**ABDULLAH GUL UNIVERSITY**
**INSTITUTE OF SCIENCE AND TECHNOLOGY**
**BIOENGINEERING DEPARTMENT**
**INFORMATION OF COURSE INTRODUCTION AND PRACTICE**

| Course Name | CODE | SEMESTER | I+P Hour | CREDIT | AKTS |
|---|---|---|---|---|---|
| Biological Sciences for Bioengineers | BENG538 | Spring-Fall | 3 + 0 | 3 | 10 |

| | |
|---|---|
| **Prerequisite Courses** | - |

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|---|---|
| **Course Type** | Elective |
| **Course Language** | English |
| **Course Coordinator** | Mona El Khatib |
| **Lecturers** | Dr.Adan, Dr, Kaplan, Dr. Okhubo, Dr. El Khatib |
| **Course Assistants** | - |
| **Purpose of Course** | Teaching students about the definitions and principles of different biological processes and concepts including cell biology, macromolecules, cell signaling and biochemistry |
| **Learning Outcome** | 1- Gain knowledge about the basic principles in Biology<br>2- Introduce students to biological concepts<br>3- Gain the knowledge about the cell, central Dogma, Cellular interactions etc..<br>4- Understand how biological processes occur |
| **Course Content** | Introduction, the cell, DNA synthesis and replication, transcription, translation, protein structure and modification, helix coil transition, Cell-cell and cell-ECM interactions, cytoskeleton, cell signaling, genetics and epigenetics, biochemistry and molecular modeling |

**WEEKLY SUBJECTS AND RELATED PRELIMINARY PAGES**

| Week | Subjects | Preliminary |
|---|---|---|
| 1 | Introduction to Biology | |
| 2 | The Cell-I | |
| 3 | The Cell-II | |
| 4 | DNA synthesis and Replication | |
| 5 | Transcription | |
| 6 | Translation, Protein Structure and Modification-I | |
| 7 | Midterm | |
| 8 | Helix-Coil Transition | |
| 9 | Cell-Cell and Cell-ECM Interactions | |
| 10 | The Cytoskeleton | |
| 11 | Cell signaling | |
| 12 | Genetics and Epigenetics | |
| 13 | Biochemistry-I | |
| 14 | Molecular Modeling:coagulation | |
| 15 | Presentation | |
| 16 | Final | |

**RESOURCES**

| | |
|---|---|
| **Course Notes** | notes and slides |
| **Other Resources** | - |

**MATERIAL SHARING**

| | |
|---|---|
| **Documents** | Lecture notes |
| **Homework** | No H.W |
| **Exams** | One Midterm and one Final |

| RATING SYSTEM | | |
|---|---|---|
| **SEMESTER WORKS** | **NUMBER** | **CONTRIBUTION** |
| Midterm | 1 | 40% |
| Quiz | 0 | 0 |
| Homework | 0 | 0 |
| Final | 1 | 60% |
| **TOTAL** | | 100% |
| **Success Rate of Semester** | | 40 |
| **Success Rate of Final** | | 60 |
| **TOTAL** | | 100 |

| Course Category | |
|---|---|
| Basic Sciences and Mathematics | %100 |
| Engineering Sciences | |
| Social Sciences | |

**THE RELATIONSHIP BETWEEN THE LEARNING OUTCOMES AND PROGRAM COMPETENCE**

| No | Program Competence | Contribution level | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| 1 | Understanding of Life Sciences, Mathematics and Engineering at the post-graduate level, and being able to implement of this knowledge into bioengineering problems | | | | X | |
| 2 | Having the ability of developing a new scientific method or a technological product or process, and, designing experiments, implementing, collecting data and evaluating regarding these issues | | | X | | |
| 3 | Choosing technical equipment used in the applications related to bioengineering, having sufficient knowledge in adopting and using new technological equipment | | X | | | |
| 4 | Having the ability of reaching the information, using resources, contributing to the literature by transferring the process and results of scientific studies as written or verbally in the national and international environments | | | X | | |
| 5 | Having the ability of working as an individual or a team, in the teams composed of discipline or different disciplines, gaining awareness of leadership and taking responsibility | | | | X | |
| 6 | Having advanced level of foreign language knowledge to manage efficient verbal, written and visual communication in the major field | | | X | | |
| 7 | Having the understanding of ethics in science and the responsibility in profession with the awareness of lifelong learning, being beneficial to society and sensitiveness to global issues | | | X | | |
| 8 | Being aware of the social impacts of the solutions and applications of the challenges regarding Bioengineering | | X | | | |

*From 1 to 5, it increasingly goes.

**ECTS / WORK-LOAD TABLE**

| Activities | Activites | Duration (Hour) | Total (Work-Load) |
|---|---|---|---|
| Course Duration (Including exam week: 16x total course hour) | 16 | 3 | 48 |
| Out of Class Exercise Time (Pre-study, reinforcement) | 16 | 7 | 112 |
| Reading | | | |
| Scanning on Internet, library study | 16 | 5 | 90 |
| Material Designing, practice | | | |
| Preparation of report | | | |
| Preparation of presentation | 1 | 18 | 18 |
| Presentation | 1 | 3 | 3 |
| Homework | | | |
| Midterms | 1 | 15 | 15 |
| Final | 1 | 15 | 15 |
| **Total Work-Load** | | | 301 |
| **Total Work-Load / 30** | | | 301/30 |
| **Course ECTS Credit** | | | 10 |