CLO & PLO

Bachelor of Science Food Technology

or

Bachelor of Science Food Technology (Hons.)/ (Hons. with Research)/

Academic Projects

(A 4 Year Graduate Programme)

Under UGC Framework- 2022 based on NEP- 2020

[w. e. f. Academic Year: 2024-2025]

Department of Food Technology

Faculty of Science & Humanities

SRM University, Delhi-NCR, Sonepat, Haryana-131029, India

Year/Semester	**1st Year/1st Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS101**	**Course Title**	**Introduction to Food Science**
Continuous Evaluation: 40		**End Semester Examination :60**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To comprehend the fundamentals of food science, and the various branches of food science.
2. To learn the global history of food processing.
3. To comprehend the fundamentals of plant and animal foods, including their forms, structures and compositions, nutritional value.
4. To analyse the changes that occur during storage, and processing.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Learn about some of the techniques used to prepare meals from plants and animals.
2. Recognise the background and development of food processing.
3. Recognise the makeup and structure of various animal meals.
4. Learn about the structure, content, nutritional value, and changes that occur after harvest in a variety of plant foods.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**1st Year/1st Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS151**	**Course Title**	**Introduction to Food Science Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To evaluate and differentiate between enzymatic and non-enzymatic browning reactions in various food samples.
2. To compare and analyze the gelatinization behavior of different starches and its implications in food processing.
3. To examine and understand the concept of gluten formation in various flours and its role in determining food texture and structure.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Identify and separate enzymatic from non-enzymatic browning processes in various food samples.
2. Study different starches' gelatinization behaviour and analyse it.
3. Explain the principle of gluten production in different flours and demonstrate how it affects food preparation.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**1st Year/1st Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS102**	**Course Title**	**Fundamentals of Food Technology**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. Identify the principles of colloidal chemistry in food systems, including the characteristics of sols, gels, pectin gels, colloidal sols, and their stabilization methods.
2. Compose the factors affecting microbial growth in food, the concept of hurdle technology, and its application in the preservation of fermented foods and shelf-stable products.
3. Evaluate the techniques and safety criteria involved in minimal processing of foods using thermal and non-thermal methods, with a focus on fruits, vegetables, and seafood.
4. Compare the food packaging materials, their properties, and their application in preserving food quality and safety.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Understand the colloidal system stabilisation techniques and their significance in food preparation.
2. Comprehend the idea of hurdle technology and how it may be used to assure food preservation and safety.
3. Arrange the many basic processing methods for food, including both thermal and non-thermal ones.
4. Recognise the various packaging materials used in the food business and assess their merits for maintaining food quality.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CO \ CLO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**1st Year/1st Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS152**	**Course Title**	**Fundamentals of Food Technology Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To develop the practical abilities necessary to perform chemical analyses of dietary components, such as lowering sugar, salt level, and fat content.
2. To get practical experience utilising laboratory tools and methods for analysing food, such as refractometry and the Soxhlet method.
3. To use colloidal chemistry concepts while preparing meals and comprehend the stability and behaviour of emulsions.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Determine the salt content of butter and brine and recognise the value of salt in flavour and food preservation.
2. Learn the processes for making Brix solutions, using a hand refractometer to determine their concentration, and using refractometry to determine the amount of sugar in food samples.
3. Use the Fehling's approach to calculate the reducing sugar concentration of food samples and colloidal chemistry to comprehend its relevance for food quality and flavour.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**1st Year/ 2nd Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS202**	**Course Title**	**Food Preservation Technology**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To recognise the tenets and techniques of food preservation, such as physical, chemical, biological.
2. To express the significance and need of food preservation, as well as the definitions of shelf life, perishable foods, semi-perishable foods, and shelf-stable foods.
3. To describe the concepts and procedures used in low-temperature food preservation techniques.
4. To examine the commercial heat preservation procedures for high-temperature food preservation.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Learn the principles of food preservation and classify the various preservation strategies based on temperature, irradiation, microwave, and moisture management techniques.
2. Understand about food preservation and how it helps produce shelf-stable foods and increase the shelf life of perishable and semi-perishable goods.
3. Understand the distinctions between slow freezing and fast freezing techniques and adhere to the low-temperature food preservation rules.
4. Express the different high-temperature food preservation techniques and how they are used in the food sector to preserve and ensure the safety of food.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**1st Year/2nd Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS252**	**Course Title**	**Food Preservation Technology Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To explain the concept of shelf life and its significance in determining the quality and safety of different foods.
2. To discuss the principles and techniques of asepsis, which is essential for maintaining a sterile environment in food processing and preservation.
3. To list the concept of sterilization and understand its application in ensuring the safety and extended shelf life of various food products.

COURSE LEARNING OUTCOMES (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

1. Learn the idea of shelf life and its significance in determining the calibre and safety of various food items.
2. Understand to maintain a sterile environment while processing and preserving food, and demonstrate aseptic practises.
3. Learn the sterilisation idea and its importance in protecting food goods, assuring their safety and extending their shelf life.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**1st Year/2nd Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS201**	**Course Title**	**Basic Nutrition**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To examine the basic terms and concepts used in the study of food and nutrition, and methods of assessing nutritional status.
2. To underline the functions of food from physiological, psychological, and social perspectives, and explore the relationship between food, nutrition, and health.
3. To distinguish the classification, digestion, absorption, functions, dietary sources, and recommended dietary allowances (RDA) for energy, carbohydrates, lipids, and proteins, along with their clinical manifestations of deficiency and excess.
4. To evaluate the essential fat-soluble vitamins, water-soluble vitamins, and important minerals along with their dietary sources and health implications.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Define and apply fundamental words relating to food and nutrition, and utilise a variety of techniques to determine an individual's nutritional condition.
2. Understanding the relationship between a healthy diet and general health and well-being is important.
3. Learn how energy, carbohydrates, lipids, and proteins are classified, digested, absorbed, and used, and identify the clinical effects of their deficits and excesses.
4. Understand the dietary sources of the vital fat-soluble and water-soluble vitamins, as well as significant minerals, and their functions in preserving health and preventing deficiency illnesses.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CO \ CLO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**1st Year/2nd Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS251**	**Course Title**	**Basic Nutrition Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To identify food sources for various nutrients using food composition tables and understand their importance in maintaining a balanced diet.
2. To plan one's own diet using a 24-hour dietary recall method and gain practical experience in dietary assessment.
3. To demonstrate the students to meal planning and the concept of food exchange system, allowing them to design balanced and nutritious meals.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Choose and pick the right food sources for different nutrients, allowing students to make educated dietary decisions.
2. Track their own diet using the 24-hour dietary recall approach, which will help them better understand their food preferences and nutrient consumption.
3. Arrange for the planning of well-balanced meals for people at various income and activity levels.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	2nd Year/3rd Semester	Course Category	Major Course
Course Code	24FTBS301	Course Title	Emerging Technology in Food Processing
Continuous Evaluation 40		End Semester Examination 60	
Prerequisite: Nil		L T P : 3 0 0	Credits: 3

COURSE OBJECTIVES (CO)

1. To understand emerging food technologies and their implications.
2. To explore innovative food production, including plant-based foods, precision agriculture, and personalized nutrition.
3. To analyze food safety, sustainability, and ethical considerations.
4. To apply data-driven solutions, AI, and predict future industry trends.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Point out and assess emerging food technologies and their ethical aspects.
2. Apply innovative food production methods.
3. Understand the food safety, sustainability, and propose waste reduction strategies.
4. Apply data-driven solutions to food challenges, predict trends, and anticipate industry impacts.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	2nd Year/3rd Semester	Course Category	Major Course
Course Code	24FTBS351	Course Title	Emerging Technology in Food Processing Lab
Continuous Evaluation: 60		End Semester Examination: 40	
Prerequisite: Nil		L T P : 0 0 2	Credits: 1

COURSE OBJECTIVES (CO)

1. To develop a variety of flavored snack food by experimenting with seasonings and flavors to create unique and appealing snack options.
2. To conduct a survey to collect data on peers' food preferences, including flavors and dietary preferences, to inform future food product development.
3. To explore and implement innovative food production methods to create mock meat substitutes using alternative ingredients and techniques.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Learn the different spices and flavours to create flavoured popcorn and unusual snack alternatives.
2. Understand designing and executing surveys to gather information on food preferences of peers and obtain knowledge for next food product development.
3. Understand new strategies for producing food, especially for imitation meat and meat replacements, while looking into alternate components and procedures.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**2nd Year/3rd Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS302**	**Course Title**	**Technology of Fruits and Vegetables**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To understand the significance of fruits and vegetables in human nutrition and the historical context of food preservation, including the reasons for spoilage.
2. To evaluate the different methods of short-term and long-term preservation for fruits and vegetables, and comprehend the chemical changes that occur during maturation.
3. To estimate the canning and bottling processes for fruits and vegetables, including factors influencing processing time and temperature, container selection, and spoilage prevention.
4. To examine the processing techniques involved in producing various fruit beverages and learn about their preservation methods.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Learn the nutritious worth of fruits and vegetables and recognise how crucial preservation is to keeping them available and of high quality.
2. Identify the various preservation techniques and whether or not they are suitable for both short- and long-term storage of fruits and vegetables.
3. Understand to prepare can fruits and vegetables, regulate the processing conditions, and guard against food spoiling in canned goods.
4. Learn the pasteurisation, freezing, drying, and packing procedures used in the processing and preservation of various fruit drinks, such as juices and concentrates.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**2nd Year/3rd Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS352**	**Course Title**	**Technology of Fruits and Vegetables Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To determine important quality parameters of food products, including total soluble solids (TSS), pH, acidity, and calculate the brix: acidity ratio for assessing product characteristics.
2. To understand the can making process, study the sequential steps involved, and gain insights into the packaging aspect of food preservation.
3. To explain and process fruit juices from different types of fruits, applying appropriate techniques such as de-aeration, straining, and filtration.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Learn the analytical instruments to calculate brix: acidity ratio, pH, TSS, and other parameters that allow users to evaluate and contrast product quality.
2. Understand the can-making process, get acquainted with the procedures, and comprehend the importance of appropriate packaging in food preservation.
3. Learn the fruit juice extraction and processing.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**2nd Year/3rd Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS303**	**Course Title**	**Dairy Technology**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To understand the milk production and milk products.
2. To highlight the characteristics and makeup of milk as well as the operation of some dairy equipment.
3. To classify the technologies used to produce dairy products.
4. To use the value-adding process for dairy products.

COURSE LEARNING OUTCOMES (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

1. Understand the platform tests of the dairy industry.
2. List the numerous attributes and components of milk.
3. Understand the production processes for a variety of goods, including cheese, condensed milk, milk powder, flavoured milk, yoghurt, dahi, and paneer.
4. Learn the production processes that may be utilised to create various dairy products with added value.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**2nd Year/3rd Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS353**	**Course Title**	**Dairy Technology Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To describe the basic ideas behind dairy technology.
2. To consider the ideas related to dairy food processing and preservation.
3. To stress the significance of dairy product quality standards.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Learn the dairy products' fundamental analysis.
2. Understand the idea behind various dairy product processing techniques.
3. Suggest the fundamental dairy products.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**2nd Year/4th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS401**	**Course Title**	**Food Microbiology**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To identify the fundamental food microbiology.
2. To describe the key genera of food-associated bacteria and their characteristics.
3. To summarise how bacteria play a part in food production.
4. To provide examples of food rotting and food-borne illnesses.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Learn the role that microorganisms play in food processing.
2. List the significant microbial species connected to food along with their traits, patterns of growth, and parameters.
3. Understand the positive effects of microorganisms and the various types of fermented foods.
4. State the function of microbes in food-borne illnesses and preventative methods.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CO \ CLO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**2nd Year/4th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS451**	**Course Title**	**Food Microbiology Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To discuss the concepts of food microbiology.
2. To describe the different methods of microbial detection.
3. To understand the importance of microorganism in food.

COURSE LEARNING OUTCOMES (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

1. Classify the importance of food microbiology.
2. Illustrate the different methods of microbial detection.
3. Develop the fermented food.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

LLO / LO	LLO 1	LLO 2	LLO 3
LO 1			
LO 2			
LO 3			

Year/Semester	**2nd Year/4th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS402**	**Course Title**	**Technology of Cereal Pulses and Oilseeds**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To identify the technology of milling of various cereals.
2. To explain the processing of pulses and oilseeds.
3. To understand the importance & processing of protein rich products.
4. To evaluate the different methods of preparation of alcoholic beverages.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Describe the fundamentals of milling processes.
2. Explain the fundamental makeup and structure of pulses and oilseeds.
3. Encourage the production of goods with added value from food grains.
4. Explain the brewing principle for alcoholic beverages.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**2nd Year/4th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS452**	**Course Title**	**Technology of Cereal Pulses and Oilseeds Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To evaluate the technologies associated with processing of cereals and pulses.
2. To explain the different characteristics associated with cereals and pulses.
3. To understand quality characteristics associated with cereals and pulses.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to

1. Learn the various technologies that pertain to grains and pulses.
2. Recognise the qualitative traits connected to grains and pulses.
3. Understand the fundamental techniques for evaluating grains and pulses.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

LLO / LO	LLO 1	LLO 2	LLO 3
LO 1			
LO 2			
LO 3			

Year/Semester	**2nd Year/4th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS403**	**Course Title**	**Meat, Poultry and Egg Technology**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To illustrate the meat and poultry sector.
2. To express the methods used to kill meat animals and poultry, as well as the quality of the flesh.
3. To describe techniques for animal food processing, preservation, and by-product utilisation.
4. To investigate the methods used for egg production, egg preservation, variables affecting egg quality, and egg quality indicators.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Learn the demand for and significance of the cattle, egg, and poultry industries.
2. Recognise the technologies involved in the production of various animal feeding items and the use of byproducts.
3. Understand the procedures for egg production and egg preservation into practise.
4. List the variables that impact egg quality and the metrics used to determine it.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CO \ CLO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**2nd Year/4th Semester**	**Course Category**	**Major Course**
Course Code	**23FTBS453**	**Course Title**	**Meat, Poultry and Egg Technology Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To explain the terms "meat," "poultry," and "technology."
2. To describe the ideas involved in the preservation and processing of meat, poultry, and eggs.
3. To provide examples of the significance of animal product quality standards.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Highlight the fundamental evaluation of animal products.
2. Understand the rationale behind various animal product processing techniques.
3. Summarise the scientific rationale for animal product manufacturing.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**3rd Year/5th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS501**	**Course Title**	**Unit Operations in Food Technology**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P : 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To gain a complete grasp of the equipment, handling methods, and grading, mixing, filtration, evaporation, and freeze-drying processes used in the processing of food.
2. To develop the knowledge and abilities necessary to evaluate, choose, and put into practise cleaning, size-reduction, mixing, and dehydration techniques used in the food processing sector.
3. To examine the fundamentals, benefits, and difficulties of cutting-edge methods like freeze drying and use what you learn in practical food processing situations.
4. To develop a thorough grasp of effective and sustainable food production by becoming an expert in the many phases of food processing, from basic material handling and cleaning to advanced processing procedures.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Learn a thorough understanding of material handling, processing procedures, and cutting-edge food production and preservation processes.
2. Choose, use, and optimise equipment for cleaning, grading, mixing, filtering, and dehydration operations using analytical abilities.
3. Assess the benefits, difficulties, and real-world uses of freeze drying, demonstrating mastery of cutting-edge food processing.
4. Gain a comprehensive understanding of the various facets of food processing, promoting effectiveness, quality, and innovation across the supply chain.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**3rd Year/5th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS551**	**Course Title**	**Unit Operations in Food Technology Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P : 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To become proficient in a variety of dry cleaning techniques to efficiently remove pollutants and impurities from food products.
2. To be familiar with how size reduction equipment for processing and treating food particles works.
3. To improve the quality of the finished product, examine how various mixers affect the consistency and texture of food.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Learn a variety of dry cleaning techniques to effectively remove pollutants and impurities from food products.
2. Understanding of how size reduction machinery, which is crucial for processing and handling food particles, works.
3. Recognise the quality of the finished product.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (LCOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**3rd Year/5th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS502**	**Course Title**	**Food Chemistry-I**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To outline the discoveries about food chemistry.
2. To create a thorough understanding of food composition.
3. To highlight the functions of food ingredients.
4. To describe the function of food ingredients in food processing.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Adhere to the fundamental chemical compositions of dietary constituents.
2. Noted the physical characteristics and reactivity of significant dietary ingredients.
3. Determine if the processing circumstances will affect the reactivity of food ingredients.
4. Organise the modifications to the general composition are likely to modify the food's responsiveness.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CO \ CLO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**3rd Year/5th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS552**	**Course Title**	**Food Chemistry-I Lab**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To identify the students to concepts of food chemistry.
2. To explain the concepts surrounding chemistry and their influence on food product development.
3. To understand the importance different chemical reactions on food product development.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Identify the fundamentals of food chemistry.
2. Explain how food chemistry affects the creation of food products.
3. Decide on the fundamental estimation techniques for the examination of various parameters.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**3rd Year/5th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS503**	**Course Title**	**Spices and Plantation Crops Process Technology**
Continuous Evaluation 40		**End Semester Examination 60**	
Prerequisite: Nil		**L T P : 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To discover the production of main and minor spices as well as plantation crops including tea, coffee, cocoa, coconut, and cashew.
2. To maintain quality, learn how to extract and use oleoresins, essential oils, and other flavouring ingredients.
3. To learn quality assurance techniques for safe products and the health advantages of spice use.
4. To recognise the manufacture, production, and chemical makeup of goods like chocolate and coffee.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Identify various spice varieties and divide them into major and minor spices.
2. Use techniques for drying, storing, and packing to maintain quality.
3. Analyse the health benefits of eating spices and certain foods.
4. Apply practical knowledge to the processing of coconut, cashew, cocoa, tea, and coffee.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**3rd Year/5th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS553**	**Course Title**	**Spices and Plantation Crops Process Technology Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P : 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To identify spices, sauces, and plantation crops by recognising the unique chemicals they contain.
2. To develop abilities to spot adulteration to guarantee product quality and originality.
3. To develop hands-on experience using the Soxhlet apparatus to extract oleoresin from diverse sources, and exhibit innovation by creating new coconut-based goods.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Understanding the products prepared from spices and plantation crops.
2. Detect adulteration using analytical methodologies to ensure customer safety and product integrity through trustworthy quality evaluation.
3. Understand the soxhlet apparatus with proficiency for effective oleoresin extraction, and show creativity in product invention employing a variety of plantation elements for distinctive and alluring outcomes.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**3rd Year/5th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS504**	**Course Title**	**Food Packaging**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To identify fundamentals of packaging.
2. To design the broad overview of the scientific and technical aspects of food packaging.
3. To illustrate the packaging machinery systems.
4. To state the testing and regulations of food packaging.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Interpret the technical and scientific overview of food packaging.
2. Choose the packing equipment systems, test,
3. Learn about various packing materials.
4. Understand the general laws and rules governing food packing.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**3rd Year/5th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS554**	**Course Title**	**Food Packaging Lab**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To explain the overview of the scientific and technical aspects of food packaging.
2. To analyze the packaging requirement and packaging designing of food.
3. To state the packaging machinery systems.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Learn the technical and scientific elements of food packing.
2. Understand the science underlying the various specifications for food packaging.
3. List fundamental material evaluations for food packaging.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**3rd Year/6th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS601**	**Course Title**	**Food Chemistry-II**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To explain the chemistry of food components and their interactions.
2. To describe the role of enzymes.
3. To describe the various food safety and quality laws in food industry.
4. To evaluate the concept of new product development.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Learn the interactions and chemistry of dietary constituents.
2. State how the enzymes are used in food processing.
3. Examine the possible methods for reducing the reactivity of dietary ingredients.
4. Create the concept of New Product Development.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CO \ CLO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**3rd Year/6th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS651**	**Course Title**	**Food Chemistry-II Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To examine the concepts of food chemistry.
2. To illustrate the concepts surrounding chemistry and their influence on food product development.
3. To estimate the importance different chemical reactions on food product development.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Learn the fundamentals of food chemistry.
2. Understand how food chemistry is applied to the creation of food products.
3. Learn the fundamental estimation techniques for the examination of various parameters.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**3rd Year/6th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS602**	**Course Title**	**Fundamentals of Sensory Evaluation**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To describe the fundamental and derivative flavours found in food.
2. To describe the fundamental sensory characteristics of both raw and processed foods.
3. To discuss the objective and subjective methods of sensory evaluation.
4. To exhibit how sensory assessment is used in food industry.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Utilise sensory science principles.
2. Examine the food's sensory and physical attributes.
3. Ensure food quality, evaluate the colour, taste, texture, and other sensory qualities.
4. Assess how consumers feel about and accept food goods.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**3rd Year/6th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS652**	**Course Title**	**Fundamentals of Sensory Evaluation Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To state the concepts of sensory evaluation.
2. To express the different sensory evaluation tests.
3. To illustrate the importance of objective sensory evaluation methods.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Enumerate the subjective and sensory techniques of sensory evaluation.
2. Learn the idea underlying sensory evaluation for affective and discriminative tests.
3. Understand the fundamental sensory assessment tests, such as an investigation of texture, colour, and viscosity.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**3rd Year/6th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS603**	**Course Title**	**Bakery & Confectionary Technology**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To understand the fundamentals of baking.
2. To comprehend technology behind various bakery products.
3. To understand technology used in modified bakery products.
4. To learn the technologies used in preparation of confectionery products.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Apply the fundamentals of baking.
2. Acquire the knowledge of the technologies behind bakery products.
3. Recognise the technologies for confectionary product preparations.
4. Understand different innovations and trends in baking and confectionery industry.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**3rd Year/6th Semester**	**Course Category**	**Major Stream Course**
Course Code	**23FTBS653**	**Course Title**	**Bakery & Confectionary Technology Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P : 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To create yeast-fermented goods and cakes with appealing textures and flavours while effectively using bakery equipment and basic mixing procedures.
2. To determine the dough's capacity to rise, ensure optimum hydration, and innovate flavoured bread recipes to increase product diversity to optimise baking outcomes.
3. To understand the craft of creating burger, pizza, and bun breads; discover the fundamentals of making cookies and biscuits; and build desserts with imaginative frosting and tempting toppings.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Learn the necessary mixing procedures for efficient bakery preparation, calculate the dough rising capacity, and identify the necessary bakery equipment.
2. Prepare yeast-fermented foods, make cakes with the flavours and textures you choose, and use the right methods to generate breads for burgers, pizza, and buns.
3. Construct pastries with inventive frosting and tempting toppings for appealing presentations. Learn the essential principles for making biscuits and cookies.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**3rd Year/6th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS604**	**Course Title**	**Food Fermentation Technology**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. To state the basics of fermentation.
2. To discuss the design of various reactors used in Industries.
3. To describe the basis of criteria for selection of media for microbial growth.
4. To classify the fermented food products.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Learn the fundamentals of fermentation.
2. Understand the reactor design's underlying idea.
3. Choose a variety of medium for microbial growth.
4. Learn how the various products made from fermentation are made.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CO \ CLO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**3rd Year/6th Semester**	**Course Category**	**Major Course**
Course Code	**23FTBS654**	**Course Title**	**Food Fermentation Technology Lab**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P: 0 0 2**	**Credits: 1**

COURSE OBJECTIVES (CO)

1. To state the important of food fermentation.
2. To discuss the principles behind creation of certain fermented food product.
3. To describe the importance microorganisms in preparation of fermented food products.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Prepare basic fermented food products.
2. Select the concept behind different fermented food products.
3. Recognize role of microorganisms in preparation of fermented food products.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3
CO 1			
CO 2			
CO 3			

Year/Semester	**4th Year/7th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS701**	**Course Title**	**Food Engineering**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 1 0**	**Credits: 4**

COURSE OBJECTIVES (CO)

1. To list the basics of food production unit.
2. To describe the principle of Unit Operation.
3. To apply the principles and methods of food engineering.
4. To develop the fundamentals of food plant and system design.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Understand the fundamentals of developing a food processing and storage facility.
2. Learn the unit operations principle.
3. Use fundamental concepts in steam, psychrometrics, fluid movement, freezing, and heat and mass transfer.
4. Practise at solving numerical and system and food plant difficulties.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CO \ CLO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**4th Year/7th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS702**	**Course Title**	**Nutraceuticals and Functional Foods**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 1 0**	**Credits: 4**

COURSE OBJECTIVES (CO)

1. To state the types of nutraceutical and functional foods.
2. To illustrate the potential of various nutraceuticals and functional foods in promoting human health.
3. To describe the safety issues and consumer acceptance of nutraceutical and functional foods.
4. To develop the concepts of labelling, marketing and regulatory issues related to nutraceutical and functional foods.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Understand the many categories of functional and nutraceutical foods.
2. Learn which nutraceuticals and functional foods have the most potential to promote health.
3. Understand the market for functional foods and nutraceuticals.
4. Learn the consumer adoption of nutraceuticals and functional foods and safety concerns.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	4th Year/7th Semester	Course Category	Major Course
Course Code	24FTBS703	Course Title	Flavor Technology
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P: 3 1 0	Credits: 4

COURSE OBJECTIVES (CO)

1. To state basics of flavour technology.
2. To discuss the chemical stimuli involved in flavour perception.
3. To explain the flavour-ingredient interactions, mechanisms of flavour release and industrial methods of flavour production.
4. To describe the analytical methods of flavour analysis and different manufacturing processes.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Use the fundamentals of taste technology.
2. Select the sense of taste.
3. Set up the systems responsible for flavour generation.
4. Analyse various flavour profiles.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CO \ CLO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**4th Year/8th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS801**	**Course Title**	**Food Additive**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P : 3 1 0**	**Credits: 4**

COURSE OBJECTIVES (CO)

1. To understand the classifications, applications, and regulatory aspects of food additives and preservatives.
2. To explore the flavoring agents, flour improvers, and sweeteners and their roles in enhancing food quality.
3. To study the emulsifiers, thickeners, and nutrient supplements, and analyzing their functions.
4. To evaluate the dosages, safety considerations, and potential impact of food additives on consumer health.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Learn the various food additives, their regulatory requirements, and categorization schemes.
2. Recognise and distinguish various sweeteners, flour enhancers, and flavouring compounds used in food applications.
3. Understand the use of emulsifiers, thickeners, and vitamin supplements to alter the qualities of food.
4. Assess the permitted doses, safety issues, and possible health effects of food additives.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**4th Year/8th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS802**	**Course Title**	**Food Toxicology**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P : 3 1 0**	**Credits: 4**

COURSE OBJECTIVES (CO)

1. To understand the core concepts of food and nutritional toxicology, including sources of toxicants and the influence of diet on toxicity.
2. To learn the phases of toxic effects, dose-response relationships, and categories of toxicity to assess potential risks accurately.
3. To evaluate how diet, biotransformation, macronutrients, and micronutrients impact toxicity, considering factors like gender and age.
4. To identify causes of food poisoning, bacterial toxins, and intoxications, while applying risk assessment and regulatory knowledge to real-world cases.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Acquire a thorough understanding of dietary and nutritional toxicology principles, including toxicant sources, impacts, and consequences.
2. To ensure that risk assessments are correct, show that you are skilled at analysing toxicological phases, dose-response relationships, and categories of toxicity.
3. Analyse the intricate interactions between nutrition, biotransformation, nutrients, and factors like age and gender that affect the results of toxicology.
4. Use newly gained information to pinpoint the origins of bacterial toxins, intoxications, and food poisoning while incorporating risk analysis and regulatory insights for workable food safety solutions.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**4th Year/8th Semester**	**Course Category**	**Major Course**
Course Code	**24FTBS803**	**Course Title**	**Food Safety and Quality**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P: 3 1 0**	**Credits: 4**

COURSE OBJECTIVES (CO)

1. To state the concept of food safety, types of hazards and their control measures.
2. To discuss about Food Safety Management tools.
3. To describe the need and importance of quality management in food production chain.
4. To explain the chemical, technological and toxicological aspects of food additives.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Learn the threats and difficulties with food safety.
2. Use principles of food safety management in practical contexts.
3. Understand the requirement for a quality management system.
4. Understand the importance of food additives are necessary and important.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CO \ CLO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	Year/Semester	Course Category	Minor Stream Course
Course Code	24FTBS001	Course Title	Principles of Food Processing
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P: 3 1 0	Credits: 4

COURSE OBJECTIVES (CO)

1. To describe the fundamentals and uses of freezing, freeze drying, freeze concentration, and drying techniques in food processing, as well as how these techniques affect the quality and preservation of food.
2. To ensure the safety of food, emphasise the foundations of thermal processing.
3. To adhere to the packaging specifications and methods for different processed goods.
4. To contrast the separation techniques used in the separation and purification of ingredients in food processing.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Define the principles and uses of freezing, freeze drying, freeze concentration, and drying techniques, and evaluate how they affect food quality and preservation.
2. Learn the concepts of thermal processing, the thermal death time, and the analysis of heat penetration data and how to use them to guarantee effective food safety measures.
3. Understand the packaging needs for various processed goods and choose the best packaging methods for maintaining quality and extending shelf life.
4. Learn the fundamentals of separation procedures and how they are used to separate components for various purposes as well as how they are used in the food processing industry.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CCO / CO	CCO 1	CCO 2	CCO 3	CCO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	Year/ Semester	Course Category	Minor Stream Course
Course Code	24FTBS002	Course Title	Clinical Nutrition
Continuous Evaluation 40		End Semester Examination 60	
Prerequisite: Nil		L T P: 3 1 0	Credits: 4

COURSE OBJECTIVES (CO)

1. To describe the nutritional evaluation and treatment planning for patients of all backgrounds.
2. To apply evidence-based medical nutrition therapy to the treatment of degenerative and metabolic illnesses.
3. To examine the effects of diet on gastrointestinal illnesses and cardiovascular health and adopt the most effective therapies.
4. To show ethical awareness and discuss difficulties in delivering all-encompassing nutritional treatment.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Recall and use appropriate nutritional evaluation techniques for a range of patient demographics.
2. Use medical nutrition therapy strategies for disorders including diabetes, cardiovascular disease, and others.
3. Create and carry out tailored nutritional treatments for individuals with certain medical requirements.
4. Learn ethical issues and include them into nutritional care procedures.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	Year/ Semester	Course Category	Minor Stream Course
Course Code	24FTBS003	Course Title	Community Nutrition
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P : 3 1 0	Credits: 4

COURSE OBJECTIVES (CO)

1. To describe how community, nutrition, and public health are related, and examine the variables affecting community health.
2. To assess the prevalence and effects of nutritional problems on a community's health, such as protein-energy malnutrition and micronutrient deficiencies.
3. To make use of different data sources to evaluate nutritional status, create instructional plans, and suggest solutions targeting particular community health needs.
4. To evaluate how national and international programmes are affecting community nutrition, and develop ways to enhance programme design, execution, and assessment.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Learn the importance of community nutrition to public health and how it affects the growth of a country.
2. Understand the nutritional issues in the context of the community, such as protein-energy malnutrition and micronutrient deficiencies.
3. Use abilities in data analysis and research to create and carry out successful community-based nutrition programmes.
4. Learn the success of community-based programmes and efforts to enhance public health outcomes.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	Year/ Semester	Course Category	Minor Stream Course
Course Code	24FTBS004	Course Title	Food Product Development
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P : 3 1 0	Credits: 4

COURSE OBJECTIVES (CO)

1. To show that you understand the principles of new product development.
2. To use imagination and market research to develop product concepts
3. To create and improve food product formulas
4. To use successful product launch and marketing techniques

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Learn the steps involved and the significance of new product development.
2. Incorporate Market Research and Creative Ideation into NPD
3. Create and improve food product formulas
4. Understand the efficient marketing and product launch plans

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CCO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	Year/ Semester	Course Category	Minor Stream Course
Course Code	24FTBS005	Course Title	Food Analysis and Instrumentation
Continuous Evaluation 40		End Semester Examination 60	
Prerequisite: Nil		L T P : 3 1 0	Credits: 4

COURSE OBJECTIVES (CO)

1. To understand the fundamental concepts of sampling techniques and their significance in analytical chemistry.
2. To gain proficiency in various methods of carbohydrate analysis, including extraction, chemical, physical, and enzymatic techniques.
3. To develop a comprehensive knowledge of protein analysis methods, encompassing spectrophotometric, colorimetric, and turbidometric approaches.
4. To acquire a deep understanding of lipid analysis principles, chromatographic techniques, and their applications in lipid composition determination.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Understand analytical chemistry, distinguish between the population, laboratory sample, and sample, with an emphasis on measurement precision, accuracy, and sensitivity.
2. Carry out enzymatic, gravimetric, titrimetric, and colorimetric carbohydrate analysis, demonstrating expertise in starch and crude fibre analysis.
3. Learn the protein concentration using Kjeldahl, UV-Visible, colorimetric, and turbidometric techniques while understanding the underlying principles of each approach.
4. Understand the lipid analyses using chromatography, distinguish between solvent and non-solvent extraction.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CCO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	Year/ Semester	Course Category	Minor Stream Course
Course Code	24FTBS006	Course Title	Food Supply Chain Management
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P: 3 1 0	Credits: 4

COURSE OBJECTIVES (CO)

1. To Identify the fundamentals of food supply chain.
2. To describe the supply chain as a strategic tool.
3. To recognise different factors influencing the supply chain.
4. To organize and appreciate logistics.

COURSE LEARNING OUTCOMES (CLO)

After completion of course, students would be able to:

1. Select the basics of food supply chain.
2. Understand the strategic advantages of well- developed food supply chain.
3. Apply basics to real life situation.
4. Learn the need of a well-defined supply chain network.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CO \ CCO	CCO 1	CCO 2	CCO 3	CCO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	Year/ Semester	Course Category	Minor Stream Course
Course Code	24FTBS009	Course Title	Agri Business Management
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P : 2 0 0	Credits: 2

COURSE OBJECTIVES (CO)

1. Understand the historical and economic significance of the agri-business sector in India and its global impact.
2. Gain skills in entrepreneurship for agri-business, including industry analysis and government incentives.
3. Learn marketing management for agricultural produce, market research, and management strategies.
4. Analyze international trade agreements, export potential of Indian food products, and consumer behavior patterns.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Learn the historical development, goals, and significance of agribusiness in India and globally.
2. Evaluate government incentives, conduct SWOT analyses for new markets, and understand entrepreneurial traits.
3. Assess marketing plans for agricultural products, evaluate agri-business manager roles, and conduct market research.
4. Analyze trade agreements, project export prospects for Indian food products, and study consumer consumption trends.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CCO / CO	CCO 1	CCO 2	CCO 3	CCO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**Year/ Semester**	**Course Category**	**Minor Stream Course**
Course Code	**24FTBS010**	**Course Title**	**Waste Management and By-Product Utilization**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P : 2 0 0**	**Credits: 2**

COURSE OBJECTIVES (CO)

1. Understand food processing by-products, characterize them, and explore sustainable utilization.
2. Acquire proficiency in treating food industry effluents to meet environmental standards.
3. Analyze treatment methods' impact on effluent characteristics and assess pollution reduction effectiveness.
4. Develop expertise in regulatory compliance, emphasizing proper effluent handling and disposal to mitigate environmental impact.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Learn the food processing waste management principles, including by-product utilization, efficient treatment, and environmental compliance.
2. Demonstrate expertise in selecting and applying primary and advanced treatment methods for diverse food industry effluents.
3. Assess environmental impacts of food processing waste, optimizing treatment to meet regulations and reduce harm.
4. Develop sustainable solutions for handling, treating, and disposing of food industry effluents, considering economic, social, and ecological factors.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	Year/ Semester	Course Category	Minor Stream Course
Course Code	24FTBS007	Course Title	Food Biotechnology
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P : 3 1 0	Credits: 4

COURSE OBJECTIVES (CO)

1. To understand food biotechnology's definition, historical development, and applications in the food industry.
2. To comprehend cell structure, DNA, RNA, protein synthesis, and genetic engineering techniques in food biotechnology.
3. To explore the significance of probiotics, fermentation processes, and foodborne pathogens in food biotechnology.
4. To study genetic variation in food crops, GMOs' role in the food industry, and gene editing applications.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Understand the principles and applications of food biotechnology, including its historical development and its role in the food industry.
2. Learn the cell structure, DNA, RNA, protein synthesis, and genetic engineering techniques essential in food biotechnology.
3. Explore the significance of microorganisms in food biotechnology and their role in food spoilage and foodborne pathogens.
4. Study genetic variation in food crops, the role of GMOs in the food industry, and the applications of gene editing technologies in food biotechnology.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**Year/ Semester**	**Course Category**	**Minor Course**
Course Code	**24FTBS008**	**Course Title**	**Beverage Technology**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite:		**L T P : 3 1 0**	**Credits: 4**

COURSE OBJECTIVES (CO)

1. To know the technologies used to produce alcoholic and non-alcoholic drinks, comprehend the relevance of water treatment.
2. To learn about the manufacturing, preservation, packing, and clarity of fruit juices.
3. To gain knowledge of the technology behind carbonation and quality requirements for soft drinks and mineral water.
4. To expertise using machinery for juice pressing, bottling, and enzymatic clarifying to create speciality drinks with low-calorie sweeteners.

COURSE LEARNING OUTCOMES (CLO)

After completion of this course, learners will be able to:

1. Analyse the significance of beverages and understand how water treatment affects food safety.

2. Use manufacturing methods for varied drinks and preservation strategies.

3. Adhere to quality requirements and implement soft drink technology, including carbonation.

4. Use specialised equipment to carry out processes for creating specialty beverages, such as fortified drinks.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**Year/ Semester**	**Course Category**	**Minor Stream Course**
Course Code	**24FTBS011**	**Course Title**	**Post Harvest Technology**
Continuous Evaluation: 60		**End Semester Examination: 40**	
Prerequisite: Nil		**L T P : 3 1 0**	**Credits: 4**

COURSE OBJECTIVES (CO)

1. To thorough comprehension of post-harvest management.
2. To use of food additives and plant growth regulators effectively.
3. To reduce food grain losses and pest control.
4. The preparation and preservation of spices, fruits, and vegetables.

COURSE LEARNING OUTCOMES (CLO)

After successful completion of this Course, students will be able to:

1. Learn the necessity of the preservation, canning, and bottling processes for fruit and vegetable goods.
2. Understand the logic behind fruit and vegetable processing and drying procedures that result in a finished product with improved qualities and shelf life.
3. Assess the reactions and alterations that occur in fruits and vegetables, liquids, and spices during the course of processing.
4. Use the techniques to preserve the crop and give it several uses.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**4th Year/7th Semester**	**Course Category**	**Minor Course**
Course Code	**23RMBS710**	**Course Title**	**Research Methodology**
Continuous Evaluation: 40		**End Semester Examination:60**	
Prerequisite:		**L T P: 1 0 2**	**Credits: 2**

COURSE OBJECTIVES (CO)

1. Provide necessary background on research methodology to undergraduate students
2. Give understanding of hypothesis testing
3. Give understanding of different types sampling techniques.
4. Explain the concept of data and data types and Know about the Formats of Reports, introduction, and different parts of a report

COURSE LEARNING OUTCOMES (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

1. have an idea about research methodology
2. understand the applications of sampling schemes and data types and data analysis
3. know how to write a report for a particular type of research work
4. understand the presentations method

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

CLO CO	CLO 1	CLO 2	CLO 3	CLO 4
CO 1	✓			
CO 2		✓		
CO 3			✓	
CO 4				✓

Year/Semester	Year/ Semester	Course Category	Inter disciplinary Course
Course Code	21OEMA001	Course Title	Introduction to Algebra
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P : 3 1 0	Credits: 4

COURSE OBJECTIVE (CO)

1. To introduce the basics of relations and functions.
2. To understand the basics of set theory and set algebra.
3. To equip the students with basics of matrix and applications.
4. To introduce the solutions of system of equations.
5. To learn the concept of vector identities.

COURSE LEARNING OUTCOMES (CCO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

1. Identify and develop concept of mapping and relations.
2. Solve the basics problems of set theory.
3. Well versed with different type of matrices.
4. Apply matrix method solving system of equations problems.
5. Solve vector identities.

MAPPING COURSE OBJECTIVES & COURSE LEARNING OUTCOMES

CLO / CO	CLO 01	CLO 02	CLO 03	CLO 04	CLO 05
CO 01	✓				
CO 02		✓			
CO 03			✓		
CO 04				✓	
CO 05					✓

Year/Semester	Year/ Semester	Course Category	Inter disciplinary Course
Course Code	21OEMA002	Course Title	Differential Calculus
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P : 3 1 0	Credits: 4

COURSE OBJECTIVE (CO)

1. To make students aware of different type function and mapping.
2. To understand the limit continuity of functions.
3. To equip the students with differentiability of functions.
4. To introduce the topic of tangent normal and curvature.
5. To learn polar coordinate and curve tracing of curve.

COURSE LEARNING OUTCOMES (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

1. Identify and develop concept of mapping of functions.
2. Solve the limit continuity problems of functions.
3. Apply graphical method for test differentiability of function.
4. Well versed with tangent normal and curvature.
5. Solve problems of polar coordinate and curve tracing of curve.

MAPPING COURSE OBJECTIVES & COURSE LEARNING OUTCOMES

CLO / CO	CLO 01	CLO 02	CLO 03	CLO 04	CLO 05
CO 01	✓				
CO 02		✓			
CO 03			✓		
CO 04				✓	
CO 05					✓

Year/Semester	Year/ Semester	Course Category	Inter disciplinary Course
Course Code	21OEMA003	Course Title	Differential Equations
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P : 3 1 0	Credits: 4

COURSE OBJECTIVE (CO)

1. To make students aware of the ordinary differential equations.
2. To understand the linear differential equations.
3. To equip the students with Cauchy-Euler equation
4. To introduce the total differential equations
5. To learn classification of second order partial differential equations

COURSE LEARNING OUTCOMES (CCO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

1. Identify ordinary differential equations.
2. Solve the linear differential equations by various methods.
3. Well versed with Cauchy-Euler equation.
4. Apply the concept of total differential equations.
5. Identify classification of second order partial differential equations.

MAPPING COURSE OBJECTIVES & COURSE LEARNING OUTCOMES

CLO / CO	CLO 01	CLO 02	CLO 03	CLO 04	CLO 05
CO 01	✓				
CO 02		✓			
CO 03			✓		
CO 04				✓	
CO 05					✓

Year/Semester	Year/ Semester	Course Category	Inter disciplinary Course
Course Code	21OEMA004	Course Title	Statistical Methods and Probability
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P : 3 1 0	Credits: 4

COURSE OBJECTIVE (CO)

1. To make students aware of the basics and importance of statistics
2. To understand the Concept of central tendency
3. To equip the students with random experiment, definition of probability
4. To introduce the Bayes theorem and its applications
5. To learn random variable and Concept of discrete random variable

COURSE LEARNING OUTCOMES (CCO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

1. Identify and develop knowledge of basics and importance of statistics.
2. Solve the problems based on concept of central tendency.
3. Apply the concept of random experiment, definition of probability.
4. Well versed with Bayes theorem and its applications.
5. Solve problems of concept of discrete random variables.

MAPPING COURSE OBJECTIVES & COURSE LEARNING OUTCOMES

CLO / CO	CL 01	CL 02	CL 03	CL 04	CL 05
CO 01	✓				
CO 02		✓			
CO 03			✓		
CO 04				✓	
CO 05					✓

Year/Semester	Year/ Semester	Course Category	Inter disciplinary Course
Course Code	21OECY001	Course Title	Physical Chemistry-I
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P : 3 1 0	Credits: 4

COURSE OBJECTIVES:

- To be familiar with the terminoCOgies of thermodynamics and the concept of heat, work and internal energy.
- To understand the concept of kinetic theory of gases, behaviour of real gases.
- To discuss the fundamental of radioactivity, radioactive decay and radioactive measurement.
- To be familiar with the concept of Miller indices, symmetry element, and X-ray diffraction in solids.

COURSE OUTCOMES: The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- Calculate the heat fCOw into and work done by a system and how that is constrained by the first law of thermodynamics.
- Explain the behaviour of ideal and real gases.
- Describe various radioactive decay process, decay kinetics and to measure the radioactivity.
- Demonstrate the symmetry elements and symmetry operation, lattice parameters using the X-ray diffraction pattern.

MAPPING COURSE OBJECTIVES & COURSE LEARNING OUTCOMES

Course Objectives (COs)	Course Learning Outcomes (CLOs)			
	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	Year/ Semester	Course Category	Inter disciplinary Course
Course Code	21OECY002	Course Title	Inorganic Chemistry
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P : 3 1 0	Credits: 4

COURSE OBJECTIVES

- To describe the atomic structure and shape of orbitals.
- To be familiar explain the concept of ionic bonding.
- To be familiar explain the concept of covalent bonding.
- To demonstrate the structure and properties of important coordination compounds.

COURSE LEARNING OUTCOMES

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- Describe the atomic structure and shape of orbitals.
- Explain the concept of concept of ionic bonding.
- Explain the concept of concept of covalent bonding
- Demonstrate the structure and properties of important coordination compounds.

MAPPING COURSE OBJECTIVES & COURSE LEARNING OUTCOMES

Course Objectives (COs)	Course Learning Outcomes (CLOs)			
	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	**Year/ Semester**	**Course Category**	**Inter disciplinary Course**
Course Code	**21OECY003**	**Course Title**	**Physical Chemistry-II**
Continuous Evaluation: 40		**End Semester Examination: 60**	
Prerequisite: Nil		**L T P : 3 1 0**	**Credits: 4**

COURSE OBJECTIVES:

- To be familiar with the postulates of quantum chemistry and its application to simple system.
- To describe the concept and application of rotational spectroscopy.
- To explain the concept application of vibrational spectroscopy.
- To demonstrate the structure and properties of compounds using electronic spectroscopy.

COURSE LEARNING OUTCOMES: The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- Apply the postulates of quantum chemistry and to simple system.
- Describe the applications of rotational spectroscopy.
- Explain vibrational energy and transitions in molecules.
- Demonstrate the structure and properties of compounds using electronic spectroscopy.

MAPPING COURSE OBJECTIVES & COURSE LEARNING OUTCOMES

Course Objectives (COs)	**Course Learning Outcomes (CLOs)**			
	CLO 1	**CLO 2**	**CLO 3**	**CLO 4**
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester	Year/ Semester	Course Category	Inter disciplinary Course
Course Code	21OECY004	Course Title	Analytical Chemistry
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P : 3 1 0	Credits: 4

COURSE OBJECTIVES

4. To understand the qualitative and quantitative aspects of analysis.
5. To be familiar explain the thermal methods of analysis.
6. To understand the different electroanalytical techniques.
7. To demonstrate the use of various separation methods.

COURSE LEARNING OUTCOMES

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- Apply the data analysis in qualitative and quantitative estimation.
- Explain the principle and applications of thermal methods of analysis.
- Illustrate principle and applications of different electroanalytical methods.
- Demonstrate various techniques in separation of different compounds.

MAPPING COURSE OBJECTIVES & COURSE LEARNING OUTCOMES

Course Objectives (COs)	Course Learning Outcomes (CLOs)			
	CLO 1	CLO 2	CLO 3	CLO 4
CO 1				
CO 2				
CO 3				
CO 4				

Year/Semester		**Course Category**	**Multidisciplinary Course**
Course Code	**23MDC201**	**Course Title**	**Renewable Energy Sources**
Continuous Evaluation: 40		**End Semester Examination:60**	
Prerequisite: Nil		**L T P : 3 0 0**	**Credits: 3**

COURSE OBJECTIVES

1. To create awareness about sources of energy and able to estimate how long theavailable conventional fuel reserves will last.
2. To learn the fundamental concepts about solar energy systems and devices.
3. To design wind turbine blades and know about applications of wind energy for waterpumping and Electricity generation.
4. To understand the working of OTEC system and different possible ways of extracting energy from Ocean, know about Biomass energy, mini-micro hydro systems and geothermal energy system.

COURSE LEARNING OUTCOMES (CLO) : At the end of the course, the student willbe able to

1. Analyze the energy scenario of the world and nation.
2. Carry out a comparative analysis of different types of coal, including their treatment,Liquefaction and gasification.
3. Compare the liquid and gaseous fuels sourced from petroleum including theircharacterization.
4. Analyze the potential of alternate energy sources and their scope and limitations.

Mapping Matrix between Course Objectives and Course Learning Outcomes:

Course Objectives	CLO 1	CLO 2	CLO 3	CLO 4
CO1	x			
CO2		x		
CO3			x	
CO4				x

Year/Semester		**Course Category**	**Multidisciplinary Course**
Course Code	23MDC202	**Course Title**	**Electric Vehicles**
Continuous Evaluation: 40		**End Semester Examination:60**	
Prerequisite: Nil		**L T P : 3 0 0**	**Credits: 3**

COURSE OBJECTIVES

1. To acquire knowledge on the fundamental concepts, principles, and analysis of hybrid electric vehicles.
2. To understand the concept of electrical vehicles and its operations.
3. To understand the need for energy storage in hybrid vehicles.
4. To provide knowledge about various possible emerging technologies that can be used in electric vehicles.

COURSE LEARNING OUTCOMES (CLO): At the end of the course, the student will be able to

1. Realize the importance of electric transportation systems.
2. Understand the basics of electric vehicle components and configuration.
3. Understand the various charging types, comfort and safety methods.
4. Understand the application of electric vehicle in Smart grid.

Mapping Matrix between Course Objectives and Course Learning Outcomes:

Course Objectives	CLO 1	CLO 2	CLO 3	CLO 4
CO1	x	x	x	x
CO2	x	x	x	
CO3	x			
CO4				x

DEPARTMENT OF LAW			
Year/Semester		Course Category	Multidisciplinary Course (MDC)
Course Code	23MDC301	Course Title	IPR for Business
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite: Nil		L T P: 3 0 0	Credits: 3

COURSE OBJECTIVES:

The objective of this Multidisciplinary Course (MDC) is to familiarize the students with various types of IPR and its relevance to the businesses and their respective streams.
CO 1: To provide students with a basic understanding of various types of IPR and its relevance for business.
CO 2: To acquaint students with the strategies and management techniques associated with intellectual property assets, and the legal considerations and challenges involved.
CO 3: To familiarize the students with the challenges and legal considerations related to intellectual property disputes.
CO 4 To develop skills related to management of intellectual property in business.

COURSE LEARNING OUTCOMES

At the end of this course, the students would be able to:
CLO1: Define and discuss about the various types of IPR and its relevance for business
CLO2: Discuss the adjudicating bodies and mechanisms under each of these IPRs
CLO3: Analyze and resolve business disputes relating to IPR
CLO4: Apply the learning to the real-life situations in business

MAPPING COURSE OBJECTIVES (COs) & COURSE LEARNING OUTCOMES(CCOs)

	COURSE LEARNING OUTCOMES (CLOs)			
COURSE OBJECTIVES (COs)	**CLO1**	**CLO2**	**CLO3**	**CLO4**
CO1	√			
CO2		√		
CO3			√	
CO4				√

Department of Library & Information Science			
Year/Semester		**Course Category**	**MDC**
Course Code	**23MDC302**	**Course Title**	**Library Information Science & Media Literacy**
Continuous Evaluation: 40		**End Semester Examination:60**	
Prerequisite: Nil		**L T P : 3 0 0**	**Credits: 3**

Course Objectives (CO) - The Course is designed with the following objectives:

CO-1:To know the library collection and their classifications.
CO-2: To discuss the library information services.
CO-3: To understand the importance of media
CO-4: To grasp the significance of motive of media

Course Learning Outcomes (CLO) – The Syllabus has been prepared in accordance with the NEP-2020. Upon completion of this course, learners will be able to:

CLO-1: Explain the library collection and their classifications.
CLO-2: Analyse the library information services.
CLO-3: Analyse the media roles.
CLO-4: Analyse the motive of media.

Mapping Matrix between Course Objectives and Course Learning Outcomes:

	CO-1	**CO-2**	**CO-3**	**CO-4**
CLO-1	√			
CLO-2		√		
CLO-3			√	
CLO-4				√

Management Process & Organizational Behaviour	
Course Code: 23MDC401	Continuous Evaluation: 40 Marks
Credits: 3	End Semester Examination: 60 Marks
Prerequisite: NIL	Course Category: Multidisciplinary

COURSE OBJECTIVES

1. To understand the functions and responsibilities of managers.
2. To acquaint the students with the fundamentals of managing business.
3. To understand individual and group behaviour at work place so as to improve theeffectiveness of an organization.
4. To analyse human behaviour in the organization setting in order to manage it inaccordance to the intentions.

COURSE LEARNING OUTCOMES

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

1. Demonstrate the roles, skills and functions of management.
2. Analyse the causes and consequences of applying different business strategies.
3. Analyse and compare individual behaviour related to motivation and rewards.
4. Identify group behaviour, leadership styles and the role of leaders in a decisionmaking process.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

Course Objectives (COs)	**Course Learning Outcomes (CLOs)**			
	CLO 1	**CLO 2**	**CLO 3**	**CLO 4**
CO 1				
CO 2				
CO 3				
CO 4				

Department of Mechanical Engineering			
Year/Semester	**1st Year/1st Semester**	**Course Category**	**Multidisciplinary Course**
Course Code	**23MDC204**	**Course Title**	**Introduction to Robotics**
Continuous Evaluation: 40		**End Semester Examination:60**	
Prerequisite: Nil		**L T P : 3 0 0**	**Credits: 3**

COURSE OBJECTIVES (CO)

1. Review of Industrial Control Devices and Circuits; Basic Ladder COgic and Control
2. Programmable COgic Controllers and Applications;
3. Robot Fundamentals; Mechanisms and Actuators, Sensors and Detectors;
4. Modeling and Control of Manipulators; Robot Applications and Programming.

COURSE LEARNING OUTCOMES (CLO) : At the end of the course, the student willbe able to

1. Explain basic concepts of Programmable logic Controller (PLC) and Industrial automation.
2. Determine basic programming languages and instructions of a PLC and Use a particularProgrammable logic Controller (PLC) for various applications.
3. Design an automated system for industrial derive to meet defined operationalspecifications.
4. Explain basic concept, type and components of Robotic system and Define the principlesand benefits of the various actuators, drives and sensors. Solve forward kinematics of anyserial robot, compute position and orientation of end effectors as a function to joint variables.

Mapping Matrix between Course Objectives and Course Learning Outcomes:

Course Objectives	CLO1	CLO2	CLO3	CLO4
CO1	**x**			
CO2		**x**		
CO3			**x**	
CO4				**x**

Department of Psychology			
Programme: B.A. (H) Psychology			
Year/Semester	Year /Semester	Course Category	MDC-
Course Code	23MDC303	Course Title	Psychology and Emotional Intelligence
Continuous Evaluation: 40		End Semester Examination: 60	
Prerequisite:		L T P : 3 0 0	Credits:3

COURSE OBJECTIVES COs

The Course is designed with the following objectives to:

- Learn the concepts of emotional intelligence and learn ways of developing it.
- Identify the different models of Emotional Intelligence
- View the expressions of perceiving emotions.
- Find the different techniques of emotional intelligence

COURSE LEARNING OUTCOMES CLOs :

After this, the students should be able to:

- Classify the concepts of emotional intelligence and learn ways of developing it.
- Demonstrate different models of Emotional Intelligence
- Recognize the expressions of perceiving emotions.
- Apply different techniques of emotional intelligence in different domains of life.

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

Course Objectives (COs)	Course Learning Outcomes (CLOs)			
	CLO 1	CLO2	CLO3	CLO4
CO1				
CO2				
CO3				
CO4				

Department of Economics			
Year/Semester		**Course Category**	**Multidisciplinary Course**
Course Code	**23MDC304**	**Course Title**	**Indian Economy**
Continuous Evaluation: 40		**End Semester Examination:60**	
Prerequisite: Nil		**L T P : 3 0 0**	**Credits: 3**

COURSE OBJECTIVES

1. To introduce about different demography terms and trends.
2. To make students familiar with growth and its distribution.
3. To discuss the major changes in agriculture sector over-time.

COURSE LEARNING OUTCOMES

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

1. review major demographic indicators
2. comprehend the concept of inequality
3. analyse agriculture sector

MAPPING BETWEEN COURSE OBJECTIVES AND COURSE LEARNING OUTCOMES

Course Objectives (COs)	**Course Learning Outcomes (CLOs)**		
	CLO 1	**CLO 2**	**CLO 3**
CO 1			
CO 2			
CO 3			

Department of Political Science			
Year/Semester	**1st Year/2nd Semester**	**Course Category**	**MDC**
Course Code	**23MDC305**	**Course Title**	**Electoral Literacy in India**
Continuous Evaluation : 40		**End Semester Examination : 60**	
Prerequisite: Nil		**L T P : 3 0 0**	**Credits: 3**

Course Objectives (CO) - The Course is designed with the following objectives:

1. To know the meaning and nature of the electoral democracy in India
2. To discuss electoral institutions in India
3. To understand the procedural aspect of elections in India
4. To grasp the significance of elections and electoral aspects of democracy, theelectoral model code of conduct, issues, and challenges in India's democracy.

Course Learning Outcomes (CLO) – The Syllabus has been prepared in accordance with the NEP-2020. Upon completion of this course, learners will be able to:

1. The student shall be able to understand the meaning, definition, and significance ofelections in India.
2. The course will help the students to analyse and understand electoral institutions, andtheir role and functions in the conduct of free and fair elections.
3. The student shall be able to know the party system of India.
4. The course will help the student understand issues and challenges in conducting freeand fair elections in India.

Mapping Matrix between Course Objectives and Course Learning Outcomes:

Course Learning Objectives (Cos)	**Course Learning Outcome (CLOs)**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
CO1					
CO2					
CO3					
CO4					

Interior Design	
Course Code: 23MDC404	**Continuous Evaluation: 40 Marks**
Credits: 3	**End Semester Examination: 60 Marks**
L T P: 3 0 0	**Course Title: Interior Decoration**
Prerequisite: NIL	

Course Objectives: -

CO 1: To explain and introduce to basics of Interior design and décor.

CO 2: To explain and inform about elements and principles of design.

CO 3: To explain the Importance of window and lightings in enhancing décor of the interiors.

CO 4: To introduce and explain about the use of furniture and accessories in Interior décor and design.

CO 5: To explain the use of different wall and floor finishes in enhancing the décor and design.

Course Outcomes: -

CLO 1: At the end of the first unit students would be able to understand the basics of Interior design and décor.

CLO 2: At the end of the Second unit students would be able to utilize elements and principles of design in décor enhancement.

CLO 3: At the end of the third unit students would be able to understand the Importance of window and lightings in enhancing décor of the interiors.

CLO 4: At the end of the fourth unit students would be able to explain and use furniture and accessories in Interior décor and design.

CLO 5: At the end of the fifth unit students would be able to use different wall and floor finishes in enhancing the décor and design

MAPPING MATRIX OF COURSE OBJECTIVES (COs') AND COURSE LEARNING OUTCOMES (CLOs)

CLO / CO	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5

CO 1					
CO 2					
CO 3					
CO 4					
CO 5					

ARDUINO BASED PROGRAMMING	
Course Code: 23MDC205	Internal Examination: -- marks
Credits: 3	External Examination: -- marks
L T P : 3 0 0	**Course Category: Multi-Disciplinary Course**
Prerequisite:	

Course Objectives (CO) - The Course is designed with the following objectives:

1. Provide students with a comprehensive understanding of the Arduino platform, its components, and its applications in various fields.
2. Introduce students to programming using the Arduino IDE, covering topics like variables, data types, control structures, functions, and basic debugging.
3. Teach students how to interface various sensors with Arduino, enabling them to gather real-world data.
4. Enable students to control output devices such as LEDs, motors, and servos using Arduino, expanding their ability to create interactive projects.
5. Guide students through the process of conceptualizing, designing, and implementing Arduino-based projects, fostering creativity and problem-solving skills.

Course Learning Outcomes (CLO) – The Syllabus has been prepared in accordance with the NEP-2020. Upon completion of this course, learners will be able to

1. Demonstrate a clear understanding of Arduino's architecture, components, and capabilities.
2. Write, upload, and debug Arduino sketches using the Arduino IDE.
3. Integrate various sensors and retrieve data from the physical world.
4. Control actuators to produce desired physical effects or actions.
5. Design and complete Arduino-based projects from ideation to implementation.

Mapping Matrix between Course Objectives and Course Learning Outcomes:

	CO1	CO2	CO3	CO4	CO5
CLO1	●				
CLO2		●			
CLO3			●		
CLO4				●	
CLO5					●

Introduction to Bioengineering

Total Contact Hours - 30 Credit: 2

Prerequisite: Nil Subject code: 23MDC203

AIM:

To engage and motivate outstanding engineering students to build their career ininterdisciplinary areas. To utilize the technologies in solving healthcare problems.

COURSE OBJECTIVES (CO):

1. To familiarize the students with the different biological concepts.
2. To impart an understanding about bioengineering.
3. To gain a better understanding of different imaging systems and AI
4. To comprehend the significance of the bioengineering application in various fields.
5.

COURSE LEARNING OUTCOMES (CLO):

1. Improve biological concepts using an engineering approach.
2. Explain the importance of biological phenomenon in bioengineering.
3. Learn to understand the different imaging system and applications of AI.
4. Able to understand the application of living organisms in various fields.

MAPPING MATRIX:

CLO's / CO's	**01**	**02**	**03**	**04**
01	✓			
02	✓	✓		
03			✓	
04				✓

Department of English			
Year/Semester		**Course Category**	**AEC**
Course Code	**23MDC101**	**Course Title**	**Functional English-I**
Continuous Evaluation : 40		**End Semester Examination : 60**	
Prerequisite: Nil		**L T P : 2 0 0**	**Credits: 2**

Course Objectives (CO) - The Course is designed with the following objectives:

1. To enhance and strength communication skills in English Language
2. To facilitate holistic and integrated development of LSRW skills - Listening, Speaking, Reading Writing abilities
3. To understand a wide range of lexical and prosodic features of the language.
4. To grasp the significance of critical reading-writing capacities and professional communication skills in the students.

Course Learning Outcomes (CLO) – The Syllabus has been prepared in accordance with the NEP-2020. Upon completion of this course, learners will be able to:

1. Demonstrate comprehensive and fluent communication in standard English – written &spoken
2. Apply the skills to engage in group discussions, debate, deliver speeches and suchothers.
3. Analyse texts on various parameters expected/demanded during different situationsand circumstances
4. Integrate the knowledge and skills to prepare basic/preliminary research documents,official documents and deliver presentations on a given topic

Mapping Matrix between Course Objectives and Course Learning Outcomes:

Course Educational Objectives (CEOs)	Course Learning Outcomes (CLOs)			
	CLO 1	CLO 2	CLO 3	CLO4
CEO 1	√			
CEO 2		√		√
CEO 3			√	√
CEO 4	√	√	√	√

Department of English			
Year/Semester		**Course Category**	**AEC**
Course Code	**23MDC201**	**Course Title**	**Functional English-II**
Continuous Evaluation : 40		**End Semester Examination : 60**	
Prerequisite: Nil		**L T P : 2 0 0**	**Credits: 2**

Course Objectives (CO) - The Course is designed with the following objectives:

1. To know the use of descriptive, narrative, and expository modes ofwriting.
2. To discuss how to recognize and correct basic grammatical errors, specificallyerrors of subject/verb agreement, verb tense, pronoun agreement, usage of prepositions and articles.
3. To grasp the significance of academic and idiomatic vocabulary.
4. To understand, read, analyze, and respond to assigned readings with anunderstanding of structure and mechanics.

Course Learning Outcomes (CLO) – The Syllabus has been prepared in accordance with the NEP-2020. Upon completion of this course, learners will be able to:

1. Illustrate the stylistic conventions of academic writing.
2. Analyse readings critically by evaluating the various contexts (social, historical, orpersonal) surrounding and underpinning each text.
3. Evaluate various texts while identifying and highlighting their main ideas andmessages
4. Develop independent perspectives and arguments via persuasive support and successful incorporation of research thus developing their own voice and creating abalance between their own voice and source summaries.
5. Assess counter arguments in order to present a more compelling argument

Mapping Matrix between Course Objectives and Course Learning Outcomes:

Course Objectives (COs)	**Course Learning Outcomes (CLOs)**				
	CLO 1	**CLO 2**	**CLO 3**	**CLO 4**	**CLO 5**
CO 1	✓				
CO 2			✓	✓	
CO 3		✓			
CO 4				✓	✓

GERMAN LANGUAGE-I	
Course Code: 23UAEC301	Continuous Evaluation: 40 Marks
Credits: 2	End Semester Examination: 60 Marks
L T P: 2 0 0	Course Type: AEC
Prerequisite: Nil	

COURSE OBJECTIVE (CO)

- To develops oral and written skills of understanding, expressing and exchanging Information/ interacting.
- To develops the ability to construct sentences and frame questions.
- To provide German language as a competitive edge in career choices.
- To know the culture of the countries where the German language is spoken.
- This may be useful in the field of employment opportunities as well as helping them to develop projects on browsing German websites

COURSE LEARNING OUTCOMES (CLO)

- After completion of this student will be able to read and write short, simple texts.
- After completion of this student will have Fluency in reading and writing.
- After completion of this student will be able understand a dialogue between two native speakers and to take part in short, simple conversations using the skills acquired.
- student will able to know the culture of the countries where the German language is spoken.
- Developing pronunciation so that they can read the text and e-mail during their employment, instructing them to write their own CV and developing a fundamental conversation with any German national.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) & COURSE LEARNING OUTCOMES (CLOs)

COURSE LEARNING OUTCOME / COURSE OBJECTIVES	CLO 01	CLO 02	CLO 03	CLO 04
CO 01	✓			
CO02		✓	✓	
CO 03			✓	
CO 04				✓

GERMAN LANGUAGE-II	
Course Code: 23UAEC401	Continuous Evaluation: 40 Marks
Credits: 2	End Semester Examination: 60 Marks
L T P: 2 0 0	Course Type: AEC
Prerequisite: Nil	

COURSE OBJECTIVE (CO)

- Students will demonstrate their ability to recognize, identify, extract and/or differentiate key information conveyed in spoken announcements, instructions, and in interactions between native speakers on familiar topics.
- Students will demonstrate effective speaking and listening skills in German on informal and some formal topics related to personal, professional, academic, and leisure activities
- To develop awareness of the nature of language and language learning

COURSE LEARNING OUTCOMES (CLO)

- After completion of this student will be able to read and write short, simple texts.
- After completion of this student will have Fluency in reading and writing.
- After completion of this student will able to use language creatively and spontaneously.
- Students will get awareness of cross-cultural and intercultural difference.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) & COURSE LEARNING OUTCOMES (CLOs)

COURSE LEARNING OUTCOME / COURSE OBJECTIVES	CLO 01	CLO 02	CLO 03	CLO 04
CO 01	✓			
CO02		✓		
CO 03			✓	
CO 04				✓

FRENCH LANGUAGE -I

Course Code: **23UAEC302**	Continuous Evaluation: **40** Marks
Credits: **2**	End Semester Examination: **60** Marks
LTP: **2 0 0**	Course Type: **AEC**
Prerequisite: **Nil**	

COURSE OBJECTIVE (CO)

1. To develop **listening, speaking, reading and writing** requisites of a language.
2. To develop the ability **to construct sentences** and **frame questions**.
3. To equip the students with **cultural elements and communication strategies** which will help them **communicate in varied situations.**
4. To familiarize the students with the **French and Francophone culture.**

COURSE LEARNING OUTCOMES (CLO)

1. After completion of this course, the student will be able **to express and interactin French** used in daily conversations.
2. The student will be able **to write short and simple texts.**
3. The student will be able to **initiate and respond to various situations** using French language skills.
4. The student can **understand and respond** effectively to the cultural elements ofthe French and Francophone culture

MAPPING MATRIX OF COURSE OBJECTIVES (COs) & COURSELEARNING OUTCOMES (CLOs)

COURSE OBJECTIVES	**Course Learning Outcome**			
	CLO 01	CLO 02	CLO 03	CLO 04
CO 01	✓			
CO02		✓	✓	
CO 03			✓	
CO 04				✓

FRENCH LANGUAGE-II

Course Code: **23UAEC402**	Continuous Evaluation: **40** Marks
Credits: **2**	End Semester Examination: **60** Marks
LTP: **2 0 0**	Course Type: **AEC**
Prerequisite: **23UAEC302**	

COURSE OBJECTIVE (CO)

1. To develop **listening, speaking, reading and writing** requisites of a language.
2. To develop the ability **to construct sentences** and **frame questions**.
3. To equip the students with **cultural elements and communication strategies** which will help them **communicate in varied situations.**
4. To familiarize the students with the **French and Francophone culture.**

COURSE LEARNING OUTCOMES (CLO)

1. After completion of this course, the student will be able **to express andinteract in French** used in daily conversations.
2. The student will be able **to write short and simple texts.**
3. The student will be able to **initiate and respond to various situations** using French language skills.
4. The student can **understand and respond** effectively to the cultural elements of the French and Francophone culture.

MAPPING MATRIX OF COURSE OBJECTIVES (COs) &COURSE LEARNING OUTCOMES (CLOs)

COURSE OBJECTIVES	Course Learning Outcome			
	CLO 01	CLO 02	CLO 03	CLO 04
CO 01	✓			
CO02		✓	✓	
CO 03			✓	
CO 04				✓

DEPARTMENT OF LAW			
Programme: Undergraduate program			
Year/Semester		**Course Category**	**Value Added Course (VAC)**
Course Code	**23VAC102**	**Course Title**	**Indian Constitution & Polity**
Continuous Evaluation: 30		**End Semester Examination: 70**	
Prerequisite: Nil		**L T P : 2 0 0**	**Credits: 2**

Course Objectives (CO) - The Course is designed with the following objectives:

1. To acquaint the students with the fundamental concepts of democracy, diversityand the Constitution.
2. To make students understand the functioning of the three wings of the State
3. To make the students appreciate the purpose of decentralised administrationunder the Constitution and its functioning
4. To make students analyse and discuss various rights and duties under theConstitution of India

Course Learning Outcomes (CLO) – At the end of this course, the learners are expected to:

1. Explain the concept of democracy, diversity and the Constitutional Values
2. Describe the functioning of the three wings of the State
3. Sketch the functioning of decentralised administration under the Constitution ofIndia and appreciate the political dimensions.
4. Examine the scope of various rights and duties under the Constitution of India.

MAPPING COURSE OBJECTIVES (COs) & COURSE LEARNING OUTCOMES(CLOs)

	COURSE LEARNING OUTCOMES (CLOs)			
COURSE OBJECTIVES (COs)	**CLO1**	**CLO2**	**CLO3**	**CLO4**
CO1	√			
CO2		√		
CO3			√	
CO4				√

Department of Environmental Sciences			
Programme: Undergraduate program			
Year/Semester	**1ST/I or II**	**Course Category**	**Value Added Course (VAC)**
Course Code	**23VAC101**	**Course Title**	Environmental Protection & Sustainable development
Continuous Evaluation: 30		**End Semester Examination: 70**	
Prerequisite: Nil		**L T P : 2 0 0**	**Credits: 2**

Course Objectives (CO) - The Course is designed with the following objectives:

5. To provide a comprehensive understanding of the relationship between humans andthe environment.
6. Aims to introduce students to the different components of the environment.
7. To develop the understanding of pollution, its causes, and their effects
8. To gain the knowledge of climate change and the contemporary issues

Course Learning Outcomes (CLO) – The Syllabus has been prepared in accordance with the NEP-2020 and based on the UGC curriculum framework. Upon completion of this course, learners will be able to:

10. Demonstrate to safeguard the Earth's environment and its resources.
11. Explain sustainable development, its goals, challenges, and global strategies.
12. Analyse the environmental pollution and sensitize themselves to adverse health impactsof pollution.
13. Appraise the concept of climate change, its science and response measures.

MAPPING COURSE OBJECTIVES (COs) & COURSE LEARNING OUTCOMES(CLOs)

	COURSE LEARNING OUTCOMES (CLOs)			
COURSE OBJECTIVES (COs)	**CLO1**	**CLO2**	**CLO3**	**CLO4**
CO1	√			
CO2		√		
CO3			√	
CO4				√

Department of Physical Education & Sports			
Programme: Undergraduate program			
Year/Semester		**Course Category**	**Value Added Course (VAC)**
Course Code	**23VAC103**	**Course Title**	Sports, Yoga & Fitness
Continuous Evaluation: 80		**End Semester Examination: 20**	
Prerequisite: Nil		**L T P : 0 0. 4**	**Credits: 2**

Course Objectives (CO) - The Course is designed with the following objectives:

1. To know about the physical body
2. To discuss about improve range of motion, mobility and coordination in body
3. To understand the ways to improve strength, balance and flexibility.
4. To grasp the significance of yoga and sports in fitness
5. To construct environment for individual and community health.

Course Learning Outcomes (CLO)–The Syllabus has been prepared in accordance with the NEP-2020. Upon completion of this course, learners will be able to :**(BLOOM'S TEXONOMY)**

1. Explain the role of yoga and fitness in life.
2. Apply the rules of healthy and fit life
3. Analyse the ways and methods of yoga and sports
4. Recommend the practices of Asanas and different sports
5. Integrate the concept of yoga and sports in all round development of students andbeings.

Mapping Matrix between Course Objectives and Course Learning Outcomes: COURSE CONTENTS:

	COURSE LEARNING OUTCOMES (CLOs)				
COURSE OBJECTIVES (COs)	**CLO1**	**CLO2**	**CO3**	**CLO4**	**CLO5**

CO1	√				
CO2		√			
CO3			√		
CO4				√	
CO5					√