DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
INDUSTRIAL ENGINEERING PROGRAM, BSC.

Course Syllabus

1. **Course number and name**
   IE 803463 Maintenance management

2. **Credits and contact hours**
   (3+0) 3 credit hours, 3 contact hours

3. **Course Type**
   Blended Learning Course (2+1)

4. **Instructor's or course coordinator's name**
   Dr. Nader Al Theeb

5. **Textbook information**
   Ebeling, Charles, An introduction to reliability and maintainability Engineering, 3rd edition, Waveland Press, 2005, ISBN-13: 978-1478637349, ISBN-10: 147863734X

   a. **Other supplemental materials**
      -handouts.

6. **Specific course information**
   a. **Catalog description**

   The effect of reliability on the maintenance management, How to measure reliability, different arrangement of system components such as series, parallel, and complex, how to test and measure system life, how to build maintenance management systems, total productive maintenance, predictive maintenance, proactive maintenance, and maintainability.

   b. **Prerequisites or co-requisites**
   Prerequisite: Statistics and probability II

   c. **The course is:**
      Required in the Industrial Engineering program.

7. **Specific goals for the course**
   a. **Course outcomes:**
      After completion of the course, students are expected to be able to:
      1. Have the concepts of reliabilities
      2. Make system design decisions based on reliability
      3. Construct formal roles for maintenance department in organizations
      4. Solve maintenance problem based in scientific analysis

   b. **The following student outcomes are addressed by the course:**

SO-(e) an ability to identify, formulate, and solve engineering problems.

SO(pc-1) Ability to apply principles of probability, statistics and linear algebra to engineering problems

SO-(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

8. **Learning Outcomes and their Alignment with Program Educational Objective (PEO's), Methods of Delivery, and Assessment Methods:**

Learning Outcomes	Program PEOs	Method of Delivery	Assessment Method
Course Outcomes			
CO(1): Have the concepts of reliabilities	-	Lectures and Asynchronous active learning	Assignment, quiz, and Discussion boards
CO(2): Make system design decisions based on reliability	-	Lectures (Example and Problems)	Assignment and Quiz
CO(3): Construct formal roles for maintenance department in organizations	-	Lectures (Example and Problems)	Assignment and Quiz
CO(4): Solve maintenance problem based in scientific analysis	-	Lectures (Example and Problems)	Assignment and Quiz
Student Outcomes			

		Lectures (Example and Problems) and Asynchronous active learning	Midterm Exam, assignments, and project
SO-(e) an ability to identify, formulate, and solve engineering problems.		Lectures (Example and Problems) and Asynchronous active learning	Midterm Exam, assignments, and project
SO(pc-1) Ability to apply principles of probability, statistics and linear algebra to engineering problems		Lectures (Example and Problems) and Asynchronous active learning	Midterm Exam, assignments, and project
SO-(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.		Lectures (Example and Problems) and Asynchronous active learning	Midterm Exam, assignments, and project

9. Weekly Teaching Plan

Lecture	Topic	Method of Delivery
Lec_1	Chapter 1: Introduction	Lecture
Lec_2	Chapter 1: Introduction	Lecture
Lec_3	Chapter 1: Introduction	Asynchronous active learning
Lec_4	Chapter 1: Introduction	Lecture
Lec_5	Chapter - 02: The Failure Distribution	Lecture
Lec_6	Chapter - 02: The Failure Distribution	Asynchronous active learning
Lec_7	Chapter - 02: The Failure Distribution	Lecture
Lec_8	Chapter - 03: Constant Failure Rate Model	Lecture
Lec_9	Chapter - 03: Constant Failure Rate Model	Online Lecture/ synchronous active learning
Lec_10	Chapter - 03: Constant Failure Rate Model	Lecture
Lec_11	Chapter - 04: Time-Dependent Failure Models	Lecture
Lec_12	Chapter - 04: Time-Dependent Failure Models	Online Lecture

Lec_13	Chapter - 04: Time-Dependent Failure Models	Lecture
Lec_14	Chapter - 04: Time-Dependent Failure Models	Lecture
Lec_15	Chapter - 04: Time-Dependent Failure Models	Online Lecture
Lec_16	Chapter - 05: Reliability of Systems	Lecture
Lec_17	Chapter - 05: Reliability of Systems	Lecture
Lec_18	Chapter - 05: Reliability of Systems	Online Lecture
Lec_19	Chapter - 05: Reliability of Systems	Lecture
Lec_20	Chapter - 05: Reliability of Systems	Lecture
Lec_21	Chapter - 05: Reliability of Systems	Online Lecture
Lec_22	Chapter - 06: State-Dependent Systems	Lecture
Lec_23	Chapter - 06: State-Dependent Systems	Lecture
Lec_24	Chapter - 06: State-Dependent Systems	Online Lecture
Lec_25	Chapter - 08: Design for Reliability	Lecture
Lec_26	Chapter - 08: Design for Reliability	Lecture
Lec_27	Chapter - 08: Design for Reliability	Online Lecture
Lec_28	Chapter - 09: The Repair Process	Lecture
Lec_29	Chapter - 09: The Repair Process	Lecture
Lec_30	Chapter - 09: The Repair Process	Online Lecture
Lec_31	Chapter - 09: The Repair Process	Lecture
Lec_32	Chapter - 09: The Repair Process	Lecture
Lec_33	Chapter - 10: Design for Maintainability	Asynchronous active learning
Lec_34	Chapter - 10: Design for Maintainability	Lecture
Lec_35	Chapter - 10: Design for Maintainability	Lecture
Lec_36	Chapter - 10: Design for Maintainability	Asynchronous active learning
Lec_37	Chapter - 10: Design for Maintainability	Lecture
Lec_38	Chapter - 10: Design for Maintainability	Lecture
Lec_39	Chapter - 10: Design for Maintainability	Asynchronous active learning
Lec_40	Chapter - 11: Availability	Lecture
Lec_41	Chapter - 11: Availability	Lecture
Lec_42	Chapter - 11: Availability	Asynchronous active learning

Lec_43	Chapter - 13: Identifying Failure and Repair Distributions	Lecture
Lec_44	Chapter - 13: Identifying Failure and Repair Distributions	Lecture
Lec_45	Chapter - 13: Identifying Failure and Repair Distributions	Asynchronous active learning

10. Grade distribution

Assessment	Grade	Date
- Midterm Exam	30%	
-Project Reports /Quizzes/ Seminar /Homeworks ….)	20%	
- Final Examination	50%	

Make-up exams will be offered for valid reasons. It may be different from regular exams in content and format.