Course Specification
(Bachelor)

Course Title:	Reliability and Maintenance Planning
Course Code:	INE 3331
Program:	Bachelor of Industrial Engineering
Department:	Industrial Engineering
College:	Engineering
Institution:	King Khalid University
Version:	3
Last Revision Date:	15-12-2025

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (2)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (Fifth level/third Year)					
4. Course General Description:					
This course is specifically designed to help students to improve equipment maintenance, utilization, availability, reliability, and sustainability. Course material covers the approaches and practices in equipment management over the lifespan of the equipment, from development, introduction, installation, sustaining, to transfer. Discussion topics include the applied technologies in equipment management such as computerized maintenance management systems (CMMS), as well as the human factor of maintenance such as organizational structure and skills development. Key concepts include breakdown management, maintenance prevention, preventive maintenance (PM), reliability-centered maintenance (RCM), predictive maintenance, total productive maintenance (TPM), and platform ownership.					
5. Pre-requirements for this course (if any):					
STAT 1211					
6. Co-requisites for this course (if any):					
NIL					
7. Course Main Objective(s):					
To help students to improve equipment maintenance, utilization, availability, reliability, and sustainability. Course material covers the approaches and practices in equipment management over the lifespan of the equipment, from development, introduction, installation, sustaining, to transfer. Discussion topics include the applied technologies in equipment management such as computerized maintenance management systems (CMMS), as well as the human factor of maintenance such as organizational structure and skills development.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		

No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid ● Traditional classroom ● E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	30
5.	**Others (specify)**	0
Total		36

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Demonstrate a full understanding of the basic terminology and concepts in maintenance and reliability**	**K1**	**Lectures**	**In-class discussions Homework assignment**
1.2	**Demonstrate a full understanding of Real-life examples of maintenance**	**K2**	**Lectures**	**Midterm exams and Quizzes**

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	management practices.			
2.0	Skills			
2.1	Master the key concepts, techniques, and practices in maintenance and reliability to apply them based on the nature of the business environment.	S1	Lectures	Course Project: - Report presentation - Report paper
2.2	Applying methods to identify and pinpoint the root cause of equipment failures.	S2	Lectures	Midterm exams and Quizzes
3	Values, autonomy, and responsibility			
3.1	Develop Help students to improve equipment maintenance, utilization, availability, reliability, and sustainability.	V1	Lectures	Midterm exams and Quizzes
3.2	Covers the approaches and practices in equipment management over the lifespan of the Equipment, from development, introduction, installation, sustaining, to transfer.	V2	Lectures	Midterm exams and Quizzes

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction	4
2.	The Maintenance Systems	4
3.	General maintenance concepts and practices	4
4.	Maintenance logistics	6
5.	Maintenance performance indicators	6
6.	Computerized maintenance management systems.	6
7.	Equipment development process.	6
8.	Post-Maintenance Era.	6
9.	Reliability Theory	6
10.	Reliability Calculations.	6
11.	The Exponential Distribution.	6
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz 1	3	5
2.	Homework 1	4	5
3.	Midterm exam 1	6	15
4.	Quiz 2	8	5
5.	Homework 2	9	5
6.	Midterm exam 2	11	15
7.	Report and Presentation	13	10
8.	Final Exam	16	40

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Kern Peng, Equipment Management in the Post-Maintenance Era Advancing in the Era of Smart Machines: Taylor & Francis 2ND Ed., 2020, ISBN: 036770367X, 9780367703677
Address	An Introduction to Reliability and Maintainability Engineering: Third Edition, Charles E. Ebeling, Waveland Press, 2019, ISBN: 1478639334, 9781478639336
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	• Lecture room • Backboard facility for sharing lecture notes, • Submission of assignments and attempting Quizzes. • Details of recommended group profiles in the teacher manual
Technology equipment (projector, smart board, software)	• Every student requires access to a personal computer and the Internet. • On-site University access is provided through the University Central Library.
Other equipment (depending on the nature of the specialty)	• Present Planned Resources takes care of the subject's needs.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**Course Evaluation Survey (CES**
Effectiveness of Students assessment	**Students**	**Blackboard feedback**
Quality of learning resources	**Students**	**Course Evaluation Survey (CES)**
The extent to which CLOs have been achieved	**Course Evaluation Committee (CEC)**	**In-Situ Evaluation**
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Reviewed by Curriculum Committee Approved by Quality Committee
REFERENCE NO.	**9-6-47**
DATE	**25/06/1447**