# VANITA VISHRAM WOMEN'S UNIVERSITY
# SCHOOL OF SCIENCE AND TECHNOLOGY
# FACULTY OF SCIENCE
# DEPARTMENT OF FOOD AND NUTRITION


**BACHELOR OF SCIENCE**
**(B.Sc.) HONOURS**
**FOOD AND NUTRITION PROGRAMME**
**under Learning Outcomes-based Curriculum Framework (LOCF)**
**for UnderGraduate (UG) Education**

**Core Courses (CC), Skill Enhancement Courses (SEC),**
**Department Elective Courses (DE)**

***Course Structure is applicable to the students seeking admission in the following programmes***
**B.Sc. Food and Nutrition under LOCF**

**w.e.f. the Academic Year 2024-2025**

## 1. Preamble – VVWU

Vanita Vishram Women's University (VVWU) is the First-ever Women's University of Gujarat approved by the Government of Gujarat under the provisions of the Gujarat Private Universities Act, 2009. It is a University committed to achieve Women's Empowerment through Quality Education, Skill Development, and by providing employment opportunities to its girl students through its model curriculum, integration of technology in pedagogy and best-in-class infrastructure. The focus is on prioritizing practical components and experiential learning supported through academia-industry linkages, functional MoUs, skill development training, internships etc. It aims at providing opportunities to the girl students for holistic development and self-reliance.

### VISION

Empowerment of women through quality education and skill development, so as to make them strong pillars of stability in society.

### MISSION

To provide Education & Professional Training to all women for their all-round development, so as to enable them to become economically independent and socially empowered citizens.

## 2. Introduction of the Programme

It is a three-year undergraduate course offered after completion of 10+2 schooling. The course aims to provide broad and balanced knowledge of Food and Nutrition in addition to an understanding of key chemical concepts, principles and theories. It will provide knowledge and skill to the students' thus enabling them to undertake further studies in Food and Nutrition, in related areas or multidisciplinary areas that can be helpful for self-employment/entrepreneurship. The course is designed to provide intellectual and laboratory skills according to the UGC module for CHOICE-BASED CREDIT SYSTEM (CBCS) pertaining to B.Sc. Food and Nutrition (Honours).

## 3. Programme Specific Objectives (PSOs)

- To provide knowledge of Food and Nutrition with board and balanced aspects
- Development of laboratory analysis skills.
- To develop critical thinking approaches for problem-solving.
- To provide skill base training to hold out in the current competitive environment.
- Multidisciplinary approach for overall development.

## 4. Programme Specific Outcomes (PSOs)

- Identifying Food and Nutrition related problems, analysis and application of data using appropriate methodologies.
- Finding opportunity to apply subject-related skills for acquiring jobs and self-employment.
- Understanding new frontiers of knowledge in Food and Nutrition for professional development.
- Applying subject knowledge for solving societal problems related to application of Food and Nutrition in day to day life.
- Applying subject knowledge for sustainable environment friendly green initiatives.

## 5. B.Sc. Food and Nutrition Programme

| Semester | Subjects | Core Course | Credits | Total |
|---|---|---|---|---|
| SEMESTER-1 | Nutrition Science | FN11010 Fundamentals of Food and Health (Th)-2<br>FN11020 Principles of Macronutrients (Th)-2<br>FN11030 Applied Science (Pr)- 2 | 6 | 24 |
| | Clinical Dietetics | FN11040 Basic Dietetics (Th)-2<br>FN11050 Human Physiology -I (Th)- 2<br>FN11060 Food Laboratory (Pr)- 2 | 6 | |
| | Food Science | FN11070 Food Hazards & Prevention (Th)-2<br>FN11080 Essential of Food Science (Th)-2<br>FN11090 Basic Food Chemistry (Pr)- 2 | 6 | |
| | AECC | EN12010 English Communication-I<br>BT12010 Environmental Studies-I | 2<br>2 | |
| | Elective | BT31090 Biotechnology for Human Welfare (Th)-2<br>CH31090 Biochemistry-I (Th)-2<br>FN31020 Food Safety and Hygiene (Th)-2<br>PH32080 Physics in Everyday Life-I (Th)-2<br>BO31010 Microbes, Algae, Fungi and Archegonite (Th)-2 | 2 | |
| SEMESTER-2 | Nutrition Science | FN11100 Life Cycle Nutrition (Th)-2<br>FN11110 Principle of Micronutrients (Th)-2<br>FN11120 Family Meal Management (Pr)- 2 | 6 | 24 |
| | Clinical Dietetics | FN11130 Nutrition in Physical Fitness (Th)-2<br>FN11140 Human Physiology -II (Th)-2<br>FN11150 Assessment of Nutritional Status (Pr)- 2 | 6 | |
| | Food Science | FN11160 Advance Food Science (Th)-2<br>FN11170 Food Adulteration and Legislation (Th)-2<br>FN11180 Food Preservation and Processing (Pr)- 2 | 6 | |
| | AECC | EN12020 English Communication-II<br>BT12020 Environmental Studies-II | 2<br>2 | |
| | Elective | BT31100 Basics of Human Embryology (Th)-2/<br>CH31100 Biochemistry-II (Th)-2/<br>BO31020 Botany for Human Welfare (Th)-2/<br>FN31030 Food Standards and Laws (Th)-2/<br>PH31100 Physics in Everyday Life II (Th)-2 | 2 | |
| SEMESTER-3 | Nutrition Science | FN11190 Food Microbiology-I (Th)-2<br>FN11200 Food Psychology (Th)-2<br>FN11210 Food Fortification (Th)-2<br>FN11220 Sensory Evaluation (Pr)- 3 | 9 | |
| | Clinical Dietetics | FN11230 Maternal and Child Nutrition (Th)-2<br>FN11240 Malnutrition in Children (Th)-2<br>FN11250 Nutrition in GI Disorders (Th)-2 | 9 | |

| | | | | |
|---|---|---|---|---|
| | | FN11260 Maternal Counseling (Pr)-3 | | 24 |
| | SEC | FN14010 Nutrition Instrumentation(Th)-2<br>FN14020 Food Instrumentation (Th)-2 | 4 | |
| | Department Elective | FN15010 Growth and Development (Th)-2 /<br>FN15020 Mass Media and Extension (Th)-2<br>(Certificate Course (30 Hrs)*/ In House or Outside Training (30 Hrs)/ Student Exchange Program) | 2 | |
| SEMESTER-4 | Nutrition Science | FN11270 Geriatric Nutrition (Th)-2<br>FN11280 Food Entrepreneurship (Th)-2<br>FN11290 Diet for Communicable Diseases (Th)-2<br>FN11300 Food Craft(Pr)-3 | 9 | 24 |
| | Clinical Dietetics | FN11310 Special Feeding Methods(Th) - 2<br>FN11320 Diet for Non-Communicable Diseases(Th) - 2<br>FN11330 Nutrition in Critical Care (Th)- 2<br>FN11340 Hospital Diets(Pr)- 3 | 9 | |
| | SEC | FN14030 Food Tourism(Th) -2<br>FN14040 Ayurveda and Nutrition(Th) - 2 | 4 | |
| | Department Elective | FN15030 Food Packaging and Marketing (Th) -2 or<br>FN15040 Professional Applications in Food Science and Nutrition- Department Elective-2 (Certificate Course (30 Hrs)*/ In House or Outside Training (30 Hrs)/ Student Exchange Program) | 2 | |
| SEMESTER-5 | Nutrition Science | FN11350 Nutritional Biochemistry-I (Th) - 2<br>FN11360 Food microbiology- II (Th) - 2<br>FN11370 Nutrition Programme Management(Th) - 2<br>FN11380 Food Service Management (Th) - 2<br>FN11390 Food Security (Th) - 2<br>FN11400 Nutrition Education and Extension (Th) - 2<br>FN11410 Diet Therapy (Pr) - 3<br>FN11420 Food Analysis (Pr)- 3 | 18 | 24 |
| | Department Elective | FN15050 Nutrition Updates (Th)-2<br>FN15060 Dietetics Techniques (Th)-2<br>FN15070 Nutritional Biochemistry (Pr)-2 | 6 | |
| SEMESTER-6 | Nutrition Science | Core Course-XVII (Credit-2) Core Course-XVIII (Credit-2) Core Course-XIX (Credit-2) Core Course-XX (Credit-2)<br>Core Course Lab-VI (Credit-4) | 12 | 24 |
| | Department Elective | Department Elective-5 (Credit-2) Department Elective-5 Practical (Credit-1) Selections would be made from the two subjects offered | 6 | |

| | | | | |
|---|---|---|---|---|
| | | Department Elective-6 (Credit-2) Department Elective-6 Practical (Credit-1) Selections would be made from the two subjects offered | | |
| | | Project Work/ Training (90 Hrs)/ Internship (2 Weeks) | 6 | |
| SEMESTER-7 | Nutrition Science | Core Course-XXI (Credit-4)<br>Core Course Lab-7 (Credit=2) | 6 | 22 |
| | Research Specific Elective | Research Methodology (Credit-2)<br>Research Area Specific Elective-I (Credit- 2) | 4 | |
| | Research Component | Dissertation (Credit-9) Seminar (Credit-1)<br>Research Article Writing (Credit-2)** | 12 | |
| SEMESTER-8 | Nutrition Science | Core Course-XXII (Credit-4)<br>Core Course Lab-8 (Credit=2) | 6 | 22 |
| | Research Specific Elective | Data Analysis Course (Credit-2)<br>Research Area Specific Elective-II (Credit- 2) | 4 | |
| | Research Component | Dissertation (Credit-9) Seminar (Credit-1)<br>Research Paper Presentation in Seminar or Conference (Credit-2) | 12 | |
| **Total** | | | | **188** |

**Note:**

1. Course structures are to be passed year by year with necessary changes from the respective board of studies.
2. Students will have an exit option at the end of the Semester-6 and she will be awarded with the regular B.Sc Degree (Non-Honours).
3. Course structure of Semester-7 & 8 will require rigorous analysis before implementation in terms of academic requirements, finance and implementation challenges.
4. Subjects suggested above are examples of how subjects can be offered.
5. *Certificate Course may be in Online/Offline or in blended mode.
6. **Research Article Writing comprises articles submitted to the supervisor. Suggestive
7. Notes for the implementation of NEP 2020:
    a. ● As per Government guidelines, yet we can implement NCC/NSS/ Saptdhara/ Physical Training as 2 Credit component in each semester and incorporate it in the Course Curriculum
    b. ● Students with CGPA > 7.5 at the end of Semester-6 will only become eligible to go for B.Sc (Honours) Program (Research Track) in Semester-7. Rest of the students will be awarded traditional B.Sc Degree at the end of Semester-6

**BACHELOR IN FOOD AND NUTRITION**
**SEMESTER V**
**CORE COURSE**

| **FN11350- Nutritional Biochemistry I (Th)** | |
|---|---|
| **Course Objectives**<br>This course will enable students to<br>1. To lay the foundation of biological chemistry.<br>2. To give insights into the chemical reactions that occur in biological systems.<br>3. Get an insight into interrelationships between various metabolic pathways<br>4. Understand the integration of cellular level metabolic events to nutritional disorders and imbalances.<br>5. Apply the knowledge for medical nutrition management in various disease conditions | |
| **Course Outcome:** This course will help to determine the knowledge about the structures of the principal components present in living beings. | |
| **FN-THEORY COURSE CONTENTS (2 Credits)** | |
| **S.No** | **STRUCTURE** |
| **Unit 1** | **Enzymes** |
| | Enzymes – Definition, Classification, Specificity of enzymes, Mechanism of Action, Enzyme kinetics, Enzyme inhibition, Factors affecting enzyme activity, Enzymes in clinical diagnosis. |
| **Unit 2** | **Metabolism of Carbohydrates** |
| | ● Classification of Carbohydrates<br>● Glycolysis- Aerobic & Anaerobic<br>● Tricarboxylic acid cycle and its Significance<br>● Gluconeogenesis<br>● Metabolism of glycogen- Glycogenesis, Glycogenolysis, Hexose monophosphate shunt |
| **Unit 3** | **Metabolism of Protein** |
| | ● Transamination – with diagrammatic representation<br>● Role of PLP, significance<br>● Oxidative and non oxidative Deamination<br>● Metabolic fate of Ammonia- Formation of glutamate, Glutamine<br>● Urea cycle –pathway with structures<br>● Transmethylation and one carbon transfer |

**REFERENCES**


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2. IGNOU, MFN-002- Nutritional Biochemistry
3. Murray, R.K., Granner, D.K., Mayes, P.A., and Rodwell, V.W. (2000): 25th Ed. Harpers Biochemistry. Macmillan Worth Publishers.
4. Nelson, D.L. and Cox, M.M. (2000): 3rd Ed. Lehninger's Principles of Biochemistry, Macmillan Worth Publishers.
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7. Voet, D. Voet, J.G. and Pratt, C.W. (1999). Fundamentals of Biochemistry.
8. Plummer, D.T. (1987). 3rd ed. An Introduction to Practical Biochemistry. McGraw-Hill Book Co.
9. C.B Power and J.R Chatwal, 5th Edition, Biochemistry, Himalaya
10. A. C. Deb, 9th Edition, Fundamentals of Biochemistry, Fundamentals of Biochemistry
11. Devlin, T.M. (1997): 4th Ed. Textbook of Biochemistry with Clinical Correlations, Wiley Liss Inc
12. Tietz, N.W. (1976) Fundamentals of Clinical Chemistry. WB Saunders Co.
13. King, E.J. and Wootton, I.D.P. (1956). 3rd ed. Micro-Analysis in Medical Biochemistry. J and A Churchill Ltd.
14. Sharma S (1993). Practical Biochemistry (1st ed.). Published by Jaipur: Classic Publishing House.
15. Lanham -New et al. (2010) Nutrition & Metabolism. 2nd Edition. The Nutrition Society Textbook Series. Wiley- Blackwell


**Teaching Methodology**

- Powerpoint presentations
- Videos
- Chalk and talk method
- Guest Lectures
- Group discussions
- Quiz and Debate

**BACHELOR IN FOOD AND NUTRITION**
**SEMESTER V**
**CORE COURSE**

| **FN11360- Food Microbiology II (Th)** | |
|---|---|
| **Course Objectives**<br>This course will enable students to<br>1. Develop a comprehensive understanding of food microbiology.<br>2. Identify and manage foodborne pathogens.<br>3. Evaluate food preservation and processing techniques.<br>4. Ensure food safety and quality assurance: Ensure food safety and quality assurance.<br>5. Apply critical thinking and problem-solving skills in food microbiology. | |
| **Course Outcome:** Demonstrate a comprehensive understanding of microbial behavior in food systems, including factors influencing growth, survival, and control. Apply theoretical knowledge to assess and mitigate food safety risks, ensuring the production of safe and high-quality food products. | |
| **FN-THEORY COURSE CONTENTS (2 Credits)** | |
| **S.No** | **STRUCTURE** |
| **Unit 1** | **Microorganisms and its role in food** |
| | ● History of Microbiology - Proof of Biogenesis Germ theory and of fermentation - development of laboratory - Technique to study micro -organisms - pure Culture - isolation.<br>● General Characteristics of Bacteria, Viruses, Yeast, Moulds, protozoa, Algae.<br>● Bacteria: Bacterial cell Morphology and propagation in food<br>● Viruses, Yeast, Mould, Algae & Protozoa: Morphology and propagation in food |
| **Unit 2** | **Microbiology of food poisoning, food infections, food and water borne diseases** |
| | ● Microbial food poisoning by Staphylococci, Salmonella and clostridium botulinum (Botulism). Measures to prevent microbial food poisoning.<br>● Food infections - Food and water borne diseases - Dysentery diarrhea, Typhoid, Cholera. |
| **Unit 3** | **Contamination and spoilage** |

| | |
|---|---|
| | ● Sea and marine foods<br>● Pulses<br>● Fruits and beverages |

**REFERENCES**


1. Doyle, M., Buchanan, R. L., & Demain, A. L. (2013). Food Microbiology: Fundamentals and Frontiers. ASM Press.
2. Montville, T. J., Matthews, K. R., & Doyle, M. B. (2005). Food Microbiology: An Introduction. ASM Press.
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4. Yousef, A. E., & Carlstrom, C. (2019). Food Microbiology: A Laboratory Manual. Wiley-Blackwell.
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**BACHELOR IN FOOD AND NUTRITION**
**SEMESTER V**
**CORE COURSE**

| **FN11370- Nutrition Programme Management (Th)** | |
|---|---|
| **Course Objectives**<br>This course will enable students to<br>1. To make students understand about the need and steps in programme planning.<br>2. To identify the factors that influence successful programme implementation.<br>3. To familiarize with the evaluation tools and methods.<br>4. To prepare a programme for implementation at village level. | |
| **Course Outcome:** | |
| **FN-THEORY COURSE CONTENTS (2 Credits)** | |
| **S.No** | **STRUCTURE** |
| **Unit 1** | **Development programmes in India-**<br>Programmes for Nutrition, Health, Education, Wage and Self-Employment, Women's Development, Skill Development, Sanitation and Infrastructure |
| **Unit 2** | **Programme Planning** |
| | Meaning and importance of programme planning in Nutrition extension, Principles of programme planning – programme development cycle and its components |
| **Unit 3** | **Programme Planning and Implementation** |
| | ● **Plan of Work:** Importance of planning, Components of a plan of work, Developing a plan of work, Factors to be considered in preparing the plan of work<br>● **Resources:** Meaning of resource, Types of resources, Identification and appraisal of resources<br>● **Implementation:** Aspects of execution, Factors responsible for the successful conduct of a programme |
| **Unit 4** | **Participatory Tools and Urban Development Methods** |
| | Participatory Management and Importance of Participatory Methods. PLA (Participatory Learning and Action): Underlying Principles and Techniques, Working with Stakeholders, Using Participatory Methods: Advantages, Challenges and Ways Forward |

**REFERENCES**


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2. Chaubey, B.K.: A Hand book of Education Extension. Jyoti Prakashan, Allahabad, 1979.
3. Dahama, O.P. and Bharnagar, O.P.: Education and Communication for Development. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, 1987.
4. Extension Education in Community Development, Ministry of Food and Agriculture, Government of India, New Delhi, 1961.
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**BACHELOR IN FOOD AND NUTRITION**
**SEMESTER V**
**CORE COURSE**

| **FN11380- Food Service Management (Th)** | |
|---|---|
| **Course Objectives**<br>This course will enable students to<br>1. To create an awareness on the organizational aspect and functioning of different types of food service institutions.<br>2. To develop managerial skills among the students.<br>3. To understand the space allocation and arrangement of food service units . | |
| **Course Outcome:** | |
| **FN-THEORY COURSE CONTENTS (2 Credits)** | |
| **S.No** | **STRUCTURE** |
| **Unit 1** | **Food Service Industry** |
| | ● Types of catering- Hotel ,chain hotels, Restaurant, Canteen, cafe.<br>● Welfare **:** Hospital, School lunch/college canteen and Industrial catering.<br>● Transport**:** Air, Rail, Sea and Space – Contract and outdoor. |
| **Unit 2** | **Physical Plant and Food Purchase** |
| | ● Layout of kitchens, types of kitchens – Planning of Receiving preparation, storage and service area with relevant too spacing.<br>● FOOD PURCHASE- Procedures and Factors involved in the selection of food. |
| **Unit 3** | **Quantity Food Service and Equipments** |
| | ● EQUIPMENT: Classification, factors involved in selection, use and care of major equipment, traditional and modern equipment.<br>● Menu planning: Origin of menu, importance of menu planning. Types of menu- table d'hote menu, a la carte, static, cycle. Use of menus, construction of menus, Menu Design, Factors affecting menu planning. |
| **Unit 4** | **Resource Management** |

| | |
|---|---|
| | ● Human resource management<br>● Wealth<br>● Time<br>● Infrastructure |

**REFERENCES**


1. Kaufman,R. Mega planning- Practical tools for Organizational Success, Sage Publications Inc, 2000.
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**BACHELOR IN FOOD AND NUTRITION**
**SEMESTER V**
**CORE COURSE**

| **FN11390- Food Security (Th)** | |
|---|---|
| **Course Objectives**<br>This course will enable students to<br>1. To understand the concept of food security and its dimensions.<br>2. To explore the factors influencing food security at local, national, and global levels.<br>3. To analyze the impact of environmental, economic, social, and political factors on food security.<br>4. To evaluate various approaches and interventions aimed at improving food security.<br>5. To critically examine challenges and opportunities in achieving food security goals. | |
| **Course Outcome:** This course examines the multidimensional aspects of food security, including issues related to access, availability, utilization, and stability of food. Through a combination of lectures, readings, discussions, and case studies, students will gain an understanding of the complexities surrounding global food systems and explore strategies for achieving food security for all. | |
| **FN-THEORY COURSE CONTENTS (2 Credits)** | |
| **S.No** | **STRUCTURE** |
| **Unit 1** | **Introduction to Food Security** |
| | ● Definition and dimensions of food security<br>● Historical perspectives and evolution of food security concepts<br>● Global hunger and malnutrition: key statistics and trends |
| **Unit 2** | **Factors Influencing Food Security** |
| | ● Environmental factors: climate change, land degradation, water scarcity<br>● Economic factors: food prices, income inequality, poverty<br>● Social factors: demographics, cultural practices, gender dynamics |
| **Unit 3** | **Food wastage and its Management** |
| | ● Leftover meals at home level<br>● Food wastage in restaurants<br>● Food wastage in events |
| **Unit 4** | **Food Policy and Governance** |

| | |
|---|---|
| | ● National and International food policies<br>● Food sovereignty vs. food security<br>● Role of governments, NGOs, and international organizations in addressing food security |

**REFERENCES**


1. Food Politics: How the Food Industry Influences Nutrition and Health" by Marion Nestle
2. The End of Food by Paul Roberts
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4. Academic articles and reports from relevant organizations (FAO, WHO, World Bank, etc.)
5. Stuffed and Starved: The Hidden Battle for the World Food System by Raj Patel
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7. The Omnivore's Dilemma: A Natural History of Four Meals by Michael Pollan


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**BACHELOR IN FOOD AND NUTRITION**
**SEMESTER V**
**CORE COURSE**

| **FN11400- Nutrition Education and Extension (Th)** | |
|---|---|
| **Course Objectives**<br>This course will enable students to<br>1. Understand the principles, philosophy and objectives of extension<br>2. To develop awareness of the values of teaching aids in the teaching learning process | |
| **Course Outcome:** | |
| **FN-THEORY COURSE CONTENTS (2 Credits)** | |
| **S.No** | **STRUCTURE** |
| **Unit 1** | **Introduction to Extension Education in Nutrition** |
| | ● Meaning of Extension Education<br>● Objectives of Extension Education<br>● Characteristics of Extension Education<br>● Scope of Extension Education in Nutrition |
| **Unit 2** | **Principles of Extension Education** |
| **Unit 3** | **Teaching of Extension Education** |
| | ● Steps in Extension Teaching<br>● Role of Extension Education in rural development<br>● Difference between formal education and Extension Education |
| **Unit 4** | **General Principles in Selecting and Using Following Teaching Aids** |
| | ● Rod puppet<br>● Computer design tools<br>● Diagram<br>● Graphs<br>● Flash cards |
| **REFERENCES**<br>1. Khandari, H., & Yadav, K. (2011). Extension Education. New Delhi: APH Publishing Corporation.<br>2. Supe, S. V. (1973). Extension Education. Nagpur: R. Singh Science Publishers. | |

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**BACHELOR IN FOOD AND NUTRITION**
**SEMESTER V**
**CORE COURSE**

**FN11410- Diet Therapy (Pr)**

**Course Objectives**

This course will enable students to

1. Plan and implement therapeutic diets for various health conditions.
2. Monitor and evaluate the effectiveness of dietary interventions.
3. Develop communication and counseling skills for working with clients/patients.

**Course Outcome:** This practical course provides students with hands-on experience in applying the principles of diet therapy to various health conditions. Through case studies, dietary assessments, and meal planning exercises, students will develop the skills necessary to design and implement therapeutic diets tailored to individual needs.

**FN11410-PRACTICAL COURSE CONTENTS (3 Credits)**

| S.No | STRUCTURE |
|---|---|
| **Practical 1** | Planning and preparation of normal diets |
| **Practical 2** | Planning and preparation of fluid diets, soft/semi solid diets |
| **Practical 3** | Planning and preparation of diet for underweight person |
| **Practical 4** | Planning and preparation of diet for overweight and obese person |
| **Practical 5** | Planning and preparation of diet for Type- II Diabetes Mellitus |
| **Practical 6** | Planning and preparation of diet for Hypertension |
| **Practical 7** | Planning and preparation of diet for Celiac disease |
| **Practical 8** | Planning and preparation of diet for Peptic ulcer |
| **Practical 9** | Planning and preparation of diet for viral hepatitis |

**REFERENCES**


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**BACHELOR IN FOOD AND NUTRITION**
**SEMESTER V**
**CORE COURSE**

**FN11420- Food Analysis (Pr)**

**Course Objectives**

This course will enable students to

1. Understand the basic principles of food analysis.
2. Develop proficiency in various analytical techniques used in food analysis.
3. Learn to interpret analytical data to assess food quality and safety.
4. Gain insights into the relationship between food composition and nutrition.
5. Explore current trends and challenges in food analysis.

**Course Outcome:** The course aims to provide an in-depth examination of the principles and techniques used in the analysis of food. Students will explore various methods for assessing the composition, quality, safety, and nutritional value of food products.

**FN11420-PRACTICAL COURSE CONTENTS (3 CREDITS)**

| S.No | STRUCTURE |
|---|---|
| **Practical 1** | Introduction to Food analysis and its importance |
| **Practical 2** | Estimation of fat/oil by solvent extraction method. (Demonstration only) |
| **Practical 3** | Determination of acid value by NIN method |
| **Practical 4** | Determination of saponification value by NIN method |
| **Practical 5** | Determination of salt (common salt) from a given sample of Butter by Mohr's titrimetric method. |
| **Practical 6** | Determination of acidity of milk by titrimetric method |
| **Practical 7** | Estimation of ascorbic acid (Vit.C) from food sources by 2,6 dichlorophenol indophenol method. |
| **Practical 8** | Estimation of free sugars from the given Honey sample by BQR (Benedict's Quantitative Reagent) method. |

**REFERENCES**


1. Harold Egan, Ronald S. Kirk, Ronald Sawyer, David Pearson “Pearson’s Chemical Analysis of Foods. 8th Edition, 1981. Churchill Livingstone.
2. “Official Methods of Analysis of AOAC INTERNATIONAL”, 18th Edition, 2005, AOAC INTERNATIONAL.
3. N.Raghuramulu, K.Madhavan, S.Kalyanasundaram. “A Manual of Laboratory Techniques”, 2nd Edition, 2003, National Institute of Nutrition.
4. A.Y.Sathe, “A first course in Food Analysis” 1st Edition, 1999. New Age International (P) Limited.
5. Manual of Methods of Analysis of Foods. Directorate General of Health Services, Ministry of Health and Family WelfareGovernment of India, 2005.
6. Morris Boris Jacobs “The Chemical Analysis of Foods and Food Products”. 2nd Edition, 1951. D. Van Nostrad Company , 1951


**Teaching Methodology**

- Powerpoint presentations
- Videos
- Chalk and talk method
- Guest Lectures
- Group discussions
- Quiz and Debate

**BACHELOR IN FOOD AND NUTRITION**
**SEMESTER V**
**CORE COURSE**

**FN15050- Nutrition Updates (Th)**

**Course Objectives**

This course will enable students to

1. To train students to find reference material.
2. To train students to analyze, condense and evaluate articles/reports.
3. To provide experience in group discussion in the subject.
4. To help students develop an ability to make effective presentations.
5. To help students develop the ability to prepare and present reports.

**Course Outcome:** This seminar provides an opportunity for in-depth exploration and discussion of advanced topics in Food and Nutrition. Through readings, presentations, and critical analysis, students will deepen their understanding of key concepts, current research, and emerging trends within the field.

**FN15050-THEORY COURSE CONTENTS (2 Credits)**

| S.No | STRUCTURE |
|---|---|
| Unit 1 | **How to search and read research paper** |
| | ● Online and offline mode |
| Unit 2 | **Introduction to Review Article** |
| | ● To select a research article on current topics related to the subject or to review any article from newspaper, Journals, WHO data, NIN data and other sources, compile and present it in class. |
| Unit 3 | **Preparation of oral presentation** |
| Unit 4 | **Poster presentation** |

**REFERENCES**

1. Selected research papers, articles, book chapters, and other scholarly publications relevant to the topics.

**Teaching Methodology**

- Powerpoint presentations
- Chalk and talk method
- Guest Lectures

**BACHELOR IN FOOD AND NUTRITION**
**SEMESTER V**
**CORE COURSE**

**FN15060- Dietetics Techniques (Th)**

**Course Objectives**

This course will enable students to

1. Understand the principles and procedures of nutrition counseling and the role of the counselor.
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 behavior of the individuals.
3. Be familiar with various techniques used in counseling.
4. Be able to use various types and techniques of counseling to motivate patients to achieve well-being.

**Course Outcome:** This course provides an overview of practical dietetic techniques and counseling strategies for nutrition professionals. Through lectures, case studies, role-playing exercises, and hands-on experiences, students will develop skills in dietary assessment, meal planning, behavior change strategies, and effective communication with clients. Emphasis will be placed on evidence-based practices and culturally sensitive approaches to patient counseling in diverse healthcare settings.

**FN15060-THEORY COURSE CONTENTS (2 Credits)**

| S.No | STRUCTURE |
|---|---|
| **Unit 1** | **Introduction to Diet Counseling** |
| | ● Counseling – Definition, Expectations, goals, scope and limits<br>● Counselor – Characteristics of an effective counselor<br>● The Client – Characteristics, expectations |
| **Unit 2** | **The Counseling Process** |
| | ● Techniques for obtaining relevant information<br>● Counseling techniques<br>● Rapport building<br>● Opening techniques<br>● Follow up |
| **Unit 3** | ● Communication skills<br>● Body language |
| **Unit 4** | **Group Counseling and Social Networking** |

**REFERENCES**


1. D. Bauer, Liou. D, C. Sokolik. (2012). Nutrition Counseling and Education Skill Development
2. Academy of Nutrition and Dietetics. (2017). Nutrition Counseling and Education Skill Development.
3. Hark, L., & Deen, D. (2017). Medical Nutrition and Disease: A Case-Based Approach. Wiley-Blackwell.
4. Rollnick, S., Miller, W. R., & Butler, C. (2008). Motivational Interviewing in Health Care: Helping Patients Change Behavior. Guilford Press.
5. Smolin, L. A., & Grosvenor, M. B. (2016). Nutrition: Science and Applications. Wiley.
6. Murphy, E., & Thayer, Z. (2018). Nutritional Counseling CPT Codes. Springer.
7. Williams, M., & Botnick, P. (2016). Nutrition for Health, Fitness & Sport. McGraw-Hill Education.
8. Swain, L. F., & Alexander, M. (2016). Careers in Dietetics. Jones & Bartlett Learning.


**Teaching Methodology**

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**BACHELOR IN FOOD AND NUTRITION**
**SEMESTER V**
**CORE COURSE**

**FN15070- Nutritional Biochemistry (Pr)**

**Course Objectives**

This course will enable students to

1. This course will enable students to
2. To lay the foundation of biological chemistry.
3. To give insights about the chemical reactions that occur in biological systems.
4. Get an insight into interrelationships between various metabolic pathways.

**Course Outcome:** This course will help the students to know about various enzymes and their functioning.

**FN15070-PRACTICAL COURSE CONTENTS (2 Credits)**

| S.No | STRUCTURE |
|---|---|
| **Practical 1** | ● Preparation of Standard Solution (Acid) 0.1N of HCl<br>● Preparation of Standard Solution (Base) 0.1N of NaOH<br>● Preparation of a standard solution of KMnO4 |
| **Practical 2** | Estimation of serum Glucose by GOD-POD Method (Glucose Oxidase-Peroxidase Method) |
| **Practical 3** | Quantitative (Benedict Test) and Qualitative Analysis of carbohydrates |
| **Practical 4** | Determination of Total Protein in Human serum by modified Biuret method. |
| **Practical 5** | Determination of Albumin in Human serum by Bromo-Cresol-Green method (BCG method) |
| **Practical 6** | Estimation of blood Urea by using Diacetyl Monoxime (DAM) method. |
| **Practical 7** | Estimation of Uric Acid in Serum and by Tungstate method. |
| **Practical 8** | Qualitative analysis of Urine/Routine Urine Examination |

**Teaching Methodology**

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