اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	Operational Research
Course Code:	553MATH-4
Program:	BSc in Computer Science
Department:	Computer Science
College:	Collage of Computer science and information systems
Institution:	Najran university

Table of Contents

A. Course Identification

1. Credit hours:	

2. Course type

a. University ☐   College ☐   Department ☑   Others ☐

b.   Required ☑   Elective ☐

3. Level/year at which this course is offered: Year 5 / Level 14

4. Pre-requisites for this course (if any)**:**

5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	30	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	0
3	**Tutorial**	0
4	**Others** (specify)	0
	Total	**30**

B. Course Objectives and Learning Outcomes

1. Course Description

This course can be further improved by providing practical knowledge of operation research. It is also important to provide up to date reference material.

2. Course Main Objective

This course provides an introduction to the key aspects of operations research methodology. Students will model and solve a variety of problems using deterministic and stochastic operations research techniques. It provides an overview of the entire suite of techniques and some idea of how the elements fit together.

3. Course Learning Outcomes

CLOs	Aligned PLOs
1 **Knowledge and Understanding**	

	CLOs	Aligned PLOs
1.1	Recognize the importance and value of Operations Research and mathematical modeling in solving practical problems in industry;	K1
1.2	Understand Operations Research models and apply them to real-life problems;	K1, K3
1.3		
1...		
2	**Skills :**	
2.1	Contribute to the approximation problem whatsoever to reality.	S1
2.2	Use computer tools to solve a mathematical model for a practical problem.	S4, S5
2.3	Formulate a managerial decision problem into a mathematical model;	S2, S3
2.4	Apply of these models in the future when we face a similar problem;	S4
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Operations Research: Introduction	3
2	Linear and Integer Programming Models	3
3	Decision Analysis	3
4	Introduction to Quantitative Research	3
5	Introduction to Qualitative Research	1
6	Sequencing	3
7	Operation Research Models	5
8	Scheduling of Jobs	3
9	Network Optimization Models	3
10	Decision Analysis	3
11	Queuing Theory	4
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Recognize the importance and value of Operations Research and mathematical modeling in solving practical problems in industry;	● Showing and delivering PPT presentation in the class. ● Class exercise to analyze problems and	Quiz 1, Midterm, and Final Exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		propose solutions	
		● Writing the algorithm for given scenario,	
		● Practical exercises.	
		● Assignments	
		● Mini-Project on various topics related to The artificial intelligence.	
		● Classroom discussions and solving the problems in group	
		● Making students alert about class attendance, timing, cleanliness and manner inside the class.	
		● Assigning class responsibilities to the students	
		● Encourage to search the latest advancement or updated information during their free time.	
		● Discuss personally the course contents with the problematic students.	
		Guide and discuss with the student	

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		regarding the assignment.	
1.2	Understand Operations Research models and apply them to real-life problems;		Quiz 2, Midterm, and Final Exam, assignment 1
…			
2.0	**Skills**		
2.1	Contribute to the approximation problem whatsoever to reality.	- Most of cognitive skills will be achieved by lectures and explaining and highlighting the concepts. - Asking students at the end on each lecture to bring some materials or application related to the lecture's subject. - Explaining the difficult topics by taking extra tutorial to students. - Helping students to describe effective strategies to new situations. - To develop creative thinking. - To discuss new topics and make the session interactive.	Quiz 1, Midterm, and Final Exam
2.2	Use computer tools to solve a mathematical model for a practical problem..		Quiz 2, Midterm, and Final Exam assignment-2
2.3	Formulate a managerial decision problem into a mathematical model;		Final exam

Course Specifications

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.4	Apply of these models in the future when we face a similar problem;		Final exam
3.0	**Values**		
3.1	Formulate a managerial decision problem into a mathematical model;	● Explaining the difficult topics by taking extra tutorial to students. ● Helping students to describe effective strategies to new situations. ● To develop creative thinking. ● To discuss new topics and make the session interactive.	Final exam
3.2			Final exam

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Theory Assignment	1-10	20%
2	Quizzes	3-7	10%
3	Midterm Exam	6	20%
5	Final Examination	12 or 13	50%
6	Total		**100%**
7			
8			

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
Sunday: 8-9 am, 10-12 pm
Monday: 10-11 am
Tuesday:8-9 am, 11-12 pm
Wednesday: 10-11 am, 11-12 pm
Thursday: 8-9am, 9-10 am

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• Hillier and Lieberman. Introduction to Operations Research. 8th ed. 2005. ISBN 13-9780073211145. • P. Sankara Iyer. Operations Research. Tata McGraw-Hill, 2008.
Essential References Materials	Wayne L. Winston. Operations Research: Applications and Algorithms, fourth Edition. ISBN-13: 9780534380588 Sydney Allandale Urry. An introduction to operational research: the best of everything. Last edition. Longman Scientific & Technical. 1991, ISBN 0582013496, 9780582013490 Wayne L Winston. Operations Research: Applications and Algorithms. Indian University. 4th edition. 2004 A.M. Natarajan, P. Balasubramani, A. Tamilarasi.Operations Research. Pearson Education. 2005. J K Sharma. Operations Research Theory & Applications. 3e, Macmillan India Ltd,
Electronic Materials	-
Other Learning Materials	-

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom with 30 chairs, white board, podium, wireless projectors, Wi-Fi with good speed
Technology Resources (AV, data show, Smart Board, software, etc.)	● Lecture room should contain a PC attached to the data show device with latest MS Office and Adobe Acrobat Reader packages being installed. ● Laboratory contains an enough number of PC to accommodate all students with related software ● PCs in the lab should be installed by licensed antivirus.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	-

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
At the end of the semester, the university always conducts an online faculty evaluation survey for all the courses registered in a semester.	Students	Indirect

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Peer to peer meeting with the student about the course. Concerning pros and cons of the course in department	Students and faculty	Direct
Recommendations given by the Curriculum committee at the end of the previous semester about the course. By encouraging the students to follow the tutorials and assignments of the offered course	Instructor	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Computer Science Departmental Council
Reference No.	14440203-0185-00002
Date	1st Sep, 2022