SYE4035: QUALITY AND ENVIRONMENTAL SYSTEM AND MANAGEMENT

New Syllabus Proposal

Effective Term
Semester A 2024/25

Part I Course Overview

Course Title
Quality and Environmental System and Management

Subject Code
SYE - Systems Engineering
Course Number
4035

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
SYE3102 Quality Engineering

Precursors
Nil

Equivalent Courses
SEEM4025 Quality Systems and Management or
ADSE4035 Quality and Environmental System and Management

Exclusive Courses
Nil

Part II Course Details

Abstract

This course aims to develop a broad understanding of quality and environmental systems and management approach to advancing solutions for manufacturing operations of materials, processes, products, energy systems, transportation that assure good quality and environmental performance. It also discusses the requirements of various national/international standards of product quality, reliability, safety, and environmental performance. Student will gain the knowledge and skills to integrate the goals of economic growth and development in global markets with protecting public health and the environment. Students will be equipped with the ability to apply the knowhow of quality and environmental systems and management in their future work.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Define the various dimensions of quality and environmental performance in product and manufacturing operations.	10			
2	Outline the principles of contemporary quality and environmental systems and management theories and practices	20			
3	Apply the concepts and principles of quality and environmental management systems, such as ISO9000, ISO14001, ISO50001, etc. in developing organization wide quality and environmental management systems.	30			
4	Apply key elements of Total Quality Management (TQM), Six Sigma and LEAN etc.	30	x	x	x
5	Describe the framework and associated issues of implementing Integrated quality and environmental management systems in the organizations.	10			

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	Large class activities	During the large-class lectures, students are given a general overview on various aspects of the related topics with support by some small in-class assignments.	1, 2, 3, 4, 5	3 hours/week
2	Tutorial and Case Studies (Small group)	During the small-group tutorial classes, two group assignments in the form of Student-Centred Activities (SCA) will be given to students. They are expected to work in groups of three to four on two quality related topics. The groups are required to give presentations on their final outcomes of their work, as well as a group report. Each member should explicitly state in the project report about his/her effort and contributions to the overall project result.	3, 4	1 hour/bi-weekly

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	In-class Assignments Students need to participate actively in-class activities such as discussion, case study, and exercises that are designed to facilitate their understanding of topics taught in the class.	1, 2, 3, 4, 5	12	
2	Individual Report Individual course paper on a self-proposed topic in the scope of quality and environmental management. Student will critically examine and contrast the knowledge and practice of the proposed topic.	1, 2, 3, 4, 5	9	

3	Group-based case studies projects, reports and presentation Students will work in groups, study the given topics of modern quality and environmental management from multiple information sources and present the findings.	2, 3, 4	10	
4	Quiz Students' learning progress will be assessed via a mid-term quiz.	1, 2, 3, 4	9	

Continuous Assessment (%)

40

Examination (%)

60

Examination Duration (Hours)

2

Additional Information for ATs

Examination: Students will be assessed via the written examination their understanding of concepts and practices learned in the class, reading materials and their ability to apply subject-related knowledge.

For a student to pass the course, at least 30% of the maximum mark for the examination should be obtained.

Assessment Rubrics (AR)

Assessment Task

Class assignments, quiz and individual report

Criterion

Submitted written work and delivered presentation

Excellent (A+, A, A-)

Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

Good (B+, B, B-)

Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.

Fair (C+, C, C-)

Evidence that student 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; limited, or irrelevant use of literature.

Assessment Task

Group-based case studies reports and presentation

Criterion

Submitted written work and delivered presentation

Excellent (A+, A, A-)

Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter;
good teamwork and communication; evidence of extensive knowledge base.

Good (B+, B, B-)

Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; good teamwork and communication evidence of familiarity with literature.

Fair (C+, C, C-)

Evidence that student is profiting from the university experience; understanding of the subject; ability to develop solutions to simple problems in the material; satisfactory teamwork and communication

Marginal (D)

Sufficient familiarity with the subject matter to enable the student to progress without repeating the course; acceptable teamwork and communication

Failure (F)

Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited, or irrelevant use of literature; Insufficient teamwork and communication

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Assessment Task

Examination

Criterion

Submitted written work

Excellent (A+, A, A-)

Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

Good (B+, B, B-)

Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.

Fair (C+, C, C-)

Evidence that student 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; limited, or irrelevant use of literature.

Part III Other Information

Keyword Syllabus

- Definition and scope of Quality and Environment Systems and Management
- Modern Quality and Environmental Management development, principles and concepts
  - Product life cycle and life cycle assessment
- Product and process quality, health, safety and environment, energy management methods, principles and practises, with reference to ISO, EN, IEC, ASTM standards of testing for compliance
  - WEEE, RoHS, EuP and REACH Directives
  - ISO9000, QS9000, TL9000 Quality Management Systems
  - ISO14000 Environmental Management System
- ISO50001 Energy Management
- Six Sigma and Lean
  - Developing and Auditing Integrated Management Systems

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	Juran's Quality Management and Analysis, J A DeFeo and F M Gryna, 6th edition, McGraw-Hill, 2015.
2	Quality Beyond Border, D Hutchins, Routledge, 2019
3	Total Quality Management, D R Kiran, Butterworth Heinemann, 2017
4	Quality Management for organizations using lean six sigma techniques, Erick C Jones, CRC Press, 2014.
5	Exploding the myths surrounding ISO9000 : a practical implementation guide, by Andrew W. Nichols, Ely, Cambridgeshire, U.K. : IT Governance Pub., 2013
6	Management systems and performance frameworks for sustainability: a road map for sustainably managed enterprises, by James, Lowellyne, Published by NY: Routledge, 2018
7	Environmental Certification for Organisations and Products : Management Approaches and Operational Tools, by Tiberio Daddi, Fabio Iraldo, and Francesco Testa, Abingdon, Oxon ; New York, NY : Routledge, 2015
8	Environmental Management Systems: a step-by-step guide to implementation and maintenance, by Christopher Sheldon and Mark Yoxon, Earthscan, 2006
9	Quality Progress, ASQ monthly publication
10	Quality Management Journal
11	International Journal of Quality and Reliability Management