

## COURSE OUTLINE

### 1. GENERAL INFORMATION

<b>SCHOOL</b>	MARITIME AND INDUSTRIAL STUDIES		
<b>DEPARTMENT</b>	INDUSTRIAL MANAGEMENT AND TECHNOLOGY		
<b>LEVEL OF STUDY</b>	UNDERGRADUATE		
<b>COURSE UNIT CODE</b>	TEΠAP11	<b>SEMESTER OF STUDY</b>	4 <sup>th</sup>
<b>COURSE TITLE</b>	PRODUCTION SYSTEMS DESIGN		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>in case in which credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
Lectures	4	5.5	
<i>Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at section 4.</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialized general knowledge, skills development</i>	Special background		
<b>PREREQUISITE COURSES:</b>	None		
<b>LANGUAGE OF INSTRUCTION and EXAMINATION/ASSESSMENT:</b>	English/ Greek		
<b>THE COURSE IS OFFERED TO ERASMUS STUDENTS</b>	Yes		
<b>COURSE WEBSITE (URL)</b>	<a href="https://eclass.unipi.gr/courses/BDT139/">https://eclass.unipi.gr/courses/BDT139/</a>		

### 2. LEARNING OUTCOMES

<p><b>LEARNING OUTCOMES</b></p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:</i></p> <p>APPENDIX A</p> <ul style="list-style-type: none"> <li>• <i>Description of the level of learning outcomes for each qualifications' cycle, according to the European Higher Education Area's Qualification Framework.</i></li> <li>• <i>Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and APPENDIX B</i></li> <li>• <i>Guidelines for writing Learning Outcomes</i></li> </ul>
<p>The "Production Systems Design" is part of the Operations Management and more specifically of Production Management, i.e. the science dealing with the concepts, problems and managerial methods of a basic production system. The manufacture of products or services is one of the main business functions (such as marketing and financial control). Production, directly or indirectly, involves many factors (employees, machines, materials, facilities, financial resources, customers, suppliers, etc.) and can take place at different locations, e.g. in factories that may even be in different countries. The involvement of numerous factors increases the complexity of problems related to planning, programming and production control. Their scientific analysis ensures their effective handling.</p> <p>Decisions on production are an essential part of the operational decisions related to and affecting the structure and operation of the entire business. In particular, these decisions relate to and are affected by decisions concerning other functions. Such functions are, inter alia, the commercial function that links the business with demand and the financial function, which ensures the financial resources</p>

required for business operation. Harmonizing the individual business divisions and management to achieve the best result for the business as a whole is the highest goal of the company's management.

The subject of Production Management includes aspects of planning, programming, control and, in general, the organization of factors and activities related to the production process, i.e., the process by which some resources (human labor, machinery, first materials, energy, information) are transformed into products or services (or contribute to their production).

The course examines the problems of Production Management concerning the design of production systems. In particular, the course focuses on making decisions about production with long-term implications for the system and its environment, which involve significant resources, i.e., strategic decisions. Such decisions are about what product or service will be produced, how much, where and how it will be produced, etc. In this context, the productive enterprise is conceived as a system consisting of elements that cooperate in an environment of opportunities and threats for a common purpose, while its individual functions are manifestations of a collective effort, related to each other. Knowing in particular the strategic issues that concern (or should concern) such a system, the problems that arise and the scientific way of approaching them, make the executive who possesses it a particularly useful factor for the survival and development of the business. These include product / service design, capacity planning, time study, site selection and layout planning.

Upon successful completion of the course, the students will:

- Have an insight into the key strategic planning issues of a production business
- Be familiar with basic tools and techniques for analyzing relevant issues
- Acquire a total / systemic view of the productive business
- Be able to design production systems (capacity, production location, production method, etc.)
- Be able to recognize the environmental parameters that affect the design of production systems
- Be familiar with the impacts of production on climate change

#### **General Competences**

*Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aims*

*Search for, analysis and synthesis of data and information, by the use of technologies that are necessary according the case*

*Adapting to new situations*

*Decision-making*

*Independent work*

*Team work*

*Working in an international environment*

*Working in an interdisciplinary environment*

*Introduction of innovative research*

*Project planning and management*

*Respect for difference and multiculturalism*

*Environmental awareness*

*Social, professional and ethical responsibility and sensitivity to gender issues*

*Critical consciousness, criticism and self-criticism*

*Development of free, creative and inductive thinking*

- Search for, analysis and synthesis of data and information, by the use of technologies that are necessary according the case
- Adapting to new situations
- Decision-making
- Independent work
- Project planning and management
- Environmental awareness
- Social, professional and ethical responsibility and sensitivity to gender issues
- Critical consciousness, criticism and self-criticism
- Development of free, creative and inductive thinking

### **3. COURSE CONTENT**

The course covers the following topics:

Week	Topic
1	Introduction to production systems design
2	Systems theory and decision making
3	Product design
4	Capacity planning
5-6	Queuing systems
7	Production location planning
8	Process design
9-10	Work measurement
11	Facility location planning
12	Design of production systems and the environment
13	Climate change and production systems

In addition, articles, audiovisual lecture material, web addresses, useful information and exercises are posted at e-class.

#### 4. TEACHING METHODS - ASSESSMENT

<p><b>TEACHING MODE</b> <i>Face-to-face, in-class lecturing, on distance teaching and distance learning etc.</i></p>	In-class lecturing	
<p><b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</b> <i>Use of ICT in Teaching, Laboratory Education, Communication with students</i></p>	<p><b>Teaching:</b> Lectures with audiovisual media, support of the learning process through the eclass platform  <b>Communication with students:</b> face-to-face at office hours, email, eclass</p>	
<p><b>COURSE DESIGN</b> <i>Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, clinical practice, Art Workshop, Interactive teaching, Educational visits, project, Essay writing, Artistic creativity, etc.</i></p> <p><i>The study hours for each learning activity as well as the hours of non- directed study are given according to the principles of the ECTS</i></p>	<p><b>Activity / Method</b></p>	<p><b>Semester Workload</b></p>
	Lectures	52
	Bibliography study	26
	Self-study of lecture material	57
	Counselling	0.5
	Exams (written)	2
	Course Total	<b>137.5</b>
<p><b>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS</b> <i>Detailed description of the evaluation procedures: Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice questionnaires, short- answer questions, open-ended questions, problem solving, written work, Essay/report, oral exam, public presentation, laboratory work, art interpretation, other.....etc</i></p>	<p><b>Language of exams:</b> Greek</p> <p><b>Assessment Methods:</b> After the last lecture, the exam material is posted at e-class. The final course grade is formed by the written exams (100%) taken in the examination period of the spring semester and, in case of failure, in the September resits.</p> <p>The written examination includes problem solving / exercises and short-answer and open-ended questions. It is conducted with a formulas' sheet.</p> <p>The evaluation of students with special learning difficulties in writing and reading (as certified and qualified by a competent</p>	

*Evaluation criteria are specifically defined and given as well as if and where they are reported and accessible to students.*

institution) is performed according to the relevant procedure decided by the Department Assembly.

**Notification of the Assessment Criteria:** The evaluation criteria are announced during the first lecture and are clearly stated on the course website and e-class. The answers to the exam questions are posted at e-class after the exam date. Students have the opportunity to discuss their exam paper with the course instructor (at office hours) after the announcement of the course grades.

## 5. SUGGESTED BIBLIOGRAPHY

*-Suggested Bibliography (in Greek):*

- Operations Management – Sustainability and Supply Chain Management Αλυσίδας (2<sup>η</sup> έκδοση), Heizer J., Render, B., Munson, C., 2023. Εκδόσεις BROKEN HILL PUBLISHERS LTD.
- Production Management – Design of Production Systems. 2<sup>nd</sup> Edition [in Greek], K.P. Pappis, 2017, UNIBOOKS.

*-Scientific Journals:*

- Management Science
- Journal of Operations Management
- Production and Operations Management
- International Journal of Production Economics
- International Journal of Production Research
- Production Planning and Control
- Journal of Cleaner Production
- Production Planning and Control
- Journal of Cleaner Production

*-Lecture Notes*