

University: Zhetusy University named after I. Zhansugurov	
Faculty: Natural Sciences and Technical	
Course code: BIS 3.5	Course title: Modern problems of molecular biology
Type, range and method of training activities: The format is a mixture of about 45 hrs lectures/seminars/discussions on methodological topics. -15 hrs lectures + 30hrs exercises per semester The teaching is divided into modules in three separate weeks with intensive all-day coursework in the autumn semester. A day starts with a lecture over one main topic. The lectures will whenever possible seek to be concrete and problem oriented using relevant examples. The follow-up exercises are based on problem-solving of real examples. It is a must that the students are active during lectures and work with exercises, and also in presenting their own graduate work.	
Number of credits: 5	
Recommended semester of study: 1 st year 1 st semester	
Level of study: Master	
Prerequisites: Endocrine system physiology	
Conditions for completing the course: Grades will be given for two part-exams: submitted exercises count collectively for 40% and a written 3-hour final examination will count for 60% of the final grade. Both elements must receive a passing grade.	
Learning outcomes: Subject and objectives, the main directions of development of molecular biology. The place of molecular biology among other biological disciplines. Molecular mechanisms of realizing the hereditary information. The molecular structure of biological membranes and mechanisms of transport of substances across the membrane. The cell cycle and its molecular mechanisms of regulation. Hereditary variability. Combinative variability. Mutational variability. The role of mutations in the development of human hereditary pathology. Molecular genetic research methods. Electronic databases and biological sites. Genetic mechanisms of individual development. Basics of population genetics.	
Detailed description of lectures: Studies modern trends in the development of biological sciences, new theoretical concepts and achievements in this field, the development of modern biological science: the origin of life on Earth, the theory of symbiogenesis, cell theory, modern problems of genetics and molecular biology, the formation of an idea of the role of molecular genetic and cellular development of the body ; to form ideas about the basic principles of applying modern molecular genetic methods and technologies in biology; use of the achievements of molecular genetic research in biology; work with scientific literature and electronic databases of molecular biology.	
Recommended literature: Bauer E.S. Theoretical Biology / E.S. Bauer; Comp. and note by Yu.P. Golikova; Introduction by M.E. Bauer. — St. Petersburg: Rostok, 2017. — 352 p. Belyasova N.A. Biology: Textbook / N.A. Belyasova. — Mn.: Higher School, 2017. — 443 p. Belyasova N.A. Microbiology: Textbook / N.A. Belyasova. — Mn.: Higher School, 2017. — 443 p. Bryukhanov A.L. Molecular microbiology: Textbook for universities / A.L. Bryukhanov, K.V. Rybak, A.I. Netrusov. — M.: Moscow State University, 2017. — 480 p.	

Vorobyov A.A. Fundamentals of biology, microbiology and immunology: Textbook for students of secondary vocational education / V.V. Zverev, E.V. Budanova, A.A. Vorobyov; Edited by V.V. Zverev. — M.: IC Academy, 2017. — 288 p.

Vorobyov A.A. Fundamentals of microbiology and immunology: Textbook for students of secondary vocational education / V.V. Zverev, E.V. Budanova, A.A. Vorobyov; Edited by V.V. Zverev. — M.: IC Academy, 2018. — 288 p.

Gorokhova S.S. Fundamentals of biology: A textbook / S.S. Gorokhova, N.A. Prokopenko, N.V. Kosolapova. — M.: IC Academy, 2017. — 64 p.

Gorokhova S.S. Fundamentals of microbiology, industrial sanitation and hygiene: A textbook / S.S. Gorokhova, N.A. Prokopenko, N.V. Kosolapova. — M.: IC Academy, 2017. — 64 p.

Deisha-Sionitskaya M.A. General and sanitary microbiology with the technique of microbiological research: A textbook / M.A. Deisha-Sionitskaya. — St. Petersburg: Lan, 2016. — 588 p.

Language of instructions: English

Comments: The course will be teach at Zhetusy University named after I. Zhansugurov – Kazakhstan

Course assessment:

Grades will be given for two part-exams: submitted exercises count collectively for 40% and a written 3-hour final examination will count for 60% of the final grade. Both elements must receive a passing grade.

A	B	C	D	E	FX

Lecturers: candidate of biological sciences, Daurenbekova Sholpan

Date of the last revision:

Approved by: