COURSE INFORMATON					
Course Title	*Code*	*Semester*	*L+P Hour*	*Credits*	*ECTS*
LOGISTICS SYSTEMS PLANNING AND DESIGN	**ESYE549**		**3+0**	**3**	**10**

Prerequisites	ISE222 or an equivalent introductory course in optimization

Language of Instruction	English
Course Level	M. S.
Course Type	Elective
Course Coordinator	
Instructors	Assist. Prof. DilekTüzünAksu
Assistants	
Goals	This course aims to introduce major issues the planning and design of logistics systems and the operations research models used for solving these problems.
Content	Main topics include logistics network design, warehouse design and operation, planning and managing long and short haul transportation systems. Particular emphasis is given to OR models that address the operational, tactical and strategic decisions in these areas and the solution methodologies employed in their solution. The course also discusses case studies that illustrate the application of these models in practice.

Course Learning Outcomes	**Program Learning Outcomes**	**Teaching Methods**	**Assessment Methods**
Defines logistics systems and explains major issues related to these systems	2,3,4	1,2	A,C
Builds mathematical models for logistics problems	2,3,12	1,2	A,C,D
Assesses the complexity of various logistics problems	2,5	1,2	A
Solves logistics problems using operations research techniques	1,2,3	1,2	A,C,D
Designs logistics networks and models them as facility location problems	3,5,7,12	1,2,4	A,C,D
Cites the operational, tactical and strategic decisions to be made in warehouse design and operation; builds models that assist in making these decisions	3,5,7,12	1,2	A,C

Differenciates between long and short haul transportation problems; builds optimization models to solve transportation systems.	3,5,7,12	1,2,4	A,C,D
Conducts literature survey in the area of logistics and presents articles in this area in the English language	1,8,9	1,2,4	B
Uses optimization software effectively to develop solutions to logistics problems	1,4	1,4	C,D

Teaching Methods:	1: Lecture, 2: Paper Discussion, 3: Lab, 4: Case-Study
Assessment Methods:	A: Testing, B:Paper Summary, C: Homework, D: Project

COURSE CONTENT

Week	Topics	Study Materials
1	OVERVIEW OF LOGISTICS TERMINOLOGY LOGISTIC PROCESSES AND RELATED DECISIONS EMERGING TRENDS IN LOGISTICS	Textbook
2	INTRODUCTION TO FACILITY LOCATION MODELS SINGLE-FACILITY MINISUM LOCATION PROBLEMS	Textbook
3	MULTI-FACILITY MINISUM LOCATION PROBLEMS	Textbook
4	EXTENSIONS OF MULTI-FACILITY MINISUM LOCATION PROBLEMS	Textbook
5	LOCATION PROBLEMS IN THE PUBLIC SECTOR	Textbook
6	INTRODUCTION TO WAREHOUSE DESIGN AND OPERATIONS	Textbook
7	MODELS FOR DETERMINING THE SIZE, DIMENSIONS, AND LAYOUT OF A WAREHOUSE	Textbook
8	MIDTERM EXAM	Textbook
9	PRODUCT ALLOCATION AND BATCH FORMATION MODELS	Textbook
10	ORDER PICKER ROUTING AND PACKING ALGORITHMS	Textbook
11	CLASSIFICATION OF TRANSPORTATION PROBLEMS AND RELEVANT COSTS FLEET COMPOSITION MODELS FREIGHT TRAFFIC ASSIGNMENT MODELS	Textbook, Case Study
12	FREIGHT TERMINAL DESIGN AND OPERATIONS VEHICLE ALLOCATION PROBLEMS DYNAMIC DRIVER ASSIGNMENT PROBLEMS	Textbook, Case Study
13	VEHICLE ROUTING PROBLEMS ASYMMETRIC TRAVELING SALESMAN PROBLEM	Textbook, Case

		Study
14	SYMMETRIC TRAVELING SALESMAN PROBLEM	Textbook, Case Study

RECOMMENDED SOURCES	
Textbook	Introduction to Logistics Systems Planning and Control, G. Ghiani, G. Laporte, R. Musmanno, Wiley, 2005.
Additional Resources	Business Logistics / Supply Chain Management, Ronald H. Ballou, Pearson-Prentice Hall, 5th Ed. 2004 Supply Chain Management, Strategy, Planning and Operation, S. Chopra, P. Meindl, Pearson-Prentice Hall, 3rd Ed. 2007.

MATERIAL SHARING	
Documents	Various articles related to logistics
Assignments	Homework 1-5, Term Project
Exams	Final exam

ASSESSMENT		
IN-TERM STUDIES	**NUMBER**	**PERCENTAGE**
Term project	1	38.5
Assignments	5	46.0
Attendance and participation	1	18.5
Total		**100**
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		35
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		65
Total		**100**

COURSE CATEGORY	Expertise/Field Courses

COURSE'S CONTRIBUTION TO PROGRAM							
No	Program Learning Outcomes	Contribution				
		1	2	3	4	5
1	Ability to reach knowledge in breadth and depth through scientific research in Systems Engineering field; to have extensive knowledge about current techniques and procedures together with their constraints.					X
2	Ability to complement and apply knowledge by scientific methods utilizing limited or missing data; to use knowledge in different disciplines effectively by blending them.					X
3	Ability to formulate Systems Engineering problems; to develop novel and original ideas and procedures for their solutions and to use innovative procedures in solutions.					X
4	Awareness of new and developing applications in Systems Engineering; ability to investigate and learn these applications when required.					X
5	Ability to design and apply analytical, and modeling and experimental based research; to solve and interpret complex situations encountered in this process.			X		
6	Ability to lead multi-disciplinary teams; to develop solution approaches in complicated situations and to take responsibility.					
7	Ability to develop novel and/or original ideas and methods; to develop innovative solutions for the design of systems, parts or the processes.					X
8	Ability to communicate orally or in writing the process and the results of Systems Engineering studies systematically and openly in national or international platforms.			X		
9	Ability to master a foreign language (English) at the European Language Portfolio B2 General Level to communicate orally or in writing.					X
10	Ability to recognize social, scientific and ethical values in the process of collection, interpretation and publishing of data, and in all professional activities.					
11	Ability to visualize social and environmental dimensions of Systems Engineering applications and to observe these dimensions in professional practice.					
12	Ability to develop appropriate methodology and procedures for the modeling, improvement, control and design of complex systems for a specified target.					X

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Including the exam weeks: 14x Total course hours)	14	3	42
Hours for off-the-classroom study (term project)	1	40	40
Hours for off-the-classroom study (final)	1	40	40
Homework	9	15	135
Final examination	1	3	3
Total Work Load			260
Total Work Load / 25 (h)			10.4
ECTS Credit of the Course			10