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.
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સંદર્ભ:યુનિવર્સિટી પરિપત્ર ક્રમાંક:ઓથો./પરિપત્ર/૧૧૯૪૬/૨૦૨૫,તા.૨૧/૦૫/૨૦૨૫

-:પરિપત્ર:-

યુનિવર્સિટી સંલગ્ન વિજ્ઞાન વિદ્યાશાખા હેઠળની તમામ કોલેજોનાં આચાર્યશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૫–૨૬ થી અમલમાં આવેલ B.Sc.Home Science Sem.-5 & 6 નો અભ્યાસક્રમ યુનિવર્સિટી કાર્યાલય પરિપત્ર ક્રમાંક:ઓથો./પરિપત્ર/૧૧૯૪૬/૨૦૨૫,તા:૨૧/૦૫/૨૦૨૫થી પરિપત્રિત કરેલ છે જેમાં B.Sc.Home Science Sem.-5 Major-Advance Chemistry-I અને Sem.-6 Major-Advance Chemistry-II અભ્યાસક્રમના પેપર ટાઈટલમાં કરેલ સુધારો હોમસાયન્સ વિષયની અભ્યાસ સમિતિના ચેરમેનશ્રીએ અભ્યાસ સમિતિ વતી મંજૂર કરી વિજ્ઞાન વિદ્યાશાખાને કરેલ ભલામણ વિજ્ઞાન વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષા એ વિદ્યાશાખાવતી ડીનશ્રીએ મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલની તા.૨૪/૧૨/૨૦૨૪ ની સભાના ઠરાવ ક્રમાંક:૩૫૩ અન્વયે માન.કુલપતિશ્રીને આપેલ સત્તા અંતર્ગત માનનીય કુલપતિશ્રી દ્વારા મંજૂર કરેલ છે, જે સંદર્ભે B.Sc.Home Science Sem.-5 & 6 નો સુધારા સહિતનો સંપૂર્ણ અભ્યાસક્રમ આ સાથે સામેલ છે, જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

(બિડાણ: ઉપર મુજબ)

ક્રમાંક:ઓથો./પરિપત્ર/સિલેબસ/૨૩૩૮૪/૨૦૨૫
તા.૦૨/૦૯/૨૦૨૫

કુલસચિવ

પ્રતિ,
૧) યુનિવર્સિટી સંલગ્ન વિજ્ઞાન વિદ્યાશાખા હેઠળની તમામ કોલેજોનાં આચાર્યશ્રીઓ.
..... આપશ્રીની કોલેજના સંબંધિત શિક્ષકોને જાણ કરી અમલ કરવા સારૂ.
૨) અધ્યક્ષશ્રી, વિજ્ઞાન વિદ્યાશાખા.
૩) પરીક્ષા નિયામકશ્રી,પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.
.....તરફ જાણ તેમજ અમલ સારૂ.

Veer Narmad South Gujarat University

T. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition
Year-2025-26
Semester-V

Sem	Course code	Course Category	Paper Title	Theory/ Practical	Credit
V	BFSNMJT11	Major Course	Ancient Nutrition and Diet Therapy-I	Theory	2
	BFSNMJP11		Ancient Nutrition and Diet Therapy-I	Practical	2
	BFSNMJT12		Advanced Chemistry	Theory	2
	BFSNMJP12		Advanced Chemistry	Practical	2
	BFSNMJT13		Human Nutrition-I	Theory	2
	BFSNMJP13		Human Nutrition-I	Practical	2
	BFSNTMCT04	Minor Course	Dietetic Techniques & Patient Counseling	Theory	2
	BFSNTMCP04		Dietetic Techniques & Patient Counseling	Practical	2
	BFSNTMCT05		Food Processing	Theory	2
	BFSNTMCP05		Food Processing	Practical	2
	BFSNSECP05	Skill Enhancement Course	Food Product Development	Practical	2
			NCC/NSS/ Physical Training/ Saptadhara		
		TOTAL CREDITS			22

T.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition
Year 2025- 2026
Semester-VI

Sem	Course code	Course Category	Paper Title	Theory/ Practical	Credit
VI	BFSNMJT14	Major Course	Ancient Nutrition and Diet Therapy-II	Theory	2
	BFSNMJP14		Ancient Nutrition and Diet Therapy-II	Practical	2
	BFSNMJT15		Nutritional Biochemistry	Theory	2
	BFSNMJP15		Nutritional Biochemistry	Practical	2
	BFSNMJT16		Human Nutrition-II	Theory	2
	BFSNMJP16		Human Nutrition-II	Practical	2
	BFSNTMCT06	Minor Course	Food Analysis	Theory	2
	BFSNTMCP06		Food Analysis	Practical	2
	BFSNAECP05	Ability Enhancement Course	Nutritional Assessment and Surveillance	Practical	2
	BFSNPINT01	Internship	Internship	Practical	4
			NCC/NSS/ Physical Training/ Saptadhara		
		TOTAL CREDITS			22

Veer Narmad South Gujarat University

T. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-V
Year-2025-26

About Programme: 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. This program equips students with the knowledge and practical skills needed to work in various sectors including the food industry, health and wellness fields, government agencies, and research institutions. The curriculum focuses on the composition of foods, food safety, processing technologies, nutritional biochemistry, diet planning, and public health nutrition.

Semester: V

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	BFSNMJT11 BFSNMJP11	Ancient Nutrition and Diet Therapy-I	Ancient Nutrition and Diet Therapy-I	300	2	4	1	6	2	2	25	25	25	25	50	50
Major Course	BFSNMJT12 BFSNMJP12	Advanced Chemistry	Advanced Chemistry	300	2	4	1	6	2	2	25	25	25	25	50	50
Major Course	BFSNMJT13 BFSNMJP13	Human Nutrition I	Human Nutrition-I	300	2	4	1	6	2	2	25	25	25	25	50	50
Minor Course	BFSNTMCT04 BFSNTMCP04	Dietetic Techniques & Patient Counseling	Dietetic Techniques & Patient Counseling	300	2	4	1	6	2	2	25	25	25	25	50	50
Minor Course	BFSNTMCT05 BFSNTMCP05	Food Processing	Food Processing	300	2	4	1	6	2	2	25	25	25	25	50	50
Skill Enhancement Course	BFSNSECP05	Food Product Development	Food Product Development	300	-	4	-	6	-	2	-	25	-	25	-	50

T. Y. B. Sc. (NCF- NEP)
Food Science and Nutrition-V
Year-2025-26
Major-Ancient Nutrition and Diet Therapy –I (Theory)

Course (subject)Code:	BFSNMJT11	
Subject Title	Ancient Nutrition and Diet Therapy-I	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To formulate the diet to meet the needs of the patient, taking into consideration her or his food habits 2. To modify the existing diets to ameliorate the disease condition and to keep it under control. 3. To correct nutritional deficiencies if any. 4. To prevent short-term and long- term complications in cases of chronic diseases 5. To educate and counsel the patient regarding the need to adhere to the prescribed diet	
Course Outcome	Students will be able to: 1. **Understand Ancient Dietary Principles** Demonstrate a comprehensive understanding of ancient dietary practices across various cultures (e.g., Ayurveda, Traditional Chinese Medicine, Ancient Greek, and Roman nutrition), and their influence on health and wellness. 2. **Apply Ancient and modern healing diets to Health Issues** Analyse how ancient and modern dietary concepts can be adapted to address contemporary health challenges like obesity, underweight including chronic diseases like diabetes, digestive and liver disorders.	
Course Content		**18**
1.	**Introduction of Diet therapy and nutritional care in energy imbalance and in febrile conditions** • Introduction to Ancient nutrition and Dietetics: Influence of Ancient Indian diet on Modern nutrition, seasonal and regional diets in Ancient India Principles of Diet Therapy, Therapeutic modification of normal diets, Types of Hospital Diets- Clear-fluid, full fluid and soft diet. **Ancient and modern dietary practices in weight management and in fever** • Obesity: Definition, Types, Aetiology, Assessment, complications, Dietary Management of Obesity • Underweight: Aetiology, Complications, Dietary Modifications Febrile Conditions: Metabolic changes in Fever, Types- Short Duration- Typhoid, Long Duration- Tuberculosis, and Dietary Management	
2.	**1 Ancient dietary and modern dietary practices and nutritional care in gastro-intestinal disorders, diabetes and liver disorders** • Gastro-intestinal Disorders: Aetiology, Symptoms, Diagnosis, Treatment and dietary management of Peptic Ulcer, Ulcerative colitis, Diarrhoea and Constipation, ancient practices for treatment of diarrhoea and constipation. • Diabetes Mellitus: Types, Aetiology, Symptoms, Diagnosis, Complications, Treatment – Exercise, Insulin and Diet, Dietary Management- Glycaemic Index and Food Exchange List, Liver Disorders: Functions of Liver, Liver function tests, agents responsible for liver damage, Causes, symptoms, Dietary management. Jaundice, Non-alcoholic fatty liver disease (NAFLD), Hepatitis, Cirrhosis of liver.	**12**

References	1. Dietetics 5th edition by B. Srilakshmi 2. Krause's Food and Nutrition Care Process 14Th Edition by L Kathleen Mahan and Janice L Raymond, Elsevier Science. 3. Normal and Therapeutic Nutrition Paper by Corinne Hogden Robinson (Author), Marilyn Lawler (Author) 4. Nutrition And Diet Therapy by Carroll A. Lutz, Karen Rutherford Przytulski, F.A. Davis Company. 5. Understanding Normal and Clinical Nutrition - 11th edition, by Sharon Rady Rolfes, Kathryn Pinna and Ellie Whitney
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**

T. Y. B. Sc. (NCF- NEP)
Food Science and Nutrition-V
Year-2025-26
Major-Ancient Nutrition and Diet Therapy –I- (Practical)

Course (subject)Code:	BFSNMJP11	
Subject Title	Ancient Nutrition and Diet Therapy-I	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. Prescribe diets for patients to provide appropriate therapeutic nutritional care 2. Develop standards of dietetic practices	
Course Outcome	Students will be able to: 1. **Develop and Implement Therapeutic Diet Plans** Design personalized therapeutic diet plans for individuals with various health conditions (e.g., diabetes, obesity, gastrointestinal disorders) based on clinical assessments and dietary needs. 2. **Prepare Therapeutic Meals** Plan, prepare, and present therapeutic meals according to the specific needs of patients with various medical conditions, ensuring nutritional adequacy and taste while adhering to therapeutic guidelines.	
Course Content **1.**	**1. Methods used in Ancient Indian diet therapy for treating weight management and fever** **2. Different Hospitals diets:** Preparation of normal routine diets generally served in hospitals. • Different types of liquid diets • Different types of semisolid / soft diets – General mechanical and pureed • Bland Diet • Low Fibre Diets& High fibre diets **3. Diet in Obesity & Underweight** **4. Diet in Acute fever**	**18**
2.	**1. Methods used in Ancient Indian diet therapy for treating Ulcers, Diarrhea, Constipation, Diabetes Mellitus and liver diseases** **2. Diet in Peptic Ulcer& Ulcerative Colitis** **3. Diet in Diarrhea & Constipation.** **4. Diet in Diabetes Mellitus Type: II** **5. Diet in Hepatitis** **6. Diet in Cirrhosis of liver**	**12**
References	**1.** Dietetics 5th edition by B. Srilakshmi **2.** Normal and Therapeutic Nutrition Paper by Corinne Hogden Robinson (Author), Marilyn Lawler (Author) **3.** Nutrition And Diet Therapy by Carroll A. Lutz, Karen Rutherford Przytulski, F.A. Davis Company.	
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**	

T. Y. B. Sc. (NCF- NEP)
Food Science and Nutrition-V
Year-2025-26
Major-Advanced Chemistry (Theory)

Course (subject)Code:	BFSNMJT12	
Subject Title	Advanced Chemistry	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objective	1. To lay the foundation of chemistry and give insights about the chemical reactions that occurs in biological systems. 2. To impart knowledge about the structures of the principal components present in living beings.	
Course Outcome	Students will be able to: 1. Understand the Basic Concepts of Carbohydrates, Lipids, Proteins, Hormones and enzymes 2. Identify and Differentiate type's structure, properties, functions and uses Carbohydrates, Lipids, Proteins, Hormones and enzymes	
Course Content **1.**	**Carbohydrates:** • General formula, Classification, Structure • Introduction, Properties and uses of monosaccharaides (Glucose, Fructose), disaccharides (Lactose, Maltose and Sucrose), oligosaccharides, polysaccharides (Starch, Glycogen) and proteoglycans (Occurrence, structure, properties and functions of important carbohydrate compounds) • Optical and stereo isomers. (D & L isomers, Epimers Enantiomers, Diastereomers, Anomers) • Important reactions of monosaccharide, Oxidation and reduction reactions, esterification reaction, ozone formation **Lipids:** • Introduction, Definition and Classification • Fatty acids: Introduction, Classification, Saturated and unsaturated fatty acids • Characterization of fats • Structure and properties of Triacylglycerol • Properties and functions of biologically significant fats	**12**
2.	**Proteins:** • Introduction, Classification based on solubility, shape composition and functions • Classification and structure of amino acids • Physical and chemical properties of amino acids • Structure of proteins. • Denaturation and coagulation of proteins **Enzymes:** • Definition, general properties • Nomenclature and classifications • Mechanism of enzyme action. • Factors affecting enzyme activity. • Enzyme inhibition • Coenzymes and isoenzymes • Enzymes of diagnostic importance **Hormones:** • Mechanism of Hormone Action • Sources and Biochemical functions of Hormones	**18**

	• Regulation and Effects of deficiency of various endocrine glands' Hormones	
References	1. Rastogi S.C. "Biochemistry", 2nd Edition, (2003) Tata MacGraw Hill Publishing Co. Ltd. 2. Debajyoti D, "Biochemistry"2nd Edition, (1980) Academic Publishers 3. Satyanarayana U and Chakrapani U "Biochemistry", 3rd Edition, (2008), Books & Allied Publishers. 4. Chatterjee M.N, Shinde R. "TextbookofMedicalBiochemistry"8thEdition (2012) Jaypee Brothers, Medical Publishers.	
Teaching Methodology	**Classwork, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

T. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-V
Year-2025-26
Major-Advanced Chemistry (Practical)

Course (subject) Code:	BFSNMJP12	
Subject Title	Advanced Chemistry	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objective	1. Perform Standardization of Solutions Standardize solutions of unknown concentration using titrations with primary standards, and calculate the exact concentration of these solutions to ensure accurate experimental results. 2. Develop Proficiency in Performing Titrations Master the techniques and procedures involved in performing different types of titrations, such as acid-base titrations	
Course Outcome	Students will be able to: 1. Understand the Basic Concepts of Carbohydrates, Lipids, Proteins, Hormones and enzymes 2. Identify and Differentiate type structure, properties, functions and uses Carbohydrates, Lipids, Proteins, Hormones and enzymes	
Course Content **1.**	**1. Calibration of glassware's** **2. Determination of pH using pH meter** **3. Preparation of standard solutions** • 0.1N HCl • 0.1N NaOH • 0.1N $KMnO_4$ • 0.1N Iodine **4. Oxidation reduction titration-** • Ferrous ammonium sulphate with K_2Cr_2O7 • $KMnO_4$with oxalic acid. Using a standard solution of$KMnO_4$and NaOH determine the strength of a mixture of $H2SO_4$ and $H2C_2O_4$. $2H_2O$	**12**
2.	1. Estimation of hemoglobin by colorimetric method 2. Qualitative tests for proteins 3. Qualitative tests for fats 4. Qualitative analysis of carbohydrates (selected compounds) 5. Estimation of Glucose DNSA (colorimetric method) 6. Estimation of Sucrose by Benedict's Quantitative method. 7. Qualitative tests for proteins (colour reactions and precipitation reactions) 8. Qualitative tests for fats.	**18**
References	1. Finar I.L "Organic Chemistry, Volume 2": Stereochemistry and the Chemistry of Natural Products, 5th Edition, 2009. 2. Rastogi S.C. "Biochemistry", 2nd Edition, (2003) Tata MacGraw Hill Publishing Co. Ltd. 3. Jain, J, L., S. Jain and N. Jain. "Fundamentals of Biochemistry". 6th Edition, (2005). S. Chand Company Ltd. 4. Plummer, D.T., "An Introduction to Practical Biochemistry". 2nd Edition, (1971)	
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**	

T. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-V
Year-2025-26
Major-Human Nutrition-I(Theory)

Course (subject) Code:	BFSNMJT13	
Subject Title	Human Nutrition I	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To understand the fundamentals of the science of nutrition. 2. To understand the underlying biological, chemical, & regulatory mechanism. 3. To understand contemporary issue in the context of current scientific knowledge. 4. To understand interrelationship between Nutrients. 5. To understand latest developments in Human Nutrition.	
Course Outcome	Students will be able to: 1. Understand the Role of Nutrition in Human Health. 2. Evaluate Dietary Guidelines and Nutritional Recommendations 3. Understand the Relationship Between Nutrition and Metabolism	
Course Content **1.**	**CARBOHYDRATES:** • Types, absorption, functions in detail. • Types of sugars - sugar alcohol, fiber -types, properties, function, role in various diseases. **PROTEIN**: • Review of absorption, absorption, types, functions • Methods of protein evaluation Amino acid imbalance, nitrogen balance, antagonism and toxicity. • Factors affecting protein utilization RDA. • Vegetarianism	**14**
2.	**LIPIDS**: • Review of absorption and metabolism. • Types of lipids, fatty acids, lipoproteins. • RDA and Functions, role of fat in cardio-vascular diseases. **WATER:** • Sources, functions, distribution of body water. • Mechanism of loss, regulation of water balance, disturbances in water balance, dehydration, water intoxication. **INTERRELATIONSHIP** • Inter relation between carbohydrate, fat and protein in energy metabolism. • Starvation -Metabolism in starvation	**12**
References	1. R. Passmore M.A. Eastwood, Human Nutrition & Dietary -. ELBS English language book society. 2. Helen Guthrie: Introductory Nutrition, Times Mirror Publishing 3. M. Swaminathan: Advanced Text book on Food and Nutrition Vol.-I & Vol. – II 4. 4. Mantab S. Bamji, N. Prahlad Rao, Vinodini Reddy Textbook of Human Nutrition	
Teaching Methodology	**Classwork, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

T. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-V
Year-2025-26
Major-Human Nutrition-I (Practical)

Course (subject) Code:	BFSNMJP13	
Subject Title	Human Nutrition I	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To get in field experience about deficiency diseases with respect to signs and symptoms. 2. To understand case history of in-door patients of hospitals. 3. To understand contemporary issue in the context of current scientific knowledge. 4. To understand interrelationship between Nutrients. 5. To understand latest developments in Human Nutrition. 6. To understand major deficiency among preschool children.	
Course Outcome	Students will be able to: 1. Understand Energy Requirements and Expenditure Demonstrate an understanding of the concept of energy requirements and expenditure, including the factors influencing energy expenditure such as age, sex, body composition, activity level, and environmental conditions. 2. Calculate Basal Metabolic Rate (BMR) Using the Kymograph Develop practical skills in calculating Basal Metabolic Rate (BMR) using the Kymograph 3. Determine Energy Expenditure Using the Satyanarayan Method Apply the Satyanarayan Method to calculate energy expenditure and understand its significance in estimating daily energy requirements for individuals based on their activity levels. 4. Calculate the chemical score and different methods of protein quality	
Course Content		
1.	**Introduction to energy requirement and expenditure and factors which influence energy expenditure.** 1. Calculating BMR using the Kymograph. 2. Calculating the Energy Expenditure using the Satyanarayan Method. 3. Calculating the Energy Balance 4. Carbohydrates 5. Calculation of the per cent energy supplied by Carbohydrates in the Diets. 6. Survey of High fibre products available in the market	**18**
2.	**Introduction to the concept of Protein quality**. • Calculate the chemical score using the SAAP, PAAP Reference protein. • Calculating the chemical score and NDP Cal% of dishes. • Evaluation of the protein quality of dishes.	**12**
References	1. R. Passmore M.A. Eastwood, Human Nutrition & Dietary -. ELBS English language book society. 2. Helen Guthrie: Introductory Nutrition, Times Mirror Publishing 3. M. Swaminathan: Advanced Text book on Food and Nutrition Vol.-I & Vol. – II 4. Mantab S. Bamji, N. Prahlad Rao, Vinodini Reddy Textbook of Human Nutrition	
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**	

T. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-V
Year-2025-26
Minor-Dietetic Techniques & Patient Counseling (Theory)

Course (subject) Code:	BFSNMCT04	
Subject Title	Dietetic Techniques & Patient Counseling	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. Understand the principles and procedures of nutrition counselling and the role of the counsellor. 2. Develop an understanding how: (a) lifestyles influence health and well-being; (b) acute and chronic disease affects the emotional and psychological state and the behaviour of the individuals 3. Be familiar with various techniques used in counselling 4. Be able to use various types and techniques of counselling to motivate patients to achieve well-being	
Course Outcome	Students will be able to: 1. Understand the Principles and Procedures of Nutrition Counselling 2. Recognize the Influence of Lifestyles on Health and Well-being 3. Understand the Psychological and Emotional Impact of Acute and Chronic Diseases 4. Familiarize with Counselling Techniques 5. Use Counselling Techniques to Motivate and Empower Patients 6. Cultivate Communication Skills for Effective Counselling 7. Assess and Address Barriers to Healthy Behaviour Change	
Course Content **1.**	**Introduction to Dietetics and Nutrition** • Definition, scope, and importance of dietetics • Role of a dietician in healthcare, in a hospital and community, team approach to nutritional care, ethical code and responsibility. • Defining features of counselling psychology **Patient Counselling in Dietetics** • Principles of effective communication • Motivational interviewing • Dietary counselling techniques: Types of Counselling: Directive, Non-Directive, Eclectic Group counselling, One on One counselling • Diet counselling skill: Tactics and techniques of counselling- evaluating and understanding the patient's attitude, how to identify and express your feelings towards the patients, utilizing proper counselling techniques- nonverbal behaviour, verbal behaviour, covert behaviour. • Handling challenging patient behaviours	**18**
2.	**Ethical and Legal Considerations in Dietetics** • Professional ethics and responsibilities • Confidentiality and patient rights • Legal implications of nutrition counselling and recommendations	**10**
References	**1.** Bali P.A(2001) care of the Elderly in India. Changing configurations, Indian Institute of Advanced study, Shimla **2.** Bhai, L.T, (2002) Ageing on Indian perspective, Decent Books Pubs, New Delhi **3.** Dietetics 5th edition by B. Srilakshmi **4.** Singh. R. (1994) Educational and Vocational Guidance, Common Wealth pub, New Delhi **5.** Jacobs, M (2010) Psychodynamic Counselling in Action (4th edition) Sage publications, New Delhi 6. Maerns and Thorne (2007) Person-centred Counselling in Action (3rd edition), Sage publications, New Delhi	

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

T. Y. B. Sc. (NCF- NEP)
Food Science and Nutrition-V
Year-2025-26
Minor-Dietetic Techniques & Patient Counseling (Practical)

Course (subject) Code:	BFSNMCP04	
Subject Title	Dietetic techniques & Patient Counseling	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To develop practical counselling skills to support patients in making lasting dietary changes. 2. To understand how lab results can guide dietary recommendations 3. To practice assessing the patient's current diet and identifying areas for improvement	
Course Outcome	Students will be able to: 1. Develop Practical Counselling Skills for Lasting Dietary Changes. 2. Understand the Role of Lab Results in Guiding Dietary Recommendations. 3. Assess and Evaluate a Patient's Current Diet. 4. Identify Nutritional Gaps and Develop Targeted Dietary Plans. 5. Provide Evidence-Based Guidance on Diet Modification. 6. Build Rapport and Foster Trust in the Counselling Process. 7. Evaluate and Address Psychological and Behavioural Factors in Dietary Change	
Course Content **1.**	**Nutritional Counselling Techniques** • Role-playing patient counselling sessions using various communication techniques • Demonstrating motivational interviewing techniques • Assessing readiness for change and applying counselling strategies (e.g., goal-setting, problem-solving) • Teaching patients how to prepare healthy meals in line with dietary recommendations **Biochemical and Laboratory Investigations** • Interpretation of laboratory results (blood glucose, cholesterol, lipid profile, etc.) • Analysing nutritional deficiencies based on biochemical data	**16**
2.	**Food and Diet Recording** • Conducting dietary recalls and food diaries with patients • Analysing and assessing the recorded diet for nutritional adequacy	**10**
References	**1.** Bali, P.A (2001) care of the Elderly in India. Changing configurations, Indian Institute of Advanced study, Shimla **2.** Bhai, L.T, (2002) Ageing on Indian perspective, Decent Books Pubs, New Delhi **3.** Dietetics 5th edition by B. Srilakshmi **4.** Jacobs, M (2010) Psychodynamic Counselling in Action (4th edition) Sage publications, New Delhi 6. Maerns and Thorne (2007) Person-centred Counselling in Action (3rd edition), Sage publications, New Delhi **5.** Singh. R. (1994) Educational and Vocational Guidance, Common Wealth pub, New Delhi	
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**	

T. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-V
Year-2025-26
Minor-Food processing (Theory)

Course (subject) Code:	BFSNMCT05	
Subject Title	Food Processing	
Course Level	**300**	
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 processing 3. To understand the changes occurring in foods during processing	
Course Outcome	Students will be able to: 1. Understand the Nature and Composition of Food 2. Learn the Methods and Principles of Food Processing 3. Understand the Changes in Foods During Processing 4. Evaluate the Effects of Food Processing on Nutritional Value 5. Examine the Role of Food Additives in Processing 6. Assess the Impact of Processing on Food Safety 7. Understand the Consumer Preferences and Market Trends in Processed Foods	
Course Content **1.**	**Introduction to food processing, objectives of studying, food processing and its importance** **Processing of Cereals:** • Structure and composition of cereal grains. • Milling of wheat, milled products of wheat (types of flour) and flour treatments. • Rice milling (in brief) • Parboiling of Rice, Rice bran Oil. **Processing of Legumes/Pulses:** • Milling/decortication. • Soaking • Cooking, Germination, Fermentation • Anti-Nutritional factors –definition and legumes containing ANF (in brief-Tabular form). **Processing of Fats and oils:** • Rendering • Pressing (Traditional and Modern methods) • Solvent extraction • Refining of oils (in brief) • Winterization • Hydrogenation of fats/oils	**12**
2.	**Processing of Milk and milk products:** • Introduction and chemical composition of Milk. • Clarification • Pasteurization • Homogenization • Types of processed milk **Beverages:** • Introduction and classification. • Tea: Types and processing of black tea. • Coffee: Types and processing of coffee. • Carbonated beverages (Non-alcoholic): Meaning and steps involved in processing. **Convenience foods:** • Definition • Advantages and Disadvantages	**18**

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. Bennion, M. Scheule, B.: (2009): Introductory Foods,13th Edition, Prentice Hall Publications 4. Subbulakshmi, G, Udipi, S. A (2006): Food processing and Preservation, New Age International Pvt Ltd Publishers 5. Potter, N. N., Hotchkiss J. H: (1999), Food Science, 5th Edition, Springer Publications	
Teaching Methodology	**Classwork, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

T. Y.B. Sc. (NCF- NEP)
Food Science and Nutrition-V
Year-2025-26
Minor-Food processing (Practical)

Course (subject) Code:	BFSNMCP05	
Subject Title	Food Processing	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To understand the processing steps involve in manufacturing of different food products. 2. To understand the techniques, use to transmute raw ingredients in to food. 3. To understand the principle involved in food processing. 4. To conduct market survey for convenience foods and to categories them.	
Course Outcome	Students will be able to learn: 1. Processing Steps Involved in Manufacturing Different Food Products 2. Techniques for Transforming Raw Ingredients into Food. 3. Principles Involved in Food Processing 4. Regulatory and Ethical Considerations in Food Processing	
Course Content	**Market Survey** Market surveys of different processed food products available in the market and to categories them. • Evaluation of Milk by determination of fat content, determination of total solids and determination of solids-not-fat (SNF) content. And **Preparation of Paneer** by using different types of milk. • Preparation of flavoured milk, and analysis of pH, Titratable acidity, moisture, total solids, lactose content	**12**
	• Amylase rich food (ARF) preparation and its product used as weaning food. Combining cereal and pulse to develop amylase rich flour Cereals and cereal based products • Malting process: Development of nutrient dense flour using malting process	**18**
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. Bennion, M. Scheule, B.: (2009): Introductory Foods,13th Edition, Prentice Hall Publications 4. Subbulakshmi, G, Udipi, S. A (2006): Food processing and Preservation, New Age International Pvt Ltd Publishers 5. Potter, N. N., Hotchkiss J. H: (1999), Food Science, 5th Edition, Springer Publications 6. Freeland-Graves, J., Peckham, G. C, (1995): Foundations of Food Preparation (6th Edition), Prentice Hall 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**	

T. Y.B. Sc. (NCF- NEP)
Food Science and Nutrition-V
Year-2025-26
SEC-Food Product Development (Practical)

Course (subject) Code:	BFSNAECP05	
Subject Title	Food Product Development	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To equip students with the skills to identify and analyse market demands, consumer preferences, and emerging food trends. 2. To teach students the process of developing and formulating new food products based on nutritional value, taste, and functionality. 3. To help students design food products that promote health and well-being, focusing on improving the nutritional profile and addressing specific dietary needs. 4. To familiarize students with food safety protocols, standards, and regulations to maintain product safety and quality throughout the development process.	
Course Outcome	Students will be able to: 1. Identify and Analyse Market Demands and Consumer Preferences 2. Formulate New Food Products Based on Nutritional Value, Taste, and Functionality 3. Design Health-Promoting Food Products 4. Understand the Importance of Food Safety Protocols, Standards, and Regulations 5. Innovate and Respond to Consumer Trends in Food Products	
Course Content **1.**	**1. Introduction to New Food Product Development** • Definition and importance of food product development • Needs for developing new product • Steps to follow for developing new products: • Various aspect to be taken care while developing new product: • Selection of packaging materials • Labelling • Study of shelf life of the product • Estimating cost of the product developed • Marketing and sale **2. Selection, Product Formulation and Recipe Development with justification. (Finalizing minimum two recipes)** • New product concept based on consumer survey • Writing standard operating procedure for your product • Standardization of recipe	12
2.	**1. Final Packaging of the product** • **Cost Analysis**: Calculate the cost of raw materials, production, packaging, labour, and overheads • **Label Compliance**: Create a label that complies with regulatory standards, including nutritional information, ingredients, allergens, expiration dates, and health claims. • **Design Packaging:** Develop packaging that ensures product protection, ease of use, and aligns with branding and sustainability goals. Explore eco-friendly packaging options and consider the product's environmental impact in its lifecycle • **Evaluate Shelf Life:** Conduct stability and shelf-life studies to ensure the product remains safe and maintains its sensory and nutritional qualities over time. • **Marketing, sale and feedback from the customers** **2. Visit to food / Bakery industry**	18

References	1. "Food Product Design: An Integrated Approach" by Ruud L. A. H. S. (Rudolph) Heeneman 2. "Food Science" by Norman N. Potter and Joseph H. Hotchkiss 3. "Introduction to Food Science and Technology" by D. K. Tressler, J. W. H. Gauthier 4. "Handbook of Food Product Development" by Harry T. Lawless and Hildegarde Heymann
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**

Veer Narmad South Gujarat University, Surat

T. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-VI
Year-2025-26

About Programme: 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. This program equips students with the knowledge and practical skills needed to work in various sectors including the food industry, health and wellness fields, government agencies, and research institutions. The curriculum focuses on the composition of foods, food safety, processing technologies, nutritional biochemistry, diet planning, and public health nutrition.

Semester: VI

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	BFSNMJT14 BFSNMJP14	Ancient Nutrition and Diet Therapy-II	Ancient Nutrition and Diet Therapy-II	300	2	4	1	6	2	2	25	25	25	25	50	50
Major Course	BFSNMJT15 BFSNMJP15	Nutritional Biochemistry	Nutritional Biochemistry	300	2	4	1	6	2	2	25	25	25	25	50	50
Major Course	BFSNMJT16 BFSNMJP16	Human Nutrition II	Human Nutrition-II	300	2	4	1	6	2	2	25	25	25	25	50	50
Minor Course	BFSNTMCT06 BFSNTMCP06	Food Analysis	Food Analysis	300	2	4	1	6	2	2	25	25	25	25	50	50
Ability Enhancement Course	BFSNAECP05	Nutritional Assessment and Surveillance	Nutritional Assessment and Surveillance	300	-	4	-	6	-	2	-	25	-	25	-	50
Internship	BFSNPINT01	Internship	Internship	-	-	8	-	-	0	4	-	40	-	60	-	100

T. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-VI
Year-2025-26
Major-Ancient Nutrition and Diet Therapy –II- (Theory)

Course (subject) Code:	BFSNMJT14	
Subject Title	Ancient Nutrition and Diet Therapy-II	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To formulate the diet to meet the needs of the patient, taking into consideration her or his food habits 2. To modify the existing diets to ameliorate the disease condition and to keep it under control. 3. To correct nutritional deficiencies if any. 4. To prevent short-term and long- term complications in cases of chronic diseases 5. To educate and counsel the patient regarding the need to adhere to the prescribed diet	
Course Outcome	Students will be able to: 1. Formulate Personalized Diets for Patients Based on Individual Needs 2. Modify Existing Diets to Manage Disease Conditions 3. Prevent Complications in Chronic Disease Management 4. Educate and Counsel Patients on the Importance of Diet Adherence 5. Evaluate the Effectiveness of Dietary Modifications	
Course Content 1.	**Ancient dietary practices in heart diseases and renal diseases and nutritional care in cardio-vascular diseases cardio-vascular diseases**: • Atherosclerosis-Relationship between dietary fat and development of cardiovascular diseases, Risk Factors and Dietary Management. • Hypertension: Types, Causes, Symptoms and dietary management of Hypertension **Nutritional care in renal disorders** • Nephrosis and Nephritis: Functions of kidneys, Renal function tests, Causes, symptoms, Dietary management. • Chronic kidney Disease and Renal Calculi: Causes, types and Dietary management. • Dialysis: Types- peritoneal and haemodialysis and Dietary management.	**18**
	Ancient dietary practices in Pulmonary disorders, Burns and Cancer **Nutritional care in Pulmonary disorders, Burns and Cancer** • Diet in burns and trauma: Nutritional risks in trauma and burns, metabolic changes in burns & trauma, Nutritional alterations in burns & trauma, ancient practices for treatment of burns & trauma. • Diet in Pulmonary disorders: Alterations of pulmonary function-signs and symptoms of pulmonary disease, Respiratory distress syndrome in adults and newborn, Obstructive pulmonary diseases, Asthma and cystic fibrosis, ancient practices for treatment of pulmonary disorders. • Diet in Cancer: Types of Cancer, Metabolic & systemic alterations, Nutritional management and different types of cancer therapies, Cancer cachexia & other common complications, ancient practices for treatment of cancer.	**16**

References	1. Normal and Therapeutic Nutrition Paper by Corinne Hogden Robinson (Author), Marilyn Lawler (Author) 2. Nutrition And Diet Therapy by Carroll A. Lutz, Karen Rutherford Przytulski, F.A. Davis Company. 3. Krauses Food and Nutrition Care Process 14Th Edition by L Kathleen Mahan and Janice L Raymond, Elsevier Science. 4. Understanding Normal and Clinical Nutrition - 11th edition, by Sharon RadyRolfes, Kathryn Pinna and Ellie Whitney 5. Dietetics 5th edition by B. Srilakshmi
Teaching Methodology	**Classwork, Discussion, Projects, Seminar, Assignments, Workshop, Field work**
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**

Subject Code [2503030306011002]

T.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition-VI
Year-2025-26
Major-Ancient Nutrition and Diet Therapy –II- (Practical)

Course (subject)Code:	BFSNMJP14	
Subject Title	Ancient Nutrition and Diet Therapy-II	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To formulate the diet to meet the needs of the patient, taking into consideration her or his food habits 2. To modify the existing diets to ameliorate the disease condition and to keep it under control. 3. To correct nutritional deficiencies if any. 4. To prevent short-term and long- term complications in cases of chronic diseases 5. To educate and counsel the patient regarding the need to adhere to the prescribed diet	
Course Outcome	Students will be able to: 1. Formulate Personalized Diet Plans to Meet Patient Needs 2. Modify Diets to Improve Disease Management. 3. Address and Correct Nutritional Deficiencies 4. Prevent Complications in Chronic Disease Through Diet 5. Educate and Counsel Patients on Diet Adherence 6. Monitor and Evaluate the Effectiveness of Dietary Interventions 7. Empower Patients Through Nutritional Education 8. Collaborate with Healthcare Teams to Enhance Patient Care	
Course Content	**Methods used in Ancient Indian diet therapy for treating heart diseases, kidney diseases and cancer** **Planning and preparation of diet in the given disorders** • Diet in Cardiovascular diseases • Diet in Hypertension • Diet in Renal Calculi • Diet in CKD • Diet in AKD • Diet in Cancer • Diet in COPD	**18**
References	**1.** Normal and Therapeutic Nutrition Paper by Corinne Hogden Robinson (Author), Marilyn Lawler (Author) **2.** Nutrition And Diet Therapy by Carroll A. Lutz, Karen Rutherford Przytulski, F.A. Davis Company. **3.** Krauses Food and Nutrition Care Process 14Th Edition by L Kathleen Mahan and Janice L Raymond, Elsevier Science. **4.** Understanding Normal and Clinical Nutrition - 11th edition, by Sharon Rady Rolfes, Kathryn Pinna and Ellie Whitney **5.** Dietetics 5th edition by B. Srilakshmi	
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**	

T.Y.B. Sc. (NCF- NEP)
Food Science and Nutrition-VI
Year-2025-26
Major- Nutritional Biochemistry (Theory)

Course (subject) Code:	BFSNMJP15	
Subject Title	Nutritional Biochemistry	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. Understand the fundamentals of metabolic processes occurring in the body. 2. Develop awareness about the significance of various metabolic processes / pathways. 3. Understand the integration of these metabolic processes. 4. Develop the ability to apply the significance of these processes to different physiological / metabolic conditions.	
Course Outcome	Students will be able to: 1. Understand the Fundamentals of Metabolic Processes in the Body 2. Recognize the Significance of Various Metabolic Pathways. 3. Understand the Integration of Metabolic Processes 4. Apply Knowledge of Metabolic Processes to Physiological and Metabolic Conditions	
Course Content **1.**	**Carbohydrate metabolism:** • Various Biological pathways -- site, significance, intermediates with chemical structures, enzymes, and coenzymes involved, Regulation and energetics. • Glycolysis, TCA [Kreb's cycle], Pentose phosphate pathway Gluconeogenesis, Glycogenesis, Glycogenolysis. • Alcohol metabolism and biochemical alterations in alcoholism. • Biological oxidation and electron transport chain. **Lipids metabolism:** • Lipogenesis and Lipolysis • Oxidation of saturated, unsaturated and odd chain fatty acids, regulation. energetics • Biosynthesis of fatty acids, regulation of synthesis. • Ketosis and Ketogenesis • Triglyceride's synthesis --- Triglycerides, synthesis in Liver. • Introduction of Cholesterol – Parent steroid sources, Cholesterol biosynthesis with structures, mode of utilization, • Introduction to Plasma	**12**
	Protein metabolism: • Transamination – diagrammatic representation, role of PLP, significance Oxidative and Nonoxidative Deamination. • Metabolic fate of Ammonia – Formation of glutamate, Formation of Glutamine Urea cycle – pathway with structures. • Transmethylation and one carbon transfer **Metabolism of nucleotides -**Structures of purines, pyrimidines and uric acid Purine catabolism (without structures of the intermediates), Uric acid and gout.	**18**
References	1. Satyanarayana U and Chakrapani U "Biochemistry", 3rd Edition, (2008), Books & Allied Publishers. 2. Rastogi S. C. (2003) ,2nd Edition "Biochemistry, Tata MacGraw Hill Publishing Co. Ltd., New Delhi 3. Jain, J, L., S. Jain and N. Jain (2005) "Fundamentals of Biochemistry". 6th Edition, S. Chand Company Ltd.	

	4. Plummer, D.T., (1971) "An Introduction to Practical Biochemistry". 2nd Edition, McGraw-Hill Publishing Co. Ltd. 5. Vasudevan D.M. and Sreekumari S – (2007) "Textbook of Biochemistry for Medical Students". 5th Edition, Jaypee Brothers, Medical Publishers. 6. "Murray Harper's Illustrated Biochemistry" 29th Edition, (2012) Prentice Hall Int. Voet D, and Voet J.G "Biochemistry" 4th Edition. (2011), John Wiley
Teaching Methodology	**Classwork, Discussion, Projects, Seminar, Assignments, Workshop, Field work**
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**

T. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-VI
Year-2025-26
Major-Nutritional Biochemistry (Practical)

Course (subject) Code:	BFSNMJP15	
Subject Title	Nutritional Biochemistry	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To enable students, learn the principles and procedures of biochemical analysis of blood and urine. 2. To develop ability to interpret the results of the estimations of the common constituents of biological fluids.	
Course Outcome	Students will be able to: 1. Understand the Principles and Procedures of Biochemical Analysis 2. Conduct Biochemical Analysis of Biological Fluids 3. Interpret Biochemical Results of Blood and Urine Analysis 4. Identify Common Constituents in Biological Fluids 5. Apply Biochemical Data to Clinical Diagnosis 6. Evaluate Factors Affecting Biochemical Test Results	
Course Content	**Qualitative Estimation of Normal Constituents of Urine.** **Qualitative Estimation of Abnormal Constituents of Urine** **Quantitative Estimation of:** 1. Urea (Blood and urine) 2. Uric acid (Blood and urine) 3. Glucose (Blood and urine) 4. Creatinine (Blood and urine) 5. Total protein, Albumin, Globulin, A/G Ratio (Blood) 6. Cholesterol (Blood) 7. 7. Enzyme assay - SGPT (Blood)	**20**
References	1. Jain, J, L., S. Jain and N. Jain (2005) "Fundamentals of Biochemistry". 6th Edition, S. Chand Company Ltd. 2. Plummer, D.T., (1971) "An Introduction to Practical Biochemistry". 2nd Edition, McGraw-Hill Publishing Co. Ltd. 3. Apps D.K. and Cohen B.B. and Steel C.M. (1992), "Biochemistry: A Concise Text for Medical Students" Bailliere Tindall, 4. Debajyoti D, "Biochemistry" 2nd Edition, (1980) Academic Publishers. 5. Satyanarayana U and Chakrapani U "Biochemistry", 3rd Edition, (2008), Books & Allied Publishers. 6. Chatterjee M.N., Shinde R. "Textbook of Medical Biochemistry" 8th Edition (2012) Jaypee Brothers, Medical 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**	

Subject Code [2503030306033001]

T.Y. B. Sc. (NCF- NEP)
Food Science and Nutrition-VI
Year-2025-26
Major-Human Nutrition-II (Theory)

Course (subject) Code:	BFSNMJT16	
Subject Title	Human Nutrition-II	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To understand the fundamentals of the science of nutrition. 2. To understand the underlying biological, chemical, & regulatory mechanism. 3. To understand contemporary issue in the context of Current scientific knowledge. 4. To understand interrelationship between nutrients.	
Course Outcome	Students will be able to learn: 1. Understand the Fundamentals of the Science of Nutrition 2. Understand the Biological, Chemical, and Regulatory Mechanisms in Nutrition 3. Examine Contemporary Issues in Nutrition in Light of Current Scientific Knowledge 4. Understand the Interrelationship Between Nutrients 5. Apply Nutritional Knowledge to Promote Health and Prevent Disease 6. Evaluate the Impact of Diet on Overall Physiological Function	
Course Content **1.**	**VITAMINS –Functions, deficiency diseases observed in human beings:** **Fat soluble vitamins** **Vitamin A**: • Sources RDA forms of vit A.R.E.& carotenoids. Role of vitamin A in vision, protein synthesis & cell differentiation, reproduction and growth antioxidant function • Vitamin A deficiency - skin changes, eye change, effect on bone growth, infectious diseases • Vitamin A toxicity **Vitamin D:** Sources, R.D.A**.** • Role in bone growth, other functions. • Vitamin D deficiency: Rickets, osteomalacia – osteoporosis, Toxicity **Vitamin E:** antioxidant function, sources **Vitamin K:** Clotting function, sources **Water Soluble Vitamins** **Vitamin C:** Syntheses & oxidation of vitamin of vitamin C, Role of Vitamin C in colleges formation, dentin synthesis, tyrosine, metabolism, neurotransmitters, utilization of iron, calcium and folacin, stress, antioxidant. • Deficiency: Scurvy - infantile & adult **Thiamine**- Role in energy metabolism, beriberi - dry & wet, adult & infantile **Riboflavin**- Functions, Metabolism Ariboflavinosis • **Niacin** - Pellagra, conversion of tryptophan to niacin, role of B6 in niacin formation, niacin equivalents, isoleucine/Lucien ratio in pellagra. Maize and pellagra	**12**

	• **VITAMIN B6: F**orms of B6, biochemical function, nervous system, hematopoietic, lipid metabolism, effect on hormones, effects on other vitamins, reproduction • **VITAMIN B12**: Intrinsic factor and extrinsic factor • **FOLIC ACID**: Role in DNA forms, role in blood, bone narrow stomach, mouth and nervous system (along with B12), Deficiency-Pernicious anaemia & megaloblastic anaemia B12 deficiency in vegans	
2.	**MAJOR MINERALS:** Sources, REA, functions & deficiency diseases of: ● **CALCIUM: B**one formation, tooth formation, growth, blood clotting, catalysts, muscle tone, nerve impulses, factors affecting calcium absorption- Deficiency - osteoporosis, osteomalacia, tetany, hyperkalaemia ● **PHOSPHORUS:** Energy release, absorption and transport of nutrients, calcification of bones and teeth, acid base balance, deficiency ● **IRON:** Functions - carrier of oxygen and carbon dioxide, blood formation, other functions, iron metabolism (Guthrie)forms, factors affecting iron status, haemoglobin, serum ferritin, nutritional anaemia **TRACE MINERALS:** ● **IODINE** – -Absorption and metabolism Function - thyroxin formation Deficiency - Goitre, myxedema Cretinism, hyperthyroidism, goitrogens sources Iodine status: TSH, T3 & T4 ● **ZINC:** Biochemical role, reproduction, skin, taste growth, sources Deficiency - acrodermatitis enteropathica ● **SELENIUM:** Antioxidant, interrelation of vit E, exudative diathesis ● **COPPER**: Menkey's and Wilson, Biochemical role ● **CHROMIUM:** Role in glucose metabolism ● **SODIUM/POTASSIUM: S**ources, deficiency / excess	**18**
References	1. Whitney E.N., Rolfes S.R. (1996): Understanding nutrition – St. Paul, Minneapolis: West Publishing Co. 2. Wardlaw G. (2001): Perspectives in nutrition – St. Lous Mosby – Year Book 3. Sizer F.S., Whitey E. N. (2001): Nutrition – concepts ad controversies – Belmont (CA): Wadsworth (Thomson learning). 4. Smolin L. A. (1994): Nutrition – science and applications, Saunders College Publishing. 5. Helen Guthrie, Introductory Nutrition, Times Mirror pub.	
Teaching Methodology	**Classwork, Discussion, Projects, Seminar, Assignments, Workshop, Field work**	
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**	

T.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition-VI
Year-2025-26
Major-Human Nutrition-II (Practical)

Course (subject)Code:	BFSNMJP16	
Subject Title	Human Nutrition-II	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To get in field experience about deficiency diseases with respect to signs and symptoms. 2. To understand case history of indoor patients of hospitals. 3. To understand contemporary issue in the context of current scientific knowledge. 4. To understand interrelationship between Nutrients. 5. To understand latest developments in Human Nutrition. 6. To understand major deficiency among preschool children.	
Course Outcome	Students will be able to: 1. Identify and Understand Deficiency Diseases and Their Signs and Symptoms 2. Examine Contemporary Issues in Nutrition in Light of Current Scientific Knowledge 3. Understand the Interrelationship Between Nutrients 4. Stay Updated on the Latest Developments in Human Nutrition 5. Identify Major Nutritional Deficiencies Among Preschool Children 6. Assess the Role of Nutrition in Preventing and Treating Deficiency Diseases	
Course Content **1.**	**Introduction to balance studies** • Positive Balance • Negative Balance • Equilibrium • Limitation of Balance studies • Balance studies in Humans • Balance studies in Experimental animals	**08**
2.	**Calcium Balance** • To estimate the calcium content of faeces and urine and to assess the calcium balance of an individual **Nitrogen Balance** • To estimate total nitrogen intake, based on protein intake and calculate nitrogen balance of an individual. • Introduction to sports nutrition & ergogenic aids (survey of ergogenic aids) • Sports Nutrition (Diet plan for sports person)	**16**
References	1. Wardlaw G. (2001): Perspectives in nutrition – St. Lous Mosby – Year Book 2. Sizer F.S., Whitey E.N. (2001): Nutrition – concepts ad controversies – Belmont (CA): Wadsworth (Thomson learning).	
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**	

T.Y. B. Sc. (NCF- NEP)
Food Science and Nutrition-VI
Year-2025-26
Minor-Food Analysis (Theory)

Course (subject)Code:	BFSNMJT06	
Subject Title	Food Analysis	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To impart basic knowledge food composition. 2. To teach general principles involved in instrumental methods. **3.** To make the students understand the principle involved in the estimations. **4.** To make them aware with food laws, food standards and specifications.	
Course Outcome	Student will be able to: 1. Learn the fundamental concepts and methods used to analyze the chemical, physical, and microbiological properties of foods. 2. Analyse and quantify the major components of foods, including carbohydrates, proteins, fats, and moisture. 3. Identify and quantify food additives, such as preservatives and flavourings, and contaminants, such as heavy metals and pesticides.	
Course Content **1.**	**Introduction:** • Need and its importance-Meaning of food analysis, objectives behind studying food analysis. Food analysis for food quality monitoring. • Food and food components-proximate constituents (principles) of food and importance of its analysis **Sampling methods/ techniques and Sample preparation for analysis:** • Definition of Sample, population and sampling procedure. • Principle involved in sampling and problems in sampling. • General classification of sampling techniques and other sampling techniques. • Advantages and disadvantages of sampling techniques and their comparison, the best sampling method and its justification. • Importance of sample preparation and points to be kept in mind while preparing sample for analysis with suitable examples.	**12**
2.	**General Instrumental methods** • **Spectro analytical Methods**- Colorimeter and Spectrophotometer. Identification, construction (diagram), working principle, Specifications and limitations (if any) and use in food analysis. • **Other laboratory instruments-**Soxhlet apparatus, muffle furnace, Water bath and Electric oven centrifuge machine and Kjeldahl apparatus- Their identification, construction (diagram), working principle, Specifications and limitations (if any) and use in food analysis **Regulation of food laws, food standards and food specifications, food analysis for food safety and quality control**	**18**
References	1. Harold Egan, Ronald S. Kirk, Ronald Sawyer, David Pearson "Pearson's Chemical Analysis of Foods. 8th Edition, 1981. Churchill Livingstone. 2. C Gopalan; B V Rama Sastri; S C Balasubramanian "Nutritive Value of Indian Foods." 6th Edition, 1996, Reprinted 2011. National Institute of Nutrition. 3. "Official Methods of Analysis, of AOAC INTERNATIONAL", 18th Edition, 2005, AOAC INTERNATIONAL.	

	4. N. Raghuramulu, K. Madhavan, S. Kalyanasundaram. "A Manual of Laboratory Techniques", 2nd Edition, 2003, National Institute of Nutrition. Hyderabad. 5. A.Y. Sathe, "A first course in Food Analysis" 1st Edition, 1999. New Age International (P) Limited. 6. Morris Boris Jacobs "The Chemical Analysis of Foods and Food Products". 3rd Edition. 7. Food analysis by N. Khetrapal and D. Punia.
Teaching Methodology	**Classwork, Discussion, Projects, Seminar, Assignments, Workshop, Field work**
Evaluation Method	**50% CCE (Continues and Comprehensive Evaluation) Formative** **50% SEE (Semester End Evaluation) Summative**

T.Y.B. Sc. (NCF- NEP)
Food Science and Nutrition-VI
Year-2025-26
Minor-Food Analysis (Practical)

Course (subject) Code:	BFSNMJP06	
Subject Title	Food Analysis	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course Objectives	1. To impart basic knowledge food composition. 2. To teach general principles involved in instrumental methods. 3. To make the students understand the principle involved in the estimations. 4. To make them aware with food laws, food standards and specifications.	
Course Outcome	Student will be able to: 1. Learn the fundamental concepts and methods used to analyze the chemical, physical, and microbiological properties of foods. 2. Analyse and quantify the major components of foods, including carbohydrates, proteins, fats, and moisture. 3. Identify and quantify food additives, such as preservatives and flavourings, and contaminants, such as heavy metals and pesticides.	
Course Content **1.**	**Introduction food analysis subject:** **1.** How to work in the laboratory with analytical instruments, their identification, working principle, operation and handling for the analysis of various food stuffs. 2. Sample preparation of different food stuffs for analysis • cereals and pulses • fruits and vegetables • flesh foods/meat and fish • liquid foods/milk and fruit juices • fats and oils/nuts and oilseeds • spices and condiments and other foods	**12**
2.	1. Estimation of moisture from the given food sample by drying method or AOAC (Association of Analytical Chemist) method. 2. Estimation of oil or fat from the given food sample/Nuts and oilseeds by Soxhlet apparatus method or Solvent extraction method. 3. Determination of Acid value of a given fat/oil sample by NIN (National Institute of Nutrition) method. 4. Determination of titratable acidity of Milk (as % of lactic acid) by titrimetric method. 5. Estimation of Ascorbic acid (Vitamin C) from citrus fruits or from unknown solution/sample by titrimetric method or 2-6, dichlorophenol indophenols method/dye method. 6. Estimation of Total Ash from given food sample by AOAC method. 7. Estimation of Iron from given food sample by Dipyridyl method of Ramsay or by Colorimetric /Spectrophotometric method.	**18**
References	1. Harold Egan, Ronald S. Kirk, Ronald Sawyer, David Pearson "Pearson's Chemical Analysis of Foods. 8th Edition, 1981. Churchill Livingstone. 2. C Gopalan; B V Rama Sastri; S C Balasubramanian "Nutritive Value of Indian Foods." 6th Edition, 1996, Reprinted 2011. National Institute of Nutrition. 3. "Official Methods of Analysis, of AOAC INTERNATIONAL", 18th Edition, 2005, AOAC INTERNATIONAL. 4. A.Y. Sathe, "A first course in Food Analysis" 1st Edition, 1999. New Age International (P) Limited.	

	5. Morris Boris Jacobs "The Chemical Analysis of Foods and Food Products". 3rd Edition. 6. Food analysis by N. Khetrapal and D. Punia
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**

T. Y. B.Sc. (NCF- NEP)
Food Science and Nutrition-VI
Year-2025-26
SEC-Nutritional Assessment and surveillance (Practical)

Course (subject) Code:	BFSNAECP05	
Subject Title	Nutritional Assessment and Surveillance	
Course Level	**300**	
Credit	**2**	
Teaching per week	**2**	
Course objective	1. To sensitize students to the principles, and methods for assessment of nutritional status 2. To equip students to use and interpret various methods for assessing nutrition status\ 3. To enable understanding of purpose and types of nutrition surveillance	
Course Outcome	Student will able to: 1. Learn the methods and techniques used to assess an individual's or population's nutritional status. 2. Accurately measure height, weight, and other body dimensions to assess nutritional status. 3. Evaluate an individual's or population's dietary habits and nutrient intake using various methods (e.g., 24-hour recall, food frequency questionnaire). 4. Assess the impact and effectiveness of nutritional interventions and programs.	
Course Content **1.**	**1. Development of Tools for Data Collection** • Development of tools for collection of direct, indirect and ecological parameters for assessment of nutritional status from 2 different field settings (structured questionnaire and semi structured questionnaire), data collection, analysis and interpretation using MS excel • Development of tools for collection of dietary data using 24hDRM and FFQ, data collection, analysis, comparisons with RDA, calculation of consumption units and interpretation using the RDA (NIN, 2010) **2. Anthropometric Measurements and its Analysis** • Data collection for various anthropometric measurements for children and adults for Weight, height, BMI, waist/hip, MUAC, Head circumference, SFT • Analysis and interpretation using software	**12**
2.	**1. Understanding the Clinical Signs and Various Conditions** • Understanding the Clinical signs and symptoms for various nutritional deficiencies through field visits, power point presentations, videos: a. SAM / kwashiorkor b. Anaemia c. VAD, Xerophthalmia d. IDD e. Water soluble vitamin B-Complex and ascorbic acid f. Zinc and other micronutrients **2. Preparing a critique of Nutrition surveillance data available in latest reports**	**18**

	3. Preparing digital tool for nutrition awareness	
References	1. Jelliffe DB, Jelliffe EP (1989). Community nutritional assessment. Oxford University Press, New Delhi. 2. Gopaldas T and Seshadri S (1987). Nutrition monitoring and assessment. Oxford University Press. Delhi. 3. Sachdev HPS, Choudhury P (Eds), (1994). Nutrition in children. Developing country concerns. Dept of Paediatrics. Maulana Azad College. New Delhi. 4. http://www.slideshare.net/soharashed/assessment-of-nutritional-status 5. Regional workshop on national nutrition surveillance (2009) http://www.searo.who.int/LinkFiles/Publications_SEA-NUT-177.pdf 6. WHO website	
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**	

T.Y.B.Sc. (NCF- NEP)
Food Science and Nutrition-VI
Year-2025-26
Internship

Course (subject) Code:	BFSNPINT01
Subject Title	Internship
Course Level	**300**
Credit	**4**
Teaching per week	**4**
Course Objectives	1. To provide practical exposure to food and nutrition-related tasks in hospitals, food industries, bakery industries, and dairy industries 2. To gain exposure to clinical nutrition, patient care, and medical diet therapy 3. To apply theoretical knowledge gained during coursework to real-world settings 4. To enhance skills in dietetics, nutrition counselling, and meal planning 5. To understand food safety, quality control, and production processes in the food industry. To learn about the production of baked goods and their nutritional content 6. To understand ingredient formulation for different types of bakery-products and to learn about the production of baked goods and their nutritional content and also to understand the processes involved in dairy production and its nutritional aspects. 7. To work with professionals in the industry and learn industry best practices
Course Outcome	Students will be able to: 1. Apply concepts and skills learned in the classroom to real-world situations 2. Enhance communication, teamwork, problem-solving, and time management skills 3. Gain insight into the operations, challenges, and trends of a specific industry or organization 4. connections with professionals in the field and build a network of contacts **5.** Explore different career paths and gain clarity on future career goals
Course Content	**Duration:** 4 weeks **Hospital Internship** **Tasks and Activities:** • Conduct nutrition assessments and assist in meal planning. • Observe and assist in inpatient and outpatient consultations. • Prepare therapeutic diet charts for patients. • Attend interdisciplinary meetings (with doctors, nurses, and healthcare professionals). • Monitor and evaluate the progress of patients on specific diets. • Learn about food service management in a hospital. • Minimum four case study of different diseased condition patient
	Food Industry Internship **Tasks and Activities:** ● Observe food production processes, including raw material selection and processing. ● Participate in quality control and assurance activities. ● Understand regulatory requirements (FSSAI, ISO standards, etc.). ● Learn about food labelling and packaging. ● Understand supply chain management in food industries

	Bakery Industry Internship **Tasks and Activities:** • Assist in baking and formulation of different bakery products (cakes, bread, pastries). • Learn about the role of nutrition in bakery products (e.g., low-fat, gluten-free, etc.). • Observe food safety standards in a bakery setting. • Participate in product testing, quality checks, and packaging.	
	Dairy Industry Internship **Tasks and Activities:** • Assist in dairy processing, including pasteurization, fermentation, and packaging. • Learn about the nutritional benefits of various dairy products. • Participate in quality control testing for dairy products. • Observe hygiene and safety standards in dairy processing. • Understand nutritional value, packaging and labelling of dairy products	
	Evaluation and Reporting: TOTAL -100 Marks The evaluation will be done jointly by the college and placement organization. **1.Internal evaluation**: **40 marks (Report -20 +Oral presentation-20)** **Submission of report and oral presentation by the student.** • **Final Report:** A comprehensive final report, summarizing the entire internship experience, key learnings, and future recommendations for career development. Final report should be written by the student with I. Title of Internship, location of Internship & Name II. About the organization III. Internship details IV. Outcomes & suggestions • **Presentation:** Interns should prepare a presentation to summarize their experiences and learning outcomes, which will be presented to the faculty or internship coordinator. **2. External Evaluation by Industry / organization:60 marks** Evaluation criteria to be provided by the college to the Organization /Industry to be filled in & submitted by the supervisor.	
Teaching Methodology	**Discussion, Projects, Workshop, Field work, Presentation**	
Evaluation Method	**60% CCE (Continues and Comprehensive Evaluation) Formative** **40% SEE (Semester End Evaluation) Summative**	