

SYE8009: RESEARCH METHODOLOGY

Effective Term

Semester A 2025/26

Part I Course Overview

Course Title

Research Methodology

Subject Code

SYE - Systems Engineering

Course Number

8009

Academic Unit

Systems Engineering (SYE)

College/School

College of Engineering (EG)

Course Duration

Non-standard Duration

Other Course Duration

To be completed normally in 1 academic year or 2 semesters

Credit Units

0-2

Level

R8 - Research Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

SEEM8009 Research Methodology (offered until 2021/22)

ADSE8009 Research Methodology (offered until 2023/24)

Exclusive Courses

Nil

Part II Course Details

Abstract

This course aims to provide MPhil/PhD students with:

- a. the fundamental elements of research methodology which include literature review, problem identification, research methodology, writing and presentation, and spiritual science that is needed for carrying out a good research work;
- b. formal forums for the research students to -
 - broaden their knowledge and expertise;
 - present their research findings and discuss their learning experiences with their peers and academic staff; and
 - develop a strong research mindset and scholarship.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Have a general background of research (basic elements);	10	x		
2	Develop a good mind set for research (spiritual science)	10	x		
3	Formulate a good research framework - problem identification, theory development, creative thinking and execution; (research science)	50		x	
4	Manage effectively research activities - reading, writing and presentation, life control, and challenge the future; (research management)	15	x	x	
5	Communicate with fellow peers regarding own or others' research findings and experience scholarly and logically.	15			x

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Class (Lecture)	Fundamental theories and discoveries together with examples will be provided.	1, 2, 3, 4, 5
			18 hours/sem

2	Groupwork	Challenging questions are for students to consider and discuss in the class. Every student will present his own research study and answer the questions from lecturer and other students after the lecture.	1, 3, 4	9 hours/sem
3	Research Seminar	Each student is required to attend and participate in a minimum of 13 approved research seminars organized by the department, and submit a portfolio of brief write-ups and reflections of the research seminars attended and presented.	5	13 hours/sem

Additional Information for LTAs

Note ^aClass activities are made up of lectures and groupwork. The latter is used as platform for reflective and interactive learning among the students and the instructors or research supervisors. Activities include individual presentation at the class, group discussion and critique of fellow students' research design and methodology in general and their thesis proposals development in particular.

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Coursework	1, 2, 3, 4, 5	100	-	No

Continuous Assessment (%)

100

Examination (%)

0

Minimum Continuous Assessment Passing Requirement (%)

0

Minimum Examination Passing Requirement (%)

0

Assessment Rubrics (AR)

Assessment Task

Coursework (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Materials for presentation; Presentation skill; Response to questions; Seminar reports;

Pass (P)

(P) Pass

Failure (F)

(F) Fail

Assessment Task

Coursework (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Materials for presentation; Presentation skill; Response to questions; Seminar reports;

Pass (P)

(P) Pass

Failure (F)

(F) Fail

Additional Information for AR

- 100% coursework. Pass or Fail.

- The portfolio is a collection of critiques and reflections of the research seminars attended and presented. Students are also encouraged to include documented evidence of his/her learning from the lectures and groupwork in the portfolio.

- The assessment of the portfolio includes the student's qualifying panel's evaluation of the candidate's research seminar presentation.

Part III Other Information

Keyword Syllabus

Research design research methodology, quantitative and qualitative methods research writing and presentation research seminars

Reading List**Compulsory Readings**

Title	
1	Paul Leedy and Jeanne Ormrod, Practical Research (7th edition), Merrill Prentice Hall, 2001
2	Rowena Murray, How to Write a Thesis, Open U Press, 2002
3	Elbert Hubbard, A Message to Garcia, 1899

Additional Readings

Title	
1	Barbara Minto, The MINTO Pyramid Principle: Logic in Writing, Thinking and Problem Solving, 2007, Big Apple Tuttle-Mori Agency, Inc, Malaysia. (Chinese edition: 金字塔原理：思考、表达和解决问题的逻辑)
2	大前研一，思考的技术，2004 (Original in Japanese, no English edition)
3	Hill Napoleon, Think and Grow Rich, 1937