Module name	**Molecular biology - an extensive course**
Module code	B-BT.004
ISCED code	0511: Biology
Study cycle	I°
Semester	Winter semester
Responsible for this module	prof. Marek Tchórzewski (maro@hektor.umcs.lublin.pl), Tel. +48 815375956
Language of instruction	English
Website	-
Prerequisites	completed course in biochemistry
ECTS	11
ECTS points hour equivalents	Contact hours (work with an academic teacher) 45 hrs of lectures and 75 hrs of laboratory Total number of hours with an academic teacher 135 hrs Number of ECTS points with an academic teacher 5.4 Non-contact hours (students' own work) 140 Total number of non-contact hours 140 Number of ECTS points for non-contact hours 5.6 **Total number of ECTS points for the module 11**
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 analyze and to asses properties biomolecules such as: 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. John Wilson, Molecular Biology of the Cell 5. Research articles from scientific journals recommended by the teacher
Educational outcomes	**KNOWLEDGE** The student is able to describe the structure and function of structural proteins and enzymes The student can describe the impact of changes in the genetic material at the rate of evolution **SKILLS** The student can deal with eukaryotic cells, such as yeast or cell lines, perform the isolation of the intracellular structures of the cell and DNA/RNA and proteins

	The student can perform: the analysis of chromatin composition in mammalian cells, electrophoresis of DNA and proteins and PCR reaction **ATTITUDES** The student reads the literature concerning classical biotechnology and biotechnology at the molecular level
Practice	not concerns

Information about classes in the cycle

Website	-
Educational outcomes verification methods	as described above
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	Lectures the basic information and concept of molecular biology, the structure and role of DNA and RNA, proteins structure folding 3D structure determination, post-translational modifications, biological activities of proteins, transcription in Eukaryotes, RNA processing and posttranscriptional regulation of gene expression, the mechanism of translation, the mechanisms of signal transduction in eukaryotic cells, molecular biology of apoptosis. Classes Isolation and characterization of nucleic acids such as DNA and RNA from yeast and from cell lines cells, PCR technique, DNA and RNA agarose gel electrophoresis, analysis of chromatin composition in mammalian cells, protein electrophoresis in polyacrylamide gels and methods of protein staining after SDS/PAGE (coomassie brilliant blue, silver-stain, Pro-Q), western blotting, transfection of mammalian cells with genetic constructs, analysis of protein expression in cell line fluorescent confocal microscopy
Teaching methods	lecture; laboratory experiments; panel discussion
Assessment methods	written exam, continuous assessment of laboratory skills