

# EHEA's bachelor degree in Food Science and Technology

First Course	
First Semester	Second Semester
<a href="#"><u>General and Inorganic Chemistry (6 cr)</u></a>	<a href="#"><u>Laboratory Experimentation (6 cr)</u></a>
<a href="#"><u>Organic Chemistry (6cr)</u></a>	<a href="#"><u>Anthropology and Psychology of Feeding Behavior (6 cr)</u></a>
<a href="#"><u>Biochemistry (6 cr)</u></a>	<a href="#"><u>Human Physiology (6cr)</u></a>
<a href="#"><u>Biostatistics and Applied Mathematics (6 cr)</u></a>	<a href="#"><u>Physics and Physical Chemistry (6 cr)</u></a>
<a href="#"><u>Cell Biology and Genetics (6 cr)</u></a>	<a href="#"><u>Molecular Biology and Genomics (6cr)</u></a>

First  
Course

Second  
Course

Third  
Course

Fourth  
Course

# EHEA's bachelor degree in Food Science and Technology

Second Course	
First Semester	Second Semester
<a href="#"><u>Instrumental Analysis (6cr)</u></a>	<a href="#"><u>Composition and Properties of Food (6cr)</u></a>
<a href="#"><u>General Microbiology (6cr)</u></a>	<a href="#"><u>Food Microbiology and Parasitology (6cr)</u></a>
<a href="#"><u>Food Chemistry (6cr)</u></a>	<a href="#"><u>Raw Production (6cr)</u></a>
<a href="#"><u>Fundamentals of Technology (6cr)</u></a>	<a href="#"><u>Food Analysis I (6cr)</u></a>
<a href="#"><u>Human Nutrition (6cr)</u></a>	<a href="#"><u>Unitary Operations I (6cr)</u></a>

First  
Course

Second  
Course

Third  
Course

Fourth  
Course

# EHEA's bachelor degree in Food Science and Technology

Third Course	
First Semester	Second Semester
<a href="#"><u>Food Analysis II (6cr)</u></a>	<a href="#"><u>Ingredients and Formulation of Food (6cr)</u></a>
<a href="#"><u>Unitary Operations II (6cr)</u></a>	<a href="#"><u>Food Technology (6cr)</u></a>
<a href="#"><u>Food Security I (6cr)</u></a>	<a href="#"><u>Food Security II (6cr)</u></a>
<a href="#"><u>Practicals of Food Analysis (6cr)</u></a>	<a href="#"><u>Management of Food Quality and Regulations (6cr)</u></a>
<a href="#"><u>Nutrition and Health (6cr)</u></a>	Hygiene at Food Industry (6cr)

First  
Course

Second  
Course

Third  
Course

Fourth  
Course

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Fourth Course	
First Semester	Second Semester
Quality Control of Processes and Products (6cr)	Public Health and Nutritional Epidemiology (6cr)
Enviromental Management at Food Industry (6cr)	Food Biotechnology (6cr)
Functional Foods and New Foods (6cr)	Traineeships supervised (6cr)
Economy and Management at the Agrifood Industry (6cr)	Optional Subject (3cr)
Optional Subject (3cr)	Optional Subject (3cr)
Optional Subject (3cr)	Final Grade Work (6cr)

First  
Course

Second  
Course

Third  
Course

Fourth  
Course

**General and Inorganic Chemistry (6 cr):** Structure, compounds and chemical reactions. Matter properties. Atomic structure and periodic table. Periodic properties. Chemical bond. Stoichiometry. Equilibrium. Descriptive inorganic chemistry. Thermodynamics. Chemical kinetics.



**Organic Chemistry (6cr):** Structure of organic molecules. Reactions of organic compounds as acids or bases. Stereoisometry. Fundamentals of reactivity. Reactions of aromatic and carbonilic compounds. Molecules of biological interest: carbohydrates, aminoacids, peptides, proteins and lipids.



**Biochemistry (6 cr):** Structure of proteins and enzymatic catalysis. Aminoacids. Relationship between structure and function of proteins. Regulation of enzymatic activity. Metabolism. Hormonal control of metabolism. Biosignalling. Integration of metabolism.



**Biostatistics and Applied Mathematics (6 cr):** Geometry in 2D and 3D. Differential and integral calculus. Functions of one variable. Multivariable equations. Differential equations. Biostatistics. Descriptive statistics. Probability and distribution of probability. Sampling techniques. Parameter estimation. Hypothesis contrast with proportions and means.



**Cell Biology and Genetics (6 cr):** Cellular organization. Prokaryotic and eukaryotic cells. Intracellular compartments. Plasma membrane. Mechanism of transport. Cellular organelles. Endoplasmic reticulum. Golgi apparatus. Vacuoles. Endocytosis. Lysosomes. Peroxisomes. Cytosol. Nucleus. Ribosomes. Mitochondria and plastids. Cytoskeleton. Cells and environment. Cellular cycle and inheritance. Fundamentals of genetics.



**Laboratory experimentation (6 cr):** Quality control of the laboratory. Rules of security in the laboratory. Good environmental praxis. Basic operations of laboratory. Laboratory classes on Inorganic and General Chemistry, Cellular Biology, Organic Chemistry, Biochemistry, Human Physiology, Physics and Physical Chemistry, and Molecular Biology and Genomics.



**Anthropology and Psychology of Feeding Behavior (6 cr):** Feeding as a system of socio-cultural adaptation. Feeding and social differentiation. Feeding behavior. Psychology of feeding behavior. Biological and psychological processes in the regulation of feeding behavior. Perception of flavors. Acquisition of taste aversions and preferences.



**Human Physiology (6cr):** Function and structure of the human body. Levels of organization. Homeostasis and regulation. Fundamentals of tissue physiology. Bone tissue and skeletal system. Muscular tissue and contraction. Neuronal tissue, conduction and synapses. Nervous system. Endocrine system. Blood and cardiovascular system. Lymphatic system and immunity. Respiratory system. Digestive system. Urinary system. Reproductive system.. Bone tissue. Function and structure of organic systems. Immune system.



**Physics and Physical Chemistry (6 cr):** Intermolecular forces. Gaseous state. Condensed states of matter. Energy and balance. Dissolutions, phase and reaccionant systems balance. Colloidal systems. Kinetics. Catalysis.



**Molecular Biology and Genomics (6cr):** Function and structure of nucleic acids. Flow mechanisms of genetic information. Genome replication. Mutations and DNA repair. Transcription initiation. Synthesis and processing of RNA. Post-translational processing. Regulation of the genome activity. Analysis of gene expression. Basic techniques of molecular biology.



**Instrumental Analysis (6cr):** Introduction to Instrumental Techniques. Spectroscopic techniques. Electrochemic techniques. Separation techniques.



**General Microbiology (6cr):** The microbial world. Basic microbiology techniques. Structure of the prokaryotic cell. Growing and metabolism. Microbial genetics. Diversity. Microorganism-host interactions.



**Food Chemistry (6cr):** Introduction. Historic development of food knowledge. Functional properties and quality in food. Water. Carbohydrates. Lipids. Proteins. Vitamins. Minerals. Dyes and pigments. Flavor and aroma. Additives.



**Fundamentals of Technology (6cr):** Introduction. Colloidal systems with nutritional interest. Fundamental and derived units. Elemental relationships and properties of the substances. Equilibrium relationships. Material balances. Energy balances.



**Human Nutrition (6cr):** Introduction. Macronutrients and energy (water, carbohydrates, lipids, proteins and aminoacides, etilic alcohol). Energetic value of nutrients. Micronutrients (vitamins and minerals). Nutrition and feeding in the different stages on the life.



**Composition and Properties of Food (6cr):** Introduction. Meat. Fish and seafood. Eggs and derivated. Milk. Oils and edible fats. Cereals and derivatives. Legumes, tubers and derivatives. Vegetables. Fruits. Natural sweeteners and derivatives. Alcoholic and non alcoholic drinks. Stimulant food and derivatives. Condiments and species. Prepared meals.



**Food Microbiology and Parasitology (6cr):** Introduction to food microbiology. Microbial ecology of food. Effects of microorganisms on food. Microorganisms control. Microbiological quality of food. Introduction to food parasitology. Main pathogen parasites. Food parasitosis. Arthropodes and Food. Parasites of economical importance causing food deterioration.



**Raw Production (6cr):** Vegetal production. Land and fertilizers. Cultural practices and cultivation techniques. Collection and conservation. Environment and Quality. Animal production. Food Security. Animal Feeding. Productive systems. Milk. Meat. Eggs. Fish and seafood. Raw production and consumers.



**Food Analysis I (6cr):** The analytical process. Quality management. Statistical tools for assessing analytical methods and results. Selection and validation of analytical methods. Quality control. Audits.



**Unitary Operations I (6cr):** Introduction to basic operations. Fundamental concepts. Fluids circulation by conduction. Heat transport mechanisms. Heat exchangers. Pasteurization. Sterilization.



**Food Analysis II (6cr):** General aspects of food analysis. Nutrient analysis. Analysis of additives, contaminants and waste in food. Sensorial analysis.



**Unitary Operations II (6cr):** Various pretreatment with solids, grinding and extrusion. A mixture of solid and liquid. Liquid-solid extraction. Evaporation and crystallization. Separation by gravity and centrifuges. Filtration. Membranes. Ancillary services, water, steam and electricity.



**Food Security I (6cr):** Basic concepts and naming. Historic perspective. Legislation. Food security agencies. Danger types: biotic and abiotic. Risk analysis. Risk assessment. General Toxicology. Incidence. Toxicokinetics and Toxicodynamics. Toxicology of organs and systems. Bioindicators. Toxicological characteristics of the main groups of abiotic danger.



**Practicals of Food Analysis (6cr):** Chemical and sensory analysis of food. Parameters of quality control. Microbiological analysis of food. Parasitological analysis of food.



**Nutrition and Health (3cr):** Introduction. Diet in preventing and/or treating pathologies of high prevalence (cardiovascular disease, metabolic diseases and cancer). Other pathologies with nutritional implications (bone pathologies, intestinal pathologies, anemias...). Feeding in special situations. Emerging issues in food and health.



**Ingredients and Formulation of Food (6cr):** Introduction to Food Formulation. Additives. Industrial ingredients. Industrial processes. Formulation of food.



**Food Technology (6cr):** Analysis and design of process plants. Stages in the development of a project, flowcharts, degrees of freedom and choice of design variables. Processes in food industry.



**Food Security II (6cr):** Abiotic security of food. Ampliation of methods to assess toxicity. The 3R, alternative methods. Validation and acceptation methods. Methods for assessing toxicological risks. Biotic security of food. Main rellevant microorganims in food security. Methods to characterize the risk of the presence of microorganisms in food. Risk assessment.



**Management of Food Quality and Regulations (6cr):** Standardisation and food legislation. Applied Food Legislation. Food information provided to the consumer. Quality Management.

