



COURSE OUTLINE

1. COURSE INFORMATION

SCHOOL	School of Production Engineering and Management				
DEPARTMENT	-				
COURSE LEVEL	Postgraduate				
COURSE ID		SEMESTER Winter / Spring			
COURSE TITLE	Inventories and Supply Chains				
COURSE MODULES in the case of credits being awarded in distinct parts of the course eg. Lectures, Laboratory Exercises, etc. If credit units are awarded uniformly for the whole course, indicate the weekly hours of teaching and the total number of credits.		INSTRUCTION HOURS PER WEEK		CREDITS	
	Lectures		3		
Laboratories		1			
Tutorial Exercises		1			
Total		5		5	
Add rows if needed. The teaching organization and teaching					
methods used are described in detail in (4).					
COURSE TYPE	General Kno	wledge			
Background, General Knowledge,					
Scientific Area, Skills Development					
PREREQUISITES:	-				
INSTRUCTION/EXAM LANGUAGE:	English				
THE COURSE IS OFFERED TO	YES				
ERASMUS STUDENTS:					
COURSE URL:	EURECA-PRO LMS Moodle URL:				
	https://moodle.eurecapro.tuc.gr/course/view.php?id=86				

2. LEARNING OUTCOMES

Learning Outcomes

The learning outcomes of the course describe the specific knowledge, skills and competences of an appropriate level that students will acquire after successfully completing the course.

Refer to Appendix A.

- Description of the Level of Learning Outcomes for each course of study in line with the European Higher Education Area Qualifications Framework
- Descriptive Indicators of Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B
 Learning Outcomes Writing Guide

After completing this course the students will be able to:

- Describe and Formulate Supply Chain Management Problems, such as product transportation, vehicle routing problem, facility location, inventory management, scheduling of operations

- Solve supply chain management problems
- Apply heuristics, metaheuristics, evolutionary and nature-inspired algorithms to solve supply chain management problems

- Program the algorithms for solving Supply Chain Management problems in Matlab, C, C++ and Python programming languages

- Analyze real-life situations of supply chain management problems
- Practice solving complex supply chain management problems
- Use software packages to solve supply chain management problems





General Competencies/Skills

Considering the general competencies that the graduate must have acquired (as listed in the Diploma Supplement and below),					
which one(s) the course enhances? Search, analysis and synthesis of data and information, using the necessary technologies Adaptation to new situations Decision making Autonomous work Teamwork Working in an international environment Working in an interdisciplinary environment Production of new research ideas	Project design and management Respect for diversity and multiculturalism Respect for the natural environment Demonstration of social, professional and moral responsibility and sensitivity to gender issues Exercise criticism and self-criticism Promoting free, creative and inductive thinking				
- Search, analysis and synthesis of data and info	ormation, using the necessary technologies				
- Adaptation to new situations					
- Decision-making					
- Autonomous work					
- Teamwork					
- Production of new research ideas					
- Project design and management					
 Innovative thinking 					
- Working in an international environment					
- Working in an interdisciplinary environment					
- Computer use					
- Problem solving					
- Managing numerical data					
- Respect for diversity and multiculturalism					
- Respect for the natural environment					
- Demonstration of social, professional and moral responsibility and sensitivity to gender issues					
- Exercise criticism and self-criticism					
- Promoting free, creative and inductive thinking					

3. COURSE SYLLABUS

The role of the supply chain management. Demand and supply planning in a supply chain. Applications and mathematical formulation. The traveling salesman problem. The bin packing problem. Transportation and distribution of products in the supply chain. Distribution network design. Distribution channels. Route planning. Problems of fleet selection and vehicle size. Vehicle routing problem. Variants of the vehicle routing problem. Scheduling problems. Facility location problems. Inventory management. Inventory routing problems in logistics (Single period inventory routing problem, multi-period inventory routing problem). Integrated supply chain management systems. Maritime logistics. Green supply chain. Electric and unmanned aerial vehicles in the supply chain.

Laboratory courses: For a better understanding of the course, students are required to perform laboratory exercises in C, C++, Python or Matlab, solving real supply chain management problems. Each group of students implements a different problem with different programming tools and different solution algorithms.

4. TEACHING and LEARNING METHODS – ASSESSMENT

LECTURE METHOD	Face to face/Distance Learning	
Face to face, distance learning, etc.		
USE OF INFORMATION AND	Use of ICT in Teaching: Notes and presentations of lectures	
COMMUNICATION TECHNOLOGY	of the course in moodle, courses by videoconference.	
Use of ICT in Teaching, in Laboratory Exercises,	Use of ICT in Laboratory Exercises: Notes and presentations	
in Communication with students	of laboratory lectures of the course in moodle and courses	
	by videoconference. Learning different programming	
	languages and their use for creating programs in the subject	
	of the course.	



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		Use of ICT in Communication with students: Solving			
		questions via videoconference and email			
TEACHING ORGANISATION Describe in detail the way and methods of teaching. Lectures, Seminars, Laboratory Exercise, Field Exercise, Literature review & analysis, Tutoring, Practice (Placement), Clinical Exercise, Artistic Lab, Interactive teaching, Educational visits, Designatured pages data		ΑCTIVITY	Workload per semester (in Hours)		
		Lectures	39		
		Tutorials	13		
		Lab assignments	13		
		Projects	20		
Ρισμετί work, ρισμετί, ετς.		Autonomous study	40		
The student's study hours for each learning activity and the hours of non-guided study according to the ECTS principles are mentioned.					
		Course Total (25 hours' workload/ECTS credit)	125		
ASSESSMENT METHODS		Written Final Examination (Mu	ultiple Choice Questions or/and		
Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Public Presentation, Laboratory Assignment, Clinical Examination of Patients, Artistic Interpretation, Other	Problem Solving Questions) 50% Team Project (Problem Solving, Essay / Report, Public Presentation) 30% Individual Project (Problem Solving, Essay / Report, Public Presentation) 20%				
Well defined student assessment criteria are mentioned. Mention whether and how the students can access them.					

5. DIGITIZATION (use of tools & software)

Moodle, eclass, matlab, python, c, c++

6. RECOMMENDED INTERNATIONAL LITERATURE

- 1. Waters D., (2003) Logistics: An Introduction to Supply Chain Management, Palgrave Macmillan.
- 2. Lambert D., Stock J., Ellram L., (1998) Fundamentals of Logistics Management, McGraw-Hill.
- **3.** Ravindran, Ravi; Warsing, Donald Jr. (2017). Supply chain engineering: models and applications. CRC Press.
- 4. Robert B. Handfield; Ernest L. Nichols (1999). Introduction to Supply Chain Management. New York: Prentice-Hall.
- 5. Roberta S. Russell, Bernard W. Taylor (2021). Operations and Supply Chain Management, 10th edition, John Wiley & Sons.
- 6. F. Robert Jacobs and Richard Chase (2018). Operations and Supply Chain Management, 15th edition, McGraw-Hill
- **7.** Sunil Chopra, Peter Meindl (2014) Supply Chain Management, Strategy, Planning and Operation, 6th edition, Pearson.
- 8. Alan Harrison and Remko Van Hoek (2007) Logistics Management and Strategy. Competing through the Supply Chain 4th Edition, Prentice Hall

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