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ROHAIDA CHE MAN

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PREFACE

The rebranding of 8 modules has been approved by the UMP Senate in February 2016. The 8 modules comprise:

- i. Philosophy of Science and Ethics in Research
- ii. Research Overview
- iii. Literature Review
- iv. Methodology
- v. Data Collection and Analysis
- vi. Scientific Writing
- vii. Preparation for viva-voce
- viii. Conceptual Paper

8 modules are one of the Institute of Postgraduate Studies (IPS) initiatives in helping students to understand ways and means to carry out research at Master's and PhD level. There are 2 sets of 8 modules provided by IPS in accordance with the technology and engineering cluster. These 8 modules are intended to help students in conducting systematic research owing to its utmost importance in determining the effectiveness and efficiency of the research process. The 8 modules shall help students to understand the research problem and identify the areas of research. The modules also assist students on how to write a literature review in order to understand how other researchers approach, define or manage the problem to keep the research pertinent to what is current in the field. In addition, 8 modules also facilitate students to understand the methods of collecting data in an organized and controlled way to achieve valid results, analyze the data according to the considered problem and make conclusions. Therefore, IPS hopes that these modules will be able to provide some insights and benefit students in conducting research at Master's and PhD level.

INSTITUTE OF POSTGRADUATE STUDIES UNIVERSITI MALAYSIA PAHANG

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MODULE DESCRIPTION

Research methodology is a very important aspect of research. This module provides an overview and general steps involved in research methodology. There are three chapters in this module as shown in Figure 1.0; Research problem (Chapter 1), Research design (Chapter 2) and Research implementation (Chapter 3). Chapter 1 explains the techniques of defining a research problem and the construction of hypotheses and objectives. Chapter 2 presents the details of research design including the types of research methodology, identification of variables, materials, and instrument in the research process. Chapter 3 deals with the implementation of research. It provides the methods and types of data collection and the concept of validity and reliability. At the end, this module will provide the researcher the way to systematically solve the research problem.

Research problem

- Definition of research problem
- Necessity of defining research problem
- Technique of defining research problem
- Hypothesis development
- Construction of objectives

Research design

- Definition of research design
- The function of research design
- Research methodology:
 - Qualitative research method
 - -Quantitative research method
- Identification of variables
- Identification of materials and instrument
- Research constraint

Research implementation

- Method of data collection
- Types of data collection
 - Qualitative
 - Quantitative
- Validity and reliability

Figure 1.0: Flow chart of research methodology

MODULE OUTCOME

At the end of this module, the researcher should be able to:

- 1. Identify the research problem.
- 2. Develop the hypotheses and construct the objectives of the study.
- 3. Design the research process based on a research problem.
- 4. Identify variables, materials and instrumentation involved.
- 5. Differentiate the method of data collection and the types of data collected.
- 6. Understand the concepts of validity and reliability in research contexts.

MODULE SUBTOPIC

- Topic 1 Research Problem
- Topic 2 Research Design
- Topic 3 Research Implementation
- Conclusion
- References and Further Readings