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

Course Syllabus

1. **Course number and name**
   IE 331 Operations research 2

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

3. **Course Type**
   Onsite

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

5. **Textbook information**
   Taha. Operations Research: An Introduction. Prentice Hall, 9th ed. ISBN 978-0-13-139199-4

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

6. **Specific course information**
   a. **Catalog description**
   Integer programming, Goal Programming, decision systems, Markov chain, Dynamic programming, Applications in Search algorithm, probabilistic inventory models
   b. **Prerequisites or co-requisites**
   Prerequisite: IE 330 operation research 1
   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. Formulate and solve integer models.
      2. Use some solution methods to solve goal programming.
      3. Make correct decision for engineering problems by utilizing some decision systems.
      4. Apply some search algorithm to solve well-known engineering problems.
      5. Solve probabilistic inventory models.

b. **The following student outcomes are addressed by the course:**
   SO-(e) an ability to identify, formulate, and solve engineering problems

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): Formulate and solve integer models.	-	Lectures	Assignment and Discussion
CO(2): Use some solution methods to solve goal programming.	-	Lectures (Example and Problems)	Assignment and Quiz
CO(3): Make correct decision for engineering problems by utilizing some decision systems.	-	Lectures (Example and Problems)	Assignment and Quiz
CO(4): Apply some search algorithm to solve well-known engineering problems.	-	Lectures (Examples and Problems)	Assignment and Quiz
CO(5): Solve probabilistic inventory models.	-	Lectures (Example and Problems)	Assignment and Quiz
Student Outcomes			
SO-(e) an ability to identify, formulate, and solve engineering problems	2	Lectures (Example and Problems)	Midterm Exam and project

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

9. Weekly Teaching Plan

Lecture	Topic	Method of Delivery
Lec_1	Chapter 8: Goal Programming	Lecture
Lec_2	Chapter 8: Goal Programming	Lecture
Lec_3	Chapter 8: Goal Programming	Lecture
Lec_4	Chapter 9: Integer Linear Programming	Lecture
Lec_5	Chapter 9: Integer Linear Programming	Lecture
Lec_6	Chapter 9: Integer Linear Programming	Lecture
Lec_7	Chapter 9: Integer Linear Programming	Lecture
Lec_8	Chapter 9: Integer Linear Programming	Lecture
Lec_9	Chapter 9: Integer Linear Programming	Lecture
Lec_10	Chapter 9: Integer Linear Programming	Lecture
Lec_11	Chapter 9: Integer Linear Programming	Lecture
Lec_12	Chapter 9: Integer Linear Programming	Lecture
Lec_13	Chapter 9: Integer Linear Programming	Lecture
Lec_14	Chapter 9: Integer Linear Programming	Lecture
Lec_15	Chapter 9: Integer Linear Programming	Lecture
Lec_16	Chapter 11: Travelling Salesperson problem	Lecture
Lec_17	Chapter 11: Travelling Salesperson problem	Lecture
Lec_18	Chapter 11: Travelling Salesperson problem	Lecture
Lec_19	Chapter 12: Deterministic Dynamic Programming	Lecture
Lec_20	Chapter 12: Deterministic Dynamic Programming	Lecture
Lec_21	Chapter 12: Deterministic Dynamic Programming	Lecture
Lec_22	Chapter 12: Deterministic Dynamic Programming	Lecture
Lec_23	Chapter 12: Deterministic Dynamic Programming	Lecture
Lec_24	Chapter 12: Deterministic Dynamic Programming	Lecture
Lec_25	Chapter 12: Deterministic Dynamic Programming	Lecture
Lec_26	Chapter 15: Decision Analysis and Games	Lecture
Lec_27	Chapter 15: Decision Analysis and Games	Lecture
Lec_28	Chapter 15: Decision Analysis and Games	Lecture
Lec_29	Chapter 15: Decision Analysis and Games	Lecture
Lec_30	Chapter 15: Decision Analysis and Games	Lecture
Lec_31	Chapter 15: Decision Analysis and Games	Lecture

Lec_32	Chapter 15: Decision Analysis and Games	Lecture
Lec_33	Chapter 15: Decision Analysis and Games	Lecture
Lec_34	Chapter 15: Decision Analysis and Games	Lecture
Lec_35	Chapter 16: Probabilistic Inventory Models	Lecture
Lec_36	Chapter 16: Probabilistic Inventory Models	Lecture
Lec_37	Chapter 16: Probabilistic Inventory Models	Lecture
Lec_38	Chapter 17: Markov Chains	Lecture
Lec_39	Chapter 17: Markov Chains	Lecture
Lec_40	Chapter 17: Markov Chains	Lecture
Lec_41	Chapter 17: Markov Chains	Lecture
Lec_42	Chapter 17: Markov Chains	Lecture
Lec_43	Chapter 17: Markov Chains	Lecture
Lec_44	Chapter 17: Markov Chains	Lecture
Lec_45	Chapter 17: Markov Chains	Lecture

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.