

Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering  
**Genetics and Bioengineering Department**  
 2026-2027 Fall Semester

**Syllabus**

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Code/Name</b>       | GBM305 / GENETIC ENGINEERING I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Type</b>            | Required                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Credit/ECTS</b>     | 6/6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Hour per Week</b>   | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Level/Year</b>      | Undergraduate/3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Semester</b>        | Fall                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Classroom</b>       | MUHD-306                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Content</b>         | GBM305 covers fundamental tools and techniques for DNA manipulation, cloning, sequencing, and expression analysis.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Prerequisites</b>   | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Textbooks</b>       | <p><b>Primary</b><br/>           Gene Cloning and DNA Analysis, 8th Edition, Brown, 2020</p> <p><b>Supplementary</b><br/>           An Introduction to Genetic Engineering, 4th Edition, Nicholl, 2023<br/>           Snyder and Champness Molecular Genetics of Bacteria, 5<sup>th</sup> Edition, Henkin, 2020</p>                                                                                                                                                                                                                                                                                                                                    |
| <b>Objectives</b>      | <ul style="list-style-type: none"> <li>• Provide students with a fundamental understanding of the principles and tools of genetic engineering.</li> <li>• Introduce molecular cloning strategies, including DNA isolation, enzymatic manipulation, PCR, transformation, and sequencing.</li> <li>• Develop students' ability to design and analyze basic genetic engineering workflows and interpret experimental results.</li> <li>• Foster critical thinking and problem-solving skills through collaborative in-class activities.</li> <li>• Encourage self-directed learning and preparation through structured weekly topic summaries.</li> </ul> |
| <b>Course Outcomes</b> | CO1. Explain the principles and tools of genetic engineering, including DNA isolation, enzymatic manipulation, cloning vectors, and sequencing methods.<br>CO2. Apply restriction digestion, ligation, PCR, and transformation techniques to design and analyze molecular cloning workflows.<br>CO3. Interpret experimental data from gel electrophoresis, sequencing, hybridization, and transformation experiments to draw valid conclusions.                                                                                                                                                                                                        |

**Weekly Schedule of Topics**

| W | Topic                     |
|---|---------------------------|
| 1 | Introduction to Course    |
| 2 | Genetic Engineering       |
| 3 | Vectors                   |
| 4 | Purification of DNA       |
| 5 | Manipulation of DNA       |
| 6 | Polymerase Chain Reaction |
| 7 | Transformation            |
| 8 | Cloning Vectors I         |
| 9 | Cloning Vectors II        |

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|    |                       |
|----|-----------------------|
| 10 | Selection of Clones   |
| 11 | Sequencing            |
| 12 | Genome Analysis I     |
| 13 | Genome Analysis II    |
| 14 | Expression Analysis I |

**Professional Contribution** N/A

**Contribution to Program Outcomes\***

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| C01 | 5   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0    |
| C02 | 3   | 5   | 1   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0    |
| C03 | 3   | 5   | 0   | 1   | 0   | 0   | 0   | 0   | 0   | 0    | 0    |

\* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

**Special Conditions** N/A

**Requirements** N/A

**Course Policy** N/A

**Cheating & Plagiarism**

- Copying or letting someone copy anyone work on exams, assignments, or reports is cheating.
- Cutting and pasting text, figures and tables from web sources, AI or any other electronic source is plagiarism.
- The consequence of academic dishonesty is to receive a grade of **FF** for the course.

**Evaluation**

|              |      |
|--------------|------|
| Midterm Exam | 40%  |
| Final exam   | 60%  |
| Total        | 100% |

**Rubric** N/A

**Instructor**

|              |             |              |                                                       |
|--------------|-------------|--------------|-------------------------------------------------------|
| Name/Surname | Enes Durgut | Email        | <b>enes.durgut@alanya.edu.tr</b>                      |
| Room         | 321         | Office Hours | Students can arrange meetings through Google Calendar |

Prepared by Enes Durgut on October 8th, 2026