# Bachelor of Science in Food Technology

## Program Description

Bachelor of Science in Food Technology is a discipline based on the application of science and related fields of study in the conversion of raw materials into safe, stable, palatable, and nutritious foods. It includes the post-harvest handling, preparation, processing, packaging, storage, and distribution of food to ensure food and nutrition security, safety, and the well-being of individuals, families, and communities. It also includes the social, cultural, economic, managerial and entrepreneurial, and environmental aspects of food systems as well as the art of food preparation.

## Program Educational Objectives

Within three to five years after obtaining a bachelor's degree in Food Technology at University of St. La Salle, a graduate is expected to:

1. Have a successful career in the sectors of food manufacturing and engineering, quality control/assurance, product development and innovation, food analysis, food microbiology, marketing, distribution, sales, academe, research and extension, regulatory affairs, and business.
2. Apply his/her technical knowledge in food technology in addressing contemporary food-related concerns and devise strategies in alleviating food insecurity through research, product innovation, and trainings.
3. Provide technical livelihoods to the Filipino community especially those who are classified under the poverty line through proactive demonstrations, seminars, and trainings.
4. Engage in professional and community-based organizations to increase social awareness regarding the significance of food technology as well as develop resolutions to emerging food-related problems.
5. Manifest ability to communicate effectively both in written, oral or visual forms through writing research report and presentation.

## Program Outcomes

By the time of graduation, the students of the program shall have the ability to:

a. discuss the latest developments in the field of food technology;
b. work effectively and collaboratively in multi-disciplinary and multi-cultural teams in the attainment of set goals;
c. act in recognition of professional, social, and ethical responsibilities, develop inter-personal, managerial and communication skills, and cultivate professional ethics and values needed to collaborate with other fields of study for the growth of oneself and that of the organization as a whole;
d. preserve and promote "Filipino historical and cultural heritage" by using locally available raw materials;
e. demonstrate communication skills (i.e. oral and written) that lead to success in a food technology career including preparation of proposals, position papers, technical reports, communicating technical information to a nontechnical audience, making formal and informal presentations;
f. explain the functionality of different food ingredients and chemical changes

occurring during post-harvest handling, preparation, processing, packaging and storage, including reactions involving carbohydrates, proteins, and fats;

j. understand the international and local regulations required for the manufacture, distribution, and sale of food products, either fresh or processed;
k. understand and apply the role of microorganisms in post-harvest handling, preparation, processing and preservation, packaging, and storage with respect to pathogenic, spoilage, and fermentative microorganisms;
l. understand and apply the principles of engineering as they relate to converting agricultural commodities to the finished products;
m. understand and apply the principles and various facets of food technology, including sensory evaluation, in practical situations, problem solving, and environmental sustainability;
n. understand and apply the basic elements of sanitation and quality assurance programs to assure food safety;
o. evaluate the microbiological, physical, chemical, sensory, and functional properties of food; and
p. create new product ideas, concepts, and procedures leading to innovative food technologies.

## Admission Requirements

1. Students seeking admission to the program must have a weighted average of at least 80% in the report card.
2. Students admitted on probation must comply with the terms and conditions set by the University.

## Retention Policies

A student will be permanently dismissed from the program due to any of the following reasons:

1. If he/she incurs a total of 30 units of failures.
2. If a student incurs 18 units of failure in one semester.

UNIVERSITY OF ST. LA SALLE

# BACHELOR OF SCIENCE
# Food Technology
# AY 2020-2021

**FIRST YEAR**

| First Semester | | Total Credit Units | No. of hrs Lec | Lab | Total Assessed Units | Pre-requisite | Co-requisite |
|---|---|---|---|---|---|---|---|
| FTECH101 | Introduction to Food Technology | 1 | 1 | 0 | 1 | NONE | NONE |
| USELF | Understanding the Self | 3 | 3 | 0 | 3 | NONE | NONE |
| RHIST | Readings in Philippine History | 3 | 3 | 0 | 3 | NONE | NONE |
| CWRLD | The Contemporary World | 3 | 3 | 0 | 3 | NONE | NONE |
| MATHMW | Mathematics in the Modern World | 3 | 3 | 0 | 3 | NONE | NONE |
| FCHM101 | Quantitative Chemistry (Lecture) | 2 | 2 | 0 | 2 | NONE | NONE |
| FCHM101L | Quantitative Chemistry (Laboratory) | 1 | 0 | 3 | 3 | NONE | NONE |
| IRS1 | LaSallian Spirituality | 3 | 3 | 0 | 3 | NONE | NONE |
| PED1 | Physical Education 1 (Wellness & fitness) | 2 | 2 | 0 | 2 | NONE | NONE |
| NSTP1 | NSTP 1 | 3 | 3 | 0 | 3 | NONE | NONE |
| | **Total** | **24** | **23** | **3** | **26** | **NONE** | **NONE** |

| Second Semester | | Total Credit Units | No. of hrs Lec | Lab | Total Assessed Units | Pre-requisite | Co-requisite |
|---|---|---|---|---|---|---|---|
| FMTH105 | Calculus | 5 | 5 | 0 | 5 | NONE | NONE |
| APPHY | Applied Physics | 3 | 3 | 0 | 3 | NONE | NONE |
| PCOM | Purposive Communication | 3 | 3 | 0 | 3 | NONE | NONE |
| FCHM102 | Qualitative Chemistry (Lecture) | 2 | 2 | 0 | 2 | FCHM101 | NONE |
| FCHM102L | Qualitative Chemistry (Laboratory) | 1 | 0 | 3 | 3 | NONE | NONE |
| IRS2 | Christian Morality | 3 | 3 | 0 | 3 | IRS1 | NONE |
| NSTP2 | NSTP 2 | 3 | 3 | 0 | 3 | NSTP1 | NONE |
| PED2 | Physical Education 2 (Team Sports and Rhythmic Activities) | 2 | 2 | 0 | 2 | NONE | NONE |
| | **Total** | **22** | **21** | **3** | **24** | | **NONE** |

**SECOND YEAR**

| First Semester | | Total Credit Units | No. of hrs Lec | Lab | Total Assessed Units | Pre-requisite | Co-requisite |
|---|---|---|---|---|---|---|---|
| ARTAP | Art Appreciation | 3 | 3 | 0 | 3 | NONE | NONE |
| FCHM103 | Organic Chemistry (Lecture) | 2 | 2 | 0 | 2 | NONE | FCHM104 |
| FCHM103L | Organic Chemistry (Laboratory) | 1 | 0 | 3 | 3 | NONE | NONE |
| FTECH102 | General Microbiology (Lecture) | 3 | 3 | 0 | 3 | NONE | NONE |
| FTECH102L | General Microbiology (Laboratory) | 2 | 0 | 6 | 6 | NONE | NONE |
| FCHM104 | General Biochemistry (Lecture) | 2 | 2 | 0 | 2 | NONE | FCHM103 |
| FCHM104L | General Biochemistry (Laboratory) | 1 | 0 | 3 | 3 | NONE | NONE |
| PSPEAK | Public Speaking | 3 | 3 | 0 | 3 | NONE | NONE |
| PED3 | Physical Education 3 (Swimming & Recreation) | 2 | 2 | 0 | 2 | NONE | NONE |
| IRS3 | Spirituality in the Workplace | 3 | 3 | 0 | 3 | NONE | NONE |
| | **Total** | **22** | **18** | **12** | **30** | **NONE** | **NONE** |

| Second Semester | | Total Credit Units | No. of hrs Lec | Lab | Total Assessed Units | Pre-requisite | Co-requisite |
|---|---|---|---|---|---|---|---|
| LITE | Life in the IT Era | 3 | 3 | 0 | 3 | NONE | NONE |
| ETHICS | Ethics | 3 | 3 | 0 | 3 | NONE | NONE |
| APSTAT | Applied Statistics | 3 | 3 | 0 | 3 | NONE | NONE |
| FCHM105 | Food Chemistry I (Lecture) | 3 | 3 | 0 | 3 | FCHM104 | NONE |
| FCHM105L | Food Chemistry I (Laboratory) | 2 | 0 | 6 | 6 | NONE | NONE |
| FTECH103 | Food Processing I (Lecture) | 2 | 2 | 0 | 2 | NONE | NONE |
| FTECH103L | Food Processing I (Laboratory) | 1 | 0 | 3 | 3 | NONE | NONE |
| FTECH104 | Food Microbiology (Lecture) | 3 | 3 | 0 | 3 | FTECH102 | NONE |
| FTECH104L | Food Microbiology (Laboratory) | 2 | 0 | 6 | 6 | NONE | NONE |
| PED4 | Physical Education 4 (Individual and Dual Sports) | 2 | 2 | 0 | 2 | NONE | NONE |
| | **Total** | **24** | **19** | **15** | **34** | | |

**THIRD YEAR**

| First Semester | | Total Credit Units | No. of hrs Lec | Lab | Total Assessed Units | Pre-requisite | Co-requisite |
|---|---|---|---|---|---|---|---|
| GENSOC | Gender and Society | 3 | 3 | 0 | 3 | NONE | NONE |
| FTECH105 | Business Management & Entrepreneurship | 3 | 3 | 0 | 3 | FTECH103 | NONE |
| FCHM106 | Physical Chemistry (Lecture) | 2 | 2 | 0 | 2 | FCHM101, FMTH5 | FCHM102, NONE |
| FCHM106L | Physical Chemistry (Laboratory) | 1 | 0 | 3 | 3 | NONE | NONE |
| FCHM107 | Food Chemistry II (Lecture) | 3 | 3 | 0 | 3 | FCHM105 | NONE |
| FCHM107L | Food Chemistry II (Laboratory) | 2 | 0 | 6 | 6 | NONE | NONE |
| FTECH106 | Food Processing II (Lecture) | 2 | 2 | 0 | 2 | FTECH103 | NONE |
| FTECH106L | Food Processing II (Laboratory) | 1 | 0 | 3 | 3 | NONR | NONE |
| FTECH107 | Sensory Evaluation (Lecture) | 2 | 2 | 0 | 2 | APSTAT | NONE |
| FTECH107L | Sensory Evaluation (Laboratory) | 1 | 0 | 3 | 3 | NONE | NONE |
| FTECH108 | Basic Nutrition | 3 | 3 | 0 | 3 | FCHM104 | NONE |
| | **Total** | **23** | **18** | **15** | **33** | | |

| Second Semester | | Total Credit Units | No. of hrs Lec | Lab | Total Assessed Units | Pre-requisite | Co-requisite |
|---|---|---|---|---|---|---|---|
| FTECH109 | Food Engineering (Lecture) | 3 | 3 | 0 | 3 | FMTH5, APPHY | NONE |
| FTECH109L | Food Engineering (Laboratory) | 2 | 0 | 6 | 6 | NONE | NONE |
| FTECH110 | Food Processing III (Lecture) | 2 | 2 | 0 | 2 | FTECH103, FTECH106 | NONE |
| FTECH110L | Food Processing III (Laboratory) | 1 | 0 | 3 | 3 | NONE | NONE |
| FTECH111 | Food Safety | 3 | 3 | 0 | 3 | FTECH103, FTECH105, FTECH106 | NONE |
| FTECH112 | Food Analysis (Lecture) | 3 | 3 | 0 | 3 | FCHM107 | NONE |
| FTECH112L | Food Analysis (Laboratory) | 2 | 0 | 6 | 6 | NONE | NONE |
| FTECH113 | Food Packaging and Labelling (Lecture) | 2 | 2 | 0 | 2 | FTECH103, FTECH106 | NONE |
| FTECH113L | Food Packaging and Labelling (Laboratory) | 1 | 0 | 3 | 3 | NONE | NONE |
| STS | Science, Technology, and Society | 3 | 3 | 0 | 3 | NONE | NONE |
| | **Total** | **22** | **16** | **18** | **34** | | |

| Summer | | Total Credit Units | No. of hrs Lec | Lab | Total Assessed Units | Pre-requisite | Co-requisite |
|---|---|---|---|---|---|---|---|
| FTPRAC1 | On-the-Job Training | 6 | 0 | 300 | 6 | 3rd Yr Standing | |
| | **Total** | **6** | **0** | **300** | **6** | | |

**FOURTH YEAR**

| First Semester | | Total Credit Units | No. of hrs Lec | Lab | Total Assessed Units | Pre-requisite | Co-requisite |
|---|---|---|---|---|---|---|---|
| FTECH114 | Food Laws | 3 | 3 | 0 | 3 | FTECH103, FTECH106 | NONE |
| FTECH115 | Food Quality Assurance (Lecture) | 2 | 2 | 0 | 2 | FTECH103, FTECH106, FTECH111, APSTAT | NONE |
| FTECH115L | Food Quality Assurance (Laboratory) | 1 | 0 | 3 | 3 | N0NE | NONE |
| FELECT1 | Elective I | 3 | 3 | 0 | 3 | 4th Yr Standing | NONE |
| FTECH116 | Post-harvest Handling and Technology (Lecture) | 2 | 2 | 0 | 2 | FTECH104, FCHM107 | NONE |
| FTECH116L | Post-harvest Handling and Technology (Laboratory) | 1 | 0 | 3 | 3 | NONE | NONE |
| FTECH117 | Food Product Development and Innovation (Lecture) | 2 | 2 | 0 | 2 | FTECH103, FTECH106, FTECH107, FTECH110, FTECH112, FTECH113 | NONE |
| FTECH117L | Food Product Development and Innovation (Laboratory) | 1 | 0 | 3 | 3 | NONE | NONE |
| FTECH118 | Methods of Research in Food Science and Technology | 3 | 3 | 0 | 3 | APSTAT, FTECH117 | NONE |
| | **Total** | **18** | **15** | **9** | **24** | | |

| Second Semester | | Total Credit Units | No. of hrs Lec | Lab | Total Assessed Units | Pre-requisite | Co-requisite |
|---|---|---|---|---|---|---|---|
| FELECT2 | Elective II | 3 | 3 | 0 | 3 | 4th Yr Standing | NONE |
| RIZAL | Life and Works of Rizal | 3 | 3 | 0 | 3 | NONE | NONE |
| FTECH119 | Undergraduate Seminar | 1 | 1 | 0 | 1 | 4th Yr Standing | NONE |
| FTECH120 | Thesis | 3 | 0 | 9 | 9 | FTECH118 | NONE |
| FTECH121 | Environmental Sustainability in the Food Industry | 3 | 3 | 0 | 3 | FTECH103, FTECH106, FTECH111, FTECH112 | NONE |
| GBOOKS | GE Elective 3: Great Books | 3 | 3 | 0 | 3 | NONE | NONE |
| | **Total** | **16** | **13** | **9** | **22** | | |

UNIVERSITY OF ST. LA SALLE

## SUMMARY OF REQUIRED COURSES
## Food Technology

| | | No. of Courses Required | Unit Equivalent | Total Units |
|---|---|---|---|---|
| Technical Courses | | | | |
| Chemistry | | | | |
| | Quantitative Chemistry | 2 | 3 | |
| | Qualitative Chemistry | 2 | 3 | |
| | Organic Chemistry | 2 | 3 | |
| | General Biochemistry | 2 | 3 | |
| | Physical Chemistry | 2 | 3 | 15 |
| Mathematics | | | | |
| | Calculus (Integral and Differential) | 1 | 5 | |
| | Applied Statistics | 1 | 3 | 8 |
| | Applied Physics | 1 | 3 | 3 |
| Professional | | | | |
| | Introduction to Food Science and Technology | 1 | 1 | |
| | Food Processing I, II, III | 6 | 9 | |
| | Food Chemistry I, II | 4 | 10 | |
| | Food Analysis | 2 | 5 | |
| | General Microbiology | 2 | 5 | |
| | Food Microbiology | 2 | 5 | |
| | Food Packaging and Labelling | 2 | 3 | |
| | Food Laws | 1 | 3 | |
| | Food Engineering | 2 | 5 | |
| | Food Quality Assurance | 2 | 3 | |
| | Food Safety | 1 | 3 | |
| | Sensory Evaluation | 2 | 3 | |
| | Food Product Development and Innovation | 2 | 3 | |
| | Undergraduate Seminar | 1 | 1 | |
| | Basic Nutrition | 1 | 3 | |
| | Environmental Sustainability in the Food Industry | 1 | 3 | |
| | Business Management and Entrepreneurship | 1 | 3 | |
| | Methods of Research in Food Science and Technology | 1 | 3 | |
| | Post-harvest Handling Technology | 2 | 3 | |
| | Thesis | 1 | 3 | |
| | On-the-job Training | 1 | 6 | 83 |
| Electives | Elective I, II | 2 | 6 | 6 |
| | Biotechnology | | 3 | |
| | Business Economics and Accounting | | 3 | |
| | Culinary Science and Technology | | 3 | |
| | Cereal Science and Technology | | 3 | |
| | Meat Science and Technology | | 3 | |
| | Dairy Science and Technology | | 3 | |
| | Fish Science and Technology | | 3 | |
| | Marketing | | 3 | |
| **Non-Technical Courses** | | | | |
| General Education | | | | |
| | Understanding the Self | 1 | 3 | |
| | Readings in Philippine History | 1 | 3 | |
| | The Contemporary World | 1 | 3 | |
| | Mathematics in the Modern World | 1 | 3 | |
| | Purposive Communication | 1 | 3 | |
| | Art Appreciation | 1 | 3 | |
| | Science, Technology, and Society | 1 | 3 | |
| | Ethics | 1 | 3 | 24 |

| | | | |
|---|---|---|---|
| General Education Electives/Mandated | | | |
| Filipino 1-3 | 3 | 9 | |
| Great Books | 1 | 3 | |
| Life and Works of Rizal | 1 | 3 | 15 |
| Physical Education | | | |
| Physical Education 1-4 | 4 | 8 | 8 |
| National Service Training Program | | | |
| NSTP 1-2 | 2 | 6 | 6 |
| Institutional | | | |
| Religious Studies 1-3 | 3 | 9 | 9 |
| **Total** | **75** | | **177** |

UNIVERSITY OF ST. LA SALLE

# MAJOR COURSE DESCRIPTION
## Bachelor of Science in Food Technology
## (BSFT)

**FCHM101** **3 units**
**QUANTITATIVE CHEMISTRY**
This course studies the theory and practice of gravimetric and volumetric methods of analysis, including an introduction to instrumental methods of analysis.

At the end of this course, through assigned problems, the student must be able to perform calculation techniques used in neutralization, precipitation, complex titration, and redox titration methods.
Pre-requisite:None

**FCHM102** **3 units**
**QUALITATIVE CHEMISTRY**
This course covers the identification of chemical species and their properties in a sample.

At the end of this course, the student must be able to discuss the practical applications of the products of assigned reactions and their impact on the environment.
Pre-requisite: FCHM101- Quantitative Chemistry

**FCHM103** **3 units**
**ORGANIC CHEMISTRY**
This course deals with the study of the chemistry of carbon compounds and their properties, structures, and reactions. It emphasizes the study of the principal classes of aliphatic and aromatic compounds, which in conjunction with selected experiments, gives an understanding of the mechanisms of organic reactions.

At the end of this course, the student must be able to predict the product(s) of an assigned reaction involving an organic compound and discuss the practical applications of such products and their impact on the environment.
Co-requisite: FCHM104- General Biochemistry

**FCHM104** **3 units**
**GENERAL BIOCHEMISTRY**
This course covers the fundamental aspects of biochemistry and the structure and dynamics of major cellular components. It also focuses on the structure, function, and metabolism of carbohydrates, lipids, proteins, nucleic acids, enzymes, vitamins, and hormones.

At the end of this course, the student must be able to explain the significance of the chemical reactions that occur in the bodies of living organisms.
Co-requisite: FCHM103- Organic Chemistry

**FCHM105** **5 units**
**FOOD CHEMISTRY**
This course deals with the chemistry of major food components, their structure, properties, and changes during post-harvest handling, preparation, processing, storage, and utilization of food.

At the end of this course, the student must be able to demonstrate logical, analytical, and critical thinking in real-world situations (case analysis) related to changes in food macro-component chemistry, critique journal articles on food macro-components and assess their impact on various sectors. Demonstrate the ability for quick and analytical thinking, and effectively communicate and interpret results of experiments performed through oral presentation.
Pre-requisite: FCHM104- General Biochemistry

**FCHM106** **3 units**
**PHYSICAL CHEMISTRY**
This course deals with the study of the physical properties and structure of matter, laws of chemical reactions, and the theories governing these.

At the end of this course, the student must be able to analyze, and predict the physical and chemical behaviors of matter and systems and apply the principles in solving numerical and situational problems and issues.
Pre-requisites: FCHM101- Quantitative Chemistry, FCHM102- Qualitative Chemistry, FMTH5- Calculus

**FCHM107** **5 units**
**FOOD CHEMISTRY II**
This course deals with the chemistry of minor food components, their structure, properties, and changes during post-harvest handling, preparation, processing, storage, and utilization of food.

At the end of this course, the student must be able to explain the chemistry of changes in food micro- components and their effects on physico-chemical, sensory, storage, nutritional properties, and safety of food.
Pre-requisite: FCHM105- Food Chemistry I

**FMTH105** **3 units**
**CALCULUS (INTEGRAL AND DIFFERENTIAL)**
This course covers function, derivatives, differentiation of algebraic and trigonometric functions, maxima and minima, differentiation of exponential and logarithmic equation, hyperbolic functions, curvature, partial differentiation, polar coordinates, and various applications. It likewise deals with integration of powers, definite integrals, basic applications, integration formulae and procedures, plane curves, surfaces of revolutions, column of solids, hyperbolic functions, multiple integral, approximation integration, and infinite series.

At the end of this course, the student must be able to apply the techniques of integration in solving special problems related to food technology, and present solutions effectively using accepted technical terms, symbols, and representations.
Pre-requisite: None

**APSTAT** **3 units**
**APPLIED STATISTICS**
This course covers statistical concepts, distributions of empirical data, calculations of descriptive statistics, and review of commonly occurring distributions needed for understanding basic ideas of statistical inference. It also introduces central limit theories, estimation, and hypothesis testing.

At the end of this course, the student must be able to apply statistical knowledge and techniques to a mini research as an application of the different statistical concepts on this course.
Pre-requisite: None

**APPHY** **3 units**
**APPLIED PHYSICS**
This course deals with the basic principles of motion, impulse, momentum waves, properties of fluids, electricity, magnetism, light and optics, atomic and nuclear physics and their application to biological processes.

At the end of this course, the student must be able to predict outcomes of some actions or events and explain effectively why certain phenomena occur or how certain local and industrial issues are better addressed without compromising the environment and the welfare of the community (case analysis)
Pre-requisite: None

**FTECH101** **1 unit**
**INTRODUCTION TO FOOD TECHNOLOGY**
This course is an overview of food science and technology, career opportunities of food technologists, and their responsibilities to society.

At the end of this course, the student must be able to suggest or give solutions on cases / challenges/issues and concerns in Food Science and Technology.
Pre-requisite: None

**FTECH102** **5 units**
**GENERAL MICROBIOLOGY**
This course deals with the fundamental principles in microbiology, classification, characterization, properties, and identification of microorganisms, and cultural and staining techniques.

At the end of this course, the student must be able to submit a learning portfolio of their learning experiences in the course in the form of quizzes, researches and written reports in the conduct of experiments.
Pre-requisite: None

**FTECH103** **3 units**
**FOOD PROCESSING I**
This course involves principles of food preservation, sterilization of food by heat treatment, and packaging of heat sterilized food, other non-thermal methods of processing such as irradiation, and use of additives.

At the end of this course, the student must be able to assess the adequacy of the heat process applied through process calculations, microbiological, physico-chemical, sensory, and nutritional analyses to a given finished product, as well as discuss the importance and assess the use of a particular food additive on it (case analysis).
Pre-requisite: None

**FTECH104** **5 units**
**FOOD MICROBIOLOGY**
This course involves understanding various groups of microorganisms and identifying their favorable or detrimental effects, determining the advantages and disadvantages of food preservation technologies and their implications to microbial food safety, and assessing safety of food products and practices of food handlers.

At the end of this course, the student must be able to propose a food microbiology technique/process in a quality assurance program for a given finished product and recommend what microbes in food processing will be used to carry out a particular function (case analysis).
Pre-requisite: FTECH102- General Microbiology

**FTECH106** **3 units**
**FOOD PROCESSING II**
This course deals with the principles of food preservation specifically drying and dehydration, fermentation, refrigeration and freezing, sterilization of food by heat treatment, packaging of heat sterilized food, other non-thermal methods of processing such as irradiation, and use of additives in seafood.

At the end of this course, the student must be able to evaluate suitability of packaging materials for a seafood product, analyze operations involved in the manufacture of such packaging material, and review legal, environmental, and quality aspects associated with the packaging material and operations used in manufacturing it.
Pre-requisite: FTECH103- Food Processing I

**FTECH107** **3 units**
**SENSORY EVALUATION**
This course deals with the principles and techniques in sensory evaluation, statistical analysis, and interpretation of sensory evaluation data and their relations to physico-chemical tests.

At the end of this course, the student must be able to apply and compare descriptive tests to identify and characterize sensory properties of assigned foods, apply and compare types of affective tests, and apply statistical methods in sensory data analysis and evaluation of results.
Pre-requisite: APSTAT- Applied Statistics

**FTECH108** **3 units**
**BASIC NUTRITION**
This course deals with the fundamentals of nutrition science as they relate to human life and growth. It includes the study of nutrients, their nature, functions, interrelationships, and utilization in the body, food sources, requirements, and deficiencies.

At the end of this course, the student must be able to prepare a meal plan for a particular case.
Pre-requisite: FCHM104- General Biochemistry

**FTECH109 5 units**
**FOOD ENGINEERING**
This course deals with engineering concepts and principles as applied to food processing.

At the end of this course, the students must be able to critique a particular innovation in food engineering and technology related to safety, quality assurance, and health.
Pre-requisites: FMTH5- Calculus, APPHY- Applied Physics

**FTECH110 3 units**
**FOOD PROCESSING III**
This course deals with fruit and vegetable processing, general properties of fruit and vegetables, deterioration of factors and control, methods of reducing deterioration in fruits and vegetables, general procedures for fruit and vegetable preservation, and developments in packaging of fresh and processed fruits and vegetables.

At the end of this course, the student must be able to examine a particular packaging material for fruits and vegetables and evaluate its suitability. And review legal, environmental, and quality aspects associated with such packaging material.
Pre-requisites: FTECH103- Food Processing I, FTECH106- Food Processing II

**FTECH111 3 units**
**FOOD SAFETY**
This course deals with the safety of foods and ingredients, best practices, risk analysis, traceability, regulatory developments, and scientific and technical advancements.

At the end of this course, the student must be able to design a food premise.
Pre-requisites: FTECH103- Food Processing I, FTECH105- Food Microbiology, FTECH106- Food Processing II

**FTECH112 5 units**
**FOOD ANALYSIS**
This course deals with the principles, methods, and techniques necessary for quantitative physical and chemical analyses of food and food products.

At the end of this course, the student must be able to perform calculations required in determining food composition and perform appropriate statistical methods for data analysis, and correctly interpret the results of analysis.
Pre-requisite: FCHM107- Food Chemistry II

**FTECH113 3 units**
**FOOD PACKAGING AND LABELLING**
This course deals with the principles and methods of food packaging and labelling as well as the evaluation of properties of packaging and labelling materials.

At the end of the course, the student must be able to propose a particular packaging and labelling material for a particular food product.
Pre-requisites: FTECH103- Food Processing I, FTECH106- Food Processing II

**FTECH114 3 units**
**FOOD LAWS**
This course is an introduction to food law and regulations including areas of the law that would impact food science professionals. It deals with the understanding of food technology as a profession and the regulation governing, handling, processing, up to the distribution of goods. It also hones the student's awareness and compliance to food laws and regulations in manufacturing and distribution of foods in local and international markets.

At the end of this course, the student must be able to identify and analyze legal issues that may arise as they become food science professionals, distinguish the roles of government, industry, and consumers in protecting the food supply, explain the meaning and importance of standardization and food standards, compare and analyze the differences between national laws from international laws, and identify government agencies and understand their mandate in formulating food policies and regulations. (jounalize/portfolio)
Pre-requisites: FTECH103- Food Processing I, FTECH106- Food Processing II

**FTECH115 3 units**
**FOOD QUALITY ASSURANCE**
This course deals with the principles and methods of quality control and assurance in foods.

At the end of this course, the student must be able to develop procedures and approaches to identify food safety hazards in food processing (case analysis).
Pre-requisites: FTECH103- Food Processing I, FTECH106- Food Processing II, FTECH111- Food Safety, APSTAT- Applied Statistics

**FTECH116 3 units**
**POST-HARVEST HANDLING AND TECHNOLOGY**
This course deals with the basic principles on handling primary and secondary processing of agricultural food produce.

At the end of this course, the student must be able to recommend packing house operations based on international standards for a particular fruit/vegetable finished product, propose the primary and secondary processes to be employed in maintaining its quality and minimizing losses
Pre-requisites: FTECH104- Food Microbiology, FCHM107- Food Chemistry II

**FTECH117 3 units**
**FOOD PRODUCT DEVELOPMENT AND INNOVATION .**
This course deals with the development and optimization of food products with traditional and novel food ingredients and processes in both theory and practice.

At the end of this course, the student must be able to successfully produce food prototypes or food concepts, formulate products by preparing laboratory samples and determine label and nutrition facts specifications, and determine food preservation technologies to address microflora in products or ingredients.
Pre-requisites: FTECH103- Food Processing I, FTECH106- Food Processing II, FTECH107- Sensory Evaluation, FTECH110- Food Processing III, FTECH112- Food Analysis, FTECH113- Food Packaging and Labelling

**FTECH118 3 units**
**METHODS OF RESEARCH IN FOOD SCIENCE AND TECHNOLOGY**
This course deals with the introduction to research proposal writing, research methodologies, and foundational research theories and protocols.

At the end of this course, the student must be able to design a research protocol, acquire the skills to negotiate access to data and know the techniques to obtain primary and secondary data, make informed decision on the statistical analysis to be used, and develop life-long learning skills in research report presentation.
Pre-requisite: APSTAT- Applied Statistics
Co-requisite: FTECH117- Food Product Development and Innovation

**FTECH119 1 unit**
**UNDERGRADUATE SEMINAR**
This course deals with the application of concepts and theories learned in food technology through a seminar. Emerging preservation technologies, novel food trends, and solutions to contemporary food-related problems are to be discussed by the students at a wider audience.

At the end of this course, the student must be able to present solutions to address am identified modern-day challenges pertaining to food security and human consumption.
Pre-requisite:4th year standing

**FTECH120 3 units**
**THESIS IN FOOD TECHNOLOGY**
This course deals with the final application of concepts and theories in food technology.

At the end of this course, the student must be able to complete and successfully defend his/her thesis, interpret statistical data, establish strong analytical and communication skills, and effectively apply the professional courses learned in the field of food technology.
Pre-requisite: FTECH118- Methods of Research in Food Science and Technology

**FTECH121 3 units**
**ENVIRONMENTAL SUSTAINABILITY IN THE FOOD INDUSTRY**
This course deals with the sustainability and environmental issues in the food industry.

At the end of this course, the student must be able to critically evaluate (case analysis) an identified innovative method of valorization of food industry by- products to produce high value-added products with application in different sectors.
Pre-requisites: FTECH103- Food Processing I, FTECH106- Food Processing II, FTECH111- Food Safety, FTECH112- Food Analysis

**FTPRAC1**
**PRACTICUM**
On the job training for 300 hrs.

At the end of the course, the students are required to submit technical reports relating theories learned in school to the actual technical and/or practical solutions to food technology related problems. This will make the students develop their critical thinking in giving practical solutions to real industrial problems.
Pre-requisite: 3rd year standing

**FELECT1 & FELECT2**
**ELECTIVES I, II**
These are program electives. The choice comprises of Biotechnology, Business Economics and Accounting, Culinary Science and Technology, Cereal Science and Technology, Meat Science and Technology, Dairy Science and Technology, Fish Science and Technology, and Marketing.