BMED3701 BIOINFORMATICS COURSE CATALOG INFO

Course Code : BMED3701				Course Name : Bioinformatics			
Semester	**Lecture**	**Local Credit**	**ECTS**	**Language**	**Category**	**Instructional Methods**	**Prerequisites**
8	(3+0+0)	3	5	English	Core	Course	-

Course Content	Overview of bioinformatics, the application of computational methods to interpret the biological information. Analysis of gene sequences and study of protein structures. Dynamic programming method of sequence alignment for rapid searching and scoring of the thousands of sequences in a genome. Analysis of 3D structures and calculation of simple geometric quantities, such as distances, angles, axes, areas, and volumes and the relation of these quantities to the basic properties of proteins.
Course Outcomes	**CO1.** Select, find and access the appropriate web-based bioinformatics databases, use the prepared case studies and related programs and tools in order to solve the problems. **CO2.** Have knowledge about the scientific and economic importance of bioinformatics databases and tools.
	Program Outcomes
PO1	Adequate knowledge in fundamentals of mathematics (algebra, differential equations, integrals, probability etc), science (physics, chemistry, biology etc.), health science (anatomy and physiology) and computer science (programming and simulation); ability to use theoretical and applied knowledge in these areas in complex engineering problems.
PO2	Ability to identify, define, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.
PO3	Ability to design and integrate components of a complex system or process, as they relate to Biomedical Engineering discipline, under realistic constraints and conditions, in such a way as to meet desired requirements; ability to apply modern design methods.
PO4	Ability to devise, select, and use techniques and tools needed for analyzing and solving complex problems encountered in engineering practice; ability to employ information technologies effectively.
PO5	Ability to design and conduct experiments, gather, analyze and interpret data.
PO6	Ability to work in intra-disciplinary and multi-disciplinary teams; ability to take individual responsibilities.
PO7	Ability to effectively communicate in Turkish, ability to express his/her knowledge, ideas and work in English via oral, written and visual means; ability to write effective reports and comprehend written reports; ability to give and follow instructions.
PO8	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself
PO9	Consciousness to behave according to ethical principles, and about professional and ethical responsibility; knowledge on standards used in engineering practice.

PO10	Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship, innovation; knowledge about sustainable development.
PO11	Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions.

CONTRIBUTION OF COURSE OUTCOMES ON BIOMEDICAL ENGINEERING PROGRAM OUTCOMES						
Course\Program	CO1	CO2	CO3	CO4	CO5	CO6
PO1	☐	☐	☐	☐	☐	☐
PO2	☐	☐	☑	☐	☐	☐
PO3	☐	☐	☐	☐	☐	☐
PO4	☐	☐	☐	☐	☐	☐
PO5	☐	☐	☐	☐	☐	☐
PO6	☐	☐	☐	☐	☐	☐
PO7	☐	☐	☐	☐	☐	☐
PO8	☐	☐	☐	☐	☐	☐
PO9	☐	☐	☐	☐	☐	☐
PO10	☐	☐	☐	☐	☐	☐
PO11	☐	☐	☐	☐	☐	☐

COURSE ASSESMENT AND ECTS WORK LOAD			
Type of Work	**Count**	**ECTS WORK LOAD**	
		Time (Hour)(Including prep. time)	**Work Load**
Attendance	14	3	42
Final Exam	1	24	24
Quizzes			
Term project			
Reports			
Final Project			
Seminar			
Assignments			
Presentation			
Midterms	1	24	24
Project			
Laboratory			
Tutorial			
Other(Self study, Paper reviews)	14	5	60
		Total work load	150
		Total work load/25	150/25=6
		ECTS Credit	5

Course Plan:

W1	Introduction
W2	Complex systems and Bioinformatics
W3	Genomics
W4	Platforms for Genomics & Case studies
W5	Platforms for Genomics & Case studies
W6	Midterm
W7	Transcriptomics
W8	Platforms for Transcriptomics & Case studies
W9	Platforms for Transcriptomics & Case studies
W10	Proteomics
W11	Platforms for Proteomics & Case studies
W12	Platforms for Proteomics & Case studies
W13	Systems level biomedical science
W14	Final