**COURSE OUTLINEΣ**

1. **GENERAL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SCHOOL** | HEALTH SCIENCES | | | | |
| **ACADEMIC UNIT** | BIOLOGICAL APPLICATIONS AND TECHNOLOGIES | | | | |
| **LEVEL OF STUDIES** | undergraduate | | | | |
| **COURSE CODE** | ΒΕE908 | **SEMESTER** | | 7th, 9th | |
| **COURSE TITLE** | MICROBIAL GENETICS | | | | |
| **INDEPENDENT TEACHING ACTIVITIES** | | | **WEEKLY TEACHING HOURS** | | **CREDITS** |
| Lectures and bibliography paper presentation | | | 3 | | 4 |
| **COURSE TYPE** | Specialized general knowledge,  Skills development | | | | |
| **PREREQUISITE COURSES:** | - | | | | |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | Greek (instruction and examination)  English (examination) | | | | |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | yes | | | | |
| **COURSE WEBSITE (URL)** | <http://ecourse.uoi.gr/enrol/index.php?id=670>  http://bat.uoi.gr/show-lesson?l\_id=54 | | | | |

1. **LEARNING OUTCOMES**

|  |
| --- |
| **Learning outcomes** |
| By the completion of this course, the students will be able to understand, recognize and describe the mechanisms of genetic diversity in bacteria as well as the response to external stimuli that leads to the induction of certain functional processes. They will use the obtained knowledge in order to estimate, process and solve problems. In addition, they will be in the position to combine those mechanisms in order to develop their own approach of methodology in scientific studies which they will be asked to investigate. |
| **General Competences** |
| * Search for, analysis and synthesis of data and information, with the use of the necessary technology * Working independently / team work * Production of free, creative and inductive thinking |

1. **SYLLABUS**

|  |
| --- |
| **Course theory**   * The importance of bacteria. * Prokaryotic DNA metabolism. Replication of cyclic and linear DNA in bacteria. * Plasmids. Characteristics, properties, utility. * Plasmid replication and maintenance in their hosts. * Horizontal gene transfer: conjugation, transformation, conjugative transposons. * Quorum sensing in bacteria. Molecular mechanisms in Gram- και Gram+ bacteria and the cell functions that are induced. * Cell differentiation in bacteria: endospore formation in *Bacillus subtilis*. * Extremophiles: General characteristics. Examples of genetic regulation. Applications. * MicroBioWorld: Hellenic Initiative & Scientific Society.   **Bibliography paper presentation**  The students choose from a list of recent review articles in the topics of Microbial Genetics and prepare an oral presentation individually on in short group (maximum 4 depending on the review article length) which is interpreted in the class. |

1. **TEACHING AND LEARNING METHODS – EVALUATION**

|  |  |
| --- | --- |
| **DELIVERY***.* | Face-to face in the class |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** | Support of the learning procedure via the electronic platform “e-course”  Communication with students via email & ecourse |
| **TEACHING METHODS** | |  |  | | --- | --- | | ***Activity*** | ***Semester workload*** | | Lectures | 40 | | Bibliography presentation | 25 | | Individual studying | 35 | | Course total | ***100*** | |
| **STUDENT PERFORMANCE EVALUATION** | **Theory (50 %, should be ≥ 5)**  Written exams including:   * Short- or middle answer questions (85%) * Problem solving (15%)   **Bibliography paper presentation (50%)** |

1. **ATTACHED BIBLIOGRAPHY**

|  |
| --- |
| Watson, Baker, Bell, Gann, Levine, Losick. Molecular Biology of the Gene, 7th Edition, Cold Spring Harbor Laboratory Press, 2013. ISBN  978-0-321-76243-6  * Watson, Caudy, Myers, Witkowski. **Recombinant DNA**, WH Freeman Eds, 2007. ISBN**:** 9781429203128. * [www.sci.sdsu.edu/~smaloy/MicrobialGenetics/](http://www.sci.sdsu.edu/~smaloy/MicrobialGenetics/) (Microbial genetics supplement) * <http://biology-pages.info> (Kimball’s Biology pages) * <http://www.accessexcellence.org/> (Access Excellence - The National Health Museum) |