University: University of Presov	
Faculty/university workplace: Faculty of Humanities and Natural Sciences	
Code: 2BIO/EROSJCVMB/22	**Course title:** Practises of molecular biology

Type, scope and method of educational activity:
Type of educational activity: Laboratory
Scope of educational activity: 2 hour per week, 26 per semester
Method of educational activity: Attendance

Number of credits: 5

Recommended semester:

Winter/Spring	Biology

Study grade: Master

Prerequisites:

Conditions for passing the course:
Form of assessment:

Continuous evaluation:
To successfully complete the course, active participation in lectures is required. A student may have no more than 2 absences justified by a doctor. The student will receive substitute assignments, resp. attendance consultations for missed lectures. Students will not be given credits for unjustified or multiple absences. The credit test is a result of the course evaluation. Success criteria: A: 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:
Continuous evaluation

Learning outcomes:
Knowledge gained:
The student:
- can define nucleic acids and other important concepts in molecular biology,
- knows basic and more advanced methods of molecular biology at a theoretical level.

Skills Acquired:
The student:
- can apply acquired laboratory skills to research in molecular biology and independently conduct an experiment,
- the student is able to select appropriate reagents, apparatus and laboratory equipment for carrying out a molecular biology experiment,
- can calculate the quantity and concentration of reagents for a reaction mixture in a selected molecular method,
- can navigate in genetic databases, look up the sequence of a DNA molecule, design primers,
- be able to analyse results correctly, interpret them and discuss the results with the professional community.

Competences acquired:
The student:
- 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 in an interdisciplinary way and develop scientific literacy.

Course content:
Safety in molecular laboratories. Isolation of genomic DNA and RNA by different techniques from different biological materials. Nucleic acid purification techniques, determination of concentration and purity. Separation of nucleic acids by electrophoresis. Nucleic acid hybridization, hybridization probes and methods of their labeling and detection. Polymerase chain reaction. Real-Time PCR of selected polymorphisms. Sanger sequencing. Fragmentation analysis.. Genetic databases, sequence search and primer design.

Recommended literature :
Pade, Simon. Principles and Techniques of Molecular Biology. 2021. pp. 239. ISBN: 1641165529
Molecular Diagnostics: Fundamentals, Methods, and Clinical Applications Third Edition. F.A. Davis Company. ISBN-13978-0803668294
Gautam, A. DNA and RNA Isolation Techniques for Non-experts : Springer; (2022). p. 165–169, Germany. ISBN : 978-3-030-94229-8

Notes:
Student load: 90 hours
Direct education: 20 hours
Self-study: 30 hours
Guided work: 40 hours

Course evaluation:
Total number of students evaluated:

A	B	C	D	E	FX

Lecturers:
RNDr. Daniela Grejtáková, PhD., co-guarantor, examiner, instructor, seminary supervisor

Date of last change: 01.09.2022

Approved by: prof. RNDr. Jarmila Bernasovská, PhD.