LIST OF SUBJECTS FOR PROGRAM OF MASTER IN BIOTECHNOLOGY

CONTENTS	CODE	SUBJECTS	CREDITS	VOLUME
SUBJECTS FOR BOTH DIRECTION				
General subject	**SS6010**	**Philosophy**	2	2(1,5-0-1-4)
Compulsory subjects (12 CRE)	**BF6111**	**Microbial technology process**	3	3 (2-2-0-6)
	BF 6112	**Kinetics of enzyme**	2	2(1,5-1-0-4)
	BF 6113	**Downstream processing**	3	3(2-1-1-6)
	BF 6114	**Experimental data analysis**	2	2(1,5-1-0-4)
	BF 6121	**Optimal cybernetics in biotechnology**	2	2(1,5-1-0-4)
SUBJECTS FOR MASTER OF ENGINEERING				
Selective subjects (12/17 CRE)	**BF 6122**	**Product innovation**	2	2(1,5-1-0-4)
	BF 6123	**Bioremediation**	2	2(1,5-1-0-4)
	BF 6124	**Bioactive Natural compounds**	2	2(1,5-1-0-4)
	BF 6125	**Biofuel**	2	2(1-2-0-4)
	BF 6126	**Probiotic và Prebiotic**	3	3(2,5-1-0-6)
	BF 6221	**Functional Food**	2	2(1-2-0-4)
	BF 6128	**Biopolymer**	2	2(1,5-1-0-4)
	BF 6129	**Rapid analysing molecular techniques for diagnosis**	2	2(1,5-1-0-4)
		Selective	**7**	
Thesis	**BF6101**	**Final Thesis**	8	8(0-0-20-30)
SUBJECTS FOR MASTER OF SCIENCE				
Compulsory	**BF 6131**	**Proteomics**	3	3 (2,5-1-0-6)

subjects (6 CRE)	**BF 6132**	**Recombinant protein technology**	3	3 (3-0-0-6)
Selective subjects (6/12 CRE)	**BF 6125**	**Biofuel**	2	2(1-2-0-4)
	BF 6128	**Biopolymer**	2	2(1,5-1-0-4)
	BF 6129	**Rapid analysing molecular techniques for diagnosis**	2	2(1.5-1-0-4)
	BF 6221	**Functional Food**	2	2(1,5-1-0-4)
	BF 6136	**Gene regulation and expression system**	2	2(1-2-0-4)
	BF 6123	**Bioremediation**	2	2(1,5-1-0-4)
Thesis	**BF6102**	**Final Thesis**	15	15(0-0-30-30)

Brief description of subjects in program of Master in biotechnology

BF6111 Microbial technology process 3 (2-2-0-6)

Priciples in fermentation technology. Culture and solution for using in manufacture. Preparation of culture and fermentors. Operating, suprvising and adjusting fermentation process. Treatment of fermentation medium for separating and purifying products.

BF6112 Kinetics of enzyme 2(1,5-1-0-4)

Concepts and kinetics meaning of enzymes. Kinetics of homogeneous enzymes with influences of chemico-physical factors as temperatures, pH v.v…Kinetics of heterogenous enzymes. Kinetics of immobilized enzymes. Methods for determining parameters in enzyme kinetics: Km, Vmax, Ks, Ki.

BF6113 Downstream processing 3(2-1-1-6)

This course will focus on technology and processes available to produce the biological products such as cell disruption, separation and concentration, purification and finally formulation of biological products.

BF6114 Experimental data analysis 2(1,5-1-0-4)

Assistance in choosing calculation method appropriated in particular experimet of a research. Provide skill and technique in writing a research report and article.

BF6121 Optimal cybernetics in biotechnology 2(1,5-1-0-4)

Concept in cybernetics for biotechnology, optimal cybernetics, setting methematic problem, statistic optimal cybernetics and dynamic optimal cybernetics.

BF6122 Product innovation 2(1,5-1-0-4)

Main concepts about innovation product in field of biotechnology and food technology. Principles for designing new products and management for developing sustainable products.

BF6123 Bioremediation 2(1,5-1-0-4)

Contaminations sources, properties of contaminants. Mechanism of transportation of contaminants in soils and underground water. Role of biological agent (microbes, plant) in biodegradation, mechanism of biotransformation. Hazardous waste and mechanism of its biodegradation. Biological methods of treatment.

BF 6124 Bioactive Natural compounds 2(1,5-1-0-4)

Groups of natural compounds include polyphenols, terpenoid, carotenoid, alkaloid, and lectin. Explotation methods and method for determining bioactivity, application in biotechnology, food technology, pharmacy and medicine.

BF6125 Biofuel 2(1-2-0-4)

The module wills summary the biochemical characteristics of the different biomass types included agricultural byproducts that can be used for biofuel purpose. The module will introduce technology processes of biogas, biohydrogen, bioethanol and biodiesel and also the actual technical challenge that should be overcome.

BF6126 Probiotic và Prebiotic 3(2,5-1-0-6)

Principle concepts about probiotic and prebiotic: enteric microbial flora*, role of probitic and prebiotic for human health and animals; Technology for producing probiotic and prebiotic preparates: Methods for producing and evaluating preparates.*

BF6128 Biopolymer 2(1,5-1-0-4)

General knowledge on the polymer chemystry: chemical polymerization, physiological characteristics, method for mesurement the texture … Generals aspects of biopolymer: the bio-compatitive, biodegradability and compostability of biopolymer and biodegradable polimeric materials, sustainability with the biopolymer... The application of biopolymers in the some fileds: bio-plastic, drug delivery, wastewater treatment, construction engineering… Biotechnological processes for the production of some biopolymers.

BF6129 Rapid analysing molecular techniques for diagnosis 2(1,5-1-0-4)

Rapid analysing method applied in biotechnology. Methods based on detecting nucleic acid as PCR (Polymerase Chain Reaction), NASBA (Nucleic Acid Sequence Based Amplification, LAMP (Loop-mediated Isothermal Amplification), DNA array. Analysing methods based on Antigen –antibody reactions (ELISA, immuno-chromatography .

BF6131 Proteomics 3(2,5-1-0-4)

The principles of proteomics and its position in biological sciences.: Classification of proteomics, application of bioinformatics and used methods in proteomics research. Applications of proteomics in different biotechnological, medical and pharmaceutical fields.

BF6132 Recombinant protein technology 3(3-0-0-4)

General view in recombinant protein technology. Construction and making expression vector. Expressing recombinant protein in host organism. Extraction, purification and impvoving for making end-products. Several recombinant protein technologies.

BF6221 Functional Food 2(1-2-0-4)

Functional food: Definition, Functional properties of the products originated from nature. Probiotic, prebiotic and their effect on human being health. Extraction and application of natural compounds. Technology of some functional food.

BF6136 Gene regulation and expression system 2(1-2-0-4)

The modes of gene regulation in prokaryotes and eukaryotes. The necessary factors and the principle of gene expression in each system. The methods for researching the gene functions.