University: *University of Presov*	
Faculty/university workplace: *Faculty of Humanities and Natural Sciences*	
Code: 2BIO/EROSBMOB/22	**Course title:** Basics of Molecular Biology
Type, scope and method of educational activity: Type of educational activity*: lecture/exercise* Scope of educational activity: *2/2 hour per week* Method of educational activity: *combined*	
Number of credits: 5	
Recommended semester:	
Spring	Biology
Study grade: *bachelor*	
Prerequisites: no	

Conditions for passing the course:
Form of assessment:
exam
Continuous evaluation:
It is mandatory to actively participate in lectures and seminars for successful completion of the course. The evaluation of exercises will represent 20 % of the evaluation of the course. The rest of the evaluation will be an written exam on the topics described in the syllabus. Test classification criteria: 100.00 – 90.00%, B: 89.99 – 80.00%, C: 79.99% - 70.00%, D: 69.99 % - 60.00 %, E: 59.99 % - 50.00 %. FX: 49.99 % and less %.
Final evaluation:
written exam

Learning outcomes:
Knowledge gained:
The student:
- can define and interpret in his/her own words the basic concepts in the field of molecular biology,
- can describe the properties, functions, structure of information macromolecules: nucleic acids and proteins,
- has knowledge of the basic molecular-genetic processes in prokaryotic and eukaryotic cells by which genetic information is realised in all living organisms: replication, transcription and translation.

Skills acquired:
The student:
- has practical skills in the basic methods of research on living organisms at the molecular level and can independently solve laboratory tasks in molecular biology,
- can safely handle biological material (buccal swabs, blood samples), work with laboratory instruments and laboratory aids used in molecular biology laboratories,

- present and argue the results of practical tasks,
- apply the acquired knowledge in an interdisciplinary manner.

Competences acquired:
The student:
- is able to apply basic scientific methods of research in molecular biology in solving biological research tasks in practice, present and argue the results of practical tasks,
- has developed competences for further self-education, is able to apply the acquired theoretical knowledge and practical skills in solving problems in the field of molecular biology,
- can apply the acquired knowledge interdisciplinarily and develop scientific literacy.

Course content:
Definition of the content of molecular biology. Structure and biological functions of proteins, denaturation of proteins. Structure, properties and functions of nucleic acids: DNA and RNA. Organization and structure of chromatin (nucleosome, solenoid, chromosome, euchromatin, heterochromatin), histone and non-histone proteins. Replication of bacterial genome, chromosomal and plasmid DNA, replication of eukaryotic genome: replication of nuclear and extranuclear DNA. Genetic information, genetic code, gene and transcription unit: prokaryotic and eukaryotic gene. Transcription of the bacterial genome, structural genes and genes for rRNA and tRNA, transcription of the eukaryotic genome. Post-transcriptional modifications of RNA. Translation of bacterial mRNA, eukaryotic mRNA, posttranslational modifications of proteins.

Recommended literature :
STRACHAN T. AND READ A.: Human molecular genetics, 4th edition, Garland Science, Taylor & Francis Group LLC, 2011.
LODISH H. et al.: Molecular cell biology, W.H.Freeman & Co Ltd, New York, 2016.
WATSON J. D. et al. Molecular biology of the gene.7th edition, Pearson-Benjamin Cummings. 2013.

Notes:

Course evaluation:
Total number of students evaluated:

A	B	C	D	E	FX

Lecturers:
doc. RNDr. Eva Petrejčíková, PhD., lecturer, examiner, instructor, seminary supervisor
doc. RNDr. Dana Dojčáková,PhD., lecturer, examiner, instructor, seminary supervisor
RNDr. Daniela Grejtáková, PhD., instructor, seminary supervisor

Date of last change: *23.4.2024*

Approved by: