**COURSE OUTLINE**

1. **GENERAL**

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| **SCHOOL** | School of Health Sciences | | | | |
| **ACADEMIC UNIT** | Faculty of Medicine | | | | |
| **LEVEL OF STUDIES** | Undergraduate | | | | |
| **COURSE CODE** |  | **SEMESTER** | | **5th** | |
| **COURSE TITLE** | Applications of nanotechnology in medicine (Nanomedicine) | | | | |
| **INDEPENDENT TEACHING ACTIVITIES** *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* | | | **WEEKLY TEACHING HOURS** | | **CREDITS** |
| Lectures and laboratory exercises | | | 2 | | 2 |
|  | | |  | |  |
|  | | |  | |  |
| *Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).* | | |  | |  |
| **COURSE TYPE**  *general background,  special background, specialised general knowledge, skills development* | Special background | | | | |
| **PREREQUISITE COURSES:** | No | | | | |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | Greek | | | | |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | No | | | | |
| **COURSE WEBSITE (URL)** | https://ecourse.uoi.gr/enrol/index.php?id=3950 | | | | |

1. **LEARNING OUTCOMES**

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| **Learning outcomes** | |
| *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.*  *Consult Appendix A*   * *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area* * *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B* * *Guidelines for writing Learning Outcomes* | |
| **Learning outcomes**  The course covers the principles of nanomedicine, particularly focusing on the connection between the physicochemical properties of nanomaterials, potential routes of administration, and their interactions with cells and tissues of the body. Additionally, it addresses the behavior of nanoparticles in biological fluids (such as plasma and intestinal fluid) and their colloidal stability. The course references the fundamental principles of active targeting (using substituents) and passive targeting (e.g., in cancer) and the uptake of nanoparticles by cells and tissues of the body. Moreover, it explores the properties of nanoparticles and nanocarriers, including the most important synthesis methods and characterization techniques. Special attention is given to diagnostic materials for imaging techniques, as well as materials for the diagnosis and treatment of diseases (such as diabetes mellitus, neurodegenerative diseases, etc.).    The course includes lectures delivered by the professor, and students are required to engage in bibliographic research related to the course content.  Training hours per student: 26  Semester: 5th  ECTS: 2 | |
| **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…*  *…….* |
| Working independently  Teamwork  Working in an interdisciplinary environment  Production of new research ideas | |

1. **SYLLABUS**

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| 1. Introduction to nanotechnology: historical development, different types of nanoparticles, and connection of nanotechnology with biological and medical science. 2. Nanomedicine: applications of nanoparticles in vitro in biomedicine, toxicity issues. 3. Use of nanoparticles in disease diagnosis. 4. Use of nanoparticles in the treatment of diseases. 5. Use of nanoparticles in medical imaging. 6. Use of nanoparticles in regenerative medicine. 7. Use of nanoparticles as drug carriers. 8. Applications of nanoparticles in clinical practice. 9. Ethical issues in nanomedicine. 10. Newer developments in nanomedicine.   Books   1. Tibbals Harry J (2021). Ιατρική Νανοτεχνολογία και Νανοϊατρική. Εκδόσεις Παπαζήση, **Αθήνα.** Κωδικός βιβλίου στον Εύδοξο: 102074476 |

1. **TEACHING and LEARNING METHODS - EVALUATION**

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| **DELIVERY** *Face-to-face, Distance learning, etc.* | Face-to-face |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** *Use of ICT in teaching, laboratory education, communication with students* | Use of ICT |
| **TEACHING METHODS**  *The manner and methods of teaching are described in detail.*  *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.*  *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* | |  |  | | --- | --- | | ***Activity*** | ***Workload of each students group (two groups per semester)*** | | Lectures | 26 | | Project | 12 | | Essay writing | 8 | | Study hours | 14 | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | | Total | ***60*** | |
| **STUDENT PERFORMANCE EVALUATION**  *Description of the evaluation procedure*  *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*  *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.* | Methods of evaluation:  Written examination: multiple choice questionnaires and short-answer questions  Written work (essay)- presentation |

1. **ATTACHED BIBLIOGRAPHY**

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| *Teaching - study material:*   1. Tibbals Harry J (2021). Ιατρική Νανοτεχνολογία και Νανοϊατρική. Εκδόσεις Παπαζήση, **Αθήνα.** Κωδικός βιβλίου στον Εύδοξο: 102074476 |