



Barrackpore Rastraguru Surendranath College

Teaching Plan

Department of Food and Nutrition

2022-23

NAME OF THE PROGRAMME

B.Sc. (H) Food and Nutrition

PROGRAMME OUTCOME

The course of B.Sc. (H) Food and Nutrition in Choice Based Credit System would be of 3 year duration having 6 semesters, divided into 14 Core papers, 4 Discipline Specific Elective courses, 2 Skill Enhancement Elective Courses and 4 Generic Elective Courses. Each Year would consist of 2 semesters. The programme outcomes are as follows-

- Development of knowledge of various areas related to Food Science and Dietetics
- Understand food composition and its physicochemical nutritional, microbiological and biochemical aspects
- Know about the spoilage, processing and preservation techniques of pulses, oilseeds, spices, fruits and vegetables, meat, fish, poultry, milk & milk products
- Understand the importance of community nutrition, therapeutic nutrition, public health, food safety, food quality, food laws and regulations.
- Know the importance and requirements of nutrition during various stages of life.
- Development of knowledge regarding etiology and management of nutritional disorders from nutritional deficiency.
- Introduction of skill development techniques and training in food and nutrition

Notes:

You can merge cells in between and add students' seminars and class tests / internal assessment.

For incorporating PO / CO at UG level, you may refer to your WBSU CBCS syllabus.

If not there you can refer to the UGC model syllabus

https://www.ugc.ac.in/ugc_notices.aspx?id=MTA3Nw==

Semester		I			
Course Title	HUMAN NUTRITION (Theory)				
Course Code	FNTACOR01T	Credit	4		
Course Outcome	<ul style="list-style-type: none"> • Students can develop knowledge regarding various areas related to Food Science. • Enable the students to understand food composition, nutritional aspects of different food commodities, functions of foods, definition of Health and Malnutrition, • Know the cooking methods and the process of digestion and absorption of nutrients in human body. 				
Scheme of Instruction					
Total Duration	60hrs	Class/Week	4	Hours/week	4hrs
Instruction Mode	Black board and chalk, ICT,				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1	Introduction to Food and Nutrition			10	
2	Foods, Nutrients and cooking of food			10	

3	Food energy and energy requirements	15
4	Digestion of Foods	25

Semester		I			
Course Title	HUMAN NUTRITION (Practical)				
Course Code	FNTACOR01P	Credit	2		
Course Outcome	<ul style="list-style-type: none"> • Students can prepare foods by using different methods of cooking. • They can develop the knowledge regarding eye estimation of raw foods. • They can prepare supplementary foods and low cost diet for different age groups and malnourished child respectively. 				
Scheme of Instruction					
Total Duration	60hrs	Class/Week	4	Hours/week	4hrs
Instruction Mode	Demonstration, Hands-on practice				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1	Process involved in cooking, microwave, steaming, grilling, deep fat frying.			12	
2	General concepts of weights and measures, Eye estimation of raw cooked foods			08	
3	Preparation of food from different food groups and their significance in relation to health			12	

4	Preparation of supplementary food from different age group and their nutritional significance	16
5	Planning and preparation of low cost diet for Grade I and Grade II malnourished child.	12
Semester		I
Course Title	PHYSIOLOGY IN NUTRITION (Theory)	
Course Code	FNTACOR02T	Credit 4
Course Outcome	Students can acquire knowledge regarding the <ul style="list-style-type: none"> • basic concept of cellular structure and • function related to system physiology including blood and body fluids, cardio vascular system, respiratory system and renal physiology. 	
Scheme of Instruction		
Total Duration	60hrs	Class/Week 4 Hours/week 4hrs
Instruction Mode	Black board and chalk, ICT	
Scheme of Examination		
Maximum Score	50	Internal 10 End Semester 40
Course Mapping		
Units	Course Content	Lecture Hour (Cumulative)
1	Unit of Life: Cell and Tissue Structure	12
2	Blood and body fluids	12

3	Cardiovascular system	12
4	Respiratory system	12
5	Renal Physiology, skin and body temperature	12
Semester		I
Course Title	PHYSIOLOGY IN NUTRITION (Practical)	
Course Code	FNTACOR02P	Credit 2
Course Outcome	Students can perform different experiment to measure different parameters related to human Physiology.	
Scheme of Instruction		
Total Duration	60	Class/Week 4 Hours/week 4hrs
Instruction Mode	Model, Demonstration, Hands-on practice	
Scheme of Examination		
Maximum Score	25	Internal 15 End Semester 10
Course Mapping		
Units	Course Content	Lecture Hour (Cumulative)
1	Determination of pulse rate in Resting condition and after exercise (30 beats/10 beats method)	08
2	Determination of blood pressure by Sphygmomanometer (Auscultatory method).	08
3	Interpretation of normal ECG curve with 6 chest leads.	12

4	Measurement of Peak Expiratory flow rate.(By spirometer)	08
5	Determination of Bleeding Time (BT) and Clotting Time (CT).	08
6	Detection of Blood group (Slide method)	04
7.	Measurement of Haemoglobin level (Sahli's or Drabkin method)	12

Semester		II			
Course Title	FOOD CHEMISTRY, BIOPHYSICS AND BIOCHEMICAL PRINCIPLES (Theory)				
Course Code	FNTACOR03T	Credit	4		
Course Outcome	They can acquire the basic concept of physical and chemical properties of different macronutrients (carbohydrate, lipid and protein) and water along with different physicochemical principle and enzyme kinetics.				
Scheme of Instruction					
Total Duration	60	Class/Week	4	Hours/week	4
Instruction Mode	Black board and chalk, ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					

Units	Course Content	Lecture Hour (Cumulative)
1	Proteins and Amino acids.	10
2	Carbohydrate Chemistry	12
3	Lipid Chemistry	10
4	Water	6
5	Physicochemical principles	18
6	Enzymes	4

Semester		II			
Course Title	FOOD CHEMISTRY, BIOPHYSICS AND BIOCHEMICAL PRINCIPLES (Practical)				
Course Code	FNTACOR03P	Credit	2		
Course Outcome	Students can perform different qualitative and quantitative biochemical test.				
Scheme of Instruction					
Total Duration	60	Class/Week	4	Hours/week	4
Instruction Mode	Demonstration, Hands-on practice				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					

Units	Course Content	Lecture Hour (Cumulative)
1	Qualitative tests for the identification of: Glucose, Galactose, Fructose, Sucrose, Lactose, Starch, and Dextrin.	12
2	Glucose estimation in blood.	04
3	Qualitative tests for the identification of - Albumin, Gelatin, Peptone, urea, uric acid.	12
4	Protein estimation by Biuret and Lowry methods.	08
5	Estimation of urea and uric acid in blood.	08
6	Determination of acid value of oils by titrimetric method	04
7	Determination of osmotic pressure of colloidal solutions.	08
8	Determination of specific gravity of liquid (fruit juice, blood).	04

Semester		II	
Course Title	HUMAN PHYSIOLOGY (Theory)		
Course Code	FNTACOR04T	Credit	4
Course Outcome	Students can acquire knowledge regarding basic concept of system physiology including excitable cell, nervous system, reproductive		

	and endocrine system.				
Scheme of Instruction					
Total Duration	60	Class/Week	4	Hours/week	4
Instruction Mode	Black board and chalk, ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1	Physiology of excitable cells			15	
2	Nervous System			15	
3	Reproductive system			15	
4	Endocrine system			15	

Semester		II			
Course Title	HUMAN PHYSIOLOGY (Practical)				
Course Code	FNTACOR04P	Credit	2		
Course Outcome	Students can identify different tissue section (mammalian) and can perform qualitative determination of glucose in blood and urine, total count and differential count. They can also perform different visual test.				
Scheme of Instruction					
Total Duration	60hrs	Class/Week	4	Hours/week	4
Instruction Mode	Demonstration, Histological slides, Hands-on practice				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1	Test for Visual acuity, Colour vision.			08	
2	Identification with reasons of histological slides (Lung, Liver, Kidney, Small intestine, Stomach, Thyroid, Adrenal, Pancreas, Testis, Ovary and Muscle of mammals)			28	
3	Qualitative determination of glucose in blood or			12	

	urine.				
4	Total count (TC) and Differential count (DC)		12		
Semester			III		
Course Title	NUTRIENTS METABOLISM THEORY				
Course Code	FNTACOR05T	Credit	04		
Course Outcome	<ul style="list-style-type: none"> • Students are able to understand the different pathways of metabolism and their nutritional importance in human health. • They become aware of the role of nutrients on different pathways of metabolism 				
Scheme of Instruction					
Total Duration	60 hrs	Class/Week	04	Hours/week	04
Instruction Mode	BLACK BOARD & ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Carbohydrate metabolism			14	
2.	Lipid metabolism			12	

3.	Amino acid metabolism	08
4.	Biological oxidation	04
5.	Nucleic acid metabolism	08
6.	Vitamins	10
7.	Mineral metabolism	08

Semester		III	
Course Title	NUTRIENTS METABOLISM PRACTICAL		
Course Code	FNTACOR05P	Credit	02
Course Outcome	Students can perform the estimation of vitamin c, calcium, other minerals and also nucleic acid estimation in given sample.		
Scheme of Instruction			
Total Duration	60	Class/Week	04
		Hours/week	04
Instruction Mode	Laboratory based demonstration, Hands-on practice		
Scheme of Examination			

Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Estimation of vitamin c in citrus fruits			12	
2.	Estimation of calcium in blood and drinking water (using kit)			12	
3.	Estimation of sodium and potassium in blood (using kit)			12	
4.	Estimation of iron in vegetables by spectrophotometry			12	
5.	Estimation of dna and rna in tissues by spectrophotometry			12	

Semester			III
Course Title	NUTRITION THROUGH LIFE SPAN THEORY		
Course Code	FNTACOR06T	Credit	04

Course Outcome	<ul style="list-style-type: none"> • Students can understand the RDA of different nutrients at different age and sex group as well as in different physiological condition • Students can understand the nutritional problems as well as the preventive strategies at different age and sex group as well as in different physiological condition • They can prepare menu in different physiological condition based on the RDA. 				
Scheme of Instruction					
Total Duration	60	Class/Week	04	Hours/week	04
Instruction Mode	BLACK BOARD & ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Basics of meal planning			04	
2.	Nutrients in adults and elderly			08	
3.	Nutrition during pregnancy			13	
4.	Nutrition during lactation			10	

5.	Nutrition during infancy	15
6.	Nutrition for children and adolescents	10

Semester		III			
Course Title	NUTRITION THROUGH LIFE SPAN PRACTICAL				
Course Code	FNTACOR06P	Credit	02		
Course Outcome	Hands on learning on meal planning and calculation of nutrients based on RDA for different age and sex groups as well as for different physiological states .				
Scheme of Instruction					
Total Duration	60	Class/Week	04	Hours/week	04
Instruction Mode	Black board and laboratory based Demonstration, Hands-on practice				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Meal planning and preparation of adequate meal for different age groups			60	

	with reference to different physiological conditions.	
--	---	--

Semester		III	
Course Title	ELEMENTARY DIETETICS AND MENU PLANNING THEORY		
Course Code	FNTACOR07T	Credit	04
Course Outcome	<ul style="list-style-type: none"> • Students can understand the basics of diet therapy & therapeutic nutrition in detail • They are able to know the different types of dietary modifications and dietary guidelines throughout the life span • They can develop the knowledge on different food groups. 		
Scheme of Instruction			

Total Duration	60	Class/Week	04	Hours/week	04
Instruction Mode	BLACK BOARD & ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Dietetics and dietician			04	
2.	Food groups			13	
3.	Dietary guidelines			06	
4.	Menu planning			10	
5.	Basics of diet therapy			15	
6.	Diet for health care			05	
7.	Routine hospital diet			07	

Semester			III		
Course Title	ELEMENTARY DIETETICS AND MENU PLANNING PRACTICAL				
Course Code	FNTACOR07P	Credit	04		

Course Outcome	Hands on learning on preparation of different diets and their indication of use along with the nutritional analyses.				
Scheme of Instruction					
Total Duration	60	Class/Week	04	Hours/week	04
Instruction Mode	Laboratory based Demonstration, Hands-on practice				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Planning and preparation of normal diet			15	
2.	Planning and preparation of different fluid diets			15	
3.	Planning and preparation of different soft/ semi solid diets			15	
4.	Planning and preparation of different nutrient modified diet			15	

Semester		III			
Course Title	SEC-INSTRUMENTATION				
Course Code	FNTSSEC01M	Credit	02		
Course Outcome	Students can understand the basics of instrumentation their principles, mechanism and applications.				
Scheme of Instruction					
Total Duration	30	Class/Week	02	Hours/week	02
Instruction Mode	Demonstration , Black Board & ICT				
Scheme of Examination					
Maximum Score	25	Internal	NIL	End Semester	25
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Microscopy			04	
2.	Chromatography			07	

3.	Spectrophotometry	07
4.	Electrophoresis	03
5.	Centrifugation	07
6.	ECG and EEG	01
7.	ELISA	01

Semester		IV	
Course Title	COMMUNITY NUTRITION THEORY		
Course Code	FNTACOR08T	Credit	04
Course Outcome	<ul style="list-style-type: none"> • Students can able to understand the basics of a community and community health. • They can understand different techniques to assess the nutritional status of a community • They become aware of the clinical manifestations of different deficiency disorders • They know different International, national, regional agencies and organizations in relation to nutrition along with the 		

	National nutritional intervention programmes to combat malnutrition in our community as a whole.				
Scheme of Instruction					
Total Duration	60 hrs	Class/Week	04	Hours/week	04
Instruction Mode	BLACK BOARD & ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Concept of community			06	
2.	Nutritional assessment and surveillance			06	
3.	Assessment methods for human			10	
4.	Diet survey			12	
5.	Clinical signs			08	
6.	Nutritional anthropometry			06	
7.	Agencies and programmes			12	

Semester	IV
-----------------	-----------

Course Title	COMMUNITY NUTRITION PRACTICAL				
Course Code	FNTACOR08P	Credit	02		
Course Outcome	Students can able to assess nutritional status of a community by using ABCD method				
Scheme of Instruction					
Total Duration	60	Class/Week	04	Hours/week	04
Instruction Mode	Laboratory based demonstration and Hands on practice, field visit				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Anthropometric measurement of infant			12	
2.	Comparison with norms and interpretation of the nutritional assessment data and significance			12	
3.	Growth charts			08	
4.	Clinical assessment and signs of nutrient deficiencies			16	
5.	Estimation of food and nutrient intake			12	

Semester		IV			
Course Title	EPIDEMIOLOGY AND PUBLIC HEALTH THEORY				
Course Code	FNTACOR09T	Credit	04		
Course Outcome	<ul style="list-style-type: none"> • By understanding the concept & principles of public health and epidemiology students gather knowledge about basic parameters of health, its dimension, determinants, indicators and measurements of health. • They learn about basics in epidemiology and its types and uses in detail. • They acquire knowledge regarding the epidemiology of different communicable and non communicable diseases along with their prevention and control. • They understand effect of different types of pollution in a community – air, water , waste and their management techniques • They know different community health care services 				
Scheme of Instruction					
Total Duration	60	Class/Week	04	Hours/week	04
Instruction Mode	BLACK BOARD & ICT				
Scheme of Examination					

Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Introduction on health			06	
2.	Data of community health			06	
3.	Epidemiology			10	
4.	Disease : prevention and control			12	
5.	Public health			02	
6.	Immunization			07	
7.	Community health care			05	
8.	Community water management			06	
9.	Community waste management			02	
10.	Air pollution			04	

Semester		IV	
Course Title	EPIDEMIOLOGY AND PUBLIC HEALTH PRACTICAL		
Course Code	FNTACOR09P	Credit	02
Course Outcome	<ul style="list-style-type: none"> Developing the concept of presentation by using AV 		

	aids				
	<ul style="list-style-type: none"> • Formulation of low cost nutritious food products 				
Scheme of Instruction					
Total Duration	60	Class/Week	04	Hours/week	04
Instruction Mode	Demonstration, charts, posters and models				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Preparation of 3 audio visual aids like charts, posters, models related to health and nutrition education.			25	
2.	Formulation and preparation of low cost and nutrition supplementary recipe			20	
3.	Field visit			15	

Semester			IV		
Course Title	DIET THERAPY FOR LIFE STYLE DISORDERS(THEORY)				
Course Code	FNTACOR10T	Credit	04		
Course Outcome	Students are being able to gather knowledge regarding different life style disorders, metabolic disorders, respiratory diseases as well as degenerative diseases in detail with special emphasis on their pathogenesis and dietary modifications.				
Scheme of Instruction					
Total Duration	60	Class/Week	04	Hours/week	04
Instruction Mode	BLACK BOARD & ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Life style disorder			04	
2.	Diebetes mellitus			08	
3.	Cardiovascular disease			08	

4.	Weight management	12
5.	Nutritional management of metabolic disorder	08
6.	Nutrition and respiratory health	06
7.	Nutritional management in cancer	08
8.	Arthritis and osteoporosis	06

Semester		IV			
Course Title	DIET THERAPY AND LIFESTYLE DISORDER PRACTICAL				
Course Code	FNTACOR10P	Credit	04		
Course Outcome	Students can able to Plan and prepare diet chart for different life style disorders commonly found in society.				
Scheme of Instruction					
Total Duration	60	Class/Week	04	Hours/week	04
Instruction Mode	Laboratory based Demonstration, Hands-on practice				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10

Course Mapping		
Units	Course Content	Lecture Hour (Cumulative)
1.	PLANNING AND PREPARATION OF DIET FOR DIFFERENT DISEASE	60
i.	Obesity and Underweight	12
ii.	Diabetes mellitus	10
iii.	Hypertension and Atherosclerosis	16
iv.	Overweight and Underweight	08
v.	Gout	08
vi.	Osteoporosis	06

Semester		III	
Course Title	SEC: FIELD STUDY IN CLINICAL / COMMUNITY SETTING		
Course Code	FNTSSEC02M	Credit	02

Course Outcome	<ul style="list-style-type: none"> • Students can able to assess nutritional status of a given population of a community and prepare report based on the findings • They can able to prepare visual aids like chart, poster or model on nutrition related disorders 				
Scheme of Instruction					
Total Duration	30	Class/Week	02	Hours/week	02
Instruction Mode	Demonstration and Hands on practice				
Scheme of Examination					
Maximum Score	25	Internal	NIL	End Semester	25
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	THEORY: Introduction to clinical nutrition, clinical conditions requiring dietary intervention, role of dietitian in hospitals/clinics, staff training, RDA –requirements, procedure, functioning.			10	

2.	<p>PRACTICAL- ONE VISIT / INTERNSHIP&PREPARATION OF VISUAL AIDS</p> <p>(Visit to an ICDS centre</p> <p>Visit to health centre</p> <p>Visit to NGO</p> <p>Visit to old age home</p> <p>Internship)</p>	20
----	---	----

Semester		V	
Course Title	CLINICAL NUTRITION AND DIET FOR SPECIAL SITUATION IN LIFE (THEORY)		
Course Code	FNTACOR11T	Credit	4
Course Outcome	<p>Students can able-</p> <ul style="list-style-type: none"> • to understand the importance of nutrition for treating diseases. • to gain knowledge about the various causative factors of different diseases along with associated dietary principles. • to learn the association of food and nutrition with the prevention of different diseases. 		
Scheme of Instruction			

Total Duration	60	Class/Week	4	Hours/week	4
Instruction Mode	BLACK BOARD AND ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Nutritional management of physiological stress			4	
2.	Dietary modification in febrile condition			5	
3.	Nutritional management of gi diseases			14	
4.	Malabsorption syndrome			4	
5.	Diseases of gallbladder and pancreas			4	
6.	Liver diseases			8	
7.	Nutrition management of renal diseases			8	
8.	Nutritional management in allergy			5	
9.	Neurological diseases			3	

Semester	V
-----------------	----------

Course Title	CLINICAL NUTRITION AND DIET FOR SPECIAL SITUATION IN LIFE (PRACTICAL)				
Course Code	FNTACOR11P	Credit	2		
Course Outcome	Students can able- <ul style="list-style-type: none"> • to know the application of dietary principles to prepare suitable therapeutic diets for patients. • to learn the calculation of different macro and micronutrients present in the food. 				
Scheme of Instruction					
Total Duration	60	Class/Week	4	Hours/week	4
Instruction Mode	Laboratory based Demonstration, Hands-on practice				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Planning and preparation of diets for the following diseases-			60	
i.	Peptic Ulcer			15	
ii.	Viral Hepatitis			15	
iii.	Fever			10	
iv.	Acute And Chronic Renal Failure			20	

Semester		V			
Course Title	FOOD MICROBIOLOGY AND IMMUNOLOGY (THEORY)				
Course Code	FNTACOR12T	Credit	4		
Course Outcome	<p>Students can able-</p> <ul style="list-style-type: none"> • to know about different microbes and their growth curves. • to understand spoilage microbial food, microbiology of foods and food fermentation. • to learn about the entire immune system of our body. 				
Scheme of Instruction					
Total Duration	60	Class/Week	4	Hours/week	4
Instruction Mode	BLACK BOARD AND ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					

Units	Course Content	Lecture Hour (Cumulative)
1.	General introduction to microbes(bacteria, fungus and algae)	5
2.	Growth kinetics of bacteria	6
3.	Microbiology of food	8
4.	Microbial food spoilage	10
5.	Food fermentation	10
6.	Immune system	20

Semester		V	
Course Title	FOOD MICROBIOLOGY AND IMMUNOLOGY (PRACTICAL)		
Course Code	FNTACOR12P	Credit	4
Course Outcome	Students can able- <ul style="list-style-type: none"> To understand the usage of different equipment like 		

	<p>compound microscope, autoclave, incubation chamber etc.</p> <ul style="list-style-type: none"> To learn about the preparation of growth media, identification of bacteria by gram staining and water analysis by MPN method. 				
Scheme of Instruction					
Total Duration	60	Class/Week	4	Hours/week	4
Instruction Mode	Laboratory based Demonstration, Hands-on practice				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content				Lecture Hour (Cumulative)
1.	Introduction to microbiology: use of equipment. Understanding and use of compound microscope, use of autoclave, use of incubator and inoculation chamber				04
2.	Preparation of different types of media (complex, differential and selective)				08
3.	Preparation of slants, stabs and plates using nutrient agar				04
4.	Morphological study of bacteria and fungi using permanent slides.				12
5.	Gram staining				16

6.	Bacteriological analysis of water by MPN method	12
7.	Ouchterlony double diffusion test in agar-gel	04

Semester		V			
Course Title	SPORTS NUTRITION (THEORY)				
Course Code	FNTDSE01T	Credit	4		
Course Outcome	Students can able- <ul style="list-style-type: none"> • To understand the relation between sports and nutrition. • To know about the nutritional assessment of sports persons. • To understand the importance of carbohydrates, proteins, fats, vitamins, minerals and water for any kind of sports activities. 				
Scheme of Instruction					
Total Duration	60	Class/Week	4	Hours/week	4
Instruction Mode	BLACK BOARD AND ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Introduction			6	
2.	Activities			6	

3.	Carbohydrate needs	8
4.	Fat needs	6
5.	Protein needs	6
6.	Micronutrients needs	6
7.	Fluid needs	4
8.	Nutritional guidelines for different sports	8
9.	Management of selected nutritional problems among sportspersons	6
10.	Dietary supplements	4

Semester		V	
Course Title	SPORTS NUTRITION (PRACTICAL)		
Course Code	FNTADSE01P	Credit	2
Course Outcome	<p>Students can able-</p> <ul style="list-style-type: none"> • To learn how to calculate the nutritional requirements for sports persons. • To gain knowledge about the nutritional assessment of sports persons. • To know about various ergogenic supplements available in the market. 		

Scheme of Instruction					
Total Duration	60	Class/Week	4	Hours/week	4
Instruction Mode	Laboratory based Demonstration, Hands-on practice				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Calculation of energy requirement according to physical activity level of sports person.			20	
2.	Nutritional assessment of athletes.			20	
3.	Review on ergogenic nutritional products and supplements available in market.			20	

Semester	V
Course Title	FOOD BORNE DISEASES AND FOOD TOXICOLOGY

	(THEORY)				
Course Code	FNTADSE03T	Credit	4		
Course Outcome	By this course students are able to know- <ul style="list-style-type: none"> • different types of Food borne diseases, their mode of action, prevention and control • importance of food safety and its management • toxic constituents in food and their effects on human health • different aspects of hygiene and sanitation • types of hazards and lactose intolerance in detail 				
Scheme of Instruction					
Total Duration	60 HOURS	Class/Week	4	Hours/week	4
Instruction Mode	BLACK BOARD & ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1	Food borne diseases			15	
2	Lactose intolerance			03	
3	Mechanism of food borne diseases			06	
4	Food safety			10	
5	Hygiene and sanitation			09	

6	Food safety management	07
7	Toxic agents in food.	10

Semester		V			
Course Title	FOOD BORNE DISEASES AND FOOD TOXICOLOGY (PRACTICAL)				
Course Code	FNTADSE03P	Credit	2		
Course Outcome	<p>By this course students are able to</p> <ul style="list-style-type: none"> • do different assessment tests used in assessing the surface sanitation, personal hygiene, physico chemical properties of waste water as well as the testing of sanitizers and disinfectants • isolate bacteria from rotten food bread and vegetables • map out the design for various food processing systems , cold storage and ware house etc. • prepare report based on the field visit to enrich their pravgical experiences 				
Scheme of Instruction					
Total Duration	60 HOURS	Class/Week	4	Hours/week	4
Instruction Mode	Laboratory based Demonstration, Hands-on practice				
Scheme of Examination					

Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content				Lecture Hour (Cumulative)
1	Assessment of surface sanitation by swab and rinse method.				06
2	Assessment of personal hygiene.				04
3	Designing of various food processing systems and food service areas.				06
4	Design and layout of cold storage and ware house.				06
5	Assessment of physico chemical properties of waste water				06
6	Isolation and enumeration of bacteria from rotten food bread and vegetables				08
7	Testing of sanitizers and disinfectants				06
8	Study of phenol coefficient of sanitizers.				06
9	Visit to Food industry and preparation of report.				12

Semester		VI	
Course Title	FOOD PROCESSING AND FOOD TECHNOLOGY(THEORY)		
Course Code	FNTACOR13T	Credit	4
Course Outcome	By this course students are able to know- <ul style="list-style-type: none"> • storage, contamination and spoilage of different types of 		

	foods <ul style="list-style-type: none"> • different kinds of food preservation techniques along with their impact on nutritional quality • Food Standards and Laws & Food Adulteration in detail • different kinds of food packaging and labeling laws 				
Scheme of Instruction					
Total Duration	60 HOURS	Class/Week	4	Hours/week	4
Instruction Mode	BLACK BOARD & ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1	Food Storage and Spoilage			10	
2	Food preservation			12	
3	Preserved Products			13	
4	Food Standards and Food Laws			15	
5	Food Adulteration			05	
6	Food Packaging			05	

Semester		VI			
Course Title	FOOD PROCESSING AND FOOD TECHNOLOGY(PRACTICAL)				
Course Code	FNTACOR13P	Credit	2		
Course Outcome	By this course students are able to - <ul style="list-style-type: none"> • know different food preservation and standardization processes • prepare jam, jelly, pickles , beverages and fermented products • detect adulterants in common Food Stuffs • develop an experience in food industry visit 				
Scheme of Instruction					
Total Duration	60 HOURS	Class/Week	4	Hours/week	4
Instruction Mode	Laboratory based Demonstration, Hands-on practice				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1	Study on Blanching and Browning Process			02	

2	Preparation of Fruit preserves(Jam, Jelly).	08
3	Preparation of vegetable preserves.(Pickles)	06
4	Dehydrated Products – tray drying, sun drying etc.	06
5	Tomato Processing.	08
6	Fruit Pulping/Juice/Beverages production.	06
7	Preparation and Standardization of Traditional Indian Fermented Food.	06
8	Visit to Food Processing and Preservation unit.	12
9	Detection of Adulterants in common Food Stuffs like Milk, Oil, Laddu, Turmeric etc.	06

Semester		VI	
Course Title	RESEARCH METHODOLOGY AND BIOSTATISTICS (THEORY)		
Course Code	FNTACOR14T	Credit	4
Course Outcome	<p>By this course students are able to know-</p> <ul style="list-style-type: none"> • basics in research methodology including research design and problem identification • different study design and their utility in research • different sampling techniques and data analysis in terms of both qualitative and quantitative data and graphical representation • how to write report including their types and significance 		

Scheme of Instruction					
Total Duration	60 HOURS	Class/Week	4	Hours/week	4
Instruction Mode	BLACK BOARD & ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1	Research Methodology			05	
2	Research problem			10	
3	Study design			15	
4	Sampling of data and analysis			15	
5	Preparation of report			15	

Semester	VI
Course Title	RESEARCH METHODOLOGY AND BIostatISTICS

	(PRACTICAL)				
Course Code	FNTACOR14P	Credit	2		
Course Outcome	By this course students are able to do the basic statistical analysis of any given data.				
Scheme of Instruction					
Total Duration	60 HOURS	Class/Week	4	Hours/week	4
Instruction Mode	Laboratory based Demonstration, Hands-on practice				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1	Assignment for calculation of the following with provided data.			60	
	• Mean			08	
	• Median			08	
	• Mode			08	
	• Standard Deviation			16	
	• Standard Error Of Mean and			02	
	• Students' 'T' Test			18	

Semester		VI	
Course Title	FOOD & BEVERAGE MANAGEMENT (THEORY)		
Course Code	FNTADSE04T	Credit	4
Course Outcome	<p>By this course students are able to know-</p> <ul style="list-style-type: none"> • details of any food service system- how it can be formed and how it will work, recruitments, selection, induction, qualities of staffs and safety in work etc. • different forms of food services and the influencing factors including pricing, revenue control etc. • different food production process including methods of cooking , standardization of recipes in detail • different types of menu planning as well as the utility of portion control, purchase and storage in food service establishment • importance of hygiene & sanitation in any food service system 		

Scheme of Instruction					
Total Duration	60 HOURS	Class/Week	4	Hours/week	4
Instruction Mode	BLACK BOARD & ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1	Introduction to Food Service			10	
2	Food Production & Menu Planning			20	
3	Resources of food service establishments			20	
4	Personnel Management			10	

Semester		VI	
Course Title	FOOD & BEVERAGE MANAGEMENT (PRACTICAL)		
Course Code	FNTADSE04P	Credit	2
Course Outcome	By this course students are able to do- Planning of A Food Service system and identifying clientele, menu, operations and delivery system		

Scheme of Instruction					
Total Duration	60 HOURS	Class/Week	4	Hours/week	4
Instruction Mode	Laboratory based Demonstration, Hands-on practice				
Scheme of Examination					
Maximum Score	25	Internal	15	End Semester	10
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
	Planning the set up of a Food Service System			60	
	a) Identifying resources			10	
	b) Developing Project plan			15	
	c) Determining investments			15	
	d) Project Proposal.			20	

Semester		VI			
Course Title	DAIRY TECHNOLOGY (THEORY)				
Course Code	FNTADSE05T	Credit	4		
Course Outcome	Students will be able to <ul style="list-style-type: none"> • understand about the basic properties of milk and about its various components in detail. • know about different milk products and their market value. 				
Scheme of Instruction					
Total Duration	60	Class/Week	4	Hours/week	4
Instruction Mode	BLACK BOARD AND ICT				
Scheme of Examination					
Maximum Score	50	Internal	10	End Semester	40
Course Mapping					
Units	Course Content			Lecture Hour (Cumulative)	
1.	Introduction			2	
2.	Physical properties of milk			8	
3.	Lactose			4	
4.	Milk fat			10	
5.	Protein and enzymes			10	
6.	Market milk industry			12	
7.	Milk products			14	

Semester		VI			
Course Title	DAIRY TECHNOLOGY (PRACTiCAL)				
Course Code	FNTADSE05P	Credit	2		
Course Outcome	Students will be able to <ul style="list-style-type: none"> • Learn how to estimate milk protein by various methods • Prepare flavoured milk and casein and it's calculation • Visit a milk industry to know about it's detailed functions. 				

Scheme of Instruction					
Total Duration	60	Class/Week	4	Hours/week	4
Instruction Mode	Laboratory demonstration, hands on practice				
Scheme of Examination					
Maximum Score	25	Internal	10	End Semester	15
Course Mapping					
Units	Course Content				Lecture Hour (Cumulative)
1.	To perform platform tests in milk.(Acidity,COB,MBRT,specificgravity,SNF).				15
2.	To estimate milk protein by Folin method.				08
3.	To estimate milk fat by Gerber method.				08
4.	Preparation of flavoured milk/. Pasteurization of milk.				06
5.	To prepare casein and calculate its yield.				08
6.	Visit to a milk industry.				15