

SEEM3040: ENGINEERING DATABASE AND SYSTEMS

Effective Term

Summer Term 2023

Part I Course Overview

Course Title

Engineering Database and Systems

Subject Code

SEEM - Systems Engineering and Engineering Management

Course Number

3040

Academic Unit

Systems Engineering (SYE)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

CS2363 Computer Programming or CS2311 Computer Programming or CS1102 Introduction to Computer Studies or CS1302 Introduction to Computer Programming or equivalent course

Precursors

Nil

Equivalent Courses

MEEM3040 Engineering Database and Systems

Exclusive Courses

Nil

Part II Course Details

Abstract

The aim of this course is to develop an understanding of the basic principles of the engineering database design, operation, related technologies and system tools for the ability to apply them in the design of engineering database systems in a global engineering environment.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the components of a database environment	20	x	x	
2	Design data models for engineering systems using entity-relationship (ER) diagrams and relations	30	x	x	
3	Apply SQL to implementation of database systems and applications	30	x	x	
4	Apply database principles to design and build simple engineering database systems following a typical database application lifecycle	20	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.

Teaching and Learning Activities (TLAs)

TLAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Consultation hour	1 hour per week will be scheduled as consultation hour for clearing doubts of students who can meet the teaching staff on an individual or small group basis in his/her office.	1, 2, 3, 4	13 hours/semester
2	Lectures	Lectures	1, 2, 3, 4	26 hours/semester
3	Group Activities	In-class exercises, in-class Q&A, class projects and discussions	1, 2, 3, 4	13 hours/semester

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignments, projects, testStudents will be assessed their understanding of concepts and techniques learned in class, reading materials and their ability to apply these concepts, techniques and subject-related knowledge.	1, 2, 3, 4	50	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Assessment Rubrics (AR)**Assessment Task**

Coursework

Criterion

Tutorial exercises, assignments, project, test

Excellent (A+, A, A-)

Strong evidence of capacity to analyse and synthesize; superior grasp of subject matter.

Good (B+, B, B-)

Evidence of grasp of subject, some evidence of critical capacity and analytic ability.

Fair (C+, C, C-)

Student who is profiting from the university experience; understanding of the subject; ability to develop solutions to simple problems in the material.

Marginal (D)

Sufficient familiarity with the subject matter to enable the student to progress without repeating the course.

Failure (F)

Little evidence of familiarity with the subject matter; weakness in critical and analytic skills.

Assessment Task

Examination

Criterion

2-hr final examination (either open or closed book based on instructor's discretion)

Excellent (A+, A, A-)

Strong evidence of capacity to analyse and synthesize; superior grasp of subject matter.

Good (B+, B, B-)

Evidence of grasp of subject, some evidence of critical capacity and analytic ability.

Fair (C+, C, C-)

Student who is profiting from the university experience; understanding of the subject; ability to develop solutions to simple problems in the material.

Marginal (D)

Sufficient familiarity with the subject matter to enable the student to progress without repeating the course.

Failure (F)

Little evidence of familiarity with the subject matter; weakness in critical and analytic skills.

Part III Other Information

Keyword Syllabus

Database approach. Database management systems. Conceptual data model. Business Rules. E-R diagram. Relational data model. Relations. Normalization. SQL. Data warehousing. Database Administration. database application lifecycle.

Reading List**Compulsory Readings**

Title	
1	Lecture notes and slides provided by the instructor.

Additional Readings

Title	
1	Connolly, T. and Begg, C., Database Systems: a practical approach to design, implementation, and management, Addison Wesley.
2	Date, C.J., An Introduction to Database Systems, Addison Wesley.
3	Galitz, W.O., The Essential Guide to User Interface Design, Wiley.
4	Hoffer, J.A., George, J.F. and Valacich, J.S., Modern Systems Analysis & Design, Prentice Hall.
5	Kendall, P.A., Introduction to Systems Analysis & Design: a structured approach, IRWIN.
6	Kroenke, D.M., Database Processing: fundamentals, design, and implementation, Prentice Hall.
7	Mannino, M.V., Database Application Development & Design, McGraw-Hill.