*Recommended template: “Course Description, Syllabus, Course Requirements”*

# course syllabus and course requirements academic year … semester …

|  |  |
| --- | --- |
| Course title | Molecular cell Biology and Biotechnology |
| **Course Code** | **MSM607AN-GY-01 / MSM607AN-EA-00** |
| **Hours/Week: le/pr/lab** | **1 Lecture / 3 Practices** |
| **Credits** | **4** |
| **Degree Programme** | **Biomedical Engineering MsC** |
| **Study Mode** | **In Person** |
| **Requirements** | **Examination grade** |
| **Teaching Period** | **Autumn** |
| **Prerequisites** |  |
| **Department(s)**  **Course Director** | **Department of Pharmaceutical Biotechnology**  Prof. Dr. Pongrácz Judit Erzsébet |
| **Teaching Staff** | **Dr. Baradarbarjastehbaf Farid** |
|  |  |

# course description

*A short description of the course (max. 10 sentences).*

*Neptun: Instruction/Subjects/Subject Details/Basic data/Subject description*

The aim of the course is to provide an overview of prokaryotic and eukaryotic including human genetics and molecular biology techniques. In association with genetics mathematical background of data handling and statistical analysis will be introduced that is relevant to all types of biological research. The students will learn genetic modelling and manipulation systems, their relevance to human studies. Basic understanding of genomix and proteomix, biochemical processes will be linked to practical applications. To aid application of genetic principles in molecular biology, the course introduces students in the joint use of various softwares and mathematical algorithms to enable them to perform data processing and basic statistical analysis task in genetic and other routine biotech research work.

# syllabus

*Neptun: Instruction/Subjects/Subject Details/Syllabus*

## **goals and objectives**

*Goals, student learning outcome.*

*Neptun: Instruction/Subjects/Subject Details/Syllabus/Goal of Instruction*

During the course students will learn details about prokaryotic and eukaryotic cells, cellular organelles, structure of the nucleic acid and rules of cellular proliferation. The objectives include the understanding of the basic principles of genetic modifications and techniques that aid tracing genetic mutations, testing gene transcription and translation. It also includes basic principles of handling cells as well as using computer softwares in primer design and application of data bases.

## **course content**

*Neptun: Instruction/Subjects/Subject Details/Syllabus/Subject content*

|  |  |
| --- | --- |
|  | TOPICS |
| LECTURE | 1. *Introduction* 2. *Building blocks of cells* 3. *Cell organelles* 4. *Structure of DNA* 5. *Chromosmes & Genome* 6. *DNA replication* 7. *Transcription* 8. *Translation* 9. *Cell cycle and Mitosis* 10. *Meiosis and Cell proliferation checkpoints* 11. *Basics of genetics* 12. *Recombinant technology 1* 13. *Recombinant technology 2* 14. *Methods and devices used in biotechnology* |
| PRACTICE | 1. *Prokaryotic and Eukaryotic cells* 2. *Building Blocks of Cells* 3. *Cell Organelles* 4. *Cell cycle* 5. *Genetics* 6. *Cell Culturing* 7. *Cell counting* 8. *Online Databases and Primer Design* 9. *PCR operation* 10. *Plasmids* 11. *Laboratory Visit* 12. *Monoclonal Antibodies* |
| laboratory practice | 1. *topic* 2. *topic* 3. *topic* 4. *etc.* |

### **DETAILED SYLLABUS AND COURSE SCHEDULE**

### *academic holidays included*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LECTURE | | | | |
| week | **Topic** | **Compulsory reading; page number**  **(from … to …)** | **Required tasks (assignments, tests, etc.)** | **Completion date, due date** |
| 1. | Introduction | 1 - 40 (The Cell) | No Task | 2022.09.07 |
| 2. | Building blocks of cells | 43 – 172 (The Cell) | No Task | 2022.09.14 |
| 3. | Cell organelles | 565 – 809 (The Cell) | No Task | 2022.09.21 |
| 4. | Structure of DNA | 173 – 185 (The Cell) | No Task | 2022.09.28 |
| 5. | Chromosmes & Genome | 185 – 234 (The Cell) | No Task | 2022.10.05 |
| 6. | DNA replication | 237 – 285 (The Cell) | No Task | 2022.10.12 |
| 7. | Transcription | 299 – 333 (The Cell) | No Task | 2022.10.19 |
| 8. | Translation | 333- 366 (The Cell) | No Task | 2022.10.26 |
| 9. | - | - | - | - |
| 10. | Cell cycle and Mitosis | 963 – 1004 (The Cell) | Midterm Test | 2022.11.09 |
| 11. | Meiosis and Cell proliferation checkpoints | 1004 – 1018 (The Cell) | No Task | 2022.11.16 |
| 12. | Basics of genetics | 36 – 196 (Concepts of genetics) | No Task | 2022.11.23 |
| 13. | Recombinant technology 1 | 99 – 110 (Medical Biotechnology) | No Task | 2022.11.30 |
| 14. | Recombinant technology 2 | 149 – 165 (Medical Biotechnology) | No Task | 2022.12.07 |
| 15. | Methods and devices used in biotechnology |  | Midterm Retake | 2022.12.14 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PRACTICE, LABORATORY PRACTICE | | | | |
| week | **Topic** | **Compulsory reading; page number**  **(from … to …)** | **Required tasks (assignments, tests, etc.)** | **Completion date, due date** |
| 1. | Prokaryotic and Eukaryotic cells |  | In Class Task | 2022.09.07 |
| 2. | Building Blocks of Cells |  | In Class Task | 2022.09.14 |
| 3. | Cell Organelles |  | In Class Task | 2022.09.21 |
| 4. | Cell cycle |  | In Class Task | 2022.09.28 |
| 5. | Genetics |  | In Class Task | 2022.10.05 |
| 6. | Genetics |  | In Class Task | 2022.10.12 |
| 7. | Cell Culturing |  | In Class Task | 2022.10.19 |
| 8. | Cell counting |  | In Class Task | 2022.10.26 |
| 9. |  |  |  |  |
| 10. | Online databases and primer design |  | In Class Task / Midterm Test | 2022.11.09 |
| 11. | Primer design |  | In Class Task | 2022.11.16 |
| 12. | PCR |  | In Class Task | 2022.11.23 |
| 13. | Laboratory visit |  | In Class Task | 2022.11.30 |
| 14. | Laboratory Visit |  | In Class Task | 2022.12.07 |
| 15. | Plasmids |  | In Class Task / Midterm Retake | 2022.12.14 |

## **assessment and evaluation**

*(Neptun: Instruction/Subjects/Subject Details/Syllabus/Examination and Evaluation System)*

##### **Attendance**

*In accordance with the Code of Studies and Examinations of the University of Pécs, Article 45 (2) and Annex 9. (Article 3) a student may be refused a grade or qualification in the given full-time course if the number of class absences exceeds 30% of the contact hours stipulated in the course description.*

***Method for monitoring attendance*** *(e.g.: attendance sheet / online test/ register, etc.)*

Attendance Sheet

##### **assessment**

*Cells of the appropriate type of requirement is to be filled out (course-units resulting in mid-term grade or examination). Cells of the other type can be deleted.*

Course resulting in mid-term grade (PTE TVSz 40§(3))

**Mid-term assessments, performance evaluation and their ratio in the final grade** (The samples in the table to be deleted.)

|  |  |  |
| --- | --- | --- |
| **Type** | **Assessment** | **Ratio in the final grade** |
| *e.g..: Test 1* | *eg. max 20 points* | *eg. 20 %* |
| *e.g.: Test 2* | *eg. max 30 points* | *eg. 30 %* |
| *e.g.: home assignment (project documentation)* | *eg. max 30 points* | *eg. 30 %* |
| *…* | *eg. max 15 points* | *eg. 20 %* |

**Opportunity and procedure for re-takes** (PTE TVSz 47§(4))

*The specific regulations for improving grades and resitting tests must be read and applied according to the general Code of Studies and Examinations. E.g.: all tests and assessment tasks can be repeated/improved at least once every semester, and the tests and home assignments can be repeated/improved at least once in the first two weeks of the examination period.*

…

**Grade calculation as a percentage**

based on the aggregate performance according to the following table

|  |  |
| --- | --- |
| **Course grade** | **Performance in %** |
| excellent (5) | 85 % … |
| good (4) | 70 % ... 85 % |
| satisfactory (3) | 55 % ... 70 % |
| pass (2) | 40 % ... 55 % |
| fail (1) | below 40 % |

The lower limit given at each grade belongs to that grade.

Course-unit with final examination

**Mid-term assessments, performance evaluation and their weighting as a pre-requisite for taking the final exam**

(The samples in the table to be deleted.)

|  |  |  |
| --- | --- | --- |
| Type | Assessment | Weighting as a proportion of the pre-requisite for taking the exam |
| 1. *Midterm Test* | *60 points* |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Requirements for the end-of-semester signature**

(Eg.: mid-term assessment of 40%)

The students should pass the midterm test in order to take the final exam. If students score 70% and above they will get an exra point for their final grade.

**Re-takes for the end-of-semester signature** (PTE TVSz 50§(2))

*The specific regulations for grade betterment and re-take must be read and applied according to the general Code of Studies and Examinations. E.g.: all the tests and the records to be submitted can be repeated/improved each at least once every semester, and the tests and home assignments can be repeated/improved at least once in the first two weeks of the examination period.*

The retake is necessary if the student scores below 40% in the midterm test. Students can improve their grade on the retake.

***Type of examination*** *(written, oral): written*

***The exam is successful if the result is minimum 40 %.*** *(The minimum cannot exceed 40%.)*

**Calculation of the grade** (TVSz 47§ (3))

The mid-term performance accounts for  ***0*** %, the performance at the exam accounts for ***100***  % in the calculation of the final grade.

**Calculation of the final grade based on aggregate performance in percentage.**

|  |  |
| --- | --- |
| **Course grade** | **Performance in %** |
| excellent (5) | 85 % … |
| good (4) | 70 % ... 85 % |
| satisfactory (3) | 55 % ... 70 % |
| pass (2) | 40 % ... 55 % |
| fail (1) | below 40 % |

The lower limit given at each grade belongs to that grade.

## **Specified literature**

*In order of relevance. (In Neptun ES: Instruction/Subject/Subject details/Syllabus/Literature)*

##### **compulsory reading and availability**

[1.] Molecular Biology of The Cell 2017 6th Edition

[2.] Medical Biotechnology J.Pongrácz

[3.] Concepts of Genetics 12th Edition

##### **recommended literature and availability**

[3.] ……

[4.] ……

[5.] ……