Course Description

Course Code	YS 439
Course Name	INTRODUCTION TO BIOINFORMATICS
Prerequisite Courses	
Language of the Course	The English
Course Coordinator	
Instructor(s)	
Course Assistants	
The aim of the course	The main objective of the course is to provide the student with a solid foundation for conducting further research in bioinformatics.
Course Content	Introduction to main issues in computational biology and to interact with algorithms, tools, data in practice.

Weekly Course Content

Week 1	Introduction to Bioinformatics
Week 2	Introduction to biological databases
Week 3	Overview of bioinformatics problems
Week 4	Computational problems in molecular biology
Week 5	Gene finding
Week 6	Gene expression data analysis
Week 7	Pairwise sequence comparison, multiple sequence alignment algorithms
Week 8	Midterm exam.
Week 9	Introduction to protein structures
Week 10	Protein Structure Prediction
Week 11	Microarray data normalization and analysis
Week12	Introduction to Systems Biology
Week 13	Gene regulatory networks
Week 14	Final exam

Course Learning Outcomes

1	A general introduction to Bioinformatics
2	A way of tackling biological problems computationally
3	Working at the interface of computer science and biology
4	Interact with algorithms, tools, data in practice.
5	Using bioinformatic databases
6	Aligning sequences

Contribution of the Course to Program Qualifications

		Contribution Level
01	The student will have the ability to apply analytical approach, mathematics and science knowledge in software and engineering issues.	5
02	The student will have the ability to identify, define, formulate and solve a problem in software and computer systems.	5
03	The student will have gains scientific research skills in software and engineering problems, has the ability to design a system, part or process.	5
04	The student will have the ability to use the design capability, techniques and tools required for engineering applications.	5
05	The student will have the ability to design, implement and interpret experimental work and software projects by analyzing the results.	5
06	The student will have the ability to work between disciplines and teamwork.	5
07	The student will have the ability to work in international environments and adapt to different cultures.	5
08	The student will have verbal and written communication skills in Turkish and English.	5
09	The student will have the awareness of the necessity of lifelong learning and the ability to realize it.	5
10	The student will gain knowledge of legal issues with the awareness of professional and ethical responsibility.	5
11	The student will have managerial skills (leadership, organization, time and risk management, quality awareness, efficiency, etc.).	5
12	The student will have the ability to participate in social activities, to acquire regular sports habits and to use time in the best way.	5
13	The student will have the ability to find unusual ways and produce projects.	5
14	The student will have professional self-confidence, being an entrepreneur and taking initiative.	5
15	It is sensitive about the problems of the age and looks after the national interests.	5

ECTS WORKLOAD

	Number	Duration (hours)	Number*Duration
Face to face education	14	2	28
Out-of-class study time (pre-study, reinforcement)	12	1	12
Homeworks	4	4	16
Presentation / Seminar preparation	1	10	10
Quizzes	0	0	0
Preparation for midterm exams	1	6	6
midterm exams	1	2	2
Project (Semester assignment)	1	10	10
Lab	0	0	0
field work	0	0	0
Preparation for the final exam	1	8	8
Semester final exam	1	2	2
Research	0	0	0
TOTAL WORKLOAD			**94**
ECTS			**3**

Evaluation

SEMESTER EVALUATION	Number	Contribution Percentage
Midterm	1	20
Quiz	0	0
Homework	4	20
SEMESTER TOTAL		**40**
Contribution rate of mid-term evaluations to success		40
Contribution rate of the final exam to success		60
GRAND TOTAL		**100**

RESOURCES

Textbook	M. Zvelebil and J. O. Baum, Understanding Bioinformatics, Garland Science, 2008.
Helpful Resources	D.E. Krane and M.L. Raymer, Fundamental Concepts of Bioinformatics, Pearson Education, 2003. N. C. Jones and P. A. Pevzner, An Introduction to Bioinformatics Algorithms, MIT press, 2004.