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| **Obuda University**<br>John von Neumann Faculty of Informatics | | | *Institute of Biomatics and Applied Artificial Intelligence* | |
| **Name and code:** The Economics of Health Technology Innovation **Credits*: 4***<br><br>*Computer Science Engineering BSc* *2020/21 year II. semester* | | | | |
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| Subject responsible: Dr. Zrubka Zsombor | | | | |
| Subject lecturers: Dr. Zrubka Zsombor, Prof. Péntek Márta, Prof. Gulácsi László | | | | |
| Prerequisites (with code): | Vállalkozás gazdaságtan II.( GSXVG2HBNE)<br>or Enterprise Economics II (GSXVG2EBNE) | | | |
| Weekly hours: | Lecture: 2 | Seminar.: 0 | Lab. hours: 2 | Consultation: 0 |
| Way of assessment: | Midterm grade | | | |

**Course description:**

*Goal*: To introduce the economic considerations throughout the process of innovation of health technologies (medical devices, pharmaceuticals or advanced therapies), from discovery, development and market access to market growth and expiry of patent protection. The economic aspects are introduced from both the industrial and governmental stakeholders' perspective.

*Course description:* Innovation is discussed in five stages: discovery (setting up the business framework for the new technological idea), development (the structured R&D process according to the legal framework of applicable regulations), market access (demonstrating the value of innovation to governments, health insurers or customers), adoption and diffusion of innovation (market launch and growth phase, competition with the innovative technology in the market), expiry of patent protection (life-cycle management of the innovation, competition with copies). Relevant economic theories for the five stages are discussed, and students participate in a business game, where key challenges of the five stages are presented for hypothetical product case studies. Students experience the evolving complexity of business- and policy decisions about innovative product markets through the case studies, discuss challenges and present suggestions within teamwork.

Furthermore, students are required to provide individual mini presentations about technical terms and business concepts related to the business game challenge and theoretical background of the respective stage of the innovation process.

**Lecture schedule**

| *Education week* | *Topic* |
|---|---|
| 1. | Introduction and course basics |
| 2. | Innovation theories I. |
| 3. | Innovation theories II. + presentations |
| 4. | Case study: medical devices + business game I. (Discovery) |
| 5. | Institutional framework of innovation I. + presentations |
| 6. | Case study: eHealth + business game II. (Development) |
| 7. | Economic evaluation + presentations |
| 8. | Home learning (spring break) |
| 9. | Essay consultation + business game III. (Market Access) |
| 10. | Decision-making + presentations |
| 11. | Case Study: advanced therapies + business game IV. (Adoption and Diffusion) |
| 12. | Business strategy + presentations |
| 13. | Case study: pharmaceuticals + business game V. (Loss of patent protection) |
| 14. | Course closing + presentations |

**Midterm requirements**

a) The course is organised online. Lectures are provided online, student presentations are pre-recorded and provided online, group discussions are organised via MS Teams Group Channels during the course timeframe.
b) Students are assigned to pre-defined presentation topics, on which they pre-record mini presentations and upload in Moodle. The presentations are shared with other students, scored and contribute to the overall course results. Presentations are compulsory, course completion is conditional on providing a presentation.
c) Students are provided with an interactive home-learning material linked to academic papers, websites of institutions, databases and corporations involved in health technology innovation. Browsing activity is rewarded by bonus points, which contributes to the final score. Bonus points are optional.
d) Students are required to submit a year-end essay by the final week of the course. The essay is compulsory, course completion is conditional on submitting the essay.

**schedule**

| *Education week* | *Topic* |
|---|---|
| 3. -14. | Mini presentations |
| 14. | Final deadline of submission of essay |

a) Students can gather 40 points during the semester by a) providing presentations (0-15 points) b) collecting bonuses from home learning (0-5 points) c) submitting the course-end essay (0-20 points). Students will receive a proposed grade based on the following scoring: 0-20 (1-fail) 21-24 (2-weak), 25-28 (3-fair), 29-32 (4-good), 33-40 (5-excellent).
b) If students are not satisfied with the proposed grade, they can participate in a written exam. The written exam will comprise 5 randomly chosen short essay questions from the topics of the student presentations. Each question is rewarded by 8 points. Exam grades will be provided according to the following scoring: 0-20 (1-fail) 21-24 (2-weak), 25-28 (3-fair), 29-32 (4-good), 33-40 (5-excellent).

**Type of exam**

**Type of replacement**

If a student did not fulfill the requirements for obtaining a midyear grade one occasion must be provided to make up for it within the fist ten days of the study period.

**References**

Obligatory:
Course presentations and handout materials provided on Moodle

Recommended:
White & Bruton: The Management of Technology and Innovation. A Strategic Approach 2nd edition (2011) South Western Cengage Learning, Mason OH, USA