Re-Accredited 'B++' 2.86 CGPA by NAAC
VEER NARMAD SOUTH GUJARAT UNIVERSITY
University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.
વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી
યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલ્લા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.
Tel : +91 - 261 - 2227141 to 2227146, Toll Free : 1800 2333 011, Digital Helpline No.- 0261 2388888
E-mail : info@vnsgu.ac.in, Website : www.vnsgu.ac.in

ક્રમાંક :ઓથો./પરિપત્ર/૧૨૧૮૧/૨૦૨૫
તા.૨૨/૦૫/૨૦૨૫

પ્રતિ,
આચાર્યશ્રી,
શેઠ પી.ટી. મહિલા કોલેજ ઓફ આર્ટસ એન્ડ હોમસાયન્સ,
વનિતા વિશ્રામ કોલેજ કેમ્પસ,
અઠવાગેટ,
સુરત.

વિષયઃ– B.Sc.Home Science Sem.-3 & 4 નો રીવાઈઝ અભ્યાસક્રમ અંગે.

સુજ્ઞશ્રી,

સવિનય જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૫–૨૬ થી અમલમાં આવેલ B.Sc.Home Science Sem.-3 & 4 નો રીવાઈઝ કરેલ અભ્યાસક્રમ હોમસાયન્સ વિષયની અભ્યાસ સમિતિના ચેરમેનશ્રીએ અભ્યાસ સમિતિ વતી મંજૂર કરી વિજ્ઞાન વિદ્યાશાખાને કરેલ ભલામણ સ્વીકારી વિજ્ઞાન વિદ્યાશાખાની તા.૩૦/૦૪/૨૦૨૫ની સભાનાં ઠરાવ ક્રમાંકઃ૩૮ થી કરેલ ભલામણ સ્વીકારી એકેડેમિક કાઉન્સિલની તા.૦૫/૦૫/૨૦૨૫ ની સભાનાં ઠરાવ ક્રમાંકઃ ૧૦૨ થી.મંજુર કરેલ છે. જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

બિડાણઃ ઉપર મુજબ

કુલસચિવ/૦૦૧

પ્રતિ,
૧) ડીનશ્રી, વિજ્ઞાન વિદ્યાશાખા.
૨) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.
.....તરફ જાણ તેમજ અમલ સારૂ.

SCIENCE
FACULTY
B.Sc. Home Science
Major: Food Science & Nutrition
NCF- NEP
Revised Syllabus
Semester 3 & 4

S.Y. B. Sc.
SEMESTER III
FOOD SCIENCE AND NUTRITION
NCF -NEP

Semester III

Sem	Course code	Course Cate o	Paper Title	Theory/ Practical	Credit
	BFSNMJT05		Food Science I	Theory	2
	BFSNMJP05		Food Science I	Practical	2
	BFSNMJT06		Human Physiology	Theory	2
	BFSNMJP06		Human Physiology	Practical	2
	BFSNMJT07	Major Course	Community Nutrition	Theory	4
	BFSNMDCT03	Multi-Disciplinary Course	Food Microbiology	Theory	2
	BFSNMDCP03		Food Microbiology	Practical	2
	BFSNAECT03	Ability Enhancement Course	English Proficiency and Life Skills (English)	Theory	2
	BFSNSECP03	Skill enhancement Course	Sensory evaluation	Practical	2
	BFSNVACT03	Value Added Course	Basics of Statistic	Theory	2
III			NCC/NSS/Physical Training Saptadhara		
		TOTAL CREDITS			22

Semester IV

Sem	Course code	Course Cate o	Paper Title	Theory/ Practical	Credit
	BFSNMJT08		Food Science Il	Theo	2
	BFSNMJP08		Food Science Il	Practical	2
	BFSNMJT09		Food Preservation	Theo	2
	BFSNMJP09		Food Preservation	Practical	2
	BFSNMJTIO	Major Course	Food Safe & Quality Control	Theory	4
	BFSNMCT03		Maternal, Child Nutrition & Health	Theory	2
	BFSNMCP03	Minor Course	Maternal, Child Nutrition & Health	Practical	2
	BFSNAECT04	Ability Enhancement Course	English Proficiency and Life Skills (English)	Theory	2
	BFSNSECP04	Skill Enhancement Course	Culinary Science	Practical	2
	BFSNVACPOI	Value Added Course	Research Methodology	Practical	2
			NCC/NSS/Physical Training, Saptadhara		
		TOTAL CREDITS			22

Veer Narmad South Gujarat University, Surat

Programme Name: B.Sc. Food Science and Nutrition As per NEP 2020

About Program: The Food Science and Nutrition program is a multidisciplinary academic course that bridges the gap between food, health, and science. It combines the principles of biology, chemistry, and nutrition to explore the science behind the food we eat and its impact on human health and well-being.

Semester: 3

Course Category	Course Code	Course Title	Marksheet Title in English	Level of Course	Teaching Hours/ Week		Exam Duration		Credit		Internal Marks		External Marks		Total	
					Th	Pr	Th	Pr	Th	Pr	Th	Pr	Th	Pr	Th	Pr
Major Course	BFSNMJT05 BFSNMJP05	Food Science - I	Food Science - I	200	2	4	1	2	2	2	25	25	25	25	50	50
Major Course	BFSNMJT06 BFSNMJP06	Human Physiology	Human Physiology	200	2	4	1	2	2	2	25	25	25	25	50	50
Major Course	BFSNMJT07	Community Nutrition	Community Nutrition	200	4	-	2	-	4	-	50	-	50		100	-
Multi-disciplinary Course	BFSNMDCT03 BFSNMDCP03	Food Microbiology	Food Microbiology	200	2	4	1	2	2	2	25	25	25	25	50	50
Ability Enhancement Course	BFSNAECT03	English Proficiency & Life Skills (English)	English Proficiency & Life Skills (English)	200	2	-	1	-	2	-	25	-	25	-	50	-
Skill Enhancement Course	BFSNSECP03	Sensory Evaluation	Sensory Evaluation	200	-	4	-	2	-	2	-	25	-	25	-	50
Value Added Course	BFSNVACT03	Bharatiya Gyan Parampara	Bharatiya Gyan Parampara	200	2	-	1	-	2	-	25	-	25	-	50	-

[Sibject Code-2403030303011001]

S. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-III
Year-2024-25
Major-Food Science-I (Theory)

Course (subject)Code:	BFSNMJT05	
Subject Title	Food Science-I	
Course Level	200	
Credit	2	
Teaching per week	2	
Course Objectives	1. To understand the nature and composition of food. 2. To learn methods and principles involved in food preparations. 3. To understand the changes occurring in foods during cooking/preparation	
Course Outcome	Students will be able to learn: 1. Composition and structure of cereal grains and analyze the processes involved in gluten formation and starch behavior under different heating conditions. 2. To evaluate the effects of dry and moist heat on starch, including gelatinization, and understand parboiling processes and rice-based products. 3. To describe the composition and processing methods of pulses and legumes, including techniques like milling, soaking, germination, and fermentation. 4. To identify toxic factors in legumes, their potential health effects, and methods for their elimination. 5. To classify fruits and vegetables based on composition and quality, and apply criteria for their selection and use.	
Course Content		
1.	**Introduction to food science, aims and objectives of studying food science** Physical and chemical properties of foods and its application (in brief).	**04**
2.	**Plant Origin Foods** Cereals: • Composition and structure of cereal grains • Gluten formation and factors affecting it • Starch, its property and effect of dry and moist heat on starch i.e. gelatinization • Parboiling of rice and rice products in brief Pulses and legumes:	**12**

	• Composition and processing in brief i.e. milling/decortication, soaking, germination, fermentation and parching/puffing • Toxic factors, their ill effects and its elimination Fruits and Vegetables: • Composition, classification and selection of fruits and vegetables • Pectic substances of fruits and vegetables • Ripening of fruits and changes during ripening. • Enzymatic browning reactions and its prevention. • Vegetable colour pigments/plant pigments and effect of heat, acid and alkalis on it (in brief)	
3	Fats and Oils: • Brief introduction and sources and types of fats/oils • Functions of fats/oils in cookery • Fat absorption and factors affecting it • Spoilage of fats/oils and its prevention. • Hydrogenation of fats/oils	**08**
References	1. Srilakshmi, B: (2010) Food Science, 5 Edition, New Age International Pvt Ltd Publishers 2. Shadaksharaswamy, M, Manay, S, (2010): Food facts and Principles, 3 rdEdition, New Age,International Publishers 3. Bennion, M. Scheule, B.: (2009): Introductory Foods, 13th Edition, Prentice Hall Publications 4. Manay, S. (2009) Foods Facts, New Age International Pvt Ltd Publishers 5. Subbulakshmi, G, Udipi, S. A (2006): Food processing and Preservation, New Age International Pvt Ltd Publishers 6. Potter, N. N., Hotchkiss J. H: (1999), Food Science, 5 Edition, Springer Publications 7. Freeland-Graves, J., Peckham, G. C, (1995): Foundations of Food Preparation (6th Edition), Prentice Hall Publishers 8. Food science- Experiments and Applications: Mohini Sethi and Eram S. R	
Teaching Methodology	**Class work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

[Subject Code-2403030303011002]

S. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-III
Year-2023-24
Major- Food Science-II(Practical)

Course (subject)Code:	BFSNMJP05	
Subject Title	Food Science-II	
Course Level	200	
Credit	2	
Teaching per week	4	
Course Objectives	1. To understand the nature and composition of food. 2. To learn methods and principles involved in food preparations. 3. To understand the changes occurring in foods during cooking/preparation	
Course Outcome	Students will be able to learn: 1. Proper use of measuring techniques and devices, and apply standard weights and measurements in food science experiments. 2. To perform practical experiments on cereals, including gluten extraction, and evaluate the functional role of gluten in food products. 3. To investigate the gelatinization properties of various starches and understand their applications in food preparation. 4. To analyse the process of enzymatic browning in fruits and vegetables and apply methods to prevent it effectively. 5. To examine the physical properties of fats and oils, and assess the factors influencing fat absorption during cooking.	
Course Content	1. Introduction to Food science practical • Measuring techniques, devices, weights and measurements 2. Different experiments with cereals • Extraction of Gluten and Gluten based food products. 3. Different experiments with starch • Gelatinization properties of different starch 4. Fruits and vegetables • Enzymatic browning in fruits and vegetables its prevention. 5. Different experiments with fats and oils • To study the physical properties of fats and oils and factors affecting fat absorption	**15**
References	1. Subbulakshmi, G, Udipi, S. A (2006): Food processing and Preservation, New Age International Pvt Ltd Publishers 2. Potter, N. N., Hotchkiss J. H: (1999), Food Science , 5 Edition, Springer Publications	

	3. Freeland-Graves, J., Peckham, G. C, (1995): Foundations of Food Preparation (6th Edition), Prentice Hall Publishers 4. Food science- Experiments and Applications: Mohini Sethi and Eram S. R
Teaching Methodology	**Practical work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**

[Subject Code-2403030303022001]

S. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-III
Year-2024-25
Major-Human Physiology (Theory)

Course (subject)Code:	BFSNMJT06	
Subject Title	Human Physiology	
Course Level	200	
Credit	2	
Teaching per week	2	
Course Objectives	1. Get familiar with the human body 2. Make healthful choices and to take appropriate action when signs of illness arise	
Course Outcome	Students will be able to learn: 1. To understand basic anatomical terms and identify major body systems. 2. To describe the composition and functions of blood and the importance of blood groups. 3. To explain the structure and function of the heart and outline the blood circulation pathway. 4. To understand the respiratory system's structure, functions, and common diseases and identify the components of the gastrointestinal system and associated organs, along with common disorders.	
Course Content **1.**	**Introduction:** ● General terms- anatomy, physiology, symmetrical arrangement, anatomical position. **Body systems** **<u>Blood and Lymphatic System:</u>** ● Physical characteristics of blood ● Blood groups, their importance, Rh-incompatibility ● Function of RBC and WBC **<u>Cardiovascular System:</u>** ● Structure of heart and pathway of blood circulation ● Cardiac cycle, ECG ● Information about hypertension **<u>Respiratory System:</u>** ● Respiratory organs- nose, sinuses, larynx, trachea, bronchi, lungs- brief structure and functions ● Common diseases- Tuberculosis, Asthma, Bronchitis, Pneumonia **<u>Gastro intestinal System:</u>**	**12**

	● Oral cavity, tonsils, pharynx, oesophagus, stomach, small and large intestine- brief structure and functions ● Liver, gall bladder, pancreas- structure and functions Common disorders- vomiting, diarrhoea, constipation, hyperacidity, diabetes mellitus	
2,	**<u>Excretory System:</u>** ● Functions of organs of urinary system (in brief) **<u>Nervous System:</u>** ● Functions of different parts of brain, spinal cord and reflex action (in brief) **<u>Endocrine System:</u>** ● Functions of endocrine glands (in brief) **<u>Reproductive System:</u>** Functions of male and female reproductive system (	**12**
References	1. Gujarat State Board of school Text books (1994) 'Biology Standard 12': old assembly Building Sector 17, Gandhinagar. 2. Gujarat State Board of school Text books (1996) 'Biology Standard 12': old assembly Building Sector 17, Gandhinagar. 3. Maheshwari P.Manoharlal (1996) 'Biology Part 1-7' NCERT New Delhi	
Teaching Methodology	**Class work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

[Subject Code-2403030303022002]

S. Y. B.Sc. (NCF- NEP)

Food Science and Nutrition-II
Year-2023-24
Major-Human Physiology (Practical)

Course (subject)Code:	BFSNMJP06	
Subject Title	Human Physiology	
Course Level	200	
Credit	2	
Teaching per week	4	
Course Objectives	1. To develop skills to perform simple clinical tests. 2. To introduce the students to various instruments like stethoscope, sphygmomanometer, etc.	
Course Outcome	Students will be able to learn: 1. To measure and interpret primary health parameters such as anthropometry, temperature, pulse, and blood pressure 2. To determine individual blood groups and understand their clinical significance 3. To estimate haemoglobin levels and relate them to nutritional and health status, bleeding time,ESR and clotting time to evaluate basic blood functions	
Course Content	1. Measurement of primary health parameters (Anthropometric measurements, Body temperature, Pulse rate, Blood pressure) 2. Determination of blood groups 3. Estimation of haemoglobin 4. Determination of Bleeding time and clotting time 5. Test for normal and abnormal urine components like sugar, albumin and acetone and discussion on diseases in which they are found. 6. Determination of ESR	**14**
References	1. Textbook of Medical Technology, By Praful Godkar. 2. Human Physiology, By CC Chatterjee	
Teaching Methodology	**Practical work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

[Subject code-2403030303033001]

S. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-III
Year-2024-25
Major-Community Nutrition-(Theory)

Course (subject)Code:	BFSNMJT07	
Subject Title	Community Nutrition	
Course Level	200	
Credit	4	
Teaching per week	4	
Course Objectives	1. Students will be able to interpret and apply nutrition concepts to evaluate and improve the nutritional health of the community 2. It inculcates leadership qualities in conducting various extension and community outreach programs 3. Familiarize students with the methods of nutritional assessment 4. Make the students conversant with various aspects of nutrition education and promotion	
Course Outcome	Students will be able to learn: 1. To apply nutrition concepts to assess and enhance the nutritional status of individuals and communities. 2. To demonstrate leadership skills in planning and executing community outreach and extension activities. 3. To utilize appropriate methods for nutritional assessment in various population groups. 4. To develop and deliver effective nutrition education and promotion strategies.	
Course Content **1.**	**Introduction to Community Nutrition** • Definition, concept, component and characteristics of a community nutrition • Nutrition Education- Aims, Nature and Importance to the Community, Training Workers in Nutrition Education, and Extension Work- When to Teach, Whom to Teach and Who is to Teach. **Nutritional problems in India and Factors contributing to it**: • Major nutritional deficiencies - Aetiology, Prevalence, Symptoms and Preventive measures.	**08**

2.	• Prevalence of Malnutrition in India: Types of malnutrition, prevalence, morbidity and mortality rate, current status of malnutrition in India, Strategies to Overcome Malnutrition in India-Need for an Integrated Approach to Solve the Problems of Malnutrition	
	Assessment of Nutritional Status: ● Definition of nutritional status and purpose of assessment of nutritional status ● Direct and Indirect Methods of Nutritional Assessment- nutritional anthropometry, Clinical examination, biochemical methods, diet survey. **Current Vital statistics in India**: 1. Under 5 Mortality Rate (U5MR) , Infant Mortality Rate (**IMR**) , Neonatal Mortality Rate (**NMR**) , Crude Death Rate (**CDR**) ,Sex Ratio at Birth (SRB)	**08**
3	**Strategies to improve community Nutritional status:** • Individual strategies to improve maternal and child nutritional status: Nutrition education - Woman to woman, Child to child • Community strategies – contact, rural school system, exhibition, demonstration and dramatizetion , Increasing food availability by green and white revolution • Major nutrition supplementation programs in India : Integrated Child Development Services Scheme (ICDS), Mid-day meal Programs (MDM), Special Nutrition Programs (SNP),Wheat Based Nutrition Programs (WNP), Applied Nutrition Programs (ANP), Balwadi Nutrition Programs (BNP) etc. **Nutrient Deficiency Control Programs in India :** • National Prophylaxis Program for Prevention of Blindness due To Vitamin A Deficiency , National Nutritional Anemia Prophylaxis Program , National Iodine Deficiency Disorder Control Program **Organizations concerned with malnutrition and nutrition education :** • National Organizations Concerned with Food and Nutrition- ICMR, ICARM, CHEB, CSWB , SSWB etc.	**12**

	• International Organizations Concerned with Food and Nutrition- FAO, WHO, UNICEF, CARE, AFPRO, CWS and World Bank.	
References	1. Ghos S. 1976. The feeding and care of infants and young children. UNICEF. 2. Helsing and King. Breast feeding in practice – A manual for health workers, Delhi Oxford University, Press 3. Nutrient requirements & Recommended Dietary Allowances for Indians Indian Council of Medical Research, NIN Hyderabad. 4. Sachdeva, H.P. Nutrition in children. Department of Pediatrics, Maulana Azad Medical College, New Delhi. 5. Pipes, P.L. And Trahms, C.M. (1993). Nutrition in infancy and childhood. 5th edition Mosby year Book Inc. 6. Park & Park : Textbook of preventive and Social Medicine, Banarsidas, Bhanot Publication 1995. Vir S. (2011). Public Health Nutrition in Developing Countries published by 7. Woodhead Publishing India. ISBN-13: 9780857090041, ISBN-10: 0857090046	
Teaching Methodology	**Class work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

[Subject Code-2403030303044001]

S. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-III
Year-2024-25
MDC-Food Microbiology (Theory)

Course (subject)Code:	BFSNMDCT03	
Subject Title	Human Physiology	
Course Level	200	
Credit	2	
Teaching per week	2	
Course Objectives	1. To understand the nature and the role of microorganisms in food 2. To have a knowledge of the basic principles of food sanitation and safety 3. To acquire a perspective of the importance of microorganisms n environmental microbiology.	
Course Outcome	Students will be able to learn: To identify the causes and types of food spoilage and contamination. And describe common foodborne pathogens and the diseases they cause To explain methods of microbial control in food through preservation techniques. To analyze the role of beneficial microbes in food fermentation and production.	
Course Content 1.	**Introduction to Microbiology** • History and scope of food microbiology • Types of microorganisms in food: bacteria, yeasts, molds, viruses • Microbial growth: requirements, phases of growth, and factors affecting growth • Classification and morphology of microorganisms **Microorganisms in Food** • Beneficial microorganisms in food (fermentation, probiotics)	**12**

	• Spoilage microorganisms and their effects on different food groups (cereals, dairy, meat, fruits, vegetables) • Foodborne pathogens: Salmonella, E. coli, Listeria, Clostridium, etc. • Examples of micro-organisms responsible for commercial production of acid, vitamins, amino acid etc • Microbial fermentation and Role of micro-organisms in Food fermentations :Beer & Wine,Bread, Indian pickles ,Fermented dairy products Curd, yoghurt & cheese,Vinegar	
2.	**Food Spoilage and Contamination** **Introduction to Food Spoilage** • Definition and types of spoilage • Causes of food spoilage: microbial, enzymatic, chemical, physical • Signs of spoilage: changes in appearance, texture, odor, taste • Microorganisms Involved in Spoilage ;Spoilage in aerobic vs. anaerobic conditions • Spoilage of Specific Food Groups :Meat and poultry,Seafood,Dairy products,Fruits and vegetables ,Cereals and baked products,Canned foods **Food Contamination** • Sources of contamination: air, water, soil, equipment, handlers • Cross-contamination and its prevention • Role of hygiene and sanitation in controlling contamination **Food infections and intoxications**	**12**
References	1. Frazier ,W.C,&Westhoff,D.1988 Food Microbiology . Tata MeGraw-Hill 2. Guthrie ,R.K.[ed].1972.Food sanitation Inc.EaglewoodC1ifTN.J 3. Jay,1978.Modern food microbiology.VanNostrand Rcinhold Company ,New York 4. Marriot .N.G.[,1995]Principles of Food Sanitation 4" edition Edward Amold 5. Pelczar ,M.L.,and R.D Reid -1972 Microbiology. McGraw&Hill ,New York 6. Reid,G. [ed]1982 Prescott and Dunn S industrial microbiology AVI Publishing Co.lne Westport, Conn	
Teaching Methodology	**Class work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

[Subject Code-2403030303044002]

S. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-III
Year-2023-24
MDC-Food Microbiology (Practical)

Course (subject)Code:	BFSNMDCP03	
Subject Title	Food Microbiology	
Course Level	200	
Credit	2	
Teaching per week	4	
Course Objectives	1. To understand the principle, working and use of various equipment 2. To have a knowledge of the underlying principles in in practical food microbiology 3. To develop awareness about the different techniques in isolation and primary identification	
Course Outcome	Students will be able to learn: 1. To identify the causes and types of food spoilage and contamination. And describe common foodborne pathogens and the diseases they cause 2. To analyze the role of beneficial microbes in food fermentation and production	
Course Content	1. Study of laboratory equipment principle, working and use of Microscope, Autoclave, Incubator, Refrigerator, colony counter 2. Staining techniques Acid fast staining Negative staining Capsule staining 3. Preparation of culture media composition and uses	**08** **06** **02**

	4. Bacteriological Analysis of Water Bacteriological analysis of Milk	**08**
References	1. Frazier ,W.C,&Westhoff,D.1988 Food Microbiology . Tata MeGraw-Hill 2. Guthrie ,R.K.[ed].1972.Food sanitation Inc.EaglewoodC1ifTN.J	
Teaching Methodology	**Practical work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

[Subject Code-2403030303060001]

S. Y. B.Sc. (NCF- NEP)

Food Science and Nutrition-III

Year-2023-24

SEC-Sensory Evaluation (Practical)

Course (subject)Code:	BFSNSECP03
Subject Title	Sensory Evaluation
Course Level	200
Credit	2
Teaching per week	4
Course Objectives	1. Understand the physiological changes, in food on processing. 2. Preparing trained sensory evaluators. 3. Developing awareness in students about role and importance of sensory evaluators. 4. To enable students to understand different aspects of sensory science 5. Evaluation and their applications in food industries and research &development.
Course Outcome	Students will be able to learn: 1. Different aspects of sensory science 2. Understand different aspects of sensory science

Course Content		**02**
1,	**The Multinational Food Business - Strategic, Organizational and Management Issues for Product Development** • Planning stages • Prerequisites of a successful product development • The concept of added value	
2.	**Quality Evaluation** 1. Standardization of food products a. At laboratory level b. Scaling up c. Understand sale and profit margin 2. Shelf life studies - chemical and microbiological parameters	**02**
3.	**Sensory characteristics of food and selection of panel** 1. Colour, Texture, Consistency, Taste and odor 2. Effect of temperature on sensory characteristics of foods 3. Panels for Sensory Evaluation a. Types of panels b. Training the panel members c. Number of panel members for different tests	**02**
4.	**Types of Sensory Evaluation Tests** **1. Discriminative / Difference Test:** a. Single sample test / Monodic test b Paired comparison test c. Simple triangle test d. Directional triangle test e. Due-Trio test f. Multiple sample test.	**08**
5.	**1. Quality Test** a. Scoring test b. Descriptive test (i) Flavour profile method (ii)Texture profile method **2. Rating Test** a. Hedonic scale test b. Preference ranks c. Visual representation	**10**

	3. Food Samples for Evaluation a. Sample size for different evaluation tests b. Order of presentation c. Method of presentation	
References	1. S Mudambi, S.R., Rajgopal, M.V.(2012), Fundamentals of Foods and Nutrition, New Age International Pvt. Ltd. 2. Food Science (2012), Maharashtra State Board of Secondary and Higher Secondary education Pune,1' Edition, Sheth Publications. 3. Roday Sunctra, (2012), Food Science and Nutrition, 2nd Edition, Oxford University Press.	
Teaching Methodology	**Practical work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

S.Y. B. Sc.
SEMESTER IV
FOOD SCIENCE AND NUTRITION
NCF -NEP

Veer Narmad South Gujarat University, Surat
Programme Name: B.Sc. Food Science and Nutrition
As per NEP 2020
Semester - 4

Course Category	Course Code	Course Title	Marksheet Title in English	Level of Course	Teaching Hours/ Week		Exam Duration		Credit		Internal Marks		External Marks		Total	
					Th	Pr	Th	Pr	Th	Pr	Th	Pr	Th	Pr	Th	Pr
Major Course	BFSNMJT08 BFSNMJP08	Food Science - II	Food Science - II	200	2	4	1	2	2	2	25	25	25	25	50	50
Major Course	BFSNMJT09 BFSNMJP09	Food Preservation	Food Preservation	200	2	4	1	2	2	2	25	25	25	25	50	50
Major Course	BFSNMJT10	Food Safety & Quality Control	Food Safety & Quality Control	200	4	-	2	-	4	-	50	-	50		100	-
Minor Course	BFSNTMCT03 BFSNTMCP03	Maternal, Child Nutrition & Health	Maternal, Child Nutrition & Health	200	2	4	1	2	2	2	25	25	25	25	50	50
Ability Enhancement Course	BFSNAECT04	English Proficiency & Life Skills (English)	English Proficiency & Life Skills (English)	200	2	-	1	-	2	-	25	-	25	-	50	-
Skill Enhancement Course	BFSNSECP01	Culinary Science	Culinary Science	200	-	4	-	2	-	2	-	25	-	25	-	50
Value Added Course	BFSNVACP01	Research Methodology	Research Methodology	200	-	4	-	2	-	2	-	25	-	25	-	50

[Subject Code-2503030304011001]

S.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition-IV
Year-2024-25
Major- Food Science-Il (Theory)

Course (subject)Code:	BFSNMJT08	
Subject Title	Food Science-Il	
Course Level	200	
Credit	2	
Teaching per week	2	
Course Objectives	1. To understand the nature and composition of food 2. To learn methods and principle involved in food preparations 3. 3. To understand the changes occurring in foods during cooking/preparation	
Course Outcome	Students will be able to: 1. Understand the nature, structure, and composition of various food materials. 2. Apply fundamental methods and principles involved in food preparation processes. 3. Analyse and explain the physical and chemical changes that occur in foods during cooking and preparation.	
Course Content **1.**	**Milk and milk products:** • Source, Composition and nutritive value of milk Physical properties of milk • Effect of heat, acid and enzymes on milk • Types of milk in brief	**6**
2.	**Meat, fish and poultry**: **Meat:** • Composition, post-mortem changes in meat • Ageing and curing of meat, methods of tenderisation of meat • Changes during cooking of meat **Fish:** • Classification of fish, composition, selection of fish, spoilage of fish • Fish Protein Concentrate (FPC) **Poultry:** • Role of egg in cookery • Composition and nutritive value in brief • Egg as a principal poultry product • Composition and structure of egg • Methods to judge egg quality • Changes during storage of egg • hard-boiled egg (Fes formation)	**12**

	• Role of egg in cookery	
3.	**Water:** • Water content in foods and forms of water present in food • Types of water and its effect on cooking • Role of water in food preparation/processing **Sugar and its related products:** • Properties in brief, related products like honey, jaggery, and caramel sugar. • Crystallization of sugar and factors affecting it, examples of crystalline candies and non-crystalline candies	**06**
References	1. Srilakshmi, B: (2010) Food Science, 5th Edition, New Age International Pvt Ltd Publishers 2. Shadaksharaswamy, M, Manay, S, (2010): Food facts and Principles, 3rd Edition, New Age 3. International Publishers 4. Bennion, M. Scheule, B.: (2009): Introductory Foods, 13th Edition, Prentice Hall Publications 5. Manay, S. (2009) Foods Facts, New Age International Pvt Ltd Publishers 6. Subbulakshmi, G, Udipi, S. A (2006): Food processing and Preservation, New Age International Pvt Ltd Publishers 7. Potter, N. N., Hotchkiss J. 1--1: (1999), Food Science, 5 Edition, Springer Publications 8. Freeland-Graves, J., Peckham, G. C, (1995): Foundations of Food Preparation (6th Edition), Prentice Hall Publishers 9. Food science- Experiments and Applications: Mohini Sethi and Eram S. Rao	
Teaching Methodology	**Class work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

[Subject Code-2503030304011002]

S.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition-IV
Year-2024-25
Major: Food Science II(Practical)

Course (subject)Code:	BFSNMJP08	
Subject Title	Food Science -II	
Course Level	200	
Credit	2	
Teaching per week	4	
Course Objectives	1. To learn measuring different types of foods — grains, flours, raw vegetables, fruits & liquids 2. To provide students with the knowledge of serving size, exchange sizes and cooked amount of different recipes 3. To learn the uses of food guide 4. To standardize different recipes based on portion size 5. To learn the various cooking methods and mediums of cooking. 6. To make a list of rich sources of various nutrients, plan and prepare recipes.	
Course Outcome	Students will be able to: 1. Understand the nature, structure, and composition of various food materials 2. Apply fundamental methods and principles involved in food preparation 3. Analyse the physical and chemical changes that occur in foods during cooking and preparation 4. Accurately measure different types of foods, including grains, flours, raw vegetables, fruits, and liquids	
Course Content		
1.	**Different experiments with sugar** • Effect of heat on sugar • Byproducts of caramelization	**6**
2.	**Different experiments with milk** • Effect of heat on milk • Effect of heat and acid on properties of milk	**6**
3.	**Different experiments with egg** Effect of heat on egg and Fes formation. To study the role of egg in cookery	**4**
References	1. Srilakshmi, B: (2010) Food Science, 5th Edition, New Age International Pvt Ltd Publishers 2. Shadaksharaswamy, M, Manay, S, (2010): Food facts and Principles, 3rd Edition, New Age International Publishers 3. Food science- Experiments and Applications: Mohini Sethi and Eram S. Rao	

Teaching Methodology	**Lab work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**

[Subject Code-2503030304022001]

S.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition-IV
Year-2024-25
Major- Food Preservation (Theory)

Course (subject)Code:	BFSNMJT09	
Subject Title	Food Preservation	
Course Level	200	
Credit	2	
Teaching per week	4	
Course Objectives	1. Understand the basic principles of food preservation. 2. Learn the various preservation techniques and their applications.	
Course Outcome	Students will be able to: 1. Apply fundamental methods and principles involved in food preparation. 2. Understand the basic principles of food preservation. 3. Learn and apply various food preservation techniques and their practical applications.	
Course Content **1.**	**Introduction to food preservation, its importance and basic principles of food preservation** • Meaning, definition and objectives • Importance, traditional methods of food preservation (in brief) • Classification of food according to its shelf life / on the basis of ease of spoilage with suitable examples. • Basic principles involved in various methods of food reservation.	**10**
2.	**Methods of Food Preservation** • Asepsis and removal of microorganisms • Preservation of food by use of chemical preservatives, classification according to PFA- difference between chemical preservatives and food additives- properties of an ideal preservative- use of various chemical and natural preservatives. • Preservation of food by use of Low temperature terminology related to low temperature e.g. freezing, chilling, cold storage, frozen storage etc.- Selection and preparation of food for freezing e.g. blanching- Slow freezing and quick freezing-Changes during freezing meaning of Thawing, dehydro-freezing and pre-cooked frozen foods. • Preservation of food by use of high temperature- factors affecting heat resistance-TDT (Thermal Death Time) heat penetration and factors affecting it- Pasteurization and sterilization (only definition). • Preservation of food by Canning-meaning and canning process for various fruits and vegetables with flow chart terminology related to canning process: Lye peeling, scalding, syruping, brining, Aseptic canning and dehydroamino.	**14**

	• Preservation of food by Drying/ Dehydration- meaning and difference between drying and dehydration- • Treatments of food before drying- various types of driers (in brief) and about Tunnel drying and Spray drying in detail- treatments of food after drying- IMF (Intermediate Moisture Foods). • Preservation of food by irradiation- mode of action of radiation i.e. principle- Advantages and disadvantages of irradiation.	
References	1. Frazier W. & Westhoff. D. (1988): Food Microbiology, Tata McGraw- Hill Publisher 2. Subbulakshmi G. and Udipi S.A. (2001): Food Processing and Preservation, New Longree K and Armbruster Johnwiley and Sons, Quantity food sanitation 4th edition 3. Desorosier Company.N.W., (1963), The Technology of Food Preservation. The AVT Publishing 4. Banwart G.J., (1989), Basic Food Microbiology, Chapman & Hall Publication, New York. 5. Girdharilal, Siddappa. G.S. and Tandon. G. L., Preservation of Fruits and Vegetable published, ICAR, New Delhi 6. Dr Swaminathan. M., Food Science Chemistry and experimental Foods Published by the Bangalore Printing and Publishing co. Ltd.	
Teaching Methodology	**Class work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

[Subject Code-2503030304022002]

S.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition-IV
Year-2024-25
Major- Food Preservation (Practical)

Course (subject)Code:	BFSNMJP09	
Subject Title	**Food Preservation (Practical)**	
Course Level	200	
Credit	2	
Teaching per week	4	
Course Objectives	1. Understand the basic principles underlying Food Preservation as an income generating activity. 2. To develop the ability in students to prepare and preserve foods by laboratory and household methods of food preservation.	
Course Outcome	Students will be able to: 1. Understand the basic principles of food preservation, including its potential as an income-generating activity. 2. Analyse the physical and chemical changes that occur in foods during cooking and preparation. 3. Understand the basic principles of food preservation. 4. Learn and apply various food preservation techniques and their practical applications.	
Course Content		
1.	**Introduction to Food Preservation Practical** • Aseptic handling in the laboratory. • Principles and methods of food preservation in brief. • Causes of spoilage of food and favourable conditions for its causes.	**20**
2.	**Preparation of Sugar Preserves** • Preparation of Jam • Preparation of Murabbas	
3.	**Preparation of Ketchup** • Preparation of Tomato ketchup	
4.	**Preparation of Masalas and Chutney** • Plain Masala • Sambar Masala • Pav bhaji Masala • Pani puri Masala • Milk masala • Dal- coconut chutney	

5.	• Coconut garlic chutney **Preparation of Pickles** • Short and long shelf-life pickles • Sweet pickles	
References	1. Girdharilal, Siddappa. G.S. and Tandon. G. L., Preservation of Fruits and Vegetable published, ICAR, New Delhi 2. Dr Swaminathan. M., Food Science Chemistry and experimental Foods Published by the Bangalore Printing and Publishing co. Ltd.	
Teaching Methodology	**Lab work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

[Subject Code-2503030304033001]

S.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition-IV
Year-2024-25
Major- Food Safety and Quality Control (Theory)

Course (subject)Code:	BFSNMJT1O	
Subject Title	Food Safety and Quality Control	
Course Level	200	
Credit	4	
Teaching per week	4	
Course Objectives	1. Introduce students to the fundamental concepts of food safety, food quality, and their importance in public health and industry 2. Familiarize students with various types of food hazards — physical, chemical, biological, and allergens — and methods to control them 3. Develop an understanding of national and international food safety standards, regulations, and certifications (e.g., FSSAI, Codex, ISO, HACCP). 4. Equip students with knowledge of good manufacturing practices (GMP), good hygiene practices (GHP), and sanitation protocols in food production and handling 5. Provide practical skills for monitoring food quality parameters, performing basic food analysis, and applying quality control measures in food processing 6. Enhance problem-solving skills related to food contamination, spoilage, and adulteration.	
Course Outcome	Students will be able to: 1. Understand the basic concepts and significance of food safety. 2. Recognize and explain the importance of food hazards of physical, chemical, and microbial origin. 3. Understand and demonstrate the importance of sanitation and hygiene in food handling and preparation. 4. Understand the relevance of risk assessment and risk management practices in ensuring food safety.	
Course Content 1.	**Basic concept of food microbiology & food safety** • History, Occurrence and growth of microorganism in food • Role of microorganisms in fermented products • Food safety and importance of safe foods Prions, GM foods, Dioxin-contaminated foods. d importance of safe foods • Factors affecting food safety Food hazards -Physical, Chemical, Biological Recent concerns of food safety	**06**

2.	**Food safety in food service establishment** • Food Safety measures and sanitation in food service establishment and street foods • Personal hygiene and sanitation in food service establishment **Risk analysis, assessment and management** • Food safety assurance - HACCP, definition, important terms • Principles, guidelines and application and benefits of HACCP	**06**
3.	**Food regulation: Standards and quality control** • FSSAI • Food standards and regulations in India -The Prevention of Food Adulteration Act, 1954 • Compulsory National Legislations – FPO, Essential Commodities Act, Milk and Milk Product Act, Meat Product Control Order • Voluntary based Product Certifications – BIS, Agmark, Consumer Protection Act, 1986 • Regulations related to Genetically Modified Foods • International Organizations and Agreements in the area of Food Standardization and Quality Control	**04**
4.	**Food Adulteration** • Food Adulteration • Foods Commonly adulterated • Common Adulterants – Classification of Adulterants • Harmful Effects of Adulterants Food Borne Diseases -Food Borne Intoxications -Food Borne Infections -Food Borne Toxic Infections Mycotoxins Food Borne Diseases due to Naturally Occurring Toxicants ➢ Experimental/ Visual section: • Methods of Detection of Some Adulterants • Demonstration of assessing/removing food	**08**
References	1. Sathe A. Y. (1999) A First Course in Food Analysis. 1# Edition, New Age International (P) Ltd., New Delhi. 2. Jacobs M. B. (1999) Chemical Analysis of Food and Food Products. 3" Edition, CBS Publishers & Distributors, New Delhi. 3. Food Science-Sri Lakshmi 4. Frazier, W.C, & Westh off, D.1988 Food Microbiology. Tata MeGraw-Hill 5. Guthrie, R. K. [ed].1972. Food sanitation Inc.EaglewoodC1ifTN.J	
Teaching Methodology	**Class work and practical Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

[Subject Code-2503030304044001]

S.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition-IV
Year-2024-25
Minor: Maternal child Nutrition and health (Theory)

Course (subject)Code:	BFSNMCT03	
Subject Title	Maternal child Nutrition and health	
Course Level	200	
Credit	2	
Teaching per week	2	
Course Objectives	1. Understand the normal patterns of growth and the nutritional requirements of children at various stages 2. Understand the key factors affecting the growth and development of children 3. Develop familiarity with growth and developmental milestones from conception through adolescence 4. Understand the physiological changes occurring during pregnancy and lactation	
Course Outcome	Students will be able to: 1. Describe the normal growth patterns and nutritional needs of children at different stages of development 2. Identify and analyse factors that influence growth and development in children 3. Recognize and explain the key physical, cognitive, and emotional changes occurring from conception through adolescence 4. Understand and explain the physiological changes associated with pregnancy and lactation, and their nutritional implications	
Course Content **1.**	**Conception & pregnancy: Ovulation, fertilization and implantation:** i) Ovulation: • Definition and process of ovulation • Hormones involved in ovulation (LH, FSH, Oestrogen, Progesterone) ii) Fertilization: • Definition and stages of fertilization iii) Implantation: • Definition and significance of implantation • Process of blastocyst implantation into the uterine lining • Signs and symptoms of pregnancy **Prenatal care:** i) Prenatal growth and development: • Definition and characteristics of growth and development • Factors affecting prenatal growth & development • Stages of prenatal development ii) Physiological changes and development during pregnancy • Changes in various maternal systems: blood volume, • renal, Gastrointestinal, Cardiovascular, weight, nutritional status etc.	**12**

	• Importance of placenta, umbilical cord & amniotic fluid • Common problems and complications during pregnancy • Nutritional care during pregnancy	
2.	**Post-natal care:** i) Birth process: • Stages of labour and birth, types of delivery, complications during delivery • Care of new born baby and mother ii) Breast feeding and its importance • Anatomy and physiology of breast feeding, • Composition and types of human milk • Factors affecting lactation • Breast feeding practices: importance of exclusive breast feeding and methods of breast feeding • Hazards of artificial feeding, contraindications of breast feeding iii) Supplementary feeding — food square • Promotion of sound eating habits in children • Factors affecting food intake and food habit • Common eating problems during childhood and its management	**08**
3.	**Human Immunity and immunization**: i) Immunity • Definitions — immunity, antigen, antibody • Types of immunity • Factors affecting immunity ii) Childhood diseases and prevention: • Common illness and its prevention • Infectious diseases and its prevention iii) Immunization and vaccination: • Definition, Importance and difference between • Immunization and vaccination • Immunization chart	**08**
References	1. International Food Policy Research Institute (1997). Care and Nutrition: Concepts and Measurement. International Food Policy Research Institute Washington DC. USA 2. International Child Health: A Digest of Current Information 3. Barker, D.J.P. (1998). Mothers, Babies and Health in Later Life. Edinburgh, Churchill Livingstone 4. Ward, R.H.T; Smith, S.K.; Donnai, D. (eds) (1994) Early Fetal Growth and Development. London, RCOG Press 5. Sachdev, H.P.S. and Choudhary, P. (1995). Nutrition in Children-Developing Country Concerns. Cambridge Press, New Delhi	
Teaching Methodology	**Class work and Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

[Subject Code-2503030304044002]

S.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition-IV
Year-2024-25

Minor- Maternal child Nutrition and health (Practical)

Course (subject)Code:	BFSNMCP03	
Subject Title	Maternal child Nutrition and health	
Course Level	200	
Credit	2	
Teaching per week	4	
Course Objectives	1. Understand the maternal nutritional needs and common health problems faced by women in different communities. 2. Recognize the significance of breastfeeding practices and their impact on child health across various cultural contexts. 3. Learn the preparation of homemade Artificial Replacement Feeding (ARF), supplementary foods, and galactagogue-rich foods for infants, children, and mothers with special needs, along with techniques to address related challenges.	
Course Outcome	Students will be able to: 1. Identify and explain maternal nutritional requirements and prevalent health issues in community settings. 2. Evaluate the importance of breastfeeding and its practices within different cultural and community frameworks. 3. Demonstrate skills in preparing ARF, supplementary foods, and galactagogue-enriched foods for infants, children, and mothers with special needs, and apply appropriate techniques to manage related nutritional needs.	
Course Content		
1.	**Antenatal care:** • Survey, interview and report writing for maternal nutrition issues Ian a framework to overcome maternal health problems. • Breast feeding practices: • Survey, interview and report writing to aware community to improve reast feeding practices • Survey and identification of at-risk pregnant women in the community	**10**
2.	**Postnatal care** • Preparation of home-made substitutes and ARF • Preparing nutritional recipes for infants and young children • Preparing nutritional recipe for pregnant and lactating woman (Galactagogues rich) • Preparation of immunization schedule — community facility, interview	**12**

References	1. International Child Health: A Digest of Current Information 2. Barker, D.J.P. (1998). Mothers, Babies and Health in Later Life. Edinburgh, Churchill Livingstone 3. UNICEF (1997). The Care Initiative: Assessment, Analysis and Action to improve care for Nutrition. New York, UNICEF
Teaching Methodology	**Lab work, discussion Projects, Seminar, Assignments, Workshop, Field work**
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**

[Subject Code-2503030304066002]

S.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition-IV
Year-2024-25

SEC-Culinary Science (Practical)

Course (subject)Code:	BFSNMDCP02	
Subject Title	Culinary Science	
Course Level	200	
Credit	2	
Teaching per week	4	
Course Objectives	1. Integrate knowledge, skills, and practices essential for careers in food production and food service industries. 2. Integrate knowledge, skills, and practices needed for careers in food science, dietetics, and nutrition. 3. Develop proficiency in preparing various cuisines and courses while understanding their varieties and cultural significance. 4. Apply dietary guidelines effectively in planning meals that meet nutrition and wellness needs.	
Course Outcome	Students will be able to: 1. Demonstrate professional knowledge and skills required for food production and food service operations. 2. Apply principles of food science, dietetics, and nutrition to real-world career settings. 3. Prepare and present a variety of cuisines and courses, showcasing an understanding of regional and international food varieties. 4. Plan and design nutritionally balanced meals by applying established dietary guidelines to promote wellness.	
Course Content		
1.	**Introduction to Course** • Culinary terms • Work methods in food preparation & use of different equipment • Basic ingredients used in cooking.	**2**
2.	Soups: Vegetable broth, French tomato soup, Cream soup. Minestrone soup, other soups.	**2**
3.	Cold beverages: Falooda, Jaljeera, Masala Soda, Shikanji, Cold Cocoa, Hot Coffee; International cold beverages: Fruit cocktail, Mojito, Pina Colada, Bubble Tea, Cold Coffee	**4**
4.	Accompaniments: Bread sticks, cream crackers with spaghetti, caraway, toast, vegetable cups.	**2**

5.	Salads: Demonstration of decorative cuttings- cabbage and carrot salad, Moulded salad, Decorative salad.	**3**
6.	Vegetables, pulses and vegetable curries- Vegetable Kurma, Malai Kofta, Spinach chaman (with paneer), Chhole Bhature.	**4**
7.	Rice Dishes: Vegetable/ Paneer Biryani, Pulao, Kesari Bhaat, Jeera Rice, Fried Rice Indian Breads: Paratha, Naan, Roti, Laccha Paratha, Missi Roti, Kulcha.	**4**
8.	Dessert: Fruit souffle, Jalebi, Gulab jamun, Rasmalai, Cheese cake, Triffle Pudding, Malpua and rabdi, Kaju Katli,Barfi, Pooran poli, Kheer.	**6**
9.	Snacks and Appetizers: Bhel, Croquettes, Bruschetta, Garlic Bread, Cheese Balls, Paneer Tikka, Nachos.	**4**
10.	Indian and International Full course meals	**6**
References	1. Racina: Betty crocker's cook book, Eastern Publishing Co. 2. Catherine Kirkpatric: 500 recipes for cakes and pastries, Paul Hanilyn, London. 3. Cordon Bleu: Baking I, C.B.C/B.P.C. Publishing Limited, London 4. S. Evelyn Wallace, Cake decorating and sugar craft. (3rd Edition,) Hanilyn, London, 1976 5. Peckham, Gladys C. and Jeanne H. Freeland - Graves: Foundations of Food preparation. (4th edition) MacMillan, New York, 1979 6. Purnell colour cook book of Soups", Purnell, London.dolden haban 7. Purnell colour cook book of Salad and Snacks", Purnell, London 8. Food & Beverage Service, R. Singaravelavan. 9. Food Product operations, Second edition, Parvinder S. Bali. 10. International cuisine and Food Production Management, Second edition, Parvinder S. Bali.	
Teaching Methodology	**Lab work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

[Subject Code-2503030304077002]

S.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition-IV
Year-2024-25

VAC-Research Methodology (Practical)

Course (subject)Code:	BFSNVACPOI	
Subject Title	Research Methodology	
Course Level	200	
Credit	2	
Teaching per week	4	
Course Objectives	1. Understand the scientific approaches and principles underlying research methodologies. 2. Recognize the significance and application of research methods in the field of food and nutrition. 3. Identify sources of variability and uncertainty in research processes and outcomes. 4. Appreciate the importance of scientific writing and develop competence in academic and technical writing skills. 5. Build a basic understanding of computer software commonly used in research and data analysis. 6. Develop skills in data management, including collection, organization, analysis, and interpretation of research data.	
Course Outcome	Students will be able to: 1. Apply scientific approaches and research principles to studies in food and nutrition. 2. Design and evaluate research methods suitable for investigating food and nutrition-related issues. 3. Identify, assess, and manage variability and uncertainty in research data. 4. Demonstrate competence in scientific writing for research reports, papers, and presentations. 5. Utilize basic computer software for data analysis and research documentation. 6. Manage research data effectively, ensuring accuracy, reliability, and clarity in data handling and interpretation.	
Course Content		
1.	**Basic concepts of research**: Introduction, Meaning, Objectives, Characteristics, Requirements for a Scientific Research, Types of Researches: Exploratory and Descriptive • Research Problem: Introduction, Selecting the Problem, Defining the Problem, Sources of Problem, Criteria for Selection of the Problem.	**04**
2.	**Research design and Hypothesis Formulation:** • Meaning of Research Design, Types of Research Design -exploratory, descriptive, diagnostic, experimental • Hypothesis, Sources of Hypothesis, Forms of Hypothesis	**08**

3.	**Sampling methods and techniques**: Meaning and Definition of Population and Sampling, Techniques of Sampling probability and non- probability. **Data collection and Measurement:** • Types of data: Secondary and Primary • Methods of Primary data collection: Observation, Personal Interview, Questionnaire, Schedule, Case Study, Social Survey, Field study, Field experiment, • Scaling measurement: types of measurement scales	**08**
4.	**Organization and presentation of data** • Data reduction strategies • Coding and tabulation • Grouping of data: Frequency distribution 4. Graphic representation: Graphs, diagrams and charts	**06**
References	1. Hart, C. (2005). *Doing Your Master's Dissertation.* New Delhi: Vistaar Publications. 2. Williams, N. (2005). *Your Research Project.* New Delhi: Vistaar Publications. 3. Oliver, P. (2008). *Writing Your Thesis.* New Delhi: Sage Publications. 4. Sarangi, P. (2010). *Taxman's Research Methodology.* New Delhi: Taxman Publications (P) Ltd. 5. Chawla, D., & Sondhi, N. (2011). *Research Methodology: Concepts and Cases.* Noida: Vikas Publishing House. 6. Kothari, C. R., & Garg, G. (2019). *Research Methodology: Methods and Techniques* (4th ed.). New Delhi: New Age International Publishers.	
Teaching Methodology	**Lab work, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	