

COURSE OUTCOME

KM251 - Introduction to Bioeconomy

1. GENERAL

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|---|---|-------------------------|-------------|
| SCHOOL | TECHNOLOGY | | |
| DEPARTMENT | Department of Forestry, Wood Sciences and Design (FWSD) | | |
| LEVEL | <i>Undergraduate</i> | | |
| CODE | KM251 | STUDENT SEMESTER | 2nd |
| COURSE TITLE | INTRODUCTION TO BIOECONOMY | | |
| ACTIVITIES | | WEEKLY HOURS | ECTS |
| | Lectures and Workshops | 3 | 5 |
| | | | |
| | | | |
| Type of course | Scientific | | |
| PREREQUISITES: | none | | |
| LANGUAGE TEACHING AND EXAMINATION: | Greek | | |
| THE COURSE OFFERED TO STUDENTS ERASMUS | yes | | |
| WEBPAGES COURSE (URL) | https://eclass.uth.gr/courses/FWSD_U_111/ | | |

2. LEARNING OUTCOMES

| Learning Outcomes |
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| <p>The aim of the course is the basic knowledge of the core principles of bioeconomy and a gradual specialization in the forest bioeconomy, which is perhaps its most important pillar. The course responds to the rapid development of the global bioeconomy by providing fundamental knowledge and skills required in the modern competitive and fast-growing business and work environment with a focus on enterprises in the value chain of wood and other forest products. It is a basic introductory course, which will enable students to delve deeper into the concepts required for the sustainable utilization of natural resources and the development of bioeconomy in the modern economic framework.</p> <p>Upon successful completion of the course, students will:</p> <ul style="list-style-type: none"> • Have developed basic knowledge and skills in the fields of bioeconomy and especially of the value chain of the forest industry, of the circular economy and the meaning of sustainable development • have acquired an overall view and ability to assess the ways in which the bioeconomy has already begun to change production methods, industrial structures and sectors, market dynamics and strategic decision-making • have been introduced in the ecosystem of the bioeconomy which includes the state, users, citizens, and third parties and recognize emerging socio-economic trends in the bioeconomy |

- become acquainted of the ethical and legal issues that people and society face and will face in the near future as a result of these changes.
- understand and utilize the knowledge of product life cycle analysis in the context of the forest bioeconomy and make use of this knowledge in the development of business strategies or more specialized ones such as production strategy, marketing, etc. to meet modern competitive challenges.
- get acquainted with introductory concepts of innovations, technologies and the new required competences and skills in order to create new products and services attractive in the market but also in accordance with the new requirements of the circular bioeconomy.

General Skills

Upon successful completion of the course, the students will be able to develop and cultivate basic professional and social skills:

- Ability to understand and assess the interrelationship between man and the biophysical environment
- Decision-making and formulation of strategies for issues related to new business approaches in relation to the quality of the environment
- Environmental capacities
- Encourage individual initiative, sense of responsibility and commitment to creating a better future
- Search, analysis and synthesis of data and information, using the necessary technologies
- Ability to adapt to new situations
- Demonstration of social, professional and ethical responsibility
- Promoting free, creative and inductive thinking

3. COURSE CONTENT

The course focuses on issues related to:

- Introduction to natural resources and the bioeconomy.
- Bioeconomy and sustainability.
- Renewable natural resources – the forest as a renewable natural resource
- Basic concepts of Natural Resources: Biotic, Abiotic
- Distinction of natural resources
- Forest Ecosystems (Industrial forests, Non-Industrial Forests).
- Social and economic importance of forest ecosystems.
- Natural resources and value: from value chains to value loops.
- The bioeconomy as a source of economic growth.
- Product development processes of the bioeconomy.
- Procedures for the adoption of the bioeconomy by enterprises and organizations in the forest industry.
- Bioeconomy and sustainable development – connection with the circular economy.
- Markets, sustainability management and entrepreneurship.
- The transition to sustainable bioeconomy.
- Bioeconomy policy and strategy in Europe

The exercises of the course take place one (1) hour per week. Attendance by students is mandatory by at least 50%. Exercises are theory practice to maximize theoretical knowledge, while case studies of successful projects are presented in the context of the forest bioeconomy. Other practices used are constructive dialogue, resolution of questions and concerns, as well as the acquisition of conscious knowledge and application of basic principles of the subject of bioeconomy in practice.

From the 1st week of courses, students are given either a list of topics related to the syllabus of the

course and are asked to prepare and essay or discuss a case study.
 Directions, rich material and instructions are posted in the e-class portal.
 The final assignment of the course includes, the essay, a public oral presentation on the selected topic, on a fixed date (usually the 12th week of lessons). The presentation lasts 10 minutes with 5' for questions. The teacher intervenes – if necessary – for commentary, observations, corrections. The grade of the homework counts for 20% of the final grade of the course. 80% comes from the exams at the end of semester.

4. TEACHING AND LEARNING METHODS - EVALUATION

| DELIVERY METHOD | Face to face The course is organized in two parallel streams: 1. Lectures, which analyze the concepts and methodologies that form the core of the course material 2. Workshops (studios), where students: get acquainted with methods and tools of creative thinking and analysis, synthesis of ideas and presentation skills | | | | | | | | | | | | | | | |
|--|--|--|-----------------|--------------------------|----------|----|-----------|----|-----------------|----|-------------------------------|----|---------------------------|----|----------------------------|-------------------|
| USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES | <ul style="list-style-type: none"> • PC, ppt, projector • Use of a course website on the e-class platform for posting (a) notes, (b) internet links, (c) announcements, search tools and social networks • MSTEAMS platform | | | | | | | | | | | | | | | |
| MANAGEMENT OF TEACHING | <table border="1"> <thead> <tr> <th style="text-align: center;"><i>Activity</i></th> <th style="text-align: center;"><i>Semester Workload</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td style="text-align: center;">26</td> </tr> <tr> <td>Workshops</td> <td style="text-align: center;">13</td> </tr> <tr> <td>term assignment</td> <td style="text-align: center;">20</td> </tr> <tr> <td>Short essays and case studies</td> <td style="text-align: center;">20</td> </tr> <tr> <td>Individual and work study</td> <td style="text-align: center;">51</td> </tr> <tr> <td><i>Course Total</i></td> <td style="text-align: center;"><i>125</i></td> </tr> </tbody> </table> | | <i>Activity</i> | <i>Semester Workload</i> | Lectures | 26 | Workshops | 13 | term assignment | 20 | Short essays and case studies | 20 | Individual and work study | 51 | <i>Course Total</i> | <i>125</i> |
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| STUDENT EVALUATION | I. Written final exam (80%) including: - Short-answered questions - exercises related to the subject of the course II. Presentation of the term assignment (20%) | | | | | | | | | | | | | | | |

5. RECOMMENDED-BIBLIOGRAPHY

- Pietzch Joachim, (2018), Εισαγωγή στη Βιοοικονομία, Bookstation.gr, Επιμέλεια Βοργιάς Κ.
- Lewandowski, I. (Ed.). (2017). Bioeconomy: Shaping the Transition to a Sustainable, Biobased Economy. Springer.
- Lovrić, M., Lovrić, N., & Mavsar, R. (2017). Synthesis on forest bioeconomy research and innovation in Europe.

- Ellen MacArthur Foundation (2013) Towards the circular economy.
http://www.mckinsey.com/~media/mckinsey/dotcom/client_service/sustainability/pdfs/towards_the_circular_economy.ashx
- Kovacs B (ed) (2015) Sustainable agriculture, forestry and fisheries in the bioeconomy – a challenge for Europe. Standing Committee on Agricultural Research – 4th Foresight Exercise. European Commission, Brussels
- D'Amours, S., Ouhimmou, M., Audy, J. F., & Feng, Y. (2016). *Forest value chain optimization and sustainability*. CRC P
- Odegard I, Croeze H, Bergsma G (2012) Cascading of biomass: 13 solutions for a sustainable bio-based economy. CE Delft, Delft
- Cooke, P. (2013). *Growth Cultures: The global bioeconomy and its bioregions*. Routledge.
- Βλάχου, Α. (2001). Περιβάλλον και φυσικοί πόροι: Οικονομική θεωρία και πολιτική. Τόμος Α'. Αθήνα, Εκδόσεις Κριτική.

Scientific Journals:

- *Journal of Cleaner Production*
- *Forests*
- *International Journal of Life Cycle Assess*
- *Sustainability*
- *The Forestry Chronicle*
- *Forest policy and economics*
- *Scandinavian Journal of Forest Research*
- *Bioproducts Business*

