Course Title	Code	Semester	Theoretical (hours/week)	Practice (hours/week)	Laboratory (hours/week)	ECTS
BIOTECHNOLOGICAL METHODS	**BBM 515**	1st/2nd Semester	3	0	0	5
Prerequisites	None					
Course Language	Turkish					
Course Type	Elective					
Teaching Methods	Explanation, Discussion, Qestion-Answer, Practice					
Instructor(s)						
Course Objective	DNA, protein, plasmid, cDNA library knowledge banks, use of Pubmed and Ensembl web tools, functional analysis software, bacterial, mammalian expression systems, identification of plasmid structures, gene knock-out, knock-down (RNAi), knock-in techniques, vector -plasmid combinations, transformation stages, cloning types, design, colony collection, bacterial culture, plasmid DNA isolation, restriction endonuclease and control of the presence of insert, preparation of bacterial lysates, SDS-page + coomassie blue staining, colon purification, mammalian cell culture The aim of this course is to train graduate students who have knowledge about overexpression or rnai and who have an innovative perspective in this field.					
Course Learning Outcomes	1- To be able to comprehend the application areas and application methohds of biotechnology 2- To be able to have knowledge about advanced concepts such as recombinant DNA technology 3- To be able to comprehend the interdisciplinary interaction in the field of biotechnology					
References	1- David P. Clark, Nanette J. Pazdernik, Biotechnology, , Newnes, 2015, ISBN: 0123850169 2- A.J. Nair. Johns - Introduction to Biotechnologie and Genetics Engineering, Laxmi Publications, 2010 , ISBN: 938038632X, 3- Current Protocols in Molecular Biology, ISBN: 9780471142720					

WEEKLY COURSE TOPICS

Weeks	DISCUSSION TOPICS TO BE PROCESSED
1.	İn silico tools
2.	Regulation of ectopic gene expression 1
3.	Regulation of ectopic gene expression 2
4.	Cloning 1
5.	Cloning 2
6.	Plasmid production and purification 1
7.	Plasmid production and purification 2
8.	**Midterm exam**
9.	Knock-in animal model constructing
10.	Knock-out animal model constructing
11.	RNA Interference technologies
12.	Recombinant protein production
13.	Recombinant protein determination
14.	Recombinant protein purification techniques
15.	**Final Exam**

ECTS / WORK LOAD TABLE

Activities	**Number**	**Duration**	**Total Work Load**
Course	14	3	42
Laboratory			
Practice			
Field Study			
Outclass course work hours (Self working / Teamwork / Preliminary work)	16	3	48
Presentations (Video preparation / Poster preparation / Oral presentation / Focus group discussion / Applying questionnaire/ Observation and report writing)			
Seminars	1	8	8
Project			
Case study			
Role playing, dramatization			
Preparing and criticizing article			
Semester midterm exams	2	10	20
Semester final exams	1	7	7
Total Work Load (hour) / 25(s)	125/25=5		
ECTS	**5**		

EVALUATION SYSTEM

Midterm Studies	**Number**	**Contribution**
Midterm exam	1	%25
Quiz		
Laboratory		
Practice		
Field Study		
Specific practical training (If exists)		
Homework assignment		
Presentation and seminar	1	%25
Projects		
Other evaluation methods		
Total of Midterm Studies		%50
Final Studies		
Final	1	%50
Homework assignment		
Practice		
Laboratory		
Total of Final Studies		%50
Contribution of midterm studies to course grade		%50
Contribution of final studies to course grade		%50
Total Grade		100

RELATIONSHIPS BETWEEN COURSE LEARNING OUTCOMES AND PROGRAM QUALIFICATIONS

Program Qualifications		**Learning Outcomes**		
		LO1	**LO2**	**LO3**
1.	Based on undergraduate level qualifications, it has up-to-date knowledge in the field of Biological and Biomedical Sciences and develops and deepens them.	**4**	**4**	**4**
2.	Have knowledge about information technologies, technical equipment and the devices and instruments that are specific to the field in the field of Biomedical Sciences.	**4**	**4**	**4**
3.	To integrate the information in the field of Biological and Biomedical Sciences with information from different disciplines and to create new information, interpret and analyze by using different research methods and propose solutions.	**4**	**4**	**4**
4.	He writes the report of his research.	**4**	**4**	**4**
5.	Can plan and apply an experimental research	**4**	**4**	**4**
6.	In the field of Biological and Biomedical Sciences, can offers solutions, solves the problems, evaluates the results obtained and applies when necessary.	**4**	**4**	**4**
7.	Makes scientific clinical and / or descriptive research / presentation / publication on priority topics related to Biological and Biomedical Sciences and public health.	**4**	**4**	**4**
8.	Evaluates the knowledge related to Biological and Biomedical Sciences with a critical approach.	**4**	**4**	**4**
9.	Applies the principles of professional development and lifelong learning in the field of Biological and Biomedical Sciences.	**4**	**4**	**4**
10.	Students will be able to discuss and share their knowledge in the field of Biological and Biomedical Sciences in their written, oral and visual form in a systematic manner with current and other groups.	**4**	**4**	**4**
11.	Examines the social relations in the professional environment and the norms that direct these relations from a critical point of view and makes necessary to develop them.	**4**	**4**	**4**
12.	Observes and teaches the social, scientific and ethical values in the stages of data collection, recording, interpretation and announcement in the field of Biological and Biomedical Sciences.	**4**	**4**	**4**

13.	Evaluates the current developments in the field of Biological and Biomedical Sciences in line with national values and realities of the country, including children and families, which are the basic unit of society.	**4**	**4**	**4**
14.	Knows the importance of ethical principles and rules for the individual and society, behaves ethically.	**4**	**4**	**4**
15.	Develops strategy, policy and implementation plans in the field of Biological and Biomedical Sciences and evaluates the obtained results within the framework of quality processes.	**4**	**4**	**4**

Contribution to the level of proficiency: 1: Low **2:** Low/Moderate **3:** Moderate **4:** High **5:** Excellent