|  |  |
| --- | --- |
| Module name | **Molecular Biology II** |
| Module code | B-MI.049 |
| ISCED code | 0511: Biology |
| Study cycle | I° |
| Semester | summer semester |
| Responsible for this module | prof. Marek Tchórzewski (maro@hektor.umcs.lublin.pl),  Tel. +48 815375956 |
| Language of instruction | English |
| Website | - |
| Prerequisites | Completed course of biochemistry, genetics |
| ECTS | 7 |
| ECTS points hour equivalents | Contact hours (work with an academic teacher): 30 hrs of lectures and 60 hrs of laboratory Total number of hours with an academic teacher: 100  Number of ECTS points with an academic teacher: 4.0   Non-contact hours (students' own work) 75  Total number of non-contact hours 75  Number of ECTS points for non-contact hours: 3.0  **Total number of ECTS points for the module 7.0** |
| Educational outcomes verification methods | written exam, continuous assessment of labs |
| Description | The module covers the knowledge in the area of:  the essential concepts of molecular biology.  The student learns the techniques used to analyse DNA, RNA and proteins |
| Reading list | 1. J.E. Krebs, E.S. Goldstein, S.T. Kilpatrick,   Lewin’s Genes XI 2. L. A. Allison, Fundamental molecular biology 3. T.A. Brown, Genomes 3 4. Articles from prestigious journals recommended   by teacher |
| Educational outcomes | **KNOWLEDGE**   1. Student can describe regulation of expression of genetic information and function of protein factors involved in that process. 2. Student characterizes the structure of receptors and extracellular signal transduction mechanisms. 3. Student is able to explain molecular basics of: oncogenesis, apoptosis and cell cycle.   **SKILLS**   1. Student in cooperation with the group prearranges and performs isolation of intracellular structures. 2. Student can isolate proteins and nucleic acids, is able to run protein and nucleic acid gel electrophoresis and to interpret obtained results.   **ATTITUDES**   1. Student appreciates the importance of understanding biological processes on molecular level and the need to continuously expand biological knowledge. 2. Student is conscious of hazards and responsibility for its own and work place safety during experimental work, using instruments, chemicals and biological materials. |
| Practice | not concerns |

**Information about classes in the cycle**

|  |  |
| --- | --- |
| Website | - |
| Educational outcomes verification methods | written exam, continuous assessment of labs |
| Comments | The classes are carried out in room 19A, |
| Reading list | as described above |
| Educational outcomes | **KNOWLEDGE** as described above  **SKILLS** as described above  **ATTITUDES** as described above |
| A list of topics | Lecture  Principles in protein structure and function; protein folding and tertiary structure; post-translational modification of proteins; determination of protein structure. From RNA to protein - translation; aminoacyl tRNA synthetasse; ribosome structure; decoding a genetic information by translational apparatus. Antibiotics - function and structure; molecular aspects of translational inhibitors. Protein cross-talk in cells; general principles of cell communication; signaling through G-protein-linked cell-surface receptors; signaling through enzyme-linked cell-surface receptors; programmed cell death (apoptosis).  Laboratory  Isolation of plasmid DNA; PCR; Restriction enzyme digestion; Ligation; Bacterial transformation; Bacterial colony screening; DNA sequence analysis; Basics of cell culture, transfection; Confocal microscopy |
| Teaching methods | Laboratory experiments; discussion; lecture |
| Assessment methods | written exam, continuous assessment of labs |