

SYE8025D: RESEARCH METHODS IN ENGINEERING MANAGEMENT

Effective Term

Semester B 2024/25

Part I Course Overview

Course Title

Research Methods in Engineering Management

Subject Code

SYE - Systems Engineering

Course Number

8025D

Academic Unit

Systems Engineering (SYE)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

D8 - Professional Doctorate

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

SEEM8025D Research Methods in Engineering Management (offered until 2021/22) ; ADSE8025D Research Methods in Engineering Management (offered until 2023/24)

Exclusive Courses

Nil

Part II Course Details

Abstract

This course aims to familiarize students with the various research methods commonly used in the field of Engineering Management in conducting academic and applied research at the doctorate level. Throughout the course students develop competency in the research methods learned through reflective practice and cooperative learning, and write up an Engineering Doctorate thesis proposal, which will form the blueprint for their subsequent research toward the Engineering Doctorate degree.

In developing their thesis proposals, students also make use of this course as conduit to identify their future thesis supervisors from the academic staff available, who provide guidance and advice to the future supervisees in developing an acceptable thesis proposal in this course. At the end of the course, the identified future supervisor of a student assesses the proposal developed and written by the future supervisee as a part of the coursework requirement.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Discuss the various research methods commonly used in Engineering Management research projects		x	x	
2	Identify on industrial problem or issue that can be developed into an EngD thesis		x	x	
3	Formulate the appropriate research methodology for the problem on issue identified		x	x	
4	Develop the EngD thesis proposal for the research phase of the EngD programme present		x	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	Lecture/ Directed Studies	1, 2	15 hours/sem
2	Individual assignments/ Group discussion	1, 2, 3, 4	9 hours/sem
3	Individual proposal development and presentation	3, 4	15 hours/sem

Additional Information for LTAs

Note: Each student's EngD thesis development and proposal will be individually guided, advised and assessed by his/her proposed EngD thesis supervisor.

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Coursework	1, 2, 3, 4	100	

Continuous Assessment (%)

100

Examination (%)

0

Minimum Continuous Assessment Passing Requirement (%)

0

Minimum Examination Passing Requirement (%)

0

Assessment Rubrics (AR)**Assessment Task**

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

Criterion

-Background and justification of EngD research and discussion of supporting literature- 40%

-Definition of research aims and outcomes- 20%

-Formulation of research methodology- 40%

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D)

Failure

(F) Not even reaching marginal levels

Assessment Task

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

Criterion

-Background and justification of EngD research and discussion of supporting literature- 40%

-Definition of research aims and outcomes- 20%

-Formulation of research methodology- 40%

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Moderate

Failure

(F) Not even reaching marginal levels

Additional Information for AR

100% Coursework (EngD Thesis Research Proposal)

Part III Other Information

Keyword Syllabus

Introduction to research methods; research process; selecting a problem and reviewing the research; sampling and generalizability; measurement, reliability, and validity; methods of measuring behavior; data collection and descriptive statistics, inferential statistics; nonexperimental research methods; experimental research methods; quasi-experimental research; writing a research proposal; writing a research manuscript.

This course emphasizes the application of the research methods in conducting research to solve engineering/technology management problems.

Reading List

Compulsory Readings

Title	
1	NIL

Additional Readings

Title	
1	NIL