

## COURSE OUTLINE

### (1) GENERAL

<b>SCHOOL</b>	SCHOOL OF BUSINESS		
<b>ACADEMIC UNIT</b>	BUSINESS ADMINISTRATION		
<b>LEVEL OF STUDIES</b>	POSTGRADUATE		
<b>COURSE CODE</b>		<b>SEMESTER</b>	SPRING
<b>COURSE TITLE</b>			
<b>INDEPENDENT TEACHING ACTIVITIES</b>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
<i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>			
	3	8	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	General background		
<b>PREREQUISITE COURSES:</b>	None		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	No		
<b>COURSE WEBSITE (URL)</b>	<a href="https://aegeanmoodle.aegean.gr/course/view.php?id=287">https://aegeanmoodle.aegean.gr/course/view.php?id=287</a>		

### (2) LEARNING OUTCOMES

<p><b>Learning outcomes</b></p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> <li>• <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</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 4<sup>th</sup> industrial revolution or “Industry 4.0” is now underway, focus on economic and social relations except from technological developments,</p> <p>The digital transformation of business processes is necessary for industries and organizations in order to respond to the new social, economical and technological challenges.</p> <p>The aim of this course is to make students familiar with the new way of operations management, to highlight the need for the digitalization of organizations / businesses in order to challenge new requirements, to present the tools for digital transformation of business processes and to indicate opportunities of sustainable development in the new digital transformation.</p> <p>The students will be familiar with the topics of Operations management, the concepts of digital transformation and the 4<sup>th</sup> industrial Revolution, the additive</p>

manufacturing procedure (3D printing), the principles of smart sustainable development, the Blockchain, the Internet of Things and Machine Learning in a quantitative model, which help business executives and organizations to take the best decisions that improve efficiency and performance.

Upon completion of this course, students will have understood:

- Operations and Production Management
- the Digital Transformation
- 3D Printing
- Smart Sustainable Development
- Blockchain
- Internet of Things
- Machine Learning

The above learning outcomes correspond to Level 8 of the European Qualifications Framework.

#### General Competences

*Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?*

*Search for, analysis and synthesis of data and information, with the use of the necessary technology*

*Adapting to new situations*

*Decision-making*

*Working independently*

*Team work*

*Working in an international environment*

*Working in an interdisciplinary environment*

*Production of new research ideas*

*Project planning and management*

*Respect for difference and multiculturalism*

*Respect for the natural environment*

*Showing social, professional and ethical responsibility and sensitivity to gender issues*

*Criticism and self-criticism*

*Production of free, creative and inductive thinking*

*.....*

*Others...*

*.....*

- Search for, analysis and synthesis of data and information, with the use of the necessary technology Προσαρμογή σε νέες καταστάσεις
- Decision-making
- Project planning and management
- Team work
- Working in an interdisciplinary environment
- Production of new research ideas

### (3) SYLLABUS

#### *Basic modules*

- Operations and Production Management
  - Business processes
  - Production Models
- Digital Transformation & 4th Industrial Revolution Τρισδιάστατη Εκπαίδευση
- (3D printing)
  - Introduction to 3D Printing
  - Applications of 3D printing & copyrights
  - Supply chain & 3D printing
  - Introduction to 3D Design &TinkerCad-AutoCad
- Smart Sustainable Development
- 
- Blockchain
  - Introduction to Blockchain
  - Comparison of different blockchain types
  - Blockchain structure: algorithms, techniques and platforms
- Big Data Analysis
- Internet of Things
  - Introduction to IoT & applications
  - IoT structure
  - IoT and efficiency of Organizations & Businesses
- Machine Learning
  - Introduction to Machine Learning
  - Machine Learning Techniques (supervised and unsupervised)
  - Business efficiency using ML
  - Deep learning ML for Business

<p style="text-align: center;"><b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i></p>	Blended methods of learning (face to face and distance learning)																					
<p style="text-align: center;"><b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<ul style="list-style-type: none"> <li>• Use of ICT in teaching (power point presentations).</li> <li>• Use of ICT in laboratory education (use of 3D printing software)</li> <li>• Communication with students through the moodle platform and email</li> <li>• Post slides and material</li> </ul>																					
<p style="text-align: center;"><b>TEACHING METHODS</b> <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i></p> <p><i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"><i>Activity</i></th> <th style="width: 40%;"><i>Semester workload</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td style="text-align: center;">30</td> </tr> <tr> <td>Laboratory practice</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Lectures study</td> <td style="text-align: center;">30</td> </tr> <tr> <td>Collection and study of report bibliography</td> <td style="text-align: center;">65</td> </tr> <tr> <td>Report writing</td> <td style="text-align: center;">70</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td>Course total</td> <td style="text-align: center;"><b>200</b></td> </tr> </tbody> </table>		<i>Activity</i>	<i>Semester workload</i>	Lectures	30	Laboratory practice	5	Lectures study	30	Collection and study of report bibliography	65	Report writing	70							Course total	<b>200</b>
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<p style="text-align: center;"><b>STUDENT PERFORMANCE EVALUATION</b> <i>Description of the evaluation procedure</i></p> <p><i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>Assessment is done by writing reports (two during the course and one at the end of the semester).</p> <ul style="list-style-type: none"> <li>• The evaluation language is Greek</li> </ul>																					

#### (4) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Course slides
2. Anderson, C., (2012). "Makers: The new Industrial Revolution" Crown Business Eds
3. Bernier, N.S., Luyt, B., Reinhard (2015) "Make: Design for 3D Printing: Scanning, Creating, Editing, Remixing, and Making in Three Dimensions"
4. Drescher, D., (2017). "Blockchain Basics", Apress Eds
5. Hornick, J., (2015). "3D printing will rock the world", CreateSpace

Independent Publishing Platform

6. Lipson, H., Kurman, M., (2011). "Fabricated the new word of 3D printing" Wiley Eds
7. Wilkins, N., Scott, R.B., (2017). "Internet of Things: What you need to know about IoT, Big Data, Predictive Analytics, Artificial Intelligence, Machine Learning, Cybersecurity, Business Intelligence, Augmented Reality and our Future" Audiobook kindle eds
8. Watt, J., Borhani. R., (2020). " Machine Learning Refined: Foundations, Algorithms, and Applications", Cambridge University Press
9. Taha, H., (2011). "Επιχειρησιακή Έρευνα", Εκδόσεις Τζιόλα
10. Slack, N., Chambers, S., Johnston, R. (2010), "Operation Management", 6<sup>th</sup> ed., *FT/Prentice Hall*.

- Related academic journals:

- Alpern, P. (2010), "Beam me up, Scotty", *Industry Week*, Vol. 259 No. 2, pp. 46-47.
- Attaran, M. (2017), "Additive Manufacturing: The most promising technology to alter the supply chain and logistics", *Journal of Service Science and Management*, Vol. 10, pp. 189-205.
- Atzeni, E., Salmi, A. (2012), "Economics of additive manufacturing for end-usable metal parts", *International Journal of Advanced Manufacturing Technology*, Vol. 62, pp. 1147-1155.
- Barnatt, C. (2013), 3D-printing: The next industrial revolution. *ExplainingTheFuture.com*.
- Baumers, M., Holweg, M. (2019), "On the economics of additive manufacturing: Experimental findings", *Journal of Operations Management*, Vol. 65 No 8, pp. 794-809.
- Bechtold, S. (2016), "3D Printing, Intellectual Property and Innovation Policy", *IIC - International Review of Intellectual Property and Competition Law*, Vol. 47 No. 5, pp. 517-536.
- Berman, B. (2012), "3-D printing: The new industrial revolution", *Business Horizons*, Vol. 55, pp. 155-162.
- Campbell, T., Williams, C., Ivanova, O., Garrett, B. (2011), "Could 3D printing change the world", *Technologies, Potential, and Implications of Additive Manufacturing*, Atlantic Council, Washington, DC, 3.
- Casey, L. (2009), "Prototype pronto", *Packaging Digest*, Vol. 46 No. 8, pp. 54-56.
- Chan, H., Griffin, J., Lim, J., Zeng, F., Chiu, A. (2018), "The impact of 3D Printing Technology on the supply chain: Manufacturing and legal perspectives", *International Journal of Production Economics*, Vol. 205, pp.156-162.
- Chen, B., Wan, J., Shu, L., Li, P., Mukherjee, M., Yin, B. (2018), "Smart Factory of Industry 4.0: Key Technologies, Application Case, and Challenges", *Digital Object Identifier*, Vol. 6, pp. 6505-6519.
- Chesbrough, H. (2010), "Business model innovation: opportunities and barriers", *Long Range Planning*, Vol. 43 No. 2, pp. 354-363.
- Davis, F. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, Vol. 13 No. 3, pp.319-339.
- Gausemeier, J., Wall, M., Peter, S. (2013), *Thinking ahead the Future of Additive Manufacturing: Exploring the Research Landscape*, Paderborn: Heinz Nixdorf Institute.
- Gebler, M., Uiterkamp, A.J.M.S., Visser, C. (2014), "A Global Sustainability Perspective on 3D Printing Technologies", *Energy Policy*, Vol. 74, pp. 158-167.
- Groves, R. M. (1987). Research on survey data quality. *Public Opinion Quarterly*, 51, 156-172.
- Holm, A., Günzel, F., Ulhøi, J. (2013), "Openness in innovation and business models: lessons

from the newspaper industry”, *International Journal of Technology Management*, Vol. 61 No. 3, pp. 324-348.

Hsu, Y. (2011), “Design innovation and marketing strategy in successful product competition”, *Journal of Business & Industrial Marketing*, Vol. 26 No. 4, pp. 223-236.

Hultink, E.J., Griffin, A., Hart, S., Robben, H.S.J. (1997), “Industrial new product launch strategies and product development performance”, *Journal of Product Innovation Management*, Vol. 14 No. 4, pp. 243-257.

Lee, D. (2000), “The Customer Relationship Management Planning Guide: CRM Steps I & II, Customer - Centric Planning & Redesigning Roles”, *High Yield Marketing Press*, Heinel Drive MN.

Mavri, M. (2015), “Redesigning a Production Chain Based on 3D Printing Technology”, *Knowledge and Process Management*, Vol. 22 No. 3, pp. 141-147.

Mellor, S., Hao, L., Zhang, D. (2014), Additive manufacturing: a framework for implementation, *International Journal of Production Economics*, Vol. 149, pp. 194-201.

Rayna, T., Striukova, L. (2016), “From rapid prototyping to home fabrication: How 3D printing is changing business model innovation”, *Technological Forecasting and Social Change*, Vol. 102, pp. 214-224.

Teece, D.J. (2010), “Business models, business strategy and innovation”, *Long Range Planning*, Vol. 43 No. 2, pp. 172-194.