JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

ESTABLISHED BY GOVERNMENT OF RAJASTHAN

UGC APPROVED | NAAC ACCREDITED

DEAPRTMENT OF FOOD & BIOTECHNOLOGY

Course Outcomes of Bachelor in Food & Bio Technology

Course Code	Course Name	Course Outcomes
UF-BT-018	**Fundamentals of Biotechnology**	1. Learn about basics and historical perspective of biotechnology 2. Learn about basics perspective of introductory knowledge of advance technologies of biotechnology along with patenting and ethical issues.
UF-BT-019	**Fundamentals of Biotechnology Labs**	Learn basics of all all related streams of Biotechnological practical approaches such as DNA Isolation and its visualization, basics of Plant Tissue Culture, Molecular Biology and Microbiological techniques etc.
UF-BT-101	**Introduction to food technology**	1. Understand the principles of food science, different areas of food science and the historical evolution of food processing. 2. Understand the basics of plant and animal foods, their types, structure and composition, nutritional value, changes taking place during storage and different processing methods used.
UF-BT-105	**Biomolecules**	1. Learn general account of the chemical nature of living cells including Carbohydrates, Lipids, Protein and Vitamins 2. Gain knowledge from this course will make student able to learn advance knowledge related to Food and Biotechnology
UF-BT-104	**Biomolecules Lab**	Learn basics of all related streams of Biochemistry practical approaches such as qualitative analysis of all three biomolecules such as Carbohydrates, Proteins and Lipids etc.
UF-BT-102	**Basics of Biosciences**	1. Learn about diversity in biological systems. 2. Buildup concept wise knowledge to understand advanced courses of Food and Biotechnology.
UF-BT-103	**Basics of Biosciences Lab**	Learn basics of all related streams of basics of Biological system practical approaches such as isolation and identification of microorganism, Various Chromatography, studies of Plant system and Animal system etc..
UF-BT-020	**Fundamentals Of**	1. Students will able to identify various matters and

	Chemistry	equipment used in labs, perform some basic experiments. 2. Buildup concept wise knowledge to understand basic chemistry and its types.
UF-BT-021	**Fundamentals Of Chemistry Lab**	Learn basics of all related streams of Fundamentals of Chemistry practical approaches Related To Physical, Organic and Inorganic Chemistry
SEC-001	**Hands on Training Courses on-Fruits and Vegetable dehydration techniques**	Learn about handling the dehydration machines and Unit; standardization of the process of dehydration; maintenance of hygiene and sanitization of plant Documentation of Products.
UF-BT-120	**Fundamentals of microbiology**	1. Learn about the basics of microbes; physiology of microbes and their role in agriculture. 2. Student will able to think and apply microbes with new innovative ideas for betterment in Food and Biotechnology.
UF-BT-123	**Fundamentals of microbiology Lab**	Learn basics of all microbial streams with practical approaches such as isolation and identification of microorganism from various sources such as extreme environmental conditions, growth curves, and antibiotic sensitivity.
UF-BT-126	**Unit operations in Food Industry**	1. Explain basic principles of unit operations and also waste treatment in food industry. 2. Explain the methods and effects of preservation and processing on food product quality.
UF-BT-127	**Unit operations in Food Industry Lab**	Student will be able to do practical related to this course such as solvent extraction, Sieve analysis.
UF-BT-122	**Fundamentals of Food Science & Technology**	1. Understand scope of food processing in India and different areas of food processing.. 2. Understand the processing of different food products like meat and meat products, Fruit and vegetable, milk and milk products and marine products.
UF-BT-121	**Fundamentals of Food Science & Technology Lab**	Student will be able to do practical related to this course such as Food preservation Techniques, Packaging types, Food processing techniques, Study of processing equipments, etc
UF-BT-117	**Cell biology**	1. Understand the structures and basic components of prokaryotic and eukaryotic cells, including membranes, and organelles. 2. Understand cell division process, significance of mitosis and meiosis process.
UF-BT-118	**Cell biology Lab**	Student will be able to do practical related to this course such as Food preservation Techniques, Packaging types, Food processing techniques.
SEC-002	**Hands on Training Courses-**	1. Student will be skilled in this course for Quality Analysis of Food Products. 2. Student will learn about handling all essential Techniques

	Quality Analysis of Food Products	related to quality analysis of various food products.
UF-BT-046	**Molecular Biology**	This course will give student a brief knowledge about molecular biology, nucleic acid structure prokaryotic and eukaryotic replication, control of replication and nucleosomes. Students will learn about transcription in prokaryotes and eukaryotes, promoters for transcription, RNA processing, translation, mechanism, genetic code, mutation and DNA repair mechanisms.
UF-BT-047	**Molecular Biology Lab**	Student will be able to do practical related to this course such as isolate genomic DNA, isolate RNA, determine the concentration of RNA etc. after successful completion of this course.
UF-BT-044	**Metabolism and Bioenergetics**	This course will give student a brief knowledge about molecular basis of life, structure and classification of proteins, classification of lipids, classification of carbohydrates. Students will learn about nucleic acid structure, enzyme classification, kinetics of enzymes, metabolism of carbohydrate, lipid and amino acid metabolisms and photosynthesis reaction.
UF-BT-045	**Metabolism and Bioenergetics Lab**	Student will be able to do practical related to this course such understand the principle and operation of Spectrophotometer after successful completion of this course.
UF-BT-050	**Technology of Milk & Milk Products**	Students would be able to understand the basics of milk and milk processing Understand the importance of dairy, the techniques that can be used for preservation and manufacturing of various value added milk products. Understand the processing of various milk products like butter ghee, flavored milk, yoghurt and shrikhand, ice cream, cheese, channa, paneer, condensed milk and milk powder.
UF-BT-051	**Technology of Milk & Milk Products Lab**	Student will be able to do practical related to this course such Preparation of Flavored Milk COB test, Determination of Physico- chemical properties After successful completion of this course.
UF-BT-048	**Principles of Food Preservation**	This course deals with the techniques and principles involved in processing and preserving the various food products. The student will be able to apply the principles and methods involved in the processing of different foods and discuss their processing. They would understand important application of various preservation methods in food industries.
UF-BT-049	**Principles of Food Preservation Lab**	Student will be able to do practical related to this course such Measurement of water activity in Fresh fruits. Dehydration, Quality analysis of the products during storage etc After successful completion of this course.
UF-BT-041	**Food Microbiology & Safety**	Students would be able to acquaint the knowledge of the important genera of microorganisms associated with food and their characteristics. They would be able to explain the role of

		microbes in fermentation, spoilage and food borne diseases. Gain Knowledge of Food safety and hygiene, types of hazards associated with food and understand the current Food Regulations.
UF-BT-042	**Food Microbiology & Safety Lab**	Student will be able to do practical related to this course such Preparation of common laboratory & Special media for cultivation of bacteria, yeast & molds After successful completion of this course.
UF-BT-039	**Biostatistics**	Students will learn about basic of biostatistics, classification of data, tabulatin of data, correlation coefficient, regression, measures of dispersion and measures of central tendancy. This course will give students knowledge about vital statistics, life tables, sampling techniques, hypothesis testing, large sample test, small sample test and analysis of variance.
UF-BT-040	**Biostatistics Lab**	Student will be able to do practical related to this course such To find out Mean . After successful completion of this course.
UF-BT-037	**Basic Enzymology**	This course will give student a brief knowledge about basic characters of enzymes activation energy, enzyme classification and purification of enzyme. Students will learn about kinetics of enzyme enzyme substrate complex, enzyme inhibition, reversible inhibition, non reversible mechanism of enzyme action and modification of enzymes.
UF-BT-038	**Basic Enzymology Lab**	Student will be able to do practical related to this course such Inhibition of enzyme activity Determination of Ki values etc After successful completion of this course.
SEC-004	**Hands on Training Courses- Plant Tissue Culture Techniques**	Student will be skilled in this course for Techniques in Plant Tissue Culture. Student will learn about handling all essential Techniques related to Plant Tissue Culture.
UF-BT-062	**Recombinant DNA technology**	This course will give student a brief knowledge about recombinant DNA technology, basic steps of gene cloning, restriction enzymes, tools of RDT and vectors for gene cloning. Students will learn about methods of gene transfer, preparation of molecular probes, blotting methods, preparation of genomic library and DNA sequencing.
UF-BT-063	**Recombinant DNA technology Lab**	Student will be able to do practical related to this course such .To isolate plasmid DNA from E.coli., Digestion, electroporation etc. after successful completion of this course.
UF-BT-060	**Principles of Immunology**	Students will be able to understand the basic concepts of immunology including introduction of immunology, molecular patterns of pathogen, types of immunity, components and processes of innate and acquired immunity, antigen and antibody interaction, antibody structure, MHC molecules, B Cell and T Cell activation, cytokines and vaccines.
UF-BT-061	**Principles of Immunology Lab**	Student will be able to do practical related to this course such. To perform sandwich ELISA. After successful completion of

		this course.
UF-BT-151	**Waste management of Food Industries**	By the end of semester students will be able to understand and analyze different types of food industry wastes their Classification, their special characteristics and management of wastes from different food processing industries. The students will also acquaint knowledge about food industry waste by products.
UF-BT-146	**Fruits and Vegetable Processing Technology**	The course would furnish and acquaint a student with knowledge and understanding of the basic post harvest biological, chemical, physiological and metabolic processes and changes in fruits and vegetables. They would even learn the basic steps, application and operation of selected technologies and principles used to process, preserve and extend shelf life and value addition.
UF-BT-147	**Fruits and Vegetable Processing Technology lab**	Student will be able to do practical related to this course such. Preparation fruit juices and its concentrate etc After successful completion of this course.
UF-BT-052	**Environmental Biotechnology**	Students will learn about basic concept of environment, environmental pollution pollution, control, pollution monitoring, air pollution and water pollution. This course will give students knowledge about waste water treatment, solid waste, sludge waste disposal, bioremediation, biostimulation. bioaugmentation, hazardous waste management and biological detoxification.
UF-BT-053	**Environmental Biotechnology Lab**	Student will be able to do practical related to this course such. Isolation and Characterization of Bacteria from Crude Petroleum Oil., BOD, DO of water sample etc After successful completion of this course.
UF-BT-057	**Medical Biotechnology**	Students will learn about basic concept of medical biotechnology, role of biotechnology in healthcare, tissue engineering and stem cell therapy. This course will give students knowledge about sign symptoms, diagnosis, treatment and prevention of communicable and non-communicable diseases, disease diagnosis techniques, microbial culture techniques and monoclonal antibody production..
UF-BT-058	**Medical Biotechnology Lab**	Student will be able to do practical related to this course such. Determine the lethal effect of temperature on micro-organisms, Antimicrobial activity, Polymerase Chain reaction, Widal test etc after successful completion of this course.
UF-BT-069	**Enzyme technology**	Students will be able to understand the basic concepts of Enzyme technology including introduction of enzyme and enzyme kinetics, enzyme inhibition and regulation, Enzyme immobilization techniques and their applications free and immobilized enzymes, extraction and application of commercially important enzymes in medicine and industrial purposes.
UF-BT-070	**Enzyme**	Student will be able to do practical related to this course such.

	technology Lab	To study physical and chemical method of Immobilization After successful completion of this course.
UF-BT-077	**Plant biotechnology**	Students will be able to understand the basic concepts of plant biotech with introduction of plant tissue culture, various types of tissue culture media in plants and techniques of plant tissue culture for preparation oof disease free plants, production of secondary metabolites, construction of mapping, physical methods of gene transfer for the production of transgenic plants and Application of plant tissue culture.
UF-BT-078	**Plant biotechnology Lab**	Student will be able to do practical related to this course such. Preparation of different types of tissue culture medium, In Vitro Multiplication, Root initiation, Anther culture etc after successful completion of this course.
UF-BT-154	**Cereal, Pulse & oilseed Technology**	Students would be able to understand basic composition & structure of food grain and understand the basics of milling operations. They would learn processing of food grains into value added products and how to manage production, distribution & storage of grains and even understand the principle of alcoholic beverage preparation.
UF-BT-155	**Cereal, Pulse & oilseed Technology Lab**	Student will be able to do practical related to this course such. Preparation of soy-snacks Milling of oilseeds, Preparation of Soy-Milk, Development of Bakery and other products etc after successful completion of this course.
UF-BT-065	**Basic Food Engineering**	Student would learn to Emphasis the various properties of the raw material used in food processing, different processing technologies required in transforming them into quality food products and material handling equipment involved in food processing operations.
UF-BT-066	**Basic Food Engineering Lab**	Student will be able to do practical related to this course such Energy Requirement for size reduction using different mills, Mixing indices for mixing solids etc after successful completion of this course.
UF-BT-161	**Modern Baking & Confectionary Technology**	Upon successful completion of the course, the student will be able to identify and explain baking terms, ingredients, equipment and tools and employ safe food handling practices using contemporary guidelines. They would acquire the knowledge of the technologies behind bakery products and understand trends in bakery industry.
UF-BT-162	**Modern Baking & Confectionary Technology Lab**	Student will be able to do practical related to this course such. Production of bread Petties, cookies, toffee, chocolate etc after successful completion of this course.
UF-BT-073	**Food Storage and Transport**	The course would help students in acquiring and applying basic knowledge of Food storage and transport technologies. Course will emphasize on the characteristics of fresh produce, important environmental factors affecting produce quality, optimum storage conditions and harvesting.

UF-BT-072	**Food Laws. Standards & Regulations**	Students would be able to understand the concept of food safety, types of hazards and their control measures. They would be able to identify and prevent potential sources of food contamination Understand the need of hygiene and sanitation for ensuring food safety, knowledge of Food Safety Management tools and understand National and International Food Safety Laws and Regulations.
UF-BT-071	**Fermentation Technology**	Students will be able to understand the basic concepts of fermentation technology. Students will learn about introduction of fermentation, Introduction of microbial process, alchoholic fermentation microbial food products, production of fermented food like citric acid, gluconic acid, production of amino acids organic acids and antibiotics from microorganisms by fermentation.
UF-BT-062	**Applied Recombinant DNA technology**	Students will be able to understand the basic concepts of recombinant DNA technology including transgenic animals, methods of production of transgenic animals and animal cloning. Students will be able to understand advanced technique in recombinant technology including FISH, RAPD, RFLP, gene silencing gene transfer technology and gene therapy, DNA chips mutagenesis and gene knockout techniques.
UF-BT-063	**Applied Recombinant DNA technology Lab**	Student will be able to do practical related to this course such as FISH, RAPD, RFLP, microprojectile etc after successful completion of this course.
UF-BT-301	**Dairy Engineering**	Students would be able to describe the engineering principles used in dairy processes responsible for evaporation, drying and refrigeration and other related processes. They would be able to evaluate the integration of engineering concepts required for the optimized processing of milk streams.
UF-BT-302	**Dairy Engineering Lab**	Student will be able to do practical related to this course such. Preparation of shrikhand, fruit yoghurt, khoya product, cheese product, whey based products etc after successful completion of this course.
UF-BT-004	**Research Methodology**	Students will be able to understand the basic concepts of research methodology including meaning and objectives of research, types of research, various research criterial, research problem, research design, measurement and scaling techniques in research, various scaling techniques in research, and methods of data collection in research and report writing of research.
UF-BT-005	**Food Business Management**	Students would be able to introduction, theories and functions of Business Management, food industry management; marketing management and human resource development, personal management.
UF-BT-007	**Food Project Planning and**	Students would be able to develop an insight of Entrepreneurs and Entrepreneurship development and understand the basics

	Entrepreneurship	of Business project report and SWOT analysis. Develop insight for different types of Fund raising. Understand the different support system for business development.
UF-BT-006	**Sensory Evaluation**	Students would be able to have an insight of 4 basic tastes and derived tastes in food, basic understanding of flavors, colors and texture in foods and concept of sensory panels and various instruments used in assessing the quality parameters of food..
UF-BT-303	**Modeling & simulation of Bioprocess**	Students will be able to understand about general approach of modeling, modeling fundamentals, chemical kinetics, and microbial growth kinetics. Students will also learn about heat transfer, energy balance conversion and selectivity of energy, numerical techniques in modeling, simulation tools and software's and modeling of batch, fed-batch and continuous culture reactors.
UF-BT-313	**Molecular Therapeutics**	Students will be able to understand the basic concepts of molecular therapeutics. Students will learn about gene therapy, gene delivery, gene transfer technology, gene delivery, stem cell therapy. Students will also learn about recombinant therapy and application of recombinant technology, gene silencing technology and ethical issues in cloning.
UF-BT-314	**Molecular Therapeutics Lab**	Student will be able to do practical related to this course such. Isolation of total RNA from various sources and gel electrophoresis, Design of primers and PCR etc After successful completion of this course.
UF-BT-079	**Traditional and fermented food**	On successful completion of this course the students will be able to learn the importance of fermentation in traditional as well as in Commercial Food Industries. They will learn to isolate strains of microorganisms to be used in the preparation of a pure culture, its use in fermentation techniques, and usage in the processing of food products.
UF-BT-080	**Traditional and fermented food Lab**	Student will be able to do practical related to this course such as Preparation and maintenance of various types of culture, Preparation of buttermilk, curd, and yoghurt after successful completion of this course.
UF-BT-315	**Spice Processing Technology**	Students would be able to define the role, classification, properties, quality, and specifications and processing of spices and herbs; importance, working and problem associated with processing of spices and herbs; Operate and maintain various processing machines used for value addition.
UF-BT-316	**Spice Processing Technology Lab**	Student will be able to do practical related to this course such as Moisture content in spices, Oil extraction, Physiochemical characteristics and sensory evaluation of spice oil etc after successful completion of this course.
UF-BT-082	**Dairy Plant Management**	Students would be able to define management, production planning and control. They would learn about energy conservation, auditing, financial and managerial efficiency and will be able to know about safety hazards, prevention and breakdown maintenance, and food hygiene.

UF-BT-084	**Immuno Technology**	Students will be able to understand the basic concepts of immunology including introduction of immunology and types of immunity, components and processes of innate and acquired immunity, cytokines, MHC molecules, antigen and antibody interaction.
UF-BT-085	**Immuno Technology Lab**	Student will be able to do practical related to this course such as Identification of blood group, Radial Immuno diffusion, Dot ELISA, double diffusion etc after successful completion of this course.
UF-BT-087	**Industrial Biotechnology**	Students will be able to understand the basic concepts of industrial processes including bacterial, fungal and yeast fermentation, downstream processing, production of primary and secondary metabolites from industrial bioprocess, various types of primary and secondary metabolites and their production process, production of industrial important bioproducts mushroom and single cell protein production**.**
UF-BT-088	**Industrial Biotechnology Lab**	Student will be able to do practical related to this course such as Detection and quantification of siderophores, Isolation of antibiotic producing microbes, alcohol determination Production of SCP etc after successful completion of this course.
UF-BT-086	**Pharma Biotechnology & Drug Designing(**	Students will be able to understand the general introduction of drugs, scope and importance of crude drugs, classification of drugs, cultivation and utilization of medicinal plants**.**
UF-BT-081	**Quality Control in Food Processing Industries**	Student would learn organization and management of food quality, quality control methods. identification of adulteration in food, preparation of series data probability testing, instrument methods and statistical methods of quality control.
UF-BT-083	**Food Plant Design**	Students would be able to gain detailed knowledge of design of food plant and food processing equipments principles of Process Design and Principles of spreadsheet aided process design.