

Course description template

Informing students on course requirements

(In accordance with information and study materials available on
CooSpace)

From September 2019

Program: University of Szeged, Faculty of medicine
Course: Cell Biology and Molecular Genetics
Academic year/Semester: 1/2
Educator and contact details (e-mail): Prof. Boldogkői Zsolt, boldogkoi@gmail.com
Type of course: <u>lecture/seminar/practice/laboratory</u>
Weekly hours of the course: 1 (2 hours every second week)
Credit vale of the course: 4
Type of examination: <u>final exam at the end of semester</u> , practice exam, other:.....
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): none
Purpose of the course: The goal of the Cell Biology and Molecular Genetics course to elucidate the structure and function of the DNA and our cells. The scientific information of this field expands dramatically, the thematic of this subject includes several areas of biology, but we only have two lectures weekly which determines the structure and the way of explanation of the material: besides the fundamentals, many topics are explained through examples, logics of approaches and current trends, and avoids getting into unnecessary details. While the downloadable study material is well organized and easy to learn, the lectures focus on understanding and theoretical background. Molecular biology, genomics and cell biology are going to be fundamental areas of medicine in the near future. Because of the new technologies, the methods and approaches of these fields are constantly changing, therefore it is important to teach modern knowledge. Our curriculum is therefore updated year by year. During the main course, we explain the general basic principles of science, and-in a critical way-pseudo scientific approaches. During the course we focus on the current and future medical applications of cell biology and molecular genetics.
Outcome requirements of the course (specific academic results to be established by the course): The students will learn and understand the following in the first semester: Small molecules and macromolecules necessary for life. The hypothesises of the origin of life. The structure and function of cell organelles. The structure and function of DNA, RNAs, and proteins. The process and regulation of the cell cycle. The mechanism of cell division. The structure and function of the cytoskeleton. The structure and function of the extracellular matrix. The mechanisms of intracellular transport processes. The mechanisms of transport processes through cell membranes. The structure and function of the human genome. The processes of replication, transcription, and translation. The posttranscriptional and

posttranslational modification processes. The ways of epigenetic regulation and epigenetic inheritance. The laws of inheritance. The connection between genotype and phenotype. The process, mechanism and significance of evolution. The genetics of viruses and bacteria, and their significance in medicine. The basic mechanisms of cell to cell communication.

Topics:

First semester:

Basics of cell biology & origin of life

DNA

RNAs & proteins

Cell cycle, cytoskeleton & cytogenetics

Transport processes

The human genome

Inheritance

Genetic regulation & epigenetics

Genes and traits – the code for the phenotype

Evolution

Cell signaling

Molecular biology of viruses

Molecular biology of bacteria

Selected topics from modern biology

Supporting methods to achieve learning outcomes: Three-level curriculum: (1)

Basic requirements, (2) Extra requirements, (3) Facultative materials

If you only learn the basic requirements (but no extra requirements), your maximum grade can be 3. If you want to get a better mark (4 or 5) you have to learn the extra requirements, too. Before the oral exam you can decide if you want to be asked from basic material only or both basic and extra requirements, the MTOs will contain both basic and extra requirements. The header of the uploaded material marks the types of the requirements. Facultative materials are for those students who are interested in biology, but it will be not asked at the exam.

Bonus points for the exam: you can get bonus points for the following activities:

(1) attendance of the lectures

(2) attention in lectures

(3) activity in practices and seminars

(4) points from the Head of the Department

(5) good performance at the MTOs

(6) attendance of the lectures Basics of Mol. Biol. (two points in case max. of 1 absence, 1 point in case of 2 absences)

(7) other: attendance of the lectures of Frontiers of Mol. Biol.(max. 4 bonus points), visiting the lectures held on Saturday (max. 2 points), etc.

(1) Attendance points of the lectures and attention in the lectures (correct answers to the questions in lectures) You can get Maximum 50 points.

For the attendance of the lectures maximum 8 points (not bonus points!) can be earned:

- 8 points, if you attend all lectures
- 6 points, if you are absent maximum 1 times
- 3 points, if you are absent maximum 2 times
- 1 points, if you are absent maximum 3 times

(2) For the correct answers to the test questions in the lectures maximum $14 \times 3 = 42$ points can be earned.

Bonus points, attendance points of the lectures and right answers to the test questions in the lectures can be calculated according to the following:

If your written exam grade is 1:

- 10 bonus points, if you get 40-50 points
- 6 bonus points, if you get 35-39 points
- 4 bonus points, if you get 30-34 points
- 2 bonus points, if you get 25-29 points

If your written exam grade is 2:

- 6 bonus points, if you get 40-50 points
- 4 bonus points, if you get 35-39 points
- 3 bonus points, if you get 30-34 points
- 2 bonus points, if you get 25-29 points

If your written exam grade is 3:

- 4 bonus points, if you get 40-50 points
- 2 bonus points, if you get 35-39 points
- 1 bonus points, if you get 30-34 points

If your written exam is grade 4:

- 2 bonus points, if you get 40-50 points
- 1 bonus points, if you get 35-39 points

(3) Tests written on the practices

- 6 bonus points, if you have 28-30 right answers
- 5 bonus points, if you have 25-27 right answers
- 3 bonus points, if you have 22-24 right answers
- 2 bonus points, if you have 19-21 right answers
- 1 bonus point, if you have 16-18 right answers

(4) Activities on seminars and practices: 2 bonus points according to the tutors' recommendation.

(5) Bonus points from the Head of Department: maximum 2 bonus points, based on your activity on lectures, e.g. attendance at the Saturday lecture – 2 points

(6) Bonus points, based on MTO results and other awards and penalties:

Both MTOs are 5: 4 bonus points in the written exam + mark of the MTO will be counted to the exam grade: 2 marks of the MTOs+ 1 exam mark

One 5 and one 4 grades at the MTO: 3 bonus points in the written exam

Two 4 grades at the MTO: 2 bonus points in the written exam

One 4 and one 3 grades: 1 bonus points in the written exam

One failed MTO: an extra oral question in the exam (need to give correct answer to pass the exam)

Two failed MTOs: two extra oral questions in the exam (need to give correct answer to pass the exam)

(7) Attendance in Basics in Molecular Biology course: maximum 1 absence from the course: 2 bonus points, 2 absences from the course: 1 bonus point

(8) attendance of the lectures of Frontiers of Mol. Biol.(maximum 2 absences from the course: 2 bonus points, 3-4 absences from the course: 1 bonus point

(9) Other bonuses: 2 bonus points if you attend in special, named lectures (details later) in Frontiers of Molecular Biology

Comments:

(1) You can retake the MTOs at the first day of exam period (on Super Monday). If you have 4+4 or 4+5 MTO results, than you can have retake MTO to get a 5. You are allowed to rewrite the failed MTOs, but in this case you cannot get bonus points for the better MTO mark(s).

(2) In the case of maximum 2 absences in lectures: one of the extra questions (because of your failed MTOs) will be cancelled (details see below)

(3) There is a criterion to get the bonuspoints (attendance points and right answers of the test questions): the majority of the students should sign an agreement of the department, which means, that attention and obedience are dominating during the lectures.

Evaluation of the acquisition of expected learning outcomes:

MTOs:

1st MTO October 17-18: materials of lectures 1 - 6 + practices 1 – 2

2nd MTO November 28-29: materials of lectures 7 - 12 + practices 4-5

Retake MTO: Super Monday

Points and grades of the MTO

0 - 15 p: 1

15.5 – 27,5p:2

28 – 35 p: 3

35.5 – 42,5 p: 4

43-50 p: 5

Structure of the MTO:

- 15 single choice questions (9 basic- and 6 extra requirements)

- 1 essay question from basic requirements 10 points

- 5 definitions: 3 questions from basic requirements; 2 from extra requirements:

5x2p = 10 points

Maximum 34 points out of 50 points can be gathered from the basic requirements

Retake MTO - notes

(1) Points and grades for the retake-MTO are the same.

(2) You can take the retake MTO in case of one or two failed MTO(s) or with a mark 4-4, or 4-5

(3) In case of the failed MTO no bonus points are given for better performance at the retake-MTO (but extra oral question can be cancelled).

(4) In the case of failed MTOs, they can be repeated on Super Monday, or extra oral questions have to be drawn in the exam (for the details see below).

Exams:

The exam basically takes place in written, but taking the exam in oral exam is also possible, without justification (if you want to take an oral exam. The oral exam is recommended for those students who think that he or she understands biology very well. At the retake exams there will be no extra oral questions because of the failed MTOs, but practical questions will not be forgotten on the retake exams. Registration for the exams through the Neptun system. Please take in account that the places for the oral exams are limited! You can repeat an exam twice in the same exam period. To take your first exam is prohibited in retake exam period. Topic list is available in the Coospace.

Structure of the written exam:

- 10 single choice questions from basic-and extra requirements
- 3 essay questions: 2 from basic requirements and 1 from extra requirements
- 10 definitions: 5 from basic requirements; 5 from extra requirements: 10x2 points = 20 points

Maximum 60 points out of 100 points can be gathered from the basic requirements, the maximum is 100.

Points and grades:

0 - 40 p:	1
40,5 – 60p:	2
60,5 – 73p:	3
73,5 – 87p:	4
87,5-100p:	5

Remarks:

- (1) There will be questions from the material of practices and seminars in the exams.
- (2) In the case of failed MTOs, and non-attendance of practices and seminars, extra oral questions have to be drawn in the exam (for the details see below).
- (3) At the retake exam, you will not have extra oral questions due to the failed MTOs
- (4) results of the MTOs can be taken into account for the exam.

Mandatory reading list:

(1) textbook: LIFE (9th Edition, ISBN: 9781429219624

(2) text files (pdf from word doc) and **(3)** pictures (pdf from power point slide) – they are downloadable from our website or from the Coospace.

Recommended reading list: none

Indicating course requirements on Coospace scene (summary)

Description (public): Purpose of the course:

The goal of the Cell Biology and Molecular Genetics course to elucidate the structure and function of the DNA and our cells. The scientific information of this field expands dramatically, the thematic of this subject includes several areas of biology, but we only have two lectures weekly which determines the structure and the way of explanation of the material: besides the fundamentals, many topics are explained through examples, logics of approaches and current trends, and avoids getting into unnecessary details. While the downloadable study material is well organized and easy to learn, the lectures focus on understanding and theoretical background. Molecular biology, genomics and cell biology are going to be fundamental areas of medicine in the near future. Because of the new technologies, the methods and approaches of these fields are constantly changing, therefore it is important to teach modern knowledge. Our curriculum is therefore updated year by year. During the main course, we explain the general basic principles of science, and-in a critical way-pseudo scientific approaches. During the course we focus on the current and future medical applications of cell biology and molecular genetics. Cell Biology and Molecular Genetics – PRACTICE

The goal of the practices is to learn the basic techniques of cell biology and molecular genetics with special emphasis on improving the manual skills of the students. It is taught by experts, that medical doctors will be primarily data analysts in the future. In the next few years, we shall focus on improving such skills as well. During the practices we explain the most up to date techniques of molecular genetics and genomics..

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