AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Biotechnology in Dairy Industry								
Course Code	ST412		Couse Level	First Cycle (Bachelor's Degree)					
ECTS Credit	4	Workload	102 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The aim of this course is to give information about on biotechnology, nucleic acids, genetic recombination, gene transfer methods, recombinant DNA technology, recombinant foods and microorganisms, bioreactors, industrial microorganisms, their growth kinetics, fermentation and immobilization methods.								
Course Content	Molecular Microbiology, DNA replication, Protein synthesis, genetic modification of microorganisms used in food industry								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Individual Study								
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	70

Recommended or Required Reading	
1	Biyokimya Mühendisliği (Biyoteknoloji), Prof. Dr. Burhan Pekin, Ege Üniversitesi Kimya Fakültesi Yayınları, İzmir, 1983.
2	Food Biotechnology, Cambridge Press, Cambridge. -Brown, C. M., Campbell, I., Priest, F. G., 1987
3	Introduction to Biotechnology, Blackwell, Oxford. Moleküler Biyoloji. Nobel Yayınları, Ankara, 2007. Nicholl, D. S. T.
4	An introduction to genetic engineering. Cambridge University Press, Cambridge, 1996.

Week	Weekly Detailed Course Contents	
1	Theoretical	Definition, history and application area of biotechnology
2	Theoretical	Chemical properties, functions and biosynthesis of nucleic acids
3	Theoretical	Genetic recombination and gene transfer methods
4	Theoretical	Recombinant DNA technology, molecular clones and vectors
5	Theoretical	Replication of DNA in vitro conditions
6	Theoretical	Biotechnological foods produced by recombinant DNA technology and their safety
7	Theoretical	Basic principles, operation, types and control of bioreactors
8	Intermediate Exam	Mid-term exam
9	Theoretical	Fermentation methods (batch, half continues and continues),
10	Theoretical	Microbial growth parameters, kinetics of microbial growth in batch and continuous culture
11	Theoretical	Immobilization techniques and biocatalysts
12	Theoretical	İmmobilizasyon teknikleri ve biyokatalistler
13	Theoretical	Application of biotechnology in food industry (production of bread yeast, single cell protein
14	Theoretical	Application of biotechnology in food industry (production of bread yeast, single cell protein
15	Theoretical	Genetically modified microorganisms and food stuff
16	Final Exam	Mid-term exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	2	3	70
Individual Work	14	0	2	28
Midterm Examination	1	0	2	2

Final Examination	1	0	2	2
			Total Workload (Hours)	102
			[Total Workload (Hours) / 25*] = **ECTS**	4
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	Knowing of fundamentals of biotechnology
2	Understanding the importance of Molecular Biology on food production
3	Understanding of biotechnologyin agricultural production
4	Understanding of genetically modified microrganisms and their importance
5	Definition of microorganisms which are used in food technology

Programme Outcomes *(Dairy Technology)*	
1	Having sufficient infrastructure in basic sciences and engineering subjects and ability to use the theoretical and applied info instantly in this field.
2	Determining the modern techniques, tools and information technologies required for applications related with his field and ability to use them efficiently
3	Ability for planning, projecting, and designing, following up, analyzing and finding target-driven solutions related with his field
4	Ability to have professional ethic and awareness.
5	Ability to work, decide, express opinions orally and in written individually
6	Ability to participate team studies, taking responsibility, making leadership.
7	Ability to conceive Ataturk’s principles and reforms, to communicate in Turkish and foreign language.
8	Ability to comprehend the necessity to learn for a life time, to monitor developments in science and technology and continuously renew himself.
9	Having sufficient level of information about production and quality control of milk and dairy products and also product development, increasing product quality and food security fields.
10	Ability to detect, define, solve problems related with his field and to select and apply suitable methods and modeling techniques for this purpose.
11	To be conscious about workplace applications, worker health, work security and environment subjects, to have knowledge about legal results of the engineering applications related with his subject.

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5
P1	5	5	5	5	5
P9	5	5	5	5	5