SYLLABUS FOR UG COURSE BACHELOR OF SCIENCE IN FOOD AND NUTRITION (Semester-I, II, III & IV)

[AS PER NEP, 2020]

(With effect from - Session 2023-24 onwards)

UNIVERSITY OF GOUR BANGA

MALDA

WEST BENGAL, INDIA

COURSE COMPONENTS AND CREDIT DISTRIBUTION

Semester	Name of the Course							Total Credits	Full Marks
	Major core (MC)/DSE	Minor Core (MnC)	Interdisciplinary / Multidisciplinary (IDC/ MDC)	Ability Enhancement Course (AEC)	Skill Enhancement Course (SEC)	Value Addition course (VAC)	Internship/ Apprenticeship/Project/ Community Outreach		
I	FNTMJ-MC-01 (4)	FNTMN-MN-01 (4)	MDC-1 (3)	MIL- 1 (2)	FNTMJ-SEC-01 (3)	VAC-1.1 ENVS (2)		22	300
	FNTMJ - MC-02 (4)								
II	FNTMJ - MC- 03 (4)	FNTMN-MN-02 (4)	MDC-2 (3)	MIL- 2 (2)	FNTMJ-SEC-2 (3)	VAC-2.1 (2)	Internship/Apprenticeship/Project/ Community Outreach (IAPC) (2*) (OPTIONAL) This will be arrange by the correspondence colleges.	22+ 2*	300+25*
	FNTMJ-MC-04 (4)								

Students on exit shall be awarded Undergraduate Certificate in Food and Nutrition after securing the requisite 44+2*= 46 credits in Semester I and II after completion of Summer Internship (2) (optional)*

Semester	Name of the Course						Total Credits	Full Marks
	Major core (MC)/DSE	Minor Core (MNC)	Interdisciplinary / Multidisciplinary (IDC/ MDC)	Ability Enhancement Course (AEC)	Skill Enhancement Course (SEC)	Internship/Apprenticeship/Project/ Community Outreach		
III	FNTMJ-MC-05 (4)	FNTMN-MN-03 (4)	MDC-3 (3)	English Language-1 (2)	FNTMJ-SEC-03 (3)		20	275
	FNTMJ - MC-06 (4)							
IV	FNTMJ - MC- 07 (4)	FNTMN-MN-04 (4)		English Language-2 (2)		Internship/Apprenticeship/Project/ Community Outreach (IAPC) 2* (OPTIONAL) This will be arrange by the correspondence colleges.	18+2*	225+25*
	FNTMJ - MC-08 (4)							
	FNTMJ - MC-09 (4)							

Students on exit shall be awarded Undergraduate Diploma in Food and Nutrition after securing the requisite 84 credits in Semester IV after completion of Summer Internship (2) (either in Semester II* or in Semester IV**) (Candidates already perused IAPC in Semester II, need not to pursue IAPC in Semester IV)

FNTMJ: Food and Nutrition (Major)

FNTMN: Food and Nutrition (Minor)

SEMESTER WISE BREAKUP

SEMESTER – I						
Course Name	**Title of the Course**	**Credits**	**Full Marks**	**Marks Division**		
		L-P		**Th.**	**Pr.**	**IA**
Major Core/DSE (MC/DSE)	FNTMJ-MC-01: CONCEPT OF FOOD, NUTRITION AND HEALTH	**4 (3-1)**	**50**	**25**	**15**	**10**
	FNTMJ-MC-01: FUNDAMENTALS OF HUMAN NUTRITION	**4 (3-1)**	**50**	**25**	**15**	**10**
Minor Core (MINOR)	FNTMN-MN-01: FOOD, FOOD GROUP AND NUTRITION	**4 (3-1)**	**50**	**25**	**15**	**10**
Multidisciplinary/ Interdisciplinary (IDC/MDC)	MDC-1	**3**	**50**	**50**		
Ability Enhancement Course (AEC)	MIL-1	**2**	**25**	**25**	**-**	**-**
Skill Enhancement Course (SEC)	FNTMJ-SEC-1: COMMUNITY HEALTH CARE	**3 (2-1)**	**50**	**25**	**15**	**10**
Value Addition Course (VAC)	VAC-1.1 ENVS	**2**	**25**	**25**	**-**	**-**
Total		**22**	**300**	**-**	**-**	**-**

SEMESTER WISE BREAKUP

SEMESTER – II						
Course Name	**Title of the Course**	**Credits**	**Full Marks**	**Marks Division**		
				Th.	**Pr.**	**IA**
		L-P				
Major Core/DSE (MC/DSE)	FNTMJ -MC-03: NUTRITIONAL PHYSIOLOGY–I	**4 (3-1)**	**50**	**25**	**15**	**10**
	FNTMJ-MC-04: BASIC FOOD SCIENCE	**4 (3-1)**	**50**	**25**	**15**	**10**
Minor Core (MINOR)	FNTMN-MN-02: NUTRITIONAL PHYSIOLOGY	**4 (3-1)**	**50**	**25**	**15**	**10**
Interdisciplinary/ Multidisciplinary (IDC/MDC)	MDC-2	**3**	**50**			
Ability Enhancement Course (AEC)	MIL-2	**2**	**25**	**25**	**-**	**-**
Skill Enhancement Course (SEC)	FNTMJ-SEC-2: PATHOLOGY AND DISEASE DIAGNOSIS TECHNIQUES	**3 (2-1)**	**50**	**25**	**15**	**10**
Value Addition Course (VAC)	VAC2.1	**2**	**25**	**25**	**-**	**-**
Internship/Apprenticeship/Project/ Community Outreach (IAPC) **(2*)** (OPTIONAL) This will be arrange by the correspondence colleges.		**2***	**25***			
Total		**22+2***	**300+ 25***	**-**	**-**	**-**

SEMESTER WISE BREAKUP

SEMESTER – III						
Course Name	**Title of the Course**	**Credits**	**Full Marks**	**Marks Division**		
		L-P		**Th.**	**Pr.**	**IA**
Major Core/DSE (MC/DSE)	FNTMJ -MC-05: BASIC BIOCHEMISTRY	**4 (3-1)**	**50**	**25**	**15**	**10**
	FNTMJ -MC-06:BASIC DIETETICS	**4 (3-1)**	**50**	**25**	**15**	**10**
Minor Core (MINOR)	FNTMN-MN-03: DIETETICS	**4 (3-1)**	**50**	**25**	**15**	**10**
Interdisciplinary/ Multidisciplinary (IDC/MDC)	MDC-3	**3**	**50**	**50**		
Ability Enhancement Course (AEC)	English Language-1	**2**	**25**	**25**	**-**	**-**
Skill Enhancement Course (SEC)	FNTMJ-SEC-3: Entrepreneurship and Small Catering Units	**3 (2-1)**	**50**	**25**	**15**	**10**
Total		**20**	**275**	**-**	**-**	**-**

SEMESTER WISE BREAKUP

SEMESTER – IV						
Course Name	Title of the Course	Credits L-P	**Full Marks**	**Marks Division**		
				Th.	**Pr.**	**IA**
Major Core/DSE (MC/DSE)	FNTMJ -MC- 07: TECHNOLOGY OF FOOD PROCESSING AND PRESERVATION	4 (3-1)	**50**	**25**	**15**	**10**
	FNTMJ -MC-08: COMMUNITY NUTRITION	4 (3-1)	**50**	**25**	**15**	**10**
	FNTMJ -MC-09: NUTRITIONAL PHYSIOLOGY-II	4 (3-1)	**50**	**25**	**15**	**10**
Minor Core (MINOR)	FNTMN- MN-04: FOOD PRESERVATION TECHNOLOGY	4 (3-1)	**50**	**25**	**15**	**10**
Ability Enhancement Course (AEC)	English Language-2	2	**25**	**25**	**-**	**-**
Internship/Apprenticeship/Project/ Community Outreach (IAPC) **2*** (OPTIONAL) This will be arrange by the correspondence colleges.(Candidates already perused IAPC in Semester II, need not to pursue IAPC in Semester IV)		**2****	**25****			
Total		**18+2****	**225+ 25****	**-**	**-**	**-**

Evaluation details

Course type	Full marks	Internal Assessment (IA)	Semester End Examination	
Major Core	50	10	**Theory**	**Practical**
			25 (1×5, 5×4)	15
Minor Core	50	10	**25** (1×5, 5×4)	15
Skill Enhancement Course	50	10	**25** (1×5, 5×4)	15

Question Pattern:

Semester End Examination:

Students have to answer ***five*** **questions** carrying 1 mark each out of ***Eight*** **(08)** given questions; ***Four*** questions carrying 5 marks each out of given ***Six*** **(06)** questions. Question carrying 5 marks will have maximum two parts i.e. 1+4 or 3+2 or 2½+2½ or a single question carrying 5 marks.

Internal Assessment:

Mode: Written test relevant theoretical aspects as directed by the Department

Practical Examination:

Direction from Board of Studies and Controller of Examination department will be followed.

List and details view of Major Core (MC/DSE)

Semester No	Course Code	Course Title
I	FNTMJ-MC-01	FNTMJ-MC-01: CONCEPT OF FOOD, NUTRITION AND HEALTH
	FNTMJ-MC-02	FNTMJ-MC-02: FUNDAMENTALS OF HUMAN NUTRITION
II	FNTMJ-MC-03	FNTMJ-MC-03: NUTRITIONAL PHYSIOLOGY-I
	FNTMJ-MC-04	FNTMJ-MC-04: BASIC FOOD SCIENCE
III	FNTMJ-MC-05	FNTMJ-MC-05: BASIC BIOCHEMISTRY
	FNTMJ-MC-06	FNTMJ-MC-06: BASIC DIETETICS
IV	FNTMJ-MC-07	FNTMJ-MC-07: TECHNOLOGY OF FOOD PROCESSING AND PRESERVATION
	FNTMJ-MC-08	FNTMJ-MC-08: COMMUNITY NUTRITION
	FNTMJ-MC-09	FNTMJ-MC-09: NUTRITIONAL PHYSIOLOGY-II

SEMESTER – I

FNTMJ-MC-01: CONCEPT OF FOOD, NUTRITION AND HEALTH
[TOTAL CREDITS: 4 (LECTURE-3, PRACTICAL-1)]

Course Outcome:
The students will have a basic concept on food, nutrition and health. The student will be able to understand the chemistry and importance of different food groups. They will have fundamental concept about various food commodities.

UNIT-I: **Basic concept of Food, Nutrients, Nutrition and Health:**

- Definition: Food, Nutrients, Nutritive value, Nutrition, Optimum nutrition, Malnutrition and Undernutrition.
- Functions of food, Balanced Diet, Food selection.
- Food Groups, Food Pyramid, My plate
- Concept of health and Guidelines for good health

UNIT-II: Cereals, **Pulses and legumes:**

- Nutritional aspects of wheat, rice, bajra(pearl millet) and jowar(sorghum).
- Types of pulses and legumes, uses, and nutritional aspects.

UNIT-III: Milk and milk Products:

- Composition and nutrients of milk
- Nutritive value and Concept of milk processing, storage and Pasteurization
- Types of processed milk, milk products (curd, yogurt, paneer and cheese)

UNIT-IV: Egg, **Fish and meat:**

- Uses and nutritional importance of edible fish, egg and meat, concept of processing and storage of meat and fish.

UNIT-V: Vegetables and fruits:

- Uses and nutritional importance of commonly available vegetables and their storage.
- Fresh fruits and dry fruits– concept of raw and processed product.
- Basic concept of olericulture.

UNIT-VI: Fats and oils:

- Types, sources, use and nutritional aspects of fats and oils.
- Storage of fat and oils, hydrogenation, rancidity and its prevention.

UNIT-VII: Beverages:

- Common types (tea, coffee and wines) and their uses, nutritional aspect.

UNIT-VIII: Food adjuncts and preserved products:

- Spices (Chilies, Turmeric, Garlic and Ginger), use and nutritional aspect.
- Jams, Jellies uses and nutritional aspects.

UNIT-IX: Methods of cooking:

- Dry, moist, frying and microwave cooking.
- Effect of various methods of cooking on foods, nutrient losses in cooking.

Practical:

Food Preparation:

- Beverages (Milk shake / Lassi), Milk and milk products (Custard / Payasam) and Snacks (Poha / Sandwiches) [Any one from each category].
- Preparation of homemade ORS.
- Preparation of weaning foods for infants (Soup / Khichuri) [Any one].

Suggested Reading:

- Hughes O, Bennion M (1970). Introductory Foods, Macrnillan & Co. New York.
- Lavies S (1998). Food Commodities.
- Pomeranz Y (Ed) (1991). Functional Properties of Food Components, (2nd edition), Academic Press, New York.
- Tindall HD (1983). Vegetables in the Tropics, MacMillan Press, London.
- Winton AL, Winton KB (1999). Techniques of Food Analysis. Allied Scientific Publishers.
- Nutrition and Dietetics Book. Shubhangini A Joshi.

FNTMJ-MC-02: FUNDAMENTALS OF HUMAN NUTRITION
[(TOTAL CREDITS: 4 (LECTURE-3, PRACTICAL-1)]

Course Outcome:

The course deals with a basic understanding of Nutrition, Health, RDA, Growth and development, Water balance and Food consumptions. Students learn the importance of energy and nutritional requirement of human. Knowledge is also imparted on Relationship between nutrition and health.

UNIT-I: Concept and definition of terms:

- Nutrition, Nutritional status, Malnutrition and Health: Nutritional genomics, Scope and History of Nutrition.
- Utilization of Nutrients. Macro and micro nutrients.
- Relationship between nutrition and health. Importance of nutrition and application to different professions.

UNIT-II: Minimum Nutritional Requirement and RDA:

- RDA of different age groups. Factors affecting RDA, General principles of Formulation of RDA.
- Dietary Guidelines of Reference Man and Reference Woman.

UNIT-III: Energy in Human Nutrition:

- Idea of Energy and its unit, Determination of Energy in food, Energy Balance, Assessment of Energy Requirements—deficiency and excess. Calorific value of Food. Concept of calorimetric. Measuring of total energy requirement.
- B.M.R. and its regulation and factors affecting BMR.

UNIT-IV: Growth & development from infancy to adulthood:

- Somatic, physical, brain and mental development, puberty, menarche, prepubertal and pubertal changes, Factors affecting growth and development.
- Importance of Nutrition for ensuring adequate development.

UNIT-V: Food consumption:

- Introduction to major food groups.
- Variations in dietary pattern, factors in dietary variations.

UNIT-VI: Water balance:

- Distribution of water, functions, water depletion, and water intoxication.

Practical:

1. Process involved in modern cooking.

2. General concepts of weights and measures, Eye estimation of raw food items.

4. Preparation of supplementary food for different age group and their nutritional significance.

5. Planning and preparation of low cost diet for Undernourished children.

Suggest Reading:

- Fundamentals of Human Nutrition, Geissler Catherine, Powers Hilary, Elsevier Publication.2009.
- Mudambi S.R, M.V Rajgopal Fundamentals of Foods and Nutrition(2nded)Wiley Eastern Ltd,1990.
- Swaminathan S.: Advanced text book on Foods Nutrition Vol. I, II (2nded revised and enlarged) B.app C.1985.
- Textbook of Nutrition-Ravinder Chadha & Pulkit Mathur, Orient Blackswan Pvt. Ltd. Telangana.
- Srilakshmi B.(2018).Nutrition Science. New Delhi: New Age International.
- Clinical Nutrition & Dietetics- F. P. Antia and Philip Abraham, Oxford University Press

SEMESTER-II

FNTMJ-MC-03: NUTRITIONAL PHYSIOLOGY-I

[TOTAL CREDITS: 4 (LECTURE-3, PRACTICAL-1)]

Course Outcome:
Student will be able to understand the current state of knowledge about the functional organization (Digestive system, Circulatory and Cardiovascular system, and Respiratory system and Musculo-skeletal system) of the human body.

UNIT-I: General Physiology:

- Functional organization and composition of human body.
- The cell physiology. Structure and functions of mammalian cell with special reference to Plasma membrane (Fluid Mosaic Model), Mitochondria, Ribosome, Endoplasmic reticulum.
- Nucleus (nuclear membrane, nuclear chromatin and nucleolus).

UNIT-II: **Circulatory and Cardiovascular system**:

- Blood its composition and functions of blood components. Blood groups, Mechanism of blood coagulation.
- Functional anatomy and functions of heart.
- Cardiac cycle, cardiac output, blood pressure and its regulation.

UNIT-III: Digestive system:

- Structure and functions of Digestive system • Process of digestion and absorption of food.
- Composition, function of saliva, gastric, pancreatic and intestinal juices.

UNIT-IV: **Respiratory system:**

- Functional anatomy of respiratory tract.
- Structure of Lungs and gaseous exchange (oxygen and carbon dioxide transport).
- Physiology of high altitude. Pathophysiology of dysponoea and hypoxia.

UNIT-V: Musculoskeletal System:

- Formation and functions of muscles, bones and teeth.

Practical:

1. Determination of pulse rate.
2. Determination of blood pressure by Sphygmomanometer (Auscultatory method).
3. Determination of Bleeding Time (BT) and Clotting Time (CT).
4. Detection of Blood group (Slide method).
5. Measurement of Haemoglobin level (Sahli`s method).

Suggested Reading:

- Chatterjee CC (1988). Text Book of Physiology – Vol I & II.
- Medical Physiology for undergraduate students by Khorana Indu and Khorana Arushi. Second Edition. Elsevier Publication. 2015.
- Guyton AC, Hall JE (1966). Text book of Medical Physiology. 9th Ed. Prism Books (Pvt.) Ltd. Bangalore.
- Guyton AC (1985). Function of the Human Body, 4th Edition, W.B. Sanders Company, Philadelphia.
- Hadley ME (2000). Endocrinology. 5th ed. Pearson Education.
- Hoar WS (1984).General and comparative Physiology. 3rd ed. Prentice-Hall of India.
- Wilson (1989). Anatomy and Physiology in Health and Illness. Edinburgh, Churchill Livingstone.

FNTMJ-MC-04: BASIC FOOD SCIENCE

[TOTAL CREDITS: 4 (LECTURE-3, PRACTICAL-1)

Course Outcome:
The course deals with a complete understanding of dietary sources, daily requirement, physiological role and deficiency disorders of various macronutrients and micronutrients.

UNIT-I: Basic concept on Food:

- Nutrients. Nutrition.
- Classification of Food. Classification of Nutrients.

UNIT-II: Carbohydrates:

- Definition, Classification. Structure and properties. Monosaccharides - glucose, fructose, galactose. Disaccharides - Maltose, lactose, sucrose Polysaccharides - Dextrin, starch, glycogen, resistance starch.
- Sources, daily requirements, functions. Digestion and absorption.

UNIT-III: Dietary Fibre- RDA, Classification, sources, composition, properties & nutritional significance.

UNIT-IV: Proteins:

- Definition, Classification, Structure & properties. Amino acids - Classification, types, functions.
- Sources, daily requirements, functions. Effect of too high - too low proteins on health. Digestion & absorption.
- Assessment of Protein quality (BV, PER, NPU). Factors affecting protein bio-availability including anti-nutritional factors.

UNIT-V: Lipids:

- Definition, Classification & Properties. Fatty acids - composition, properties, types.
- Sources, daily requirements, functions. Digestion & Absorption. Role & nutritional significances of PUFA, MUFA, SFA, W-3 fatty acid.

UNIT-VI: Vitamins:

- Classifications, Water and Fat soluble vitamins, physiological role, bio-availability and requirements, sources, deficiency disorder and excess of vitamins.

UNIT-VII: Minerals:

- Macro minerals (Calcium, Magnesium, Phosphorus), Micro minerals (Iron, Iodine, Copper, Zinc), Physiological role, bio-availability and requirements, sources, deficiency disorder and excess of minerals.

Practical:

1. Identification of Mono, Di and polysaccharides (Qualitative tests)

2. Identification of Proteins. (Qualitative tests)

3. Qualitative tests for lipid (Emulsification test, Saponification test).

Suggested Reading:

- B. Srilakshmi : Nutrition Science, New Age International Publishers.
- Sunetra Roday : Food Science & Nutrition, Oxford University Press.
- Mann and Truswell: Essentials of Human Nutrition, Oxford University Press.

Semester-III

FNTMJ-MC-05: BASIC BIOCHEMISTRY

[TOTAL CREDITS: 4 (LECTURE-3, PRACTICAL-1)

Course Outcome:
Student will be able to have coherent and systematic knowledge on carbohydrates, their types, metabolism and role of various carbohydrates in relation to human health. They will be able to understand the lipids and fatty acids, lipid and their clinical importance.

UNIT-I: Carbohydrate:

- Classes of carbohydrate rich foods, Glycemic index (GI) and glycemic load (GL).
- Properties and dietary importance of starch, sucrose, lactose, glucose and fructose.
- Metabolism: Glycolysis, Tricarboxylic acid (TCA) cycle, Gluconeogenesis, Glycogenesis.

UNIT- II: Protein:

- Protein rich foods, Biological importance of protein
- Structural features of protein (alpha helix and beta pleated sheet)
- Classes, chemical properties and functions (Hydration, Denaturation / Coagulation, Enzymatic reactions, Buffering, Browning)
- Concept and definition: Complete and incomplete proteins, Biological value, Protein Efficiency Ratio (PER), Net Protein Utilization (NPU), Essential and non-essential amino acids.

UNIT-III: Lipid:

- Fat rich foods, Biological importance of lipids
- Classes of lipids (Simple lipids, compound lipids and derived lipids), Properties and functions of fats, oils and fatty acids (MUFA, PUFA, SFA, TFA), Clinical importance of essential fatty acids (EFA)
- Chemical reactions and functional properties of food lipids (Fractionation, hydrogenation, hydrolysis and hydrolytic rancidity, Interesterification, lipo-oxidation and polymerization).
- Lipoproteins: Types and clinical significance.

Practical:

1. Quantitative estimation of protein (Biuret method/Lowry method)
2. Quantitative estimation of Carbohydrate (Anthrone method).
3. Preparation of buffer solution.

Suggested reading:

- Murray, R. K. Grannen, D. K.; Mayes, P. A. and Rodwell. V. W. : Harper's Biochemistry. Lange Medical Book.
- Handler, P.: Smith E.I.; Stelten, D. W. : Principles of Biochemistry, Me. Grew Hill Book Co.
- Lehninger, A.L.; Nelson, D. L. and Cox, M. M. Principles of Biochemistry. CBS Publishers and Distributors.
- Devlin, T. M. : Text Book of Biochemistry with Clinical Corelations. John Wiley and Sons.
- Strayer. L. Biochemistry. Freeman W.H. and Co.
- Assaini. J. Kaur. Text Book of Biochemistry. C.B.S. Publication.

FNTMJ-MC-06: BASIC DIETETICS

[TOTAL CREDITS: 4 (LECTURE-3, PRACTICAL-1)

Course Outcome: Students will have a basic idea about diet therapy, routine hospital diet and the role of a dietitian. Students will be able to comprehend the diet therapy of gastrointestinal diseases, in surgical conditions.

UNIT I: Basic Concepts of Diet Therapy:

- Therapeutic adaptation of normal diets. Principles and classification of therapeutic diets.

UNIT II: Routine Hospital Diets and Feeding:

- Regular diet, light diet, soft diet, fluid diet. Enteral feeding - tube feeding. Parenteral Feeding - Central and peripheral.

UNIT III: Energy Modifications and Nutritional Care for Weight Management:

- Identification of overweight and obese- Aetiological factors contributing to obesity and prevention Treatment – Low Energy diets, behavioral modification.
- Complications of obesity. Underweight – Aetiology and assessment. Treatment - high energy diets.

UNIT IV: Diseases of The Gastrointestinal Tract:

- Etiologic factors, symptoms and dietary treatment for Esophagitis, Diarrhoea and Constipation – high and low fiber diet.
- Gastritis, Peptic Ulcer and Ulcerative colitis. Malabsorption Syndrome – Gluten restricted diet, Steatorrhoea.

UNIT V: Modifications of Diet in Infections and Surgery:

- Fever and infections – aetiology, types symptoms and dietary treatment- Pre-Operative and Post Operative conditions.
- Burns and Trauma – Complications and dietary treatment.
- Allergy - Definition, Causes, Symptoms and dietary management in allergy.

Practical:

1. Planning and preparation of normal diet.

2. Planning and preparation of fluid diet, soft/semi solid diet.

3. Planning and preparation of high protein diet.

4. Planning and preparation of high fibre diet.

Suggested reading:

- Lee RD & Neiman DC. (2009). Nutritional Assessment. 5th Edition. Brown & Benchmark.
- Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier ·Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) Modern Nutrition in Health and Disease. 10th ed. Lipincott, William and Wilkins.
- Srilakshmi B, Dietetics 9th Edition, 2024

Semester-IV

FNTMJ-MC-07: TECHNOLOGY OF FOOD PROCESSING AND PRESERVATION

[TOTAL CREDITS: 4 (LECTURE-3, PRACTICAL-1)]

Course Outcome: Students gather elaborate knowledge on the basic principles of food preservation processes.

UNIT I: Food Storage and Preservation

- Principles of fresh food storage: Nature of harvested crop, plant, animal; product storage; effect of cold storage and quality – storage of grains.
- Preservation- Definition, objectives.

UNIT II: Food Preservation by High Temperature:

- Processing and preservation by heat: Blanching, pasteurization and UHT processing, canning, extrusion cooking, dielectric heating, baking, roasting and frying.

UNIT III: Food Preservation by Low Temperature and Irradiation:

- Processing and preservation by low Temperature: refrigeration, freezing, CA, MA, and dehydrofreezing.
- Principles of using electromagnetic radiation in food processing, ionizing radiations and non ionizing radiations, advantages and disadvantages.

UNIT IV: Food Preservation by Drying:

- Processing and preservation by drying, concentration and evaporation: Drying – water activity, microbial spoilage due to moisture. Dehydration of fruits, vegetables, animal products, advantages and disadvantages of different methods, sun drying, tray or tunnel drying, spray drying.

UNIT IV: Food Preservation by Non Thermal Method:

- Processing and preservation by non-thermal methods: High pressure, pulsed electric field, hurdle technology. Preservation by chemical preservatives, Permissible limits for chemical preservatives.

Practical:

1. Preparation of pickles, tomato sauce and chilly, squashes, jam and jelly.

2. Visit to food industry/ dairy industry.

Suggested reading:

- B. Srilakshmi, Food science, New Age Publishers, 2002.
- Meyer, Food Chemistry, New Age, 2004.
- Bawa. A.S, O.P Chauhanetal. Food Science. New India Publishing agency, 2013.
- Frazier WC and Westhoff DC, Food Microbiology, TMH Publication, New Delhi, 2004.
- Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S (2010). Basic Food Preparation:A Complete Manual, Fourth Edition. Orient Black Swan Ltd.
- Manay S. and Shadaksharaswamy M (2002). Foods–Facts and Principles. Wiley Eastern Ltd.

FNTMJ -MC-08: COMMUNITY NUTRITION

[TOTAL CREDITS: 4 (LECTURE-3, PRACTICAL-1)]

Course Outcome: Students are able to understand the concept and purpose of nutritional status assessment in community setting. They will gain knowledge with regard to standard methods and techniques for assessing nutritional status. Students' will be familiar with the use of indices and indicators for screening and consequent identification of malnutrition in the community.

UNIT- I: Basic Concept:

- Concept of Community, types of Community, Factors affecting health of the Community.

UNIT-II: Nutritional Assessment and Surveillance:

- Meaning, need, objectives and importance.
- Nutritional assessment of human: Clinical findings, nutritional anthropometry, biochemical tests, biophysical methods.

UNIT-III: Diet Survey:

- Need and importance, methods of dietary survey, Interpretation - concept of consumption unit, individual and total distribution of food in family, adequacy of diet in respect to RDA, concept of family food security.

UNIT-IV: Nutritional anthropometry:

- Need and importance, standard for reference, techniques of measuring height, weight, head, chest and arm circumference, interpretation of these measurements.
- Use of growth chart.

Practical:

1. Anthropometric Measurement of infant - Length, weight, circumference of chest, mid - upper arm circumference, precautions to be taken.

2. Growth charts - plotting of growth chart, growth monitoring and promotion.

3. Estimation of food and nutrient intake - Household food consumption data, adult consumption unit, 24 hours dietary recall, 24 hours record. Weighment method, food diaries, food frequency data, use of each of the above, information available through each individual, collection of data, estimation of intakes.

Suggested reading:

- Jelliffe, D. B. : Assessment of the Nutritional Status of the Community; World Health Organisation.
- Sain, D. R. Lockwood, R., Scrimshaw, N. S.: Methods the Evaluation of the Impact of Food and Nutrition Programmes, United Nations University.
- Ritchie, J.A.S. : Learning Bettor Nutrition FAO, Rome.
- Gopalon. C. : Nutrition Foundation of India, Special Publication service.
- Beghin, 1. Cap. M: Dujardan. B. : A Guide to Nutrition Status Assessment. W.H.O. Geneva.
- Gopaldas, t. Seshadri, S. : Nutrition Monitoring a Assessment: Oxford University Press.
- Mason, J. B., Habicht, J. P.; Tabatabai. H. Valverde. U.: Nutritional Surveillance, W.H.O.

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FNTMJ-MC-09: NUTRITIONAL PHYSIOLOGY-II

Course Outcome:

Student will be able to understand the current state of knowledge about the functional organization (Excretory system, Reproductive system, Nervous system and Endocrine system) of the human body. They will be able to develop insight of normal functioning of all the organ systems of the body and their interactions.

UNIT- I: Excretory system:

- Structure and function of skin.
- Regulation of temperature of the body.
- Structure and functions of kidney.
- Physiology of urine formation.

UNIT- II: Endocrine system:

- Location, anatomy, functional morphology, hormones of hypothalamus, pituitary, thyroid and adrenal gland.
- Secretions of the pancreas and their functions.

UNIT- II: Nervous System:

- Concept on sympathetic and parasympathetic nervous system.
- Brief anatomy and functions of cerebrum, cerebellum, hypothalamus and neuron.
- Concept on synapse and synaptic transmission.

UNIT- IV: Reproductive system:

- Structure and functions of gonads, concept on menstrual cycle.
- Brief idea of pregnancy, parturition, lactation and menopause.
- Brief concept on spermatogenesis and oogenesis process.

Practical:

1. Total count (TC) of RBC, WBC and Platelets.
2. Differential count (DC) of WBC.
3. Identification with reasons of histological slides (Liver, Kidney, Small intestine, Stomach, Pancreas, Testis, and Ovary).

Suggested reading:

- Chatterjee CC (1988). Text Book of Physiology – Vol I & II.
- Medical Physiology for undergraduate students by Khorana Indu and Khorana Arushi. Second Edition. Elsevier Publication. 2015.
- Guyton AC, Hall JE (1966). Text book of Medical Physiology. 9th Ed. Prism Books (Pvt.) Ltd. Bangalore.
- Guyton AC (1985). Function of the Human Body, 4th Edition, W.B. Sanders Company, Philadelphia.
- Hadley ME (2000). Endocrinology. 5th ed. Pearson Education.
- Hoar WS (1984).General and comparative Physiology. 3rd ed. Prentice-Hall of India.
- Wilson (1989). Anatomy and Physiology in Health and Illness. Edinburgh, Churchill Livingstone.

List and details view of Minor Core

Semester No	Course Code	Course Title
I	**FNTMN-MN-01:**	FNTMN-MN-01: FOOD, FOOD GROUP AND NUTRITION
II	**FNTMN-MN-02:**	FNTMN-MN-02: NUTRITIONAL PHYSIOLOGY-I
III	**FNTMN-MN-03:**	FNTMN-MN-03: DIETETICS
IV	**FNTMN-MN-04:**	FNTMN-MN-04: TECHNOLOGY OF FOOD PRESERVATION

SEMESTER-I

FNTMN-MN-01: **FOOD, FOOD GROUP AND NUTRITION**
[TOTAL CREDITS: 4 (LECTURE-3, PRACTICAL-1)]

Course Outcome:
The students will have a basic concept on food, nutrition and health. The student will be able to understand the chemistry and importance of different food groups. They will have fundamental concept about various food commodities.

1. **Basic concept of Food, Nutrients, Nutrition and Health:**
   - Definition: Food, Nutrients, Nutritive value, Nutrition, Optimum nutrition, Malnutrition and Undernutrition.
   - Functions of food, Balanced Diet, Choice of food.
   - Food Groups, Food Pyramid, My plate
   - Concept of health and Guidelines for good health
2. **Cereals**, **Pulses and legumes:**
   - Nutritional aspects of wheat, rice.
   - Types of pulses and legumes, uses, and nutritional aspects.
3. **Milk and milk Products**:
   - Composition and nutrients of milk
   - Nutritive value and Concept of milk processing, storage and Pasteurization
   - Types of processed milk, milk products (butter, curd, paneer and cheese)
4. **Egg**, **Fish and meat:**
   - Uses and nutritional importance of edible fish, egg and meat.
5. **Vegetables and fruits:**
   - Uses and nutritional importance of commonly available vegetables and their storage.
   - Fresh fruits and dry fruits.
6. **Fats and oils:**
   - Types, sources, use and nutritional aspects of fats and oils.
7. **Beverages:**
   - Common types (tea, coffee and wines) and their uses, nutritional aspect.
8. **Food adjuncts, food additives**
   - Spices (Chilies, Turmeric, Garlic and Ginger), use and nutritional aspect.
   - Commonly used food additives.
9. **Methods of cooking:**
   - Dry, moist, frying and microwave cooking.
   - Effect of various methods of cooking on foods, nutrient losses in cooking.

Practical:

Food Preparation:

- Beverages (Milk shake / Lassi), Cereals (Fried Rice / Chapatti), Milk and milk products (Custard / Payasam) and Snacks (Poha / Sandwiches) [Any one from each category].
- Preparation of homemade ORS.
- Preparation of weaning foods for infants (Soup / Khichuri) [Any one].
- Preparation of low cost and medium cost school tiffin. [Any one item]

Suggested reading:

- Hughes O, Bennion M (1970). Introductory Foods, Macrnillan& Co. New York.
- Lavies S (1998). Food Commodities.
- Pomeranz Y (Ed) (1991). Functional Properties of Food Components, (2^{nd} edition), Academic Press, New York.
- Tindall HD (1983). Vegetables in the Tropics, MacMillan Press, London.
- Winton AL, Winton KB (1999). Techniques of Food Analysis. Allied Scientific Publishers.
- Nutrition and Dietetics Book. A Joshi Shubhangini, Mc Graw Hill publication, 5^{th} edition.

SEMESTER-II

FNTMN-MN-02: **NUTRITIONAL PHYSIOLOGY-I**
[TOTAL CREDITS: 4 (LECTURE-3, PRACTICAL-1)]
Course Outcome:
Student will be able to understand the current state of knowledge about the functional organization (Digestive system, Circulatory and Cardiovascular system, and Respiratory system of the human body.

1. **General Physiology:**

- The cell physiology. Structure and functions of mammalian cell with special reference to Plasma membrane (Fluid Mosaic Model), Mitochondria, Ribosome.
- Nucleus (nuclear membrane, nuclear chromatin and nucleolus).

2. Circulatory and Cardiovascular system:

- Blood its composition and functions of blood components. Blood groups, Mechanism of blood coagulation.
- Functions of heart.
- Cardiac cycle, cardiac output, blood pressure and its regulation.

3. Digestive system:

- Structure and functions of Digestive system • Process of digestion and absorption of food.
- Composition, function of saliva, gastric, pancreatic and intestinal juices.

4. Respiratory system:

- Functional anatomy of respiratory tract.
- Structure of Lungs and gaseous exchange (oxygen and carbon dioxide transport).
- Physiology of high altitude. Pathophysiology of dysponoea and hypoxia.

Practical

- Determination of pulse rate.
- Determination of blood pressure by Sphygmomanometer (Auscultatory method).
- Determination of Bleeding Time (BT) and Clotting Time (CT).
- Detection of Blood group (Slide method).
- Measurement of Haemoglobin level (Sahli`s method).

Suggested reading:

- Chatterjee CC (1988). Text Book of Physiology – Vol I & II.
- Medical Physiology for undergraduate students by Khorana Indu and Khorana Arushi. Second Edition. Elsevier Publication. 2015.
- Guyton AC, Hall JE (1966). Text book of Medical Physiology. 9th Ed. Prism Books (Pvt.) Ltd. Bangalore.
- Guyton AC (1985). Function of the Human Body, 4th Edition, W.B. Sanders Company, Philadelphia.
- Hadley ME (2000). Endocrinology. 5th ed. Pearson Education.
- Hoar WS (1984).General and comparative Physiology. 3rd ed. Prentice-Hall of India.
- Wilson (1989). Anatomy and Physiology in Health and Illness. Edinburgh, Churchill Livingstone.

SEMESTER-III

FNTMN-MN-03: DIETETICS

[TOTAL CREDITS: 4 (LECTURE-3, PRACTICAL-1)]

Course Outcome: Students will have a basic idea about diet therapy, routine hospital diet and the role of a dietitian. Students will be able to comprehend the diet therapy of gastrointestinal diseases, in surgical conditions.

UNIT I: Basic Concepts of Diet Therapy:

- Therapeutic adaptation of normal diets. Principles and classification of therapeutic diets.

UNIT II: Routine Hospital Diets and Feeding:

- Regular diet, light diet, soft diet, fluid diet. Enteral feeding - tube feeding. Parenteral Feeding - Central and peripheral.

UNIT III: Energy Modifications and Nutritional Care for Weight Management:

- Identification of overweight and obese- Aetiological factors contributing to obesity and prevention Treatment – Low Energy diets, behavioral modification.
- Complications of obesity. Underweight – Aetiology and assessment. Treatment - high energy diets.

UNIT IV: Diseases of the Gastrointestinal Tract:

- Etiologic factors, symptoms, diagnostic tests and dietary treatment for Esophagitis, Diarrhoea and Constipation – high and low fiber diet.

UNIT V: Modifications of diet in Infections and Surgery:

- Fever and infections – aetiology, symptoms, diagnostic tests and dietary treatment – High Protein diet Surgical conditions – Pre-Operative and Post Operative conditions.
- Burns and Trauma – Complications and dietary treatment.

Practical:

1. Planning and preparation of normal diets.

2. Planning and preparation of fluid diets.

3. Planning and preparation of soft/semi solid diets.

4. Planning and preparation of high protein diets.

Suggested reading:

- Lee RD & Neiman DC. (2009). Nutritional Assessment. 5th Edition. Brown & Benchmark.
- Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier ·Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) Modern Nutrition in Health and Disease. 10th ed. Lipincott, William and Wilkins.
- Srilakshmi B, Dietetics 9th Edition, 2024

SEMESTER-IV

FNTMN-MN-04: TECHNOLOGY OF FOOD PRESERVATION

[TOTAL CREDITS: 4 (LECTURE-3, PRACTICAL-1)]

Course Outcome: Students gather elaborate knowledge on the food preservation processes.

UNIT I: Food Storage:

- Principles of fresh food storage: Nature of harvested crop, plant, animal; product storage; effect of cold storage and quality – storage of grains.

UNIT II: Food Preservation by Heat:

- Processing and preservation by heat: Blanching, pasteurization and UHT processing, canning, extrusion cooking, baking, roasting and frying.

UNIT III: Food Preservation by Low Temperature and Irradiation:

- Pocessing and preservation by low Temperature: refrigeration, freezing, CA, MA, and dehydrofreezing.
- Principles of using electromagnetic radiation in food processing, ionizing radiations and non ionizing radiations, advantages and disadvantages.

UNIT IV: Food Preservation by Drying:

- Processing and preservation by drying, concentration and evaporation: Drying – water activity, microbial spoilage due to moisture. Dehydration of fruits, vegetables, animal products. sundrying,.

Practical:

1. Aseptic handling: Sources of contamination of foods.
2. Preparation of pickles, tomato sauce, chili sauce, jelly, tomato purees squash etc.

Suggested reading:

- B. Srilakshmi, Food science, New Age Publishers, 2002.
- Meyer, Food Chemistry, New Age, 2004.
- Bawa. A.S, O.P Chauhanetal. Food Science. New India Publishing agency, 2013.
- Frazier WC and Westhoff DC, Food Microbiology, TMH Publication, New Delhi, 2004.
- Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S (2010). Basic Food Preparation:A Complete Manual, Fourth Edition. Orient Black Swan Ltd.
- Manay S. and Shadaksharaswamy M (2002). Foods–Facts and Principles. Wiley Eastern Ltd.

List and details view of Skill Enhancement Course (SEC)

Semester No	Course No	Course Title
I	**FNTMJ-SEC-01**	FNTMJ-SEC-01: COMMUNITY HEALTH CARE
II	**FNTMJ-SEC-02**	FNTMJ-SEC-02: PATHOLOGY AND DISEASE DIAGNOSIS TECHNIQUES
III	**FNTMJ-SEC-03**	FNTMJ-SEC-0**3:** ENTREPRENEURSHIP AND SMALL CATERING UNITS

SEMESTER-I

FNTMJ-SEC-01: COMMUNITY HEALTH CARE
[TOTAL CREDITS: 3 (Lecture2, Practical-1)]

Course Outcome:

Under this course, the students will be introduced to the different issues of health care of the community. This course provides an insight to the students about the principle of health care system, concept of occupational health and disorders, knowledge about family planning. They will be provided a brief insight about health planning and management as well as principle and practice of health education.

UNIT-I: Health Care of the Community

- Concept of health care and levels of health care
- Elements of health care, Principles of primary health care, Health for All
- Health problems: Communicable disease problems, non-communicable disease problems, Environmental sanitation
- Health care systems: Primary health care in India (Village level, Sub-centre level, Primary health centre level, Community health centre)

UNIT-II: Occupational Health

- Concept of health: Determinants and various dimensions
- Definition and objectives of occupational health
- Occupational environment
- Occupational hazards (Physical, Chemical, Biological and Psychological)
- Occupational Diseases (Silicosis, Asbestosis, Lead-poisoning, Occupational cancer)
- Measures for health protection of workers: Nutrition, Communicable disease control, Environmental sanitation, Measures for women and children, Health education
- Prevention of occupational diseases.

UNIT-III: Family planning and health education:

- Concept of family planning, Health aspect of family planning
- Contraceptive methods (Concept, Advantages and disadvantages): Spacing methods (Barrier, IUD, Hormonal, Post-conceptional), Terminal method (Male sterilization, Female sterilization)

UNIT-IV: Health Education Aspect:

- Definition and objectives of health education
- Alma-Ata Declaration
- Approaches of health education: Regulatory, Service, Health education, Primary health care approach,
- Role of health care providers

- Contents of health education: Human biology, Nutrition, Hygiene, Family health health, Disease prevention and control, prevention of accidents and use of health services

UNIT-V: Role of Dietitians:

- Types of dietitians and role of dietitian.

Practical:

1. Clinical assessment and signs of nutrient deficiencies specially PEM (Kwashiorkor, marasmus), Vitamin A deficiencies, Anaemia, Rickets, B-Complex deficiencies.
2. Comparison with normal value and interpretation of the nutritional assessment data and its significance-Weight for age, height for age, weight for height, Z scores, Body Mass Index (BMI) Waist - Hip Ratio (WHR).

Suggested reading:

- Park's Textbook of Preventive and social medicine (K. Park).
- Jalihal KA & Veerabhadraiah V. 2007. Fundamentals of Extension Education and Management in Extension. Concept Publ.
- Van Den Ban AW & Hawkins HS. 1998. Agricultural Extension .2nd Ed. CBS.
- Rural Sociology: Dr. Kumar, Lakshmi Narain Agrwal, Educational Pubilsher, Anupam Plaza-I, Block No. 50, Sanjay Place, Agra-2.
- Mushroom Growing, S.C. Day, Agrobios India.
- Mushroom and their Cultivation Technique, R. C. Ram, Aavishkar Publishers, Distibutors, Jaipur,India.
- Vermiculture and Organic Farming, T. V. Sathe, Daya Publishing House, New Delhi. Handbook of Beekeeping: Dharm Singh/ Devendra Pratap Singh, Agrobios, India.

SEMESTER-II

FNTMJ-SEC-02: PATHOLOGY AND DISEASE DIAGNOSIS TECHNIQUES

[TOTAL CREDITS: 3 (Lecture-2, Practical-1)]

Course outcome:

In this course, the students will be introduced to the fundamental concepts of basic medical laboratory technology and the career opportunities available in this field. This course provides an insight to the students regarding various issues associated with laboratory works like investigation of bio-fluids, analysis of blood smear etc. and building up goodwill and reputation of Laboratory or Hospitals with the essential concepts of medical diagnostics. They will be provided a brief insight about personal grooming and its stages, meaning and importance of knowledge of Laboratory base works and other key dimensions of laboratory management in Hospitals.

UNIT-I: Cellular Adaptations, Cell Injury and Cell Death:

- Causes and mechanisms of cell injury.
- Brief concept of cellular responses: Hyperplasia, Hypertrophy, Atrophy, Metaplasia, Necrosis, Apoptosis.

UNIT-II: Hemodynamic Pathology:

- Brief concept on Edema, Hyperaemia, Haemorrhage, Haemostasis and Thrombosis.

UNIT-III: Cell proliferation and Cancer:

- Characteristics of benign and malignant neoplasms, grading and staging of cancer (In brief).

UNIT-IV: Pathology of Urine:

- Physical characteristics-Color, transparency, pH and specific gravity.
- Chemical characteristics-Protein, Sugar, Ketone bodies, Bile.
- Microscopical features- RBC, Epithelial cell, Pus cells, Casts and Crystals.

UNIT-V: Analysis of Blood (Principle, Technique, Reference value and Clinical significance):

- Preparation of Blood smear
- Differential Leucocyte Count (D.L.C) using Leishman's stain
- TC of RBC, WBC and Platelet using haemocytometer
- Erythrocyte Sedimentary Rate (E.S.R), Packed Cell Volume (P.C.V.)

UNIT-VI: Diagnosis of Hypertension and Cardio-vascular diseases (CVDs)

- Determination of Blood pressure and ECG

UNIT-VII: Clinical Biochemistry (Principle, Reference value and Clinical significance)

- Liver Function Tests (LFTs), Renal function Test (RFTs), Lipid profiling

Practical:

1. Pregnancy test by using urine sample. (Strip method)
2. Measurement of glucose using single touch glucometer.
3. Determination of ESR (Westergren method)
4. Qualitative detection of sugar and protein in urine sample.

Suggested reading:

- Robbins and Cotran Pathologic Basis of Disease, 8th edition (2009), Vinay Kumar, Abul K. Abbas, Jon C. Aster, Nelson Fausto; Saunders Publishers, ISBN-13: 978-1416031215.
- General and Systematic Pathology, 2nd edition (1996), J., Ed. Underwood and J. C. E. Underwood; Churchill Livingstone, ISBN-13: 978-0443052828.
- Robbins Basic Pathology, 9^{th} edition (2012), Kumar, Abbas, Fausto and Mitchell; Saunders Publication, ISBN-13: 978-1437717815.
- Medical Laboratory Technology Methods and Interpretations Volume 1 and 2, 6th edition (2009), Ramnik Sood; Jaypee Brothers Medical Publishers, ISBN-13: 978-8184484496

SEMESTER-III

FNTMJ-SEC-03: ENTREPRENEURSHIP AND SMALL CATERING UNITS.
[Credits: 3 (Lecrure-2, Practical-1)]

Course outcome: In this course, the students will be introduced to the fundamental concepts of entrepreneurship and catering.

UNIT-I: Introduction to Food Service and Menu Planning:

- Concept of Food service, Food hygiene and sanitation.
- Origin of Food Service units, kinds of food service units.
- Types of menu, Importance of menu, factors affecting menu planning.

UNIT-II: Food Production Process:

- Quantity food production: Standardization of recipes, Recipe adjustments and portion control, Food purchase and receiving, Storage.

UNIT-III: Organization and Management:

- Principles of management, functions of management/ manager.
- Space-Types of kitchen areas, Flow of work and work area relationship.
- Equipment-factors affecting selection of equipment, equipment needs for different situations.
- Financial Management-Importance of Financial Management, Concept of cost, Budgets and budgeting process.

UNIT-IV: Planning of a Small Food Service Unit:

- Survey of types of units, identifying clientele, menu, operations and delivery.
- Identifying resources, Developing Project plan, Determining investments, Development of a business plan.

Practical:

3. Planning menus for the following: Packed meals for office employees. Nutritious tiffins for school children. School/College canteens

4. Demonstration of a specialized cuisine

5. Develop a checklist for good hygiene practices.

Suggested reading:

- West B Bessie & Wood Levelle (1988). Food Service in Institutions 6th Edition Revised By Hargar FV, Shuggart SG, & Palgne Palacio June, Macmillian Publishing Company New York.
- Sethi Mohini (2005). Institution Food Management New Age International Publishers.
- Knight JB & Kotschevar LH (2000). Quantity Food Production Planning & Management 3 rd edition John Wiley & Sons.
- Kazarian EA (1977). Food Service facilities Planning 3rd Edition Von Nostrand Reinhold New York.
- Taneja S and Gupta SL (2001). Enterpreneurship development, Galgotia Publishing

SEMESTER: II

VAC (VALUE ADDITION COURSE)

FRUITS AND VEGETABLES PRODUCTS (Credit- 2)

UNIT-I: Importance of fruits and vegetable, history and need of preservation, reasons of spoilage, method of preservation (short & long term).

UNIT-II: Classification of fruits and vegetables, general composition, enzymatic browning,

UNIT-III: Pathological and chemical changes during the storage of fruits and vegetables.

UNIT-IV: Fruits Beverages:

Introduction, Processing of fruit juices (selection, juice extraction, deaeration, straining, filtration and clarification), preservation of fruit juices (pasteurization, chemically preserved with sugars, freezing, drying, tetra-packing, carbonation),

UNIT-V: Jams, Jellies.

- Jam - Constituents, selection of fruits, processing and technology.
- Jelly-Essential constituents (Role of pectin), Theory of jelly formation, processing and technology, defects in jelly.

UNIT-VI: Pickles, Chutneys, Sauces and Tomato Products:

- Processing, Types, Causes of spoilage in pickling.
- Selection of tomatoes, pulping and processing of tomato juice, tomato puree, paste, ketchup, sauce and soup.

UNIT-VII: Dehydration of Fruits and Vegetables:

- Drying and mechanical dehydration, process variation for fruits and vegetables, packing and storage.

Suggested reading:

- Girdharilal, Siddappaa, G.S and Tandon, G.L.1998. Preservation of fruits & Vegetables, ICAR, New Delhi.
- W B Crusess.2004. Commercial Unit and Vegetable Products, W.V. Special Indian Edition, Pub: Agrobios India.
- Manay, S. & Shadaksharaswami, M.2004. Foods: Facts and Principles, New Age Publishers.
- Ranganna S.1986. Handbook of analysis and quality control for fruits and vegetable products, Tata Mc Graw-Hill publishing company limited, second edition.

SEMESTER: II

INTERDISCIPLINARY/ MULTIDISCIPLINARY (IDC/MDC)

NUTRITION AND DIETETICS (CREDIT-3)

UNIT-I: Basic concept of Food, Nutrients, Nutrition and Health:

- Definition: Food, Nutrients, Nutritive value, Nutrition, Optimum nutrition, Malnutrition and Undernutrition.
- Functions of food, Balanced Diet, Food selection.
- Food Groups, Food Pyramid, My plate
- Concept of health and Guidelines for good health

UNIT-II: Minimum Nutritional Requirement and RDA:

- RDA of different age groups. Factors affecting RDA, General principles of Formulation of RDA.

  Dietary Guidelines of Reference Man and Reference Woman

UNIT-III : Basic Concepts of Diet Therapy:

- Therapeutic adaptation of normal diets. Principles and classification of therapeutic diets.

UNIT-IV: Routine Hospital Diets:

- Regular diet, light diet, soft diet, fluid diet. Enteral feeding - tube feeding. Parenteral Feeding - Central and peripheral.

UNIT-V: Energy Modifications and Nutritional Care for Weight Management:

- Identification of overweight and obese- Aetiological factors contributing to obesity and prevention Treatment – Low Energy diets, behavioral modification. dietary management of obesity.
- Underweight – Aetiology, assessment and dietary management of underweight

Suggested reading:

- Lee RD & Neiman DC. (2009). Nutritional Assessment. 5th Edition. Brown & Benchmark.
- Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier ·Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) Modern Nutrition in Health and Disease. 10th ed. Lipincott, William and Wilkins.
- Srilakshmi B, Dietetics 9th Edition, 2024