

**ABDULLAH GUL UNIVERSITY
GRADUATE SCHOOL OF ENGINEERING & SCIENCE
BIOENGINEERING DEPARTMENT
COURSE DESCRIPTION AND SYLLABUS**

| Course Name | CODE | SEMESTER | T+L Hour | CREDIT | ECST |
|------------------------------------|----------|--------------|----------|--------|------|
| Basic Engineering for Bioengineers | BENG 530 | FALL- SPRING | 3 + 0 | 3 | 7,5 |

Prerequisite Courses

| | |
|---------------------------|---|
| Course Type | Elective |
| Course Language | English |
| Course Coordinator | Asst. Prof. İsmail Alper İšoğlu |
| Lecturers | Asst. Prof. İsmail Alper İšoğlu |
| Course Assistants | - |
| Course Objectives | To become familiar with the fundamental principles of engineering and to be able to use these principles in the related research fields |
| Learning Outcomes | Students, <ul style="list-style-type: none"> To be able to understand the fundamental principles of engineering To be able to calculate things related to engineering and to analyze the data To be able to describe the mass and energy equations and their technics To be able to define the basic principles and applications of process engineering To be able to comprehend the basic principle and applications of reaction and reactor To be able to make research, to utilize the scientific sources and to attain the ability of designing the project |
| Course Content | The fundamental principles of engineering, calculation based on engineering, mass and energy equations, fluid mechanics in the process engineering, the principle and applications of heat and mass transfer, the fundamental of reaction engineering and homogeneous and heterogeneous reactor. |

WEEKLY SUBJECTS AND RELATED PRELIMINARY PAGES

| Week | Subjects | Preliminary |
|------|---|--|
| 1 | Introduction to engineering | Related sections of the recommended books and articles |
| 2 | Calculation based on engineering and analysis of data | Related sections of the recommended books and articles |
| 3 | Mass equation | Related sections of the recommended books and articles |
| 4 | Energy equation | Related sections of the recommended books and articles |
| 5 | Energy equation | Related sections of the recommended books and articles |
| 6 | Midterm I | |
| 7 | Fluid mechanics | Related sections of the recommended books and articles |
| 8 | Mass equation | Related sections of the recommended books and articles |
| 9 | Energy equation | Related sections of the recommended books and articles |
| 10 | Basic calculations | Related sections of the recommended books and articles |
| 11 | Midterm II | |

| | | |
|----|------------------------|--|
| 12 | Reactors | Related sections of the recommended books and articles |
| 13 | Homogeneous reactors | Related sections of the recommended books and articles |
| 14 | Heterogeneous reactors | Related sections of the recommended books and articles |
| 15 | Presentation | |
| 16 | Final | |

RESOURCES

Course Notes Pauline M. Doran. *Bioprocess Engineering Principles*. Academic Press, USA, 1995.
Saterbak A., Sun, K.-Y., McIntire L.V. *Bioengineering Fundamentals*. Prentice Hall, Inc., 2007.

Other Resources Related articles

MATERIAL SHARING

Documents

Homework Presentation at the end of semester

Exams Two midterms, one final

RATING SYSTEM

| SEMESTER WORKS | NUMBER | CONTRIBUTION |
|---------------------------------|--------|--------------|
| Midterm | 2 | 30 |
| Presentation and Final | 1-1 | 25- 45 |
| TOTAL | | 100 |
| Success Rate of Semester | | 55 |
| Success Rate of Final | | 45 |
| TOTAL | | 100 |

Course Category

Basic Sciences and Mathematics

Engineering Sciences

x

Social Sciences

THE RELATIONSHIP BETWEEN THE LEARNING OUTCOMES AND PROGRAM COMPETENCE

| No | Program Outcomes | 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 | Activities | 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 | 3 | 48 |
| Reading | | | |
| Searching 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 | 2 | 15 | 30 |
| Final | 1 | 15 | 15 |
| Total Work-Load | | | 300 |
| Total Work-Load / 30 | | | 300/30 |
| Course ECTS Credit | | | 7,5 |