



IPS POSTGRADUATE competency COURSES

UIT1113	Thesis Writing 1	The course is an overview of the writing and organisational skills necessary for the completion of a thesis. It is designed to help postgraduate students master the writing of the thesis. It includes main issues involved in the construction and writing a thesis—defining the topic, formulating the research question and hypothesis, theory and methodology, seeking out sources, building a bibliography, structuring the thesis.
UIT1123	Thesis Writing 2	The main aim of this course is to provide students with the sound technical knowledge and skills necessary to interpret data that leads to conclusive findings and quality journal papers.

CONTACT

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UIS1143	Structural Equation Modelling	This course is primarily focused on the applications of multivariate statistics (second generation technique) which is more advanced than linear regressions (first generation techniques). In this course, students are exposed to latent variable modelling that are applied in many areas of field such as management, education, engineering, medical, social sciences and others. Students are able to use the structural equation modelling (SEM) technique in solving problems that relate to their field of interest as this technique is being rigorously used in research and widely accepted in many journals.
UIR1113	Research Methodology for Engineering, Science & Technology	The course presents an overview and general steps involved in research methodology. The topics describe the elements required in research methodology such as literature study, research design, data analysis and scientific writing to prepare students in writing research proposal, thesis and scientific publications.
UIR1123	Research Methodology For Social Science and Humanities	The principal aim of this course is to assist students in the process of identifying research topics and problems, and to provide them with a logical framework in which to consider such problems, the associated methodologies and the results. Both quantitative and case study approaches will be emphasised in the course. Overall, this subject is intended to give an understanding and knowledge on the methodology of research and its application when conducting research projects. The topics to be covered are: Introduction to Research; Research topic, research question and research design; reviewing the Literature; Sampling and measurement; Observation; Research instruments; Analysing Data, Completing the Research Project.
UIR1133	Philosophy of Research	The philosophy of science is the consideration of the most basic concepts and principles at work in scientific inquest. What principles do all of the sciences have in common? How are the theories of different sciences (like engineering, physics, biology, and psychology, accounting, economics etc.) related? How are the scientific theories of today related to the scientific theories of yesterday and tomorrow? Conventionally, answers to these sorts of questions have been formulated on the basis of four essential assumptions about the nature of scientific inquiry: (1) scientific thinking is fundamentally rational; (2) scientific knowledge is fundamentally objective.

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INTRODUCTION

Institute of Postgraduates Studies has listed 16 common course for all postgraduate student to take these course will assist the student to increase their understanding, skills and competency in conducting research and thesis writing.

The 16 courses can be clustered into 5 categories, namely (i) Engineering Mathematics, (ii) English and Presentation Skills (iii) Statistic and Data Analysis (iv) Research Methodology and (v) Thesis Writing. Course synopsis of the 16 courses can be found in **Appendix 1**. The courses are open to both the coursework and research student.

The courses are 3 credit unit courses and will be given a grade. They are offered every semester as an elective course.

FEES Fee for each course is RM855

FUNDING SOURCES

Students can apply to Research & Innovation Department to seek for funding. However, it is subjected to the approval based on availability of fund and other requirements.

Sources of funding available are as follows:

- 1) PGRS (Postgraduate Research Scheme, UMP)
- 2) UMP RDU (UMP Internal Grant)
- 3) UIC (External Industrial Grant)
- 4) UMP FLAGSHIP (UMP Internal Grant)
- 5) FRGS (Fundamental Research Grant Scheme, External Grant)-

Students are required to apply for funding using IPS Postgraduate Competency Courses Registration Form which can be downloaded in IPS website <https://ips.ump.edu.my>

Appendix 1: IPS POSTGRADUATE competency COURSES

COURSE CODE	LIST OF COURSES	SYNOPSIS
UIM113	Advanced Numerical Methods	This course covers the numerical solutions of linear systems, nonlinear systems, ordinary differential equations (ODEs) and stochastic differential equations (SDEs). It also includes the development of cubic spline and B-spline for curve fitting. The emphasis is on learning in a practical context for students to write numerical algorithms using Matlab. The numerical algorithms will be developed through their use in applications from a wide range of practical problems such as traffic flow problems and cancer growth progression.

UIM1123	Optimization Techniques	This course covers optimization techniques, in particular, linear programming, nonlinear optimisation and non-standard optimization techniques. The theory is applied to solve the industrial problems such as work scheduling, job assignment, blending problem, production planning or optimising the provision of services. Besides manual calculations, students learn how to use available software such as LINGO and TORA to solve and analyze the respective problems.
UIM1133	Mathematical Modelling	This course discusses a variety of mathematical modelling that arise in engineering and industrial applications. It covers modelling with different kind of differential equations, namely ordinary, partial and delay. Mathematical modelling requires a diverse range of skills and tools. The student will learn how to formulate a mathematical model from a given problem, investigate the stability of the model, solve the model using numerical methods and interpret the simulation results. On top of that, students will become aware of the concepts involved in mathematical modelling, hence build a solid foundation in the subject. This course will incorporate numerous examples from physics, chemistry, biology, ecology and engineering including fluid flow, heat flow, vibrating spring and traffic flow. Also, discussion on real-life problems such as cancer immune system in medical and healthcare applications will be covered. This course would prepare students to venture forth on their own to solve problems on mathematical modelling using differential equations.
UIE1113	Preparatory English For Postgraduates	The course is designed to develop skills in using English language effectively. The language skills to focus on are reading, writing and speaking. Knowledge and application of grammar will be integrated in all the skills. These components are structured to strengthen learners' language proficiency at postgraduate level. This course also emphasizes on improving reading and writing by applying effective strategies which include elements of contextual grammar, extensive lexical building and syntactical enhancement. These are the fundamentals in providing essential English language skills that are needed at postgraduate level. Note: Exit level is at CEFR B1.
UIE1123	Scientific English Communication	The course aims to further enhance learners to become independent users of the English language. The primary focus emphasizes reading and writing skills, in which the knowledge of grammar is embedded. The course requires students to read and write various scientific discourse of specific topics by incorporating analytical and critical reading and writing skills Note: Exit level is at CEFR B2.

UIE1133	Presentation Skills	The course aims to develop learners' presentation skills for various rhetoric requirements at postgraduate level. Learners will be required to undergo the processes of preparing and delivering presentations. Learners will learn how to construct a topic, gather supporting materials, organize the content, and deliver the presentations. This will also emphasize informative, persuasive and argumentative presentation skills required in postgraduate context.
UIE1143	Research Project Presentation Skills	This course will equip students with practical strategies for them to deliver their research projects effectively. The course will highlight topics on presentation anxiety, verbal, non-verbal and visual communication, and audience interaction through Q&A session. This course will provide ample opportunities for students to present and improve on their research projects presentation skills.
UIS1113	Descriptive Statistics	This course discusses on basic statistical problem-solving methodology, graphical and numerical data analyses and confidence interval. Software will be used in this course to implement the data analysis such as <i>Microsoft Excel</i> (other statistical packages are SPSS, R Language, S Plus, EViews and Minitab shall be used in this course)
UIS1123	Inferential Statistics	This course discusses on inferential statistics including hypothesis testing; analysis of variance (ANOVA); regression and correlation including simple and multiple linear regressions; goodness-of-fit test and contingency tables. Software will be used in this course to analyse the data such as <i>Microsoft Excel</i> (other statistical packages are SPSS, R Language, S Plus, EViews and Minitab shall be used in this course).
UIS1133	Statistical Modelling	In this course, the linear model is generalized in several directions, and the resulting framework is investigated from a theoretical and practical perspective, in an intention to develop core skills in statistical data analysis. The course is in three parts. Part A: Model Selection including linear model and Bayesian Inference. Part B: Beyond Generalised Linear Model including Random and mixed effects models. Part C: Missing Data and Latent Variables. The R statistical package will be used throughout.
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