

University of Science & Technology Meghalaya

Department of Applied Biology

BSc Food Science and Technology

POs , PSOs, COs

SCHOOL OF BIOLOGICAL SCIENCES



PROGRAM OUTCOMES (PO)

Under Graduate Professional Degree Programmes

B. Sc. Food Science & Technology programme incorporates the utilization of logical standards and techniques in assembling and protection of food items; additionally covering the regions of food preparing and packaging that provides students with a lot career opportunities. Principle target of this course is to train the students to have understanding about composition of the food, their healthful, physio-synthetic, microbiological properties, various systems identified with food prevention and handling and to ponder the significance of food quality, plant sanitation, sustenance laws and guidelines, food engineering and packaging in food industry. Students having degree on B. Sc. Food Science & Technology are in huge demand in the food processing or production industry that creates more employment in the food production industry so that better service can be given to the customers. There are endless career opportunities in the field of food production where a professional is highly required to ensure that the food which is getting produced and supplied provide highest quality to the customers. This course mostly focuses on making students able to understand the formation of food, the importance of the nutrition available in it, microbiological properties of food, various techniques which get used in food preservation and processing the food. All these area provide a huge employment opportunity in food industry.

PROGRAMME SPECIFIC OUTCOMES (PSO)

Programme Name: B.Sc. Food Science and Technology

Programme Code: BFST

PSO1. Understand the concepts of different areas of food science and technology.

PSO2. Understand the food composition and its physicochemical, nutritional, microbiological and sensory aspects.

PSO3. Comprehend the processing and preservation techniques of cereals, pulses, plantation crops, oilseeds, spices, fruits and vegetables, meat, fish, poultry, milk & milk products.

PSO4. Understand various concepts of food engineering, food packaging, food laws and regulations (national and international), food safety and quality assurance and food plant sanitation.

PSO5. Become a successful entrepreneur, professional and pursue higher education, apply skill based knowledge in food industry.

Details of Courses for B.Sc. Food Science and Technology

SEMESTER I

FST-101: INTRODUCTION TO FOOD SCIENCE AND TECHNOLOGY (CREDITS: 4)

CO1: To understand the history and evolution of food processing and to make aware about the career and present scenario of Food and nutrition.

CO2 : Students will get thorough knowledge of the structure and composition of cereals, pulses and oil-seeds.

CO3: To give complete description of meat and meat products and their processing

CO4: To learn about the technologies behind the processing of milk and their products.

CO5: To learn about traditional Indian foods and genetically modified and organic foods.

FST-102: FOOD CHEMISTRY (CREDITS: 4)

CO1: To provide thorough understanding of different properties of water and their effect in shelf life

CO2: To understand the chemical structure and the different reactions of various components of food

CO3: To provide comprehensive knowledge about the physical and functional properties of the proteins

CO4: To provide comprehensive knowledge about the physical and functional properties of different vitamins

CO5: To understand the basic characteristic and stability of colors, flavor, enzyme and other aromatic compounds

FST- 103: BIOCHEMISTRY AND NUTRITION (CREDITS: 4)

CO1: To understand the concept of food, nutrients, diet, balanced diet.

CO2: To classify foods into various food groups and understand the food pyramid.

CO3: To understand various different nutrients present in food, its types, sources and dietary requirements in the body.

CO4: To have a basic knowledge about the various important functions of the different nutrients required to maintain proper health

CO5: To understand digestion and absorption of various nutrients inside the human body.

FST-104: FOOD PROCESSING & PRESERVATION (CREDITS: 4)

CO1: To impart knowledge about post harvest handling of foods for food processing

CO2: To learn about various heat processing methods and their effects on the nutritional aspects of food

CO3: To provide complete knowledge of all the chemical additives used in foods and standards

CO4: To understand the fermentation process and its usage in preparation of different products

CO5: To learn about the sciences behind the fermented products

FST-106 : Practical –I (CREDITS: 4)

CO1: To acquaint students with the various laboratory instruments used in food processing analysis

CO2: To give comprehensive knowledge to students regarding practical laboratory works related to the preliminary analysis of the food materials.

CO3: To give detailed understanding of the analytical processes to be used in food processing and preservation laboratories

CO4: To increase the better documentation and communication abilities of students

CO5: To provide students better computing skills through practical exposures.

SEMESTER- II

FST-201: UNIT OPERATION IN FOOD PROCESSING (CREDITS: 4)

CO1: Students will have a thorough understanding of all the unit operations related to food system

CO2: This course provide thorough understanding of heat transfer, mass transfer as well as Energy transfer fundamentals

CO3: The course gives the idea about different fluid flow behavior in food

CO4: The students will get complete knowledge of different filtration methods used in food system

CO5: The course also includes all the non thermal preservation techniques

FST-202: TECHNOLOGY OF FRUITS AND VEGETABLES PROCESSING (CREDITS: 4)

CO1: Students will have thorough understanding of various methods to identify any disorder in fresh fruits and vegetables.

CO2: Students will get thorough idea of the techniques used to increase palatability of fruits and vegetables.

CO3: Students will get to know all the processing techniques to make value added products from fruits and vegetables.

CO4: Students will have thorough knowledge of different transportation, packaging and storing techniques of fresh as well as processed products.

CO5: Students will get to know the methods used for increasing shelf life.

FST-203: BASIC AND FOOD MICROBIOLOGY (CREDITS: 4)

CO1: To acquaint students the cellular structure and characteristics of different types of microorganisms.

CO2: To help students understand the growth pattern, and the control agents for different microorganisms.

CO3: To provide students a thorough understanding of various factors responsible for food spoilage.

CO4: To make students understand the specifications of various contamination sources and disease developed in certain processed products.

CO5: Students will also have an exposure to various equipments, reagents and techniques used for microbial analysis of food products.

FST-204: SENSORY EVALUATION OF FOODS (CREDITS: 4)

CO1: To acquaint with sensory quality parameters of food

CO2: To provide comprehensive knowledge about the methods of sensory evaluation of foods.

CO3: To study the impact of food processing on its sensory and nutritional quality.

CO4: To understand the different problems related to sensory.

CO5: To give thorough understanding of different tests used in sensory evaluation.

BEV 720 (FST 205): ENVIRONMENTAL STUDIES (CREDITS: 4)

CO1: To provide knowledge about the multidisciplinary nature of environmental science

CO2: To give comprehensive knowledge about various resources and their impact on human life.

CO3: To understand the concept of ecosystem, biodiversity and their conservation

CO4: To acquaint and understand environmental pollution, climate change, global warming and how rise in human population impacts environmental issues.

CO5: To access the nearby areas for potential threats to the environment.

FST -206: Practical –II (CREDITS: 4)

CO1: To give detailed practical knowledge about the various unit operations related to processing of food materials.

CO2: To teach students the practical techniques for processing of fruits and vegetables.

CO3: To prepare and understand the science behind production of fruits and vegetable based products

CO4: To provide students a knowledge about the various spoilage organisms, their growth, culture media , enumeration and isolation techniques used for microbiological analysis of food products.

CO5: To teach students the analytical techniques of food materials for sensory evaluations.

SEMESTER- III

FST-301: INSTRUMENTAL TECHNIQUES IN FOOD ANALYSIS (CREDITS: 4)

CO1: To give thorough understanding basic chemical properties of solutions.

CO2: Students will have a thorough understanding on the working principle and instrumentation of various instruments used in food analysis.

CO3 : The course will provide of fundamentals of chemical solutions.

CO4: Students will become expertise in all the sophisticated instrumentation

CO5: The students will know the importance of various methods to identify any malfunction aspect of food and different microbial assays.

FST-302: CEREAL, PULSES AND OILSEED TECHNOLOGY (CREDITS: 4)

CO1: To acquaint with production and consumption trends of different types of cereals, pulses and oilseeds.

CO2: To provide students knowledge about the structure, and composition of different cereals, pulses and oilseeds.

CO3: To teach quality evaluation, and processing technologies of various cereals, pulses and oilseeds.

CO4: To provide insight of Product development and value addition of various cereals, pulses and oilseeds.

CO5: To provide the students the science behind the spoilages in food.

FST-303: DAIRY TECHNOLOGY (CREDITS: 4)

CO1: To know the need and importance of dairy industries

CO2: To know the compositional and technological aspects of milk

CO3: To learn about the unit operation used in milk processing

CO4: Students will have a thorough understanding of processing and preservation of milk

CO5: (0.25) To impart the importance of various milk based products, its standard specification and various defects found in them.

FST-304: FOOD FERMENTATION TECHNOLOGY (CREDITS: 4)

CO1: To provide students understanding of the origin of fermentation processes, its history and media formulation

CO2: To give a comprehensive knowledge of the concepts of fermentation processes

CO3: To understand the various factors that impact fermentation processes

CO4: To understand the technology and processing involved in purification and extraction of various industrially important fermented products

CO5: To acquaint students with the various microorganisms involved in different types of value added fermented food products

FST-305: FOOD PROCESS ENGINEERING (CREDIT: 4)

CO1: To provide basics of Food Engineering.

CO2: To impart knowledge of engineering approach in material handling

CO3: To teach different Engineering units and their dimensions

CO4: To understand all the engineering properties of packaging materials

CO5: To impart basic knowledge of Milling, its equipment and different methods used

FST 306: Practical –III (CREDITS: 4)

CO1: To give them comprehensive demonstration of Sophisticated instrument and estimation of different parameters using them

CO2: To provide them thorough understanding of milling of cereal grains, their grading and all tests for quality assessment related to them

CO3: To impart knowledge of all the platform tests of milk along with physico- chemical and microbiological analysis

CO4: To study the development of different fermented drinks and fermented products.

CO5: To study different instrument related to heat transfer, pasteurization and selection of pumps.

SEMESTER- IV

FST-401: TECHNOLOGY OF BEVERAGE, PLANTATION CROPS AND SPICES (CREDITS: 4)

CO1: To impart the importance of various fermentation methods used for beverage preparation for respective flavor development

CO2: To understand different types of beverage and their processing

CO3: To provide complete knowledge of different plantation crops with their processing and preservation techniques

CO4: To teach the extraction method of different spices with their usage

CO5: To learn about processing techniques used in tea, coffee and cocoa production.

FST-402: BAKERY, CONFECTIONERY AND EXTRUDED FOODS (CREDITS: 4)

CO1: The course provides sciences behind bakery product.

CO2: The course will provide basic functions of all the ingredients used in different products

CO3: To know about technologies used in Chewing gum and chocolates.

CO4: To provide thorough knowledge of all the instruments used in bakery and confectionary

CO5: Students will get complete knowledge of functions of extruders along with the different extruded products

FST- 403:FOOD PACKAGING TECHNOLOGY (CREDITS: 4)

CO1: To provide comprehensive overview of the scientific and technical aspects of food packaging.

CO2: To instill knowledge on packaging machinery, systems, testing and regulations of packaging.

CO3: To impart the effect of various environmental factors on the stability of food.

CO4: To develop comprehensive understanding of different packaging tests.

CO5 : To know the importance of selective packaging related to food products.

FST-404: FOOD PRODUCT DEVELOPMENT (CREDITS: 4)

CO1: To introduce students to the food product development process, design, development and commercialization

CO2: To understand the role of consumers in the development of a new food product.

CO3: To give a comprehensive knowledge about the entire process of product development, the factors affecting the success, failure and marketability of a food product.

CO4: To know the ethics of food production and consumption

CO5: To understand the cases of various new products launched in the market and understand the reactions of customers to them through case study

FST-405: STATISTICS AND DATA ANALYSIS (CREDITS : 4)

CO1. The students will be exposed to various research methods and statistical tools required.

CO2. to analyze the experimental data in food research and industry.

CO3. The focus will be on providing knowledge related to research process, data collection and data analysis etc.

FST-406: PRACTICAL –IV (CREDITS: 4)

CO1: To understand water treatment analysis.

CO2: To prepare different carbonated beverages along with their analysis.

CO3: To study all the bakery equipments and preparation of different baked products.

CO4: To analyze different packaging parameters and determination of shelf life and film thickness.

CO5: To impart thorough knowledge of all the steps required for the development of a new product.

SEMESTER- V

FST- 501: MEAT, POULTRY & FISH TECHNOLOGY (CREDITS: 4)

- CO1:** To impart the complete understanding of compositional and technological aspects of meat, poultry and fish.
- CO2:** To provide their sources and importance in national economy.
- CO3:** To study the chemical and microscopic structure of meat
- CO4:** To provide different processing techniques used in meat, poultry and fish based products.
- CO5 :** To give students a basic knowledge about methods of slaughtering & meat Processing.

FST-502: FOOD QUALITY, STANDARDS AND REGULATIONS (CREDITS: 4)

- CO1:** To learn about the objectives and need of quality in food products
- CO2:** To acquaint with food quality parameters, adulteration and control systems, in a food industry
- CO3:** To give students a basic knowledge about food labeling and its parameters
- CO4:** To provide students a deep understanding about the various food standards, laws and regulations,
- CO5:** Students will have a thorough understanding of concept of hygiene considerations and sanitation in during food processing.

FST-503: BUSINESS MANAGEMENT AND ENTREPRENEURSHIP (CREDITS: 4)

- CO1:** Understand the meaning and concept of entrepreneurship development.
- CO2:** Sensitized and oriented towards identifying entrepreneurial opportunities and market potential.
- CO3:** Gain knowledge setting up of an enterprise and its management.
- CO4:** To provide thorough knowledge of accounting and finance.

Elective course: FST 504: NUTRACEUTICALS AND FUNCTIONAL FOODS (CREDITS: 4)

- CO1:** To develop comprehensive understanding of different nutraceutical and functional foods.
- CO2:** To provide knowledge about different types of nutraceutical compounds and their food sources.

CO3: To understand the potential of various functional foods in promoting human health.

CO4: To learn about fabrication and formulation of different functional foods.

CO5: To understand the legal aspects about the stability, safety, consumer acceptance, marketing and regulatory issues of nutraceutical and other functional foods

Elective Course: FST- 505: TEA PLANTATION TECHNOLOGY (CREDITS: 4)

CO1: To provide the knowledge about historical background of cultivation of tea.

CO2: To impart complete understanding of manufacturing of different types of tea.

CO3: To learn the potential of tea in promoting human health.

CO4: To understand quality analysis of different varieties of tea.

CO5: To study different tea based products.

Elective Course: FST- 506: FOOD BIOTECHNOLOGY AND TOXICOLOGY (CREDITS: 4)

CO1: To provide students the fundamentals and application of biotechnology in relation to food processing, food fermentations,

CO2: To acquaint with application of micro-organisms for the production of Industrial products with particular reference to foods and food ingredients.

CO3: To gain an understanding of microbial, chemical and natural toxicants and allergens those are indigenously present and developed during food processing.

CO4: To learn about toxicity of water

CO5: To provide understanding about the systems for food safety surveillance with an aim of producing safe food, assess risk and develop detoxification strategies for the same

FST-507: PRACTICAL –V (CREDITS: 4)

CO1: To give students practical knowledge about the various processing technologies of meat, poultry and fish products.

CO2: To impart knowledge regarding safety and quality standards that need to be maintained in a food processing industry

CO3: To teach students about the steps and the procedure of auditing and the important documents to be maintained during the process

CO4: To give a comprehensive knowledge about the practicality of setting up a new business and entrepreneurship development.

CO5: Visit to different industries of meat, fish and poultry.

SEMESTER- VI

FST-601: INDUSTRIAL TRAINING & REPORT WRITING (CREDITS: 12)

- CO1:** To expose the students to actual working environment and enhance their knowledge and skill from what they have learned in the college
- CO2:** To instill the good qualities of integrity, responsibility and self confidence
- CO3:** To enhance students' familiarity with the world of work and enable them to reflect constructively in issues related to work
- CO4:** To develop employability skills, intellectual skills, core of key skills, personal attributes and
- CO5:** To develop knowledge about how organizations work.

FST-602: SEMINAR (CREDIT: 1)

- CO1:** To provide platforms for practicing professional communication techniques and skills
- CO2:** To offer chances to debate issues related to the respective topics, share experiences and exchange perspectives
- CO3:** To provide chance for in depth study on a particular topic
- CO4:** To increase their presentation skills as well as confidence

FST-603: PROJECT / DISSERTATION (CREDITS: 6)

- CO1:** The main objective of Project and viva voice is to inculcate Research interest among students
- CO2:** To mentor students to design and conduct original and ethical research.
- CO3:** To carry out projects which help to improve lifestyle of local people

Elective Course: FST-604: AROMATIC AND MEDICINAL PLANT (CREDITS: 4)

- CO1:** To provide complete understanding of flavors, their composition and method of extraction
- CO2:** To impart knowledge of biogenesis of flavor in food

- CO3:** To identify different sources of off flavors and their corrective methods
CO4: To teach the scope and importance of crude drugs and their processing
CO5: To get full description of the analysis phytochemicals and their applications

Elective Course: FST-605: FOOD HYGIENE AND SANITATION (CREDITS: 4)

- CO1:** To study design of plant and processing equipment.
CO2: To develop comprehensive understanding of waste product handling and management.
CO3: To understand cold chain management
CO4: To learn about the designing of warehouse storage
CO5: To provide technologies used in ETP Plant manufacturing

FST-606: PRACTICAL –VI (CREDIT:1)

- CO1:** To teach techniques of sensory analysis of various aromatic compounds and flavours.
CO2: To provide knowledge regarding unsuitable flavours in different foods.
CO3: To provide practical knowledge regarding designing of a food processing plant, warehouse or cold storage.
CO4: To impart knowledge regarding the analysis of effluents, sanitizers, disinfectants.
CO5: To understand and study the effluent treatment and sanitization facility required in a food processing industry

HVP 760: FUNDAMENTALS OF HUMAN VALUES AND PROFESSIONAL ETHICS
[Non-Credit Compulsory Course]

- CO1.** To introduce the students about the importance of human values and professional ethics.
CO2. To understand the ethical concerns in professional and personal space.

