni Anwar

 <p>Deputy Dean Associate Professor Wan Mohd. Nasir Wan Kadir , Dr.</p>	<ul style="list-style-type: none"> • Software Design / Architectures • Software Evolution • Software Modeling and Meta-modeling • Business Rules • Design Patterns • CASE Tools • Requirements Traceability • Open Source Software • Internet and Web-based Software Development • Service-oriented Architecture • Distributed Computing (software aspects) • Wireless Programming 	N28
 <p>Imran Ghani, Dr.</p>	<ul style="list-style-type: none"> • Semantic Web, Ontology (alignment, matching) • Web Services, Interoperability, Web Mining, Web Information Filtering and Retrieval • Personalized Web Sites and Services • User Modeling, Learning User Profiles, Usability and User-Centric Systems • Metadata, XML, RDF, OWL, Knowledge Management • Software Testing • Software Architecture, Enterprise Architecture, EAMS, Enterprise Application Integration • IT Governance, Information Governance • Agile Software Development, Secure Software Development Lifecycle 	N28
 <p>Ismail Mat Amin, Dr.</p>	<ul style="list-style-type: none"> • Software Engineering • Web-based Application • Expert systems 	N28
 <p>Masitah Ghazali, Dr.</p>	<ul style="list-style-type: none"> • Software Engineering • HCI, • user interaction, • physicality, • usability, • usability testing 	N28

<p>Masitah Ghazali, Dr.</p>  <p>Mohd. Yazid Idris, Dr.</p>	<ul style="list-style-type: none"> • Real Time Software • Telecommunication Software • Web Application and Service • Network Traffic Analysis • Network Intrusion Detection 	<p>N28</p>
 <p>Norbahiah Hj. Ahmad</p>	<ul style="list-style-type: none"> • Software Engineering 	<p>N28</p>
 <p>Radziah Mohamad, Dr.</p>	<ul style="list-style-type: none"> • Software testing, • software oriented computing, • software reusability 	<p>N28</p>

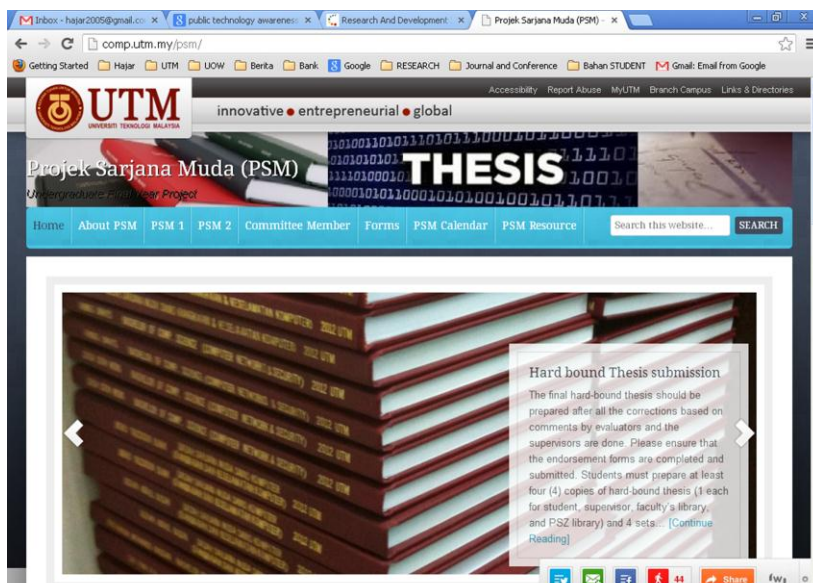
	<ul style="list-style-type: none"> • Artificial intelligence, • planning and scheduling, • theory of computation 	N28
 <p>Mohamad Ashari Hj. Alias</p>	<ul style="list-style-type: none"> • Software Engineering 	N28
 <p>Norizam Katmon</p>	<ul style="list-style-type: none"> • Software Engineering • Distributed Systems • Mobile Pervasive Application 	N28
 <p>Noraini Ibrahim</p>	<ul style="list-style-type: none"> • Software Engineering • Mobile and Wireless Applications 	N28
 <p>Norsham Idris</p>	<ul style="list-style-type: none"> • Software Engineering • Artificial intelligence, • soft computing, • adaptive e-learning 	N28
<p>Mohd Adham Isa, Dr</p>	<ul style="list-style-type: none"> • Probability and Mathematical Modeling, • Embedded Real-Time Systems, • Software Modeling, • Software Design, • Software Quality and Measurement 	

 <p>Ruhaidah Samsudin</p>	<ul style="list-style-type: none"> • Software Engineering • Artificial Intelligence, • Soft Computing 	N28
 <p>Shahliza Abd. Halim</p>	<ul style="list-style-type: none"> • Software Requirement Engineering 	N28
<p>Hishamuddin Asmuni, Dr</p>	<ul style="list-style-type: none"> • Artificial intelligence, • software testing 	N28a

Appendix E: UTM Grading System

Marks	Grades	Evaluation Points
90-100	A+	4.00
80-89	A	4.00
75-79	A-	3.67
70-74	B+	3.33
65-69	B	3.00
60-64	B-	2.67
55-59	C+	2.33
50-54	C	2.00
45-49	C-	1.67
40-44	D+	1.33
35-39	D	1.00
30-34	D-	0.67
00-29	E	0.00

Formal FC PSM Website: <http://comp.utm.my/psm/>



Miscellaneous Picture of PSM Activities

A promotional banner for the 'ICT INNOVATION AND EXHIBITION IDEA 2013'. The banner features a yellow and blue color scheme with a stylized graphic of a network or data flow. The text on the banner includes:
ICT INNOVATION AND EXHIBITION
IDEA 2013
Date: 30 January 2013 (Wednesday)
Venue: N28a, Faculty of Computing (FC)
Time: 8AM - 5PM
At the bottom, logos for organizing and collaborating institutions are displayed, including UTM, UTM CSI, MDEC, Microsoft, hp, ORACLE, Brel, and TM.