هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2024
TP-153

Course Specification
(Bachelor)

Course Title:	**Supply Chain Engineering Planning, Design and Modeling**
Course Code:	**INE 4351**
Program:	Bachelor of Industrial Engineering
Department:	Industrial Engineering
College:	Engineering
Institution:	King Khalid University
Version:	**2**
Last Revision Date:	17-12-2025

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (7/4)					
4. Course general Description:					
This course seeks to equip individuals with the knowledge and skills necessary to analyze, model, and manage complex supply chain networks in today's dynamic business environment. Develop a deep comprehension of the key components, processes, and functions within supply chains, including procurement, production, distribution, inventory and logistics. This course introduces students to various modeling techniques and methodologies used in supply chain analysis, such as mathematical modeling, simulation, and optimization, enabling them to make informed decisions and improve overall supply chain performance.					
5. Pre-requirements for this course (if any)**:**					
INE 3321					
6. Co-requisites for this course (if any)**:**					
NIL					
7. Course Main Objective(s):					
The aim of the Supply Chain Engineering, Planning, Design and Modeling course is to provide students with a comprehensive understanding of the principles, strategies, and tools essential for effective supply chain design, optimization, and operation. This course introduces students to various modeling techniques and methodologies used in supply chain analysis, such as mathematical modeling, simulation, and optimization, enabling them to make informed decisions and improve overall supply chain performance. Participants will gain a deep understanding of the entire supply chain lifecycle, from initial planning and design to ongoing optimization models, with a focus on enhancing efficiency, agility, and responsiveness.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning		
3	Hybrid		

No	Mode of Instruction	Contact Hours	Percentage
	• Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	NIL
3.	Field	NIL
4.	Tutorial	NIL
5.	Others (specify)	NIL
Total		45

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Demonstrate knowledge of fundamental concepts and principles of Operations Research and optimization.	K1	Lectures and tutorials	Assignments Midterm Exam Final Exam
1.2	Explain duality theory and its economic interpretation in decision-making problems.	K3		
1.3	Recognize applications of	K4		

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	transportation, assignment, and network models in industrial systems.			
2.0	**Skills**			
2.1	Formulate real-world engineering problems into appropriate mathematical optimization models.	S1	Lectures and tutorials	Assignments Midterm Exam Final Exam
2.2	Apply Big-M and related techniques to handle constrained optimization problems	S3		
2.5	Develop and analyze network models for flow, shortest path, and project scheduling problems.	S6		
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate professional responsibility and ethical awareness when applying optimization techniques.	V1	Lectures and tutorials	Assignments Midterm Exam Final Exam

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.2	Show commitment to continuous learning and responsible decision-making in engineering practice.	V4	Teamwork	Assignments

C. Course Content

No	List of Topics	Contact Hours
1.	Conceptual understanding of what a supply chain is and the various issues that need to be considered when designing, planning, or operating a supply chain	3
2.	Supply Chain Drivers and Metrics	3
3.	Facility Location Planning and Decisions	6
4.	Transportation/Transshipment models	3
5.	Network Design and models	3
6.	Aggregate Planning	6
7.	Demand forecasting & planning	3
8.	Inventory models in supply chain management.	9
9.	Dynamic production planning and scheduling in the Supply Chain	3
10.	Global Supply chain Network optimization models	6
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	E-learning based activities (On-line Quizzes, Assignments)	Every Week	30%
2.	Mid Exam- I	5	15%
3.	Mid Exam- II	10	15%
4.	Final Exam	15	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	Supply Chain and Logistics Management Made Easy: Methods and Applications for Planning, Operations, Integration, Control and Improvement, and Network Design, by Paul A. Myerson (Author), Pearson FT Press; 1 Edition (May 10, 2015).
Supportive References	- Integral Logistics Management: Operations and Supply Chain Management Within and Across Companies, Schönsleben, P., Auerbach Publications; 4 th Edition,2016, ISBN-13: 978-1439878231, ISBN-10: 1439878234
Electronic Materials	Course page on Blackboard
Other Learning Materials	Lecture handouts

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms
Technology equipment (projector, smart board, software)	projector
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect (Questionnaire)
Effectiveness of Students' assessment	Faculty	Direct
Quality of learning resources	Program Leaders	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, 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