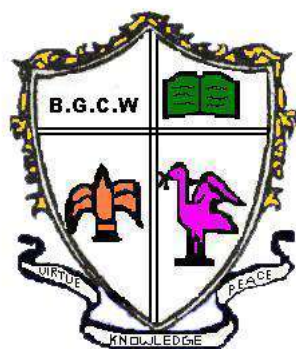


BHARATHIDASAN GOVERNMENT COLLEGE FOR WOMEN (AUTONOMOUS)
Affiliated to Pondicherry University
PUDUCHERRY – 605 003



DEPARTMENT OF HOME SCIENCE

NEP BASED

SYLLABUS AND REGULATIONS

FOR

B.Sc. (Hons.) CLINICAL NUTRITION AND DIETETICS

[I TO VIII SEMESTERS]

[FROM THE YEAR 2024-2028 ONWARDS]

Course Structure

SEMESTER – I

Level - 100

S. No	Category	Course Code	Course Title	Credits	Lecture/Tutorial Hours
1	MJD 1		Food Science	4	5
2	MID 1		Food Microbiology	4	5
3	MLD 1		Banking Practices	3	3+1
4	AEC 1		English	2	2+2
5	SEC 1 (Practical)		Foods – Preparation and Spoilage Practical	3	4
6	VAC 1		Understanding India	2	2+2
7	VAC 2		Environmental Science/Education	2	2+2
TOTAL				20	30

SEMESTER – II

Level - 100

S. No	Category	Course Code	Course Title	Credits	Lecture/Tutorial Hours
1	MJD 2		Human Nutrition	4	5
2	MID 2		Human Physiology	4	5
3	MLD 2		Economics for Competitive Exams	3	3+1
4	AEC 2		Tamil/French/Hindi	2	2+2
5	SEC 2 (Practical)		Human Nutrition and Physiology Practical	3	4
6	VAC 3		VAC 3 – Health, Wellness, Yoga Education, Sports & Fitness	2	2+2
7	VAC 4		VAC 4 – Digital Technology Education	2	2+2
TOTAL				20	30

SEMESTER – III**Level-200**

S. No	Category	Course Code	Course Title	Credits	Lecture/Tutorial Hours
1	MJD 3		Lifecycle Nutrition I	4	5
2	MJD 4		Lifecycle Nutrition II	4	5
3	MID 3		Nutritional Biochemistry	4	6
4	MLD 3		Physical Science - Chemicals for Life	3	3+1
5	AEC 3		English	2	2+2
6	SEC 3 (Practical)		Lifecycle Nutrition and Biochemistry Practical	3	6
TOTAL				20	30

SEMESTER – IV**Level - 200**

S. No	Category	Course Code	Course Title	Credits	Lecture/Tutorial Hours
1	MJD 5		Nutritional Assessment, Surveillance & Education	4	5
2	MJD 6		Food Preservation Techniques	4	5
3	MJD 7 (Practical)		Food Preservation Practical	4	6
4	MID 4		Food Safety, Sanitation & Hygiene	4	4
5	AEC 4		Tamil/French/Hindi	2	2+2
6	Project		Summer Internship (Community Engagement)	2	6
TOTAL				20	30

SEMESTER – V**Level - 300**

S. No	Category	Course Code	Course Title	Credits	Lecture/Tutorial Hours
1	MJD 8		Clinical Nutrition in Specific Diseases	4	6
2	MJD 9		Diet For Specific Diseases	4	6
3	MJD 10 (Practical)		Clinical Nutrition and Dietetics Practical - I	4	6
4	MJD 11		(Winter Internship – Industrial Training)	4	6
5	MID 5		Fitness And Sports Nutrition	4	6
TOTAL				20	30

SEMESTER - VI**Level - 300**

S. No	Category	Course Code	Course Title	Credits	Lecture/Tutorial Hours
1	MJD 12		Clinical Nutrition in Lifestyle Diseases	4	6
2	MJD 13		Diet For Lifestyle Diseases	4	6
3	MJD 14 (Practical)		Clinical Nutrition and Dietetics Practical - II	4	6
4	MJD 15		Food Service Management	4	6
5	MID 6		Hospital Administration	4	6
TOTAL				20	30

SEMESTER – VII**Level - 400**

S. No	Category	Course Code	Course Title	Credits	Lecture/Tutorial Hours
1	MJD 16		Medical Nutrition Therapy in Critical Care	4	6
2	MJD 17		Research Methodology & Biostatistics	4	6
3	MJD 18		Food Laws and Regulations	4	6
4	MID 7		a) Herbal Nutrition OR b) Functional Foods & Nutraceuticals for Health	4	6
5	MID 8		a) Diabetes & Diabetes Management OR b) Food - Quality Control & Adulteration	4	6
TOTAL				20	30

SEMESTER – VIII**Level-400**

S. No	Category	Course Code	Course Title	Credits	Lecture/Tutorial Hours
1	MJD 19		Public Health & Nutrition	4	6
2	MJD 20		Techniques in Diet Counselling	4	6
3A	RESEARCH PROJECT (OR)		Research Project (OR)	12	18 (OR)
3B	MJD 21		Advances in Nutrition	4	6
	MJD 22		Maternal and Child Nutrition	4	6
	MJD 23		Food Product Development & Entrepreneurship	4	6
TOTAL				20	30

Semester-wise Clinical Nutrition & Dietetics Course Structure and Scheme
For Under Graduate Students of Other Departments

(Minor Disciplinary & Multi-Disciplinary Courses in CLINICAL NUTRITION & DIETETICS)

SEMESTER – I / II / III

Multi-Disciplinary Course

S. No	Category	Course Code	Course Title	Credits	Lecture/Tutorial Hours
1	MLD1		Fundamentals of Food Preservation (For the students of other Departments)	3	4
2	MLD2		Culinary Nutrition (For the students of other Departments)		
3	MLD1		Banking Practices (For the students of CND)		
4	MLD		Chemicals for Life (For the students of CND)		

SEMESTER – I

Minor Disciplinary Course (For Chemistry Department)

S. No	Category	Course Code	Course Title	Credits	Lecture/Tutorial Hours
1	MID 1		Lifespan Nutrition -I	4	5

SEMESTER – II

Minor Disciplinary Course (For Chemistry Department)

S. No	Category	Course Code	Course Title	Credits	Lecture/Tutorial Hours
1	MID 2		Lifespan Nutrition -II	4	5

SEMESTER – III

Minor Disciplinary Course (For Chemistry Department)

S. No	Category	Course Code	Course Title	Credits	Lecture/Tutorial Hours
1	MID 3		Lifespan Nutrition Practical	4	5

EVALUATION

All credit courses will be evaluated based on a total of 100 Marks, distributed as follows:

Theory

- Internal Assessment: 25 Marks
- End Semester Examination: 75 Marks

Practical

- Internal Assessment: 50 marks
- End Semester Practical Examination: 50 marks

Breakup of Internal Assessment Marks

For all credit courses, the internal assessment marks will be broken down as follows:

Theory

- Mid-Semester Exam - 20 Marks
- Percentage of Attendance - 5 Marks
- **Total - 25 Marks**

Practicals

- Observation note / Demo note / Work dairy - 20 Marks
- Practical record - 30 Marks
- **Total - 50 Marks**

Summer Internship/Community Engagement

- Identifying the problem/Topic Selection – 20 Marks
- Survey/Data Collection – 20 Marks
- Analysis, Consolidation and Report Submission– 30 Marks
- Presentation and Viva voce – 30 Marks
- **Total – 100 Marks**

Winter Internship/Industrial Training

- Attendance – 20 Marks
- Observational Reports Submission/Certificate – 80 Marks
- **Total – 100 Marks**

Internal Test Scheme

- Mid-Semester Exams: Conducted during the 8th or 9th week from the start of classes.
- Duration of the Exam: 1 hour 30 minutes (90 minutes).

Marks for Attendance

- Below 75%: 0 marks
 - 75% to 80%: 1 mark
 - 80% to 85%: 2 marks
 - 85% to 90%: 3 marks
 - 90% to 95%: 4 marks
 - 95% to 100%: 5 marks
- A minimum of 70% attendance is required to be eligible to appear in the end-semester exam.
 - Attendance Below 70%: Eligible for the Examination with condonation Fee.
 - Attendance Below 60%: Not eligible to appear for the Examination.

Criteria for Pass Marks

(Minimum Pass Marks)

- Internal Assessment: No minimum pass marks required.
- End Semester Exams: Minimum pass marks are 30 out of 75 Marks
- Overall Pass Marks: A combined minimum of 40 marks out of 100 Marks (including Internal Assessment and End Semester Exams) is required to pass the course.

End Semester Examination Scheme -Theory Subjects

Total Marks: 75 marks

- Section A: $10 \times 2 = 20$ Marks (10 out of 12 Questions to be answered)
- Section B: $5 \times 5 = 25$ Marks (5 out of 8 Questions to be answered)
- Section C: $3 \times 10 = 30$ Marks (3 Out of 5 Questions to be answered)

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: I		Course Category: Major Discipline MJD 1					Semester: I		
Course Title: FOOD SCIENCE							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	5	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to - Understand the different food groups and their contribution to nutrition - Comprehend the principles of food and its application in food preparation							
Course Outcome		After successful completion of this course, students will be able to: - Utilize the understanding gained through application of scientific cooking methods - Applying the principles of food preparation techniques							
CONTENT									
UNIT: I		FOOD GROUPS AND COOKING METHODS					No. of Hours: 10		
- Food groups – Classification - Functions of food - Objectives of cooking - Preliminary preparations - Cooking methods — Principles, merits and demerits - Moist heat methods - Dry heat methods - Microwave cooking - Solar cooking									

UNIT: II	CEREALS, MILLETS, PULSES, NUTS AND OILSEEDS, FATS AND OILS	No. of Hours: 20
Cereals and Millets • Composition, Nutritive Value and Structure of Wheat, Rice • Convenient Cereal products -Millets and its products • Cereal cookery - Gluten formation, Gelatinization and Dextrinisation • Role of cereals in cookery Pulses • Composition and Nutritive Value • Toxic constituents • Role of Pulses in cookery Fats, Nuts and Oilseeds • Composition and Nutritive value • Types of oils • Changes during storage and heating of fat • Role of fat in cookery		
UNIT: III	VEGETABLES AND FRUITS	No. of Hours: 5
• Classification and nutritional significance of Vegetables & Fruits • Pigments in vegetables and its effects on different method of cooking • Role of vegetables and fruits in cookery		
UNIT: IV	MILK, EGGS AND FLESHY FOODS	No. of Hours: 15
Milk and Milk Products • Composition and Nutritive value • Processing- Clarification, Homogenization, Pasteurization and Freezing • Types of milk, Fermented and Non- fermented milk products • Role of milk in cookery Egg • Structure, Composition and Nutritive Value • Egg quality and evaluation • Egg cookery - Egg white foams, Iron sulphide formation • Role of egg in cookery		

Meat • Classification, Composition and Nutritive Value • Post mortem changes, Ageing, Tenderizing, Curing • Meat cookery		
Poultry • Classification, Composition and Nutritive Value		
Fish • Classification, Composition and Nutritive Value • Selection of Fish • Fish cookery		
UNIT: V	SUGARS, SPICES & CONDIMENTS	No. of Hours: 10
Sugar and Related Products • Types of sugars • Stages of sugar cookery • Role of sugar in cookery		
Spices and Condiments • Types • Role of spices in cookery		
Total Hours		60
PEDAGOGY	Lecture and tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS 1. Roday. S, Food Science and Nutrition, OUP India, III Edition, 2012 2. Agrawal A, Udipi S, (2022): Textbook of Human Nutrition (2nd Edition), Jaypee Publishers 3. Srilakshmi. B: (2022) Food Science, 7th Edition, New Age International Pvt Ltd Publishers 4. Mudambi, S.R. and Rajagopal, M.V. (2020), Fundamentals of Foods, Nutrition and Diet Therapy, New Age International Pvt. Ltd. 5. Shadaksharaswamy, M, Manay, S, (2020): Food facts and Principles, 4th Edition, New Age International Publishers		

REFERENCES

1. Ward D.J, Ward. L, Principles of Food Science, Goodheart –Wilcox Publishers, 2015.
2. English, Lawless H. T., Sensory Evaluation of Food: Principles and Practices, CBS Publishers, II Edition, 2014.
3. Potter, N. and Hotchkiss, J.H, Food Science, CBS Publishers & Distributors, New Delhi,
4. V Edition, 2007.
5. Vaclavik. V, Christian W. E, Essentials of Food Science, Springer-Verlag New York, III Edition, 2008
6. Subbulakshmi, G, Udipi, S. A, Padmini Ghugre (2021): Food processing and Preservation, New Age International Pvt Ltd Publishers, New Delhi
7. Bennion, M. Scheule, B.: (2019): Introductory Foods,13th Edition, Prentice Hall Publications

JOURNALS

1. International Journal of Food Science & Nutrition
2. Journal of Nutrition & Food Science
3. Journal of Food Science & Technology

RECIPE BOOKS

1. Dubey K, (2022), ‘The Indian Cuisine’ Published by PHI Learning Pvt.
2. Nambiar, V (2021) ‘Indian Food Anthropology and the Eat Right Movement’ - Volume 2.
3. Philip T (1978), ‘Indian Cuisine’, published by Ministry of Information and Broadcasting Government of India: 14-15.

WEB RESOURCES

<https://swayam.in>

<https://www.nin.res.in>

<https://cftri.res.in>

Youtube. chef deena’s kitchen

Youtube. Chef damu

Youtube. Sanjeev kapoor khazana

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: I		Course Category: Minor Discipline MID 1					Semester: I		
Course Title: FOOD MICROBIOLOGY							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	5	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to - Know about the different types of microbes and their significance - Understand the nature of microorganisms involved in food spoilage							
Course Outcome		After successful completion of this course, students will be able to: - Ability to relate the theoretical knowledge with the microbes in environment - Understand the relevance of microbial spoilage of various foods and its intoxications							
CONTENT									
UNIT: I		INTRODUCTION TO MICROBIOLOGY					No. of Hours: 5		
- Definitions – Microbiology, Microbes - Microbial growth curve, Effect of intrinsic and extrinsic factors on growth curve – pH, Moisture, Temperature, Oxygen availability, Nutrition - Useful Microorganisms – Prebiotics and Probiotics									
UNIT: II		GENERAL MORPHOLOGY OF MICROORGANISMS					No. of Hours: 15		
- Characteristics, Reproduction and Economic importance of - Bacteria - Fungi - Virus - Algae									

UNIT: III	CONTAMINATION AND SPOILAGE OF FOOD	No. of Hours: 15
• Classification of foods based on perishability, sources of contamination and spoilage, factors responsible and chemical changes due to spoilage in foods • Contamination, types of spoilage of foods and preservation of different foods ○ Cereal and Cereal products ○ Vegetables and fruits ○ Meat, Poultry, Sea Foods ○ Milk and Milk Products ○ Nuts and Oilseeds ○ Packed and Canned Foods		
UNIT: IV	MICROBIAL INTOXICATION AND INFECTION	No. of Hours: 10
• Food Intoxication – Salmonellosis, Botulism, Staphylococcus poisoning, Clostridium Welchii food poisoning • Food and water borne diseases – Typhoid, Cholera, E coli infection, Shigellosis, Dysentery		
UNIT: V	CONTROL OF MICROORGANISMS IN FOODS	No. of Hours: 15
• High and Low Temperature • Dehydration • Freezing • Irradiation • Sterilization and Disinfection		
Total Hours		60
PEDAGOGY	Lecture and tutorial/Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS		
1. Pelczar J. Michael, Chan E.C.S, Krieg N.R: Micro-biology, Affiliated East West Press, 2023 2. Frazier. W.C.: Food Micro-biology - McGraw Hill Education; New York, V Edition 2017 3. Joshua A.K.: Microbiology, Popular Book Depot, 2002		

REFERENCES

1. Adam, M.R Moss, MD: Food Microbiology, New Age International Pvt. Ltd. 2007
2. Pasha. C, Madhuri, A, Muthenna. P, Raga Sudha, T: Food Microbiology, Divya Lakshmi Publishers, 2020
3. Ray. B, Bhunia. A, Fundamental Food Microbiology, CRC Press,V Edition, 2013
4. Jay, M.J, Loessner LM, Golden AD; Modern Food Microbiology, VII Edition, Springer Verlag, NY INC, 2006

JOURNALS

1. International Journal of Food Microbiology
2. Journal of Food Microbiology
3. Journal of Food & Industrial Microbiology

WEB RESOURCES

<https://microbenotes.com>

<https://www.sciencedirect.com>

<https://www.nature.com>

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: I		Course Category: SKILL ENHANCEMENT – SEC 1					Semester: I		
Course Title: FOODS –PREPARATION AND SPOILAGE							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
3	Lecture	Tutorial	Practical/ practice	4	Theory	Lab Session	CIA	ESE	Total Marks
			3			90	50	50	100
Course Objective		To enable the students to • Comprehend the principles of food, their contribution to nutrition and its application in food preparation • Identify the different types of microbes and their significance in food spoilage							
Course Outcome		After successful completion of this course, students will be able to: • Utilize the understanding gained through application of scientific cooking methods • Understand the relevance of microbial spoilage of various foods and its intoxications							
CONTENT									
FOOD SCIENCE									
Exercise 1: Terminology related to Foods, preparation & spoilage									
Exercise 2: Weights, measures and edible portions of cereals, millets, pulses, milk, milk products, eggs, fruits and vegetables.									
Exercise 3: Preparation of Recipes on Cereals – Briyani, Stuffed Paratha									
Exercise 4: Preparation of Recipes on Pulses – Mixed Pulses Vadai, Dhal Payasam									
Exercise 5: Preparation of Recipes on Vegetables and Fruits - Avial, Vegetable Pugath, Fruit halwa, Fruit Mousse									
Exercise 6: Preparation of Recipes on milk and milk products - Paneer Gravy, Gulab Jamun, Chandrakala									

Exercise 7: Preparation of Recipes on Eggs - Boiled, omelette, French toast, caramel Pudding, Egg Burji

Exercise 8: Experimental Cookery of Foods –

Demonstration on

- Gelatinisation
- Dextrinisation
- Gluten formation
- Changes in texture and colour due to heat, acid and alkali
- Casein formation, curd setting
- Maillard reaction
- Enzymatic Browning
- Emulsions – oil in water, water in oil
- Stages of sugar cookery

MICROBIOLOGY

Exercise 1: Microbiology Laboratory: Basic Rules and Requirements

Exercise 2: Spotters - Petri plate, Inoculation loop, Glass slide, Cavity slide, L- Rod, Cover slip, Autoclave, Hot air oven

Exercise 3: Stained Slides – Bacilli, Cocci, Spirillum, Aspergillus, Rhizopus, Yeast, Penicillium, Chlamydomonas, Spirogyra – conjugation

Exercise 4: Identify the shape and arrangement of bacteria present in the given Culture / Curd / Idly batter / yeast by simple staining method

Exercise 5: Identification of Fungi (Aspergillus / Mucor / Rhizopus) by wet mount using Lactophenol Cotton Blue (LPCB) method

Exercise 6: Test for pasteurization of milk and milk products

Exercise 7: Special Lecture on

- Steam sterilization of laboratory glass wares, media
- Preparation of medium – Liquid, Agar slants
- Inoculation and growth of microorganisms

ASSIGNMENTS/ACTIVITIES TOWARDS INTERNAL ASSESSMENT:

- Review of recipes and project on food ingredients and preparation.

• Discussion on the spoilage occurring at household levels and identifying the kind of spoilage		
Total Hours		90
PEDAGOGY	Lecture and practice. Assignments / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: I		Course Category: Major Discipline MJD 2					Semester: II		
Course Title: HUMAN NUTRITION							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	5	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to - Familiarize the basic concepts and definitions related to Nutrition and Health - Understand the functions, role, digestion and absorption and sources of nutrients							
Course Outcome		After successful completion of this course, students will be able to: - Apply the knowledge of human nutrition in maintenance of good health for the individual and the community - Associate the role of nutrients in health and disease							
CONTENT									
UNIT: I		INTRODUCTION TO NUTRITION					No. of Hours: 5		
- Definitions – Nutrition, Health, Nutrients, Nutritional Status, Optimum Nutrition, Malnutrition – Undernutrition, Overnutrition, Reference Man and Reference Women - Inter-relationship between Nutrition and Health, Visible symptoms of good health									
UNIT: II		ENERGY BALANCE					No. of Hours: 15		
- Definition – Energy, Units of Energy, Physiological value of food, Thermic effect of food, Respiratory co-efficient, TEE, BMR, REE - Determination of energy value of foods – Bomb Calorimeter									

- Determination of Basal Metabolic Rate (BMR) – Atwater and Rosa Respiration Calorimeter, Benedict Roth Apparatus, Factors affecting Basal Metabolic Rate - Determination of energy expenditure at work - Douglas Bag - Determination of Total Energy Requirement – Factorial method - Factors affecting Total Energy Expenditure		
UNIT: III	MACRO NUTRIENTS	No. of Hours: 15
Carbohydrates - Composition, Classification, function, Food Sources, storage in body, Deficiency disorders. Dietary Fiber – Nutritional significance. Proteins - Composition, Classification, Essential and Non-essential amino acids, Functions, Food Sources, Deficiency Disorders Lipids - Composition, Properties, Classification, Essential and Non-essential Fatty acids, Saturated and unsaturated Fatty acids, Function, Food Sources, Deficiency disorders.		
UNIT: IV	MICRO NUTRIENTS – VITAMINS	No. of Hours: 15
Water-soluble vitamin – Sources, functions and deficiency of Ascorbic Acid, Thiamine, Riboflavin, Niacin, Vitamin B6, Vitamin B12 and Folic Acid Fat soluble vitamins - Sources, functions and deficiency of vitamin A, D, E & K		
UNIT: V	MICRO NUTRIENTS – MINERALS, WATER AND ELECTROLYTES	No. of Hours: 10
Minerals - Sources, functions and deficiency of Calcium, Phosphorous, Iron, Fluoride, Zinc, Iodine, Magnesium Water & Electrolyte Balance – Distribution, Functions, Requirements, Sources, Water Balance - Water depletion, Water excess Electrolyte Balance – Distribution, Disorders – Hyponatraemia, Hypernatraemia, Hypokalaemia, Hyperkalaemia, Oedema		
Total Hours		60
PEDAGOGY	Lecture and tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	

TEXT BOOKS

1. Agrawal A, Udipi S, (2022): Textbook of Human Nutrition (2nd Edition), Jaypee Publishers
2. Srilakshmi. B: (2010) Nutrition Science, 5th Edition, New Age International Pvt Ltd Publishers
3. Mudambi, S.R. and Rajagopal, M.V. (2020), Fundamentals of Foods, Nutrition and Diet Therapy, New Age International Pvt. Ltd.
4. Roday. S, Food Science and Nutrition, OUP India, II Edition, 2012
5. Yadav.S, Textbook of Nutrition and Health, Anmol Publishers 2002

REFERENCES

1. Smolin.A, Grosvenor, M.B, Basic Nutrition, Infobase Publishing, 2009
2. Whitney. E, Rolfes R.S, Understanding Nutrition, Cengage Learning, 2010
3. Robinson, C.H, Marilyn Lawler. M Normal and Therapeutic Nutrition Paperback Macmillan USA; XVII Revised edition 1990
4. Insel, Ross. D, Bernstein. M, K McMahon. K, Discovering Nutrition, Jones & Bartlett Publishers, 2015
5. Schlenker. E, Roth S.L, WILLIAM'S Essentials of Nutrition and Diet Therapy, Mosby Publishers, X Edition, 2010

JOURNALS

1. British Journal of Nutrition
2. International Journal of Food and Nutritional Sciences
3. Journal of American Dietetic Association
4. Indian Journal Medical Research
5. Indian Journal of Nutrition and Dietetics
6. American Journal of Clinical Nutrition

WEB RESOURCES

<https://swayam.gov.in/>

<https://mohfw.gov.in/>

<https://www.icmr.gov.in/>

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: I		Course Category: Minor Discipline MID 2					Semester: II		
Course Title: HUMAN PHYSIOLOGY							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	5	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to - Understand the general structure and functions of the different organs and systems of the body - Gain knowledge on the association between human physiology and Nutrition							
Course Outcome		After successful completion of this course, students will be able to: - Develop insight into the physiological processes - Comprehend the functions of different organs in the body							
CONTENT									
UNIT: I		CELL AND DIGESTIVE SYSTEM					No. of Hours: 15		
Cell - Structure - Functions - Tissues – Structure and functions of epithelial, connective, muscular and nervous tissue. Digestive System - Structure of digestive tract - Process of digestion and absorption - Liver and its functions - Pancreas and its functions									

UNIT: II	CIRCULATORY SYSTEM	No. of Hours: 10
• Blood-Composition and functions – RBC, WBC and Platelets. • Blood groups • Coagulation • Structure and functions of heart • ECG • Cardiac cycle • Blood pressure-factors influencing blood pressure		
UNIT: III	RESPIRATORY AND EXCRETORY SYSTEM	No. of Hours: 15
Respiratory System • Structure of the respiratory system • Mechanism of respiration • Exchange of Gases Excretory system • Kidney and Nephron – Structure and functions • Urine Formation • Composition of urine • Micturition (in brief)		
UNIT: IV	ENDOCRINE AND REPRODUCTIVE SYSTEM	No. of Hours: 15
Endocrine System Structure and functions of • Pituitary gland • Thyroid and parathyroid gland • Adrenal glands • Islets of Langerhans Reproductive System • General Anatomy of Female and Male Reproductive organs • Physiology of menstruation and fertilization • Physiology of lactation		

UNIT: V	NERVOUS SYSTEM	No. of Hours: 5
Structure and Functions of • Neuron • Brain • Spinal cord		
Total Hours		60
PEDAGOGY	Lecture and tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS 1. Saradha Subramanyam, K. Madhavankutty, H.D.Singh, “Textbook of Human Physiology” S.Chand and Company Ltd, 2015 1. N. Arumugam, “Cell Biology”, Saras Publication, 2001. 2. Vidya Ratan, ‘Handbook of Human Physiology’,Jaypee Brothers, 2004		
REFERENCES 1. Dr. C.C. Chatterjee, “Human Physiology Vol I” Medical Allied Agency, XI Edition, 2016 2. Dr. C.C. Chatterjee, “Human Physiology Vol II: Medical Allied Agency, XI Edition,2016 3. Ross and Wilson, “Anatomy and Physiology in Health and Disease”. Churchill Livingstone. XI Edition		
JOURNALS 1. The Journal of Physiology 2. Anatomy & Physiology Open Access Journal 3. Journal of Anatomy & Physiology		
WEB RESOURCES https://swayam.in https://www.ignouindia.in https://egyankosh.ac.in/		

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: I		Course Category: Major Discipline SEC 2					Semester: II		
Course Title: HUMAN NUTRITION AND PHYSIOLOGY PRACTICAL							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
3	Lecture	Tutorial	Practical/ practice	4	Theory	Lab Session	CIA	ESE	Total Marks
	-	-	3			90	50	50	100
Course Objective		To enable the students to - Understand the various nutritional components of food through qualitative analysis - Comprehend the physiological processes and functions of various vital organs as applicable to human nutrition							
Course Outcome		After successful completion of this course, students will be able to: - Analyze qualitative tests for nutritional components of food - Assess functioning of vital organs or systems, perform simple clinical tests and interpret the reports							
CONTENT									
HUMAN NUTRITION									
Qualitative Analysis of Carbohydrates, Proteins and Minerals									
Exercise 1: Qualitative test for Carbohydrates - Glucose, Fructose, Lactose, Maltose, Sucrose									
Exercise 2: Qualitative Analysis of Proteins									
Exercise 3: Qualitative analysis of fats									
Exercise 4: Qualitative analysis of Minerals									
Exercise 5: Computation of Energy requirements based on various activity									

Exercise 6: Calculation of energy value based on Adult Consumption Unit

PHYSIOLOGY

Exercise 1: Estimation of Haemoglobin using Haemometer

Exercise 2: Identification of Blood Groups

Exercise 3: Determination of Bleeding and Coagulation time

Exercise 4: Counting of RBC and WBC using Haemocytometer (Demonstration)

Exercise 5: Determination of Arterial Blood pressure using Sphygmomanometer

Exercise 6: Measurement of pulse rate at rest and activity and interpretation

Exercise 7: Demonstration on First Aid and Cardio pulmonary resuscitation (CPR)

ASSIGNMENTS/ACTIVITIES TOWARDS INTERNAL ASSESSMENT:

- Identifying the pulse rate and interpreting for family members
- Group discussions on variations in Haemoglobin levels and its consequences
- Individual or group projects on clinical signs of nutrients deficiencies

Total Hours

90

PEDAGOGY

Tutorial and practice. Assignments / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: II		Course Category: Major Discipline MJD 3					Semester: III		
Course Title: LIFE CYCLE NUTRITION - I							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	5	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Acquire knowledge on the nutritional needs of individuals at different age levels - Understand the basic concepts of diet, gain experience in planning, preparing and serving of meals for various age groups at different income levels based on nutritional status							
Course Outcome		After successful completion of this course, students will be able to: - Comprehend the changes during various stages of growth and development throughout lifecycle - Developing expertise to plan diet for each stage of life according to the guidelines for dietary needs							
CONTENT									
UNIT: I		INTRODUCTION TO MEAL MANAGEMENT					No. of Hours: 10		
- Understanding terminologies – Balanced Diet, Recommended Dietary Allowances. Basic Five Food Group, Food Exchange, Portion Size, Food Guide Pyramid, Food Plate - Meal Planning – principles, factors to be considered in meal planning and steps in menu planning									
UNIT: II		NUTRITION DURING INFANCY					No. of Hours: 15		
- Growth and development - Physical development in the first year of life, Developmental Milestones, Low Birth weight, Pre-Term Baby, Small for Gestational Age (SGA) - Nutritional Requirements - Breast Feeding: composition and advantages of Breast Milk									

• Feeding problems – Over Feeding, Under Feeding, Dehydration • Complementary Feeding • Problems in Weaning		
UNIT: III	NUTRITION DURING EARLY CHILDHOOD (PRESCHOOL)	No. of Hours: 10
• Growth and Development – Physical Development and developmental milestones • Nutritional Requirements • Food Requirements – portion size • Dietary Guidelines • Nutrition related problems – PEM, Vitamin A deficiency		
UNIT: IV	NUTRITION DURING LATE CHILDHOOD (SCHOOL GOING)	No. of Hours: 15
• Growth and Development – Physical Development • Nutritional Requirements • Food Requirements – portion size • Dietary Guidelines • Importance of Snacks • Packed Lunch • Feeding Problems - Constipation, Dental caries • Nutrition related problems – underweight, overweight and obesity		
UNIT: V	NUTRITION DURING ADOLESCENCE	No. of Hours: 10
• Growth and development – Physical Development • Nutritional requirements • Food Requirements – Portion Size • Dietary Guidelines • Nutrition related Problems – Iron Deficiency anaemia, Megaloblastic anaemia and Pernicious anaemia • Eating disorders – Anorexia Nervosa, Bulimia Nervosa, Binge Eating, underweight, overweight		
Total Hours		60
PEDAGOGY	Lecture and tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode	

	should be preferred. Session should be interactive in nature to enable peer group learning
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TEXTBOOKS

- Bamji.M, Krishnaswamy. N, Textbook on Human Nutrition, Oxford and IBH Publishing, IV Edition, 2019
- Khanna. K., Gupta.S., Passi. H.J., Seth.R., Mahna.R., Puri. S Textbook of Nutrition & Dietetics, Elite Publishing House, II Edition, 2020
- F.P. Antia, Clinical Dietetics and Nutrition, Oxford University press, IV edition 2002.
- Srilakshmi. B, Dietetics, New Age International(p) ltd., IX Edition, 2023
- Joshi.A.S Nutrition & Dietetics, Mc Graw Hill, 2021
- Abraham.S Nutrition Through Lifecycle, New Age International, 2016

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1. Gopalan.C. Ramasastri, B.V. and Balasubramaniam, S.C., Nutritive Value of Indian foods, National Institute of Nutrition, Hyderabad, 2021
2. Brown.E.J, Nutrition Through Lifecycle, Wadsworth Publication, VI Edition, 2016
3. Williams S.R., Schlenker.E, Essentials of Nutrition and Diet Therapy, Mosby College Publishing, St. Louis Toronto, Basin, VIII Edition, 2003
4. Whitney. E, Rolfes R.S, Understanding Nutrition, Cengage Learning, 2018Worthington
5. Roberts, Bonnie S & others - "Nutrition in Pregnancy & Lactation", III Edition, Times Mirror Mosby College, St. Louis, 1996.
6. Cappellini. B,Marshall.D,Parsons. E, The Practice of the Meal: Food, Families and the Market Place, Routledge, I Edition, 2016
7. Robinson, C.H, Marilyn Lawler. M, Normal and Therapeutic Nutrition, Macmillan USA; XVII Revised Edition, 1990
8. Guthrie H.A. & Others, "Introductory Nutrition", 1986, 6th ed. Times Mirror/Mosby College Pub. St.Louis.

JOURNALS

1. British Journal of Nutrition
2. International Journal of Food and Nutritional Sciences
3. Journal of American Dietetic Association
4. Indian Journal Medical Research
5. Indian Journal of Nutrition and Dietetics
6. American Journal of Clinical Nutrition

WEB RESOURCES

<https://swayam.gov.in/>
<https://mohfw.gov.in/>
<https://www.icmr.gov.in/>

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: II		Course Category: Major Discipline MJD 4					Semester: III		
Course Title: LIFECYCLE NUTRITION – II							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	5	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Acquire knowledge on the nutritional needs of individuals at different age levels. - Understand the basic concepts and gain experience in planning, preparing and serving of meals for various age groups at different income levels based on nutritional status							
Course Outcome		After successful completion of this course, students will be able to: - Comprehend the changes during various stages of adulthood - Develop proficiency to plan diet for each stage of adulthood according to the dietary guidelines							
CONTENT									
UNIT: I		NUTRITION DURING ADULTHOOD					No. of Hours: 10		
- Classification of Adults according to activity – Sedentary, Moderate and Heavy Work - Reference Man and Reference Woman - Nutritional Requirements - Food Requirements – Portion Size - Dietary guidelines for maintaining optimum health - Nutrition related problems – Underweight, obesity, Vitamin D deficiency									
UNIT: II		NUTRITION DURING PREGNANCY					No. of Hours: 15		
Physiology of Pregnancy - Stages of prenatal life, Basic Screening Tests of pregnancy, Birth process, Types of delivery									

• Nutritional requirements • Food requirements – Portion Size • Dietary Guidelines • Common problems in pregnancy – nausea & vomiting, heart burn, constipation, haemorrhoids, pica • Nutritional Deficiencies and pregnancy outcomes • Complications of pregnancy (in brief)- gestational diabetes, Hyperemesis gravidarum, pregnancy induced Hypertension (PIH)		
UNIT: III	NUTRITION DURING LACTATION	No. of Hours: 15
• Physiology of Lactation – Development of Mammary tissues • Process of lactogenesis • Role of hormones in milk production • Factors affecting volume and composition of breast milk • Nutritional requirements • Food requirements – Portion Size • Galactogogues • Dietary Guidelines • Problems in lactation – lactation failure		
UNIT: IV	NUTRITION DURING OLD AGE	No. of Hours: 10
• Terminologies – Geriatrics, Gerontology, senility • Physical changes in old age • Factors affecting food intake • Nutritional Requirements • Food Requirements – Portion Size • Dietary Guidelines • Nutrition related problems – osteoporosis, obesity, anaemia, constipation • Age related problems – Dementia, Alzheimer's, Parkinson diseases		
UNIT: V	NUTRITION PROGRAMMES FOR WOMEN AND CHILDREN	No. of Hours: 10
• Nutrition intervention programmes: - ICDS, Poshan SHAKti Nirman scheme (PM POSHAN), Poshan Abhiyaan, Anaemia Mukta Bharat, Scheme for Adolescent girls, national iodine deficiency disorders control programme • National and International bodies involved in Food and Nutrition Security – WHO, UNICEF, ICMR, NIN		
Total Hours		60

PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning
TEXTBOOKS 1. Bamji.M, Krishnaswamy. N, Textbook on Human Nutrition, Oxford and IBH Publishing, IV Edition, 2019 2. Khanna. K., Gupta.S., Passi. H.J., Seth.R., Mahna.R., Puri. S Textbook of Nutrition & Dietetics, Elite Publishing House, II Edition, 2020 3. F.P. Antia, Clinical Dietetics and Nutrition, Oxford University press, IV edition 2002. 4. Srilakshmi. B, Dietetics, New Age International(p) ltd., IX Edition, 2023 5. Joshi.A.S Nutrition & Dietetics, Mc Graw Hill, 2021 6. Abraham.S Nutrition Through Lifecycle, New Age International, 2016 REFERENCES 1. Gopalan.C. Ramasastri, B.V. and Balasubramaniam, S.C., Nutritive Value of Indian foods, National Institute of Nutrition, Hyderabad, 2021 2. Brown. E. J, Nutrition Through Lifecycle, Wadsworth Publication, VI Edition, 2016 3. Williams S.R., Schlenker.E, Essentials of Nutrition and Diet Therapy, Mosby College Publishing, St. Louis Toronto, Basin, VIII Edition, 2003 4. Whitney. E, Rolfes R.S, Understanding Nutrition, Cengage Learning, 2018 5. Worthington Roberts, Bonnie S & others - "Nutrition in Pregnancy & Lactation", III Edition, Times Mirror Mosby College, St. Louis, 1996. 6. Cappellini. B,Marshall.D,Parsons. E, The Practice of the Meal: Food, Families and the Market Place, Routledge, I Edition, 2016 7. Robinson, C.H, Marilyn Lawler. M, Normal and Therapeutic Nutrition, Macmillan USA; XVII Revised Edition, 1990 8. Guthrie H.A. & Others, "Introductory Nutrition", 1986, 6th ed. Times Mirror/Mosby College Pub. St.Louis. JOURNALS 1. British Journal of Nutrition 2. International Journal of Food and Nutritional Sciences 3. Journal of American Dietetic Association 4. Indian Journal Medical Research 5. Indian Journal of Nutrition and Dietetics 6. American Journal of Clinical Nutrition WEB RESOURCES https://swayam.gov.in/ https://mohfw.gov.in/ https://www.icmr.gov.in/	

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: II		Course Category: Minor Discipline MID 3					Semester: III		
Course Title: NUTRITIONAL BIOCHEMISTRY							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: • Develop an understanding of the physiological and biochemical processes related to nutrition • Obtain an insight into the metabolism of nutrients							
Course Outcome		After successful completion of this course, students will be able to: • Obtain an insight into the biochemistry of major nutrients and physiologically important compounds such as proteins and hormones • Understand the principles of biochemistry (as applicable to human nutrition)							
CONTENT									
UNIT: I		CARBOHYDRATE METABOLISM					No. of Hours: 20		
• Carbohydrates - Physical & Chemical Properties • Digestion and absorption of Carbohydrates • Cellular Metabolism of Carbohydrates - Aerobic and Anaerobic degradation – Glycolysis, Glycogenesis, Gluconeogenesis, Glycogenolysis, TCA Cycle, Hexose Monophosphate Pathway, Uronic Acid Pathway, Cori Cycle, • Biological Oxidation - Electron Transport Chain; High Energy Phosphate bonds									
UNIT: II		PROTEIN METABOLISM					No. of Hours: 10		

• Proteins- Physical & Chemical properties • Digestion and absorption of Proteins • Transamination, Oxidative Deamination, Decarboxylation, Urea cycle • Plasma Proteins-Nature, Properties and Functions		
UNIT: III	FAT METABOLISM	No. of Hours: 10
• Lipids - Physical & Chemical properties • Digestion and absorption of Lipids • Cellular Metabolism of Lipids- β- oxidation of fatty acids, ketogenesis • Synthesis of triglycerides, Synthesis of phospholipids, Metabolism of cholesterol		
UNIT: IV	VITAMIN & MINERAL METABOLISM	No. of Hours: 10
Vitamins: Biochemical functions, factors affecting metabolism and Metabolism • Fat soluble vitamins – A, D, E & K • Water soluble vitamins – B complex Vitamins & C Minerals: Biochemical functions, factors affecting metabolism and Metabolism • Macro Minerals: Sodium, Potassium, Calcium, Phosphorus. • Micro Minerals: Iron, Zinc, Iodine, Selenium		
UNIT: V	ENZYMES AND NUCLEIC ACIDS	No. of Hours: 10
• Enzymes: Classification, properties, mechanism of enzyme action, factors controlling enzyme activity • Nucleic Acids: DNA & RNA, Types, Structure and Functions. DNA Replication; Protein Synthesis – Replication, Transcription & Translation, types of Mutation, Coding		
Total Hours		60
PEDAGOGY	Lecture and tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS 1. Rao A.V.S.S., “Textbook of Biochemistry, “UBS Publishers, 2008		

2. Satyanarayana.U, and Chakrapani.U, “Biochemistry”, Fifth Edition,Elsevier-Saunders, Mosby, Churchill, 2017.
3. Vasudevan.DM.,Sreekumari, and Kannan Vaidyanathan.S., “ Textbook of Biochemistry for Medical Students”, Eighth Edition, Jaypee Brothers Medical Publishers, 2013

REFERENCES

1. Murray. R.V., Granner.P. A. Mayes. V, Rodwell. W, 21st Edition, “Harper’s Biochemistry”,McGraw – Hill Education, XXX Edition, 2015.
2. Lehninger. A.L., “Human Biochemistry”, W. H Freeman & Co., VI Edition, 2012.
3. Conn, E.E., Stumpf, P.K. Bruening, G. and Doi, R.H., 5th Edition, “Outlines of Biochemistry”, John Wiley and Sons, 2001

JOURNALS

1. Journal of Nutritional Biochemistry
2. Journal of Chemistry and Nutritional biochemistry
3. Biochemistry Research Journal

WEB RESOURCES

www.sciencedirect.com

www.ncbi.nlm.nih.gov

<https://dbtindia.gov.in>

www.indiascienceandtechnology.gov.in

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: II		Course Category: Skill Enhancement SEC 3					Semester: III		
Course Title: LIFECYCLE NUTRITIONAND BIOCHEMISTRY PRACTICAL							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
3	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	--	-	3		-	90	50	50	100
Course Objective		To enable the students to: • Develop skills to plan balanced diets for various stages of Life cycle/Activity/Income groups • Understand the application of Excel and Diet Software in nutrient calculation							
Course Outcome		After successful completion of this course, students will be able to: • Application of the acquired knowledge in planning & preparing diets for various stages of life cycle • Acquiring proficiency in handling diet software in nutrient calculation							
CONTENT									
LIFE CYCLE NUTRITION									
Exercise 1: General Laboratory Rules									
Exercise 2: Planning and preparation of one serving meal for adult man and woman based on activities / income levels									
Exercise 3: Planning and preparation of weaning foods for infants									
Exercise 4: Planning and preparation of one serving meal for toddler and pre-school child.									
Exercise 5: Planning and preparation of one serving meal/packed lunch for school going children									
Exercise 6: Planning and preparation of one serving meal/packed lunch for Adolescents									
Exercise 7: Planning and preparation of one serving meal for a pregnant woman									
Exercise 8: Planning and preparation of one serving meal for a lactating woman									

Exercise 9: Planning and preparation of one serving meal for senior citizen.

BIOCHEMISTRY PRACTICAL

Exercise 1: Quantitative Analysis of Reducing Sugar-Benedict's method

Exercise 2: Estimation of Proteins by Lowry's method

Exercise 3: Estimation of Ascorbic Acid by Dye Method

Exercise 4: Estimation of Calcium

Exercise 5: Estimation of Iron

Exercise 6: Demonstration on Estimation of Phosphorus

Exercise 7: Demonstration on Components and Working of Colorimetry

ASSIGNMENTS/ACTIVITIES TOWARDS INTERNAL ASSESSMENT

- Presentations on critiquing select trends in food and diet
- Group discussions on Dietary Myths and Facts

Total Hours

90

PEDAGOGY

Tutorial and practice. Assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: II		Course Category: Major Discipline MJD 5					Semester: IV		
Course Title: NUTRITIONAL ASSESSMENT, SURVEILLANCE AND EDUCATION							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	5	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to - Understand the concept of nutritional status and its relationship to health. - Identify aims, objectives, methods used for assessment of nutritional status. - Comprehend the role of different agencies in nutritional surveillance							
Course Outcome		After successful completion of this course, students will be able to: - Assess the nutritional status of different age groups using different methods - Recognise the importance of nutritional surveillance in combating malnutrition - Utilize the different teaching methods and aids to develop nutrition education programmes							
CONTENT									
UNIT: I		DIMENSIONS OF HEALTH AND DISEASE					No. of Hours: 10		
Health - Definition of Health, Dimensions of Health - Quality of Life – Physical Quality of Life Index, Human Development Index, Human Poverty Index - Health Indicators - Mortality Indicators – Crude Death rate, Life Expectancy, Infant Mortality Rate, Child Mortality Rate, Maternal Mortality Rate. - Morbidity Indicators – Incidence, Prevalence - Disability Indicators – Sullivan Index, Disability Adjusted Life Year (DALY), Health Adjusted Life Expectancy (HALE) - MCH Indicators – Apgar score, Bishop’s Score									
Disease Concept of Disease, Iceberg Phenomenon									

UNIT: II	METHODS OF NUTRITIONAL ASSESSMENT	No. of Hours: 15
DIRECT • Anthropometry • Biochemical Assessment • Biophysical or Radiological Examination • Clinical Examination • Functional Assessment • Rapid Assessment Procedure (RAP) INDIRECT • Dietary Assessment - Need and Importance • Methods of Dietary Survey		
UNIT: III	NUTRITIONAL PROBLEMS OF THE COMMUNITY	No. of Hours: 15
Clinical Features, Causative Factors, Sign and Symptoms, Treatment and Prevention of • PEM & Vitamin A Deficiency • Anaemia & IDD • Scurvy & Calcium Deficiency Disorders • B Complex Deficiency Disorders		
UNIT: IV	NUTRITIONAL SURVEILLANCE	No. of Hours: 10
• Nutrition Surveillance Systems (NSS) - Objectives, Indicators, Characteristics, types, Data Sources • Nutrition Surveillance Systems (NSS) in India • Nutrition & Health Care Delivery Services in India – Ministry of Health & Family Welfare, State Ministry of Health, Primary Health Centres – organizational structure and functions • Monitoring & Evaluation in relation to existing nutritional problems • Role of agencies – ○ National Agencies -ICMR, NIN, CFTRI, NNMB ○ International Agencies – WHO, UNICEF, FAO, WFP		
UNIT: V	METHODS OF NUTRITION EDUCATION	No. of Hours: 10
• Meaning, principles • Methods - Individual, group and mass • Selection, use, advantages and limitations • Role and importance of visual and Audio-visual aids • Mass and Multi-media in Nutritional Education Steps in conducting Nutrition Education Programme		

Total Hours	
60	
PEDAGOGY	Lecture, tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning
TEXT BOOKS 1. Park, Textbook of Preventive and Social Medicine, Banarsidas Bhanot Publishers, Jabalpur 2023 2. Srilakshmi, B. Nutrition Science, New Age International Publishers, New Delhi, VIII Edition, 2020 3. Bisht. P, Community Nutrition in India, Star Publication, 2017 4. Gupte.S, Pediatric Nutrition, PeePee Publishers, II Edition, 2012 REFERENCES 1. Munoz. N., Bernstein.M., Nutritional Assessment: Clinical & Research Applications, Joannes & Bartlett, I Edition, 2018 2. Gopalan, C, Nutrition and Health care- Problems and Policies, Nutrition Foundation of India, Special Publication Series, 1983. 3. Jelliffe. D.B, Assessment of the Nutritional Status of the Community, WHO Publication, 1966 4. Mason, J.B., Habicht, J.P., Tabata Bai.H., Valverdre. V, Nutritional Surveillance, WHO, 1984 5. Ghazi Daradkeh, M.Mohamed Essa, Nejib Guizani, Handbook of Nutritional Assessment through life Cycle. Nova Science Publishers, Incorporated 2016 6. Beghin, J, Cap, M., Dujardan, B.A Guide to Nutritional assessment, WHO, 1988 7. David C., Niemann, Robert D Lee, Nutritional Assessment McGraw-Hill, Education, 2011. JOURNALS 1. Journal of Community Health 2. Journal of Public Health 3. International Journal of Health Policy & Management WEB RESOURCES https://www.who.int https://mohfw.gov.in https://icmr.nic.in	

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Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: II		Course Category: Major Discipline MJD 6					Semester: IV		
Course Title: FOOD PRESERVATION TECHNIQUES							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	5	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Understand the principles of Food Preservation - Gain knowledge about various packaging materials							
Course Outcome		After successful completion of this course, students will be able to: - Analyze proper utilization of foods and prevent wastage - Selecting appropriate packaging material according to need							
CONTENT									
UNIT: I		PRINCIPLES OF FOOD PRESERVATION					No. of Hours: 10		
- Understanding terminologies –Food Spoilage, Spoiled foods, Contamination, Preservation - Objectives and Principles - Types and Importance of Food preservation									
UNIT: II		PHYSICAL METHODS OF FOOD PRESERVATION					No. of Hours: 15		
- Low Temperature - High Temperature - Drying - Irradiation									
UNIT: III		CHEMICAL METHODS OF PRESERVATION					No. of Hours: 10		

- Household Preservatives – Salt , Sugar - Commercial Preservatives – Enzymatic and Non-enzymatic		
UNIT: IV	PRESERVED PRODUCTS	No. of Hours: 15
Composition, selection, preparation, storage, uses and nutritional aspects – - Cereal based - rice, sago, millets vadam - Pulses – dhal powders - Fruits – jam, jelly, marmalades, juices, Squashes, Candied Preserves - Vegetables – vathals, pickles - Fleshy Foods- dry fish, cured meat, pickles		
UNIT: V	FOOD PACKAGING	No. of Hours: 10
- Functions of Packaging, packing materials and forms - Types of Containers used in storage of processed foods - Selection of Containers with specific reference to food - Effects of packaging on nutritive value of foods - Special Food Packaging - Modified Atmosphere Packing, military, space foods and intelligent packaging - Food and Nutrition labelling & recent developments in Food Labelling		
Total Hours		60
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS - Subhulakshmi G., Udipi A. Shobha and Ghugre S. Padmini (2021), Food Processing and Preservation (2nd Edition) New Age International Publishers, New Delhi. - Sivasankar.B, Food Processing & Preservation, PHI Learning Pvt.Ltd, 2009 - Sankhla A., Mogra R. And Avinash P (2014) A Practical Guide To Food Preservation (1st Edition) Agrotech Publishing Academy, Udaipur. - Sunetra Roday, Food Science And Nutrition, 3rd Edition, 2018 - Sumati R Mudambi, Rajagopal M. V Fundamentals Of Foods, Nutrition And Diet Therapy, 6th Edition, New Age International Publishers, 2010		

REFERENCES

1. Srivastava. P, Methods of Food Preservation, Discovery Publishing 2013
2. Srivastava. R.P., Kumar. S, Fruit and Vegetable Preservation, CBS Publishers, 2019
3. New Methods of Food Preservation – By G.W. Gould, Springer Publishing, 1995
4. Food Preservation Techniques – Peter Zeuthen and Leif Bogh – Sorensen, Woodhead Publishing, 2003.
5. Hand Book of Food Preservation – Shafiur Rahman, II Edition, CRC Press 2007.
6. Novel Food Preservation and Microbial Assessment techniques – Ioannis S. Boziaris, CRC Press, 2014.
7. Microbial food safety and Preservation Techniques – V. Ravishankar Rai, Jamuna A Bai, CRC Press, 2016
8. Preserving food without freezing or Canning – Chelsea Green Publishing, 2007.
9. Physical Principles of Food Preservation Revised and Experienced – Marcus Karrel, Daryl B. Bund, CRC Press, 2003.

JOURNALS

1. Journal of Food Processing and Preservation
2. Journal of Food Technology and Preservation
3. Journal of Food Science and Technology

WEB RESOURCES

www.egyankosh.in

<https://www.swayam.in>

www.ugcmoocs.inflibnet.ac.in

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: II		Course Category: Minor Discipline MJD 7					Semester: IV		
Course Title: FOOD PRESERVATION PRACTICAL *MANDATORY CERTIFICATION							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
			4		-	90	50	50	100
Course Objective		To enable the students to: • Acquire Knowledge of Food Preservation techniques • Identify foods suitable for food preservation							
Course Outcome		After successful completion of this course, students will be able to: • Analyze the best techniques for preservation of different foods • Develop skills to preserve foods using traditional preservation methods							
CONTENT									
UNIT I		PRESERVATION PROCESSING TECHNIQUES					No. of Hours: 10		
• Boiling • Steaming • Blanching • Pressure Cooking • Shallow And Deep Fat Frying									
UNIT: II		PRESERVATION BY PRESERVATIVES					No. of Hours: 15		
VEGETABLE (ANY TWO)									

• Puree, Paste, Ketchup, Sauce • Pickles, Chutneys FRUITS (ANY TWO) • Juices, Squashes, Cordials		
UNIT: III	PRESERVATION BY HIGH CONCENTRATION OF SUGAR	No. of Hours: 10
FRUITS (Any TWO) • Jams • Jellies • Marmalade • Murabba • Candied Preserves		
UNIT: IV	PRESERVATION BY HIGH CONCENTRATION OF SALT, SPICES AND OIL	No. of Hours: 10
• Sauerkraut • Kimchi • Pickle • Chutney/ Thokku • Rice mixes		
UNIT: V	TRADITIONAL METHODS OF PRESERVATION	No. of Hours: 15
DEMONSTRATION Sun Drying • Cereal - rice, sago, millets vadam • Pulses - Papads • Vegetables – vathals Sun Preserves • Fruit Slabs / Bars Instant Mixes • Idly/ Dosa • Upma • Dhal Powders • Health Mix (Sathumavu)		
ASSIGNMENTS/ACTIVITIES TOWARDS INTERNAL ASSESSMENT • Individual assignments on collating traditional recipes of preserved products • Group discussion on home- based fermented products		
Total Hours		90

PEDAGOGY		Tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning							
Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: III		Course Category: Minor Discipline MID 4					Semester: VI		
Course Title: FOOD SAFETY SANITATION AND HYGIENE							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: • Impart comprehensive knowledge on the issues of food safety and quality • Build proficiency in understanding food safety and quality assurance in food processing chains							
Course Outcome		After successful completion of this course, students will be able to: • Understand international and national food laws, regulations and standards governing the safety of food • Able to locate and interpret government regulations regarding the manufacture and sale of food products							
CONTENT									
UNIT: I		INTRODUCTION TO FOOD SAFETY					No. of Hours: 10		
• Definition, concept and meaning of food safety • Types of hazards - physical, chemical and biological • Factors affecting food safety • Microbial consideration in food safety									
UNIT: II		SANITATION					No. of Hours: 15		
• Principle and purposes of Sanitation • Cleaning Methods and Techniques: CIP, COP, Cleaning equipment and Sanitizers. Sterilization and Disinfection, Use of detergents, heat, chemicals, cleaning compounds									

Control of Infestation- Rodent, Insect & Pest Control, Uses of Pesticides		
UNIT: III	FOOD PROTECTION	No. of Hours: 15
- Food protection by: Thermal transfer methods, Chemical methods, Biocontrol methods and biotechnology, Irradiation methods - Foodborne Illness - Risk Factors - Food workers - Education and training		
UNIT: IV	FOOD HYGIENE	No. of Hours: 10
- Food hygiene laws and the importance of food safety. - Temperature control, food deliveries, refrigeration, low and high-risk foods, use by dates and best before dates, and stock rotation (FIFO). - Cross-contamination - hand hygiene, protective clothing, reporting illness and first aid		
UNIT: V	HYGIENE AND SANITATION IN THE FOOD SECTOR	No. of Hours: 10
- General Principles of Food Hygiene - GHP for commodities, equipment, work area, and personnel - Safety aspects of processing water, its uses & standards, Waste Water & Waste disposal		
Total Hours		60
PEDAGOGY	Lecture, tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS - Roday S. Food hygiene and sanitation with case studies, 2nd Ed., Tata McGraw Hill Education Pvt Ltd., 2017 - Mathur. P Textbook on Food Safety and Quality Control, Orient Black Swan Pvt. Ltd. 2018 - Food Safety and Standards Authority of India, Ministry of Health and Family Welfare, Government of India		
REFERENCES - Marriott, Norman G., Schilling M. W., Gravani. R.B., Principles of Food Sanitation. New York: AVI - Knechtges P.L. Food Safety-Theory and Practice: Jones & Bartlett Learning, 2012		

3. Bryan, F.L. Hazardous analysis critical control point evaluation. A guide to identifying Hazards and assessing risks associated with food preparation and storage. WHO, Geneva, 1992

JOURNALS

1. Journal of Food Safety and Hygiene
2. Journal of Food Safety and Health
3. Journal of Food Protection

WEB RESOURCES

www.eufic.org/index/en/

www.codexalimentarius.net

www.fssai.gov.in

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: II		Course Category: SUMMER INTERNSHIP					Semester: IV		
Course Title: COMMUNITY ENGAGEMENT SERVICE							Course Code: CES		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
2	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	-	2	4		-	30	50	50	100
Course Objective		To enable the students to: - To develop an appreciation of rural culture, lifestyle and wisdom amongst students - To understand causes for distress and poverty faced by vulnerable households and explore solutions for the same							
Course Outcome		After successful completion of this course, students will be able to: - Develop a sense of empathy and bonds of mutuality with local community - Identify opportunities for contributing to community’s socio- economic improvements							
CONTENT									
- Credit 2 credit, 30 hours, at least 50% in field, compulsory for all students - Contents Divided into four Modules, field immersion is part of each Unit Course Structure: 2 Credits Course (1 Credit for Classroom and Tutorials and 1 Credit for Field Engagement)									
RECOMMENDED FIELD-BASED PRACTICAL ACTIVITIES									
- Interaction with SHG women members, and study of their functions and challenges; planning for their skill building and livelihood activities - Visit MGNREGS project sites, interact with beneficiaries and interview functionaries at the work site - Field visit to Swachh Bharat project sites, conduct analysis and initiate problem-solving measures									

- Conduct Mission Antyodaya surveys to support under Gram Panchayat Development Plan (GPDP) grass-root officials and local institutions regarding village development plan preparation and resource mobilization
- Visit Rural Schools / mid-day meal centres, study academic and infrastructural resources and gaps
- Participate in Gram Sabha meetings, and study community participation
- Associate with Social audit exercises at the Gram Panchayat level, and interact with programme beneficiaries
- Visit to local Nagarpalika office and review schemes for urban informal workers and migrants
- Attend Parent Teacher Association meetings, and interview school drop outs
- Visit local Anganwadi Centre and observe the services being provided
- Visit local NGOs, civil society organisations and interact with their staff and beneficiaries,
- Organize awareness programmes, health camps, Disability camps and cleanliness camps
- Conduct soil health test, drinking water analysis, energy use and fuel efficiency surveys
- Raise understanding of people's impacts of climate change, building up community's disaster preparedness
- Organise orientation programmes for farmers regarding organic cultivation, rational use of irrigation and fertilizers and promotion of traditional species of crops and plants
- Formation of committees for common property resource management, village pond maintenance and fishing

S.NO	Module Title	Module Content	Assignment	Teaching/ Learning Methodology	No. of Classes
1.	Appreciation of Rural Society	Rural lifestyle, rural society, caste and gender relations, rural values with respect to community, nature and resources, elaboration of "soul of India lies in villages", rural infrastructure	Prepare a map (physical, visual or digital) of the village you visited and write an essay about inter-family relations in that village.	Classroom Discussions Field visit - Assignment Map	2 3 2
2.	Understanding rural and local economy & livelihood	Agriculture, farming, landownership, water management, animal husbandry, non-farm livelihoods and	Describe your analysis of rural household economy, its challenges and	Field visit	3

		artisans, rural entrepreneurs, rural markets, migrant labour	possible pathways to address them	Group discussions in class	4
			Circular economy and migration patterns focus	Assignment	1
3.	Rural and local Institutions	Traditional rural & community organisations, Self-help Groups, Panchayati raj institutions (Gram Sabha, Gram Panchayat, Standing Committees), Nagarpalikas & municipalities, local civil society, local administration	How effectively are Panchayati Raj & Urban Local Bodies (ULBs) institutions functioning in the village? What would you suggest to improve their effectiveness? Present a case study (written or audio-visual)	Classroom	2
				Field visit	3
				Group presentation of assignment	2
4.	Rural & National Development Programmes	History of various /development in India, current national programmes: Sarva Shiksha Abhiyan, Beti Bachao, Beti Padhao, Ayushman Bharat, Swatchh Bharat, PM Awaas Yojana, Skill India, Gram Panchayat Decentralised Planning, NRLM, MNREGA, SHRAM, Jal Jeevan Mission, SFURTI, Atma Nirbhar Bharat, etc.	Describe the benefits received and challenges faced in the delivery of one of these programmes in the local community. Give suggestions about improving implementation of the programme for the poor. Special focus to urban informal sector and migrant households	Classroom	2
				Each student selects one program for field visit	4
				Written assignment	2
Total Hours					30 Hours
PEDAGOGY		Lecture, tutorial and field visit. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning			

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: III		Course Category: Major Discipline MJD 8					Semester: V		
Course Title: CLINICAL NUTRITION IN SPECIFIC DISEASES							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Identify causative factors and metabolic changes in various disease/disorders - Understand the rationale of prevention of various diseases/disorders							
Course Outcome		After successful completion of this course, students will be able to: - Comprehend the basic concepts in nutrition and health - Discern the treatment modalities in management/ prevention of various diseases/disorders							
CONTENT									
UNIT: I		COMPONENTS OF NUTRITION CARE PROCESS					No. of Hours: 10		
- Definition and Steps in Nutrition Care Process - Nutritional Screening and Assessment - Nutritional Screening Tools – SGA, PGSGA - Pharmacokinetics, Pharmacodynamics - Effect of Drugs on Food Intake, Absorption and metabolism - Effect of Food and Nutrition on Drug Therapy									
UNIT: II		NUTRITIONAL DEFICIENCY DISORDERS					No. of Hours: 15		
Aetiology, Clinical Symptoms, Diagnosis and Treatment in - Protein Calorie Malnutrition - Vitamin A Deficiency - Iron Deficiency - Iodine Deficiency Disorders - Osteoporosis									

UNIT: III	INBORN ERRORS OF METABOLISM	No. of Hours: 10
Aetiology, Signs and Symptoms, Diagnosis and Treatment in - Carbohydrate Metabolism – Galactosemia, Fructosuria, Lactose Intolerance, Glycogen Storage Disease (GSD) - Protein Metabolism – Phenylketonuria, Maple Syrup Disease, Alkaptonuria, Albinism - Lipid Metabolism- Tay Sach’s Disease, Niemann Pick’s Disease, Gaucher’s disease, familial hyperlipidemia		
UNIT: IV	GASTRO- INTESTINAL DISEASES	No. of Hours: 15
Aetiology, Clinical Symptoms, Diagnosis and Treatment in - Diarrhoea - Steatorrhoea - Constipation - Gastritis - Peptic Ulcer - Inflammatory Bowel Diseases - Ulcerative Colitis, Crohn’s disease - Dumping Syndrome, Irritable Bowel Syndrome - Gastro Esophageal Reflux Disease (GERD)		
UNIT: V	SPECIAL CONDITIONS	No. of Hours: 10
Aetiology, Clinical Symptoms, Diagnosis and Treatment in - Febrile Conditions - Food Allergy - Cancer - AIDS - Burns		
Total Hours		60
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	

TEXT BOOKS

1. Joshi. A.S., Nutrition and Dietetics, McGraw Hill, 2021
2. Bamji. M., Krishnaswamy. N., Textbook on Human Nutrition, Oxford and IBH publishing, IV Edition, 2019
3. Antia, F. P., Clinical Dietetics, IV Edition, Oxford University press, 2002

REFERENCES

1. Raymond, J.L., Marrow. K, Krause and Mahan's Food and Nutrition Care Process, Elsevier, XV Edition, 2020
2. Whitney, E., Rolfes, R.S Understanding Nutrition, Cengage Learning, 2018
3. Mahan, L, K., Escott-Stump, S., Krause's Food, Nutrition and Diet Therapy, WB Saunders, 14 Edition, 2017
4. Shills, E.M, Olson, A.J. and Shike, M.C. Modern Nutrition in Health and Diseases, Shea and Febiger, Philadelphia, vol. II, 1994
5. Sue Rodwell Williams, Nutrition and Diet Therapy, Times Mirror Mosby College Publishing, St. Louis Toronto, Basin, 1989

JOURNALS

1. British Journal of Nutrition
2. International Journal of Food and Nutritional Sciences
3. Journal of American Dietetic Association
4. Indian Journal Medical Research
5. Indian Journal of Nutrition and Dietetics
6. American Journal of Clinical Nutrition

WEB RESOURCES

<https://swayam.gov.in/>

<https://mohfw.gov.in/>

<https://www.icmr.gov.in/>

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: III		Course Category: Major Discipline MJD 9					Semester: V		
Course Title: DIET FOR SPECIFIC DISEASES							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Understand the nutrition support system in Medical Nutrition Therapy - Identify therapeutic modifications of diet for treating various disease conditions							
Course Outcome		After successful completion of this course, students will be able to: - Discern the principles of diet therapy for various ailments and diseases - Calculate the modifications of normal diet for therapeutic purposes							
CONTENT									
UNIT: I		INTRODUCTION TO DIETETICS					No. of Hours: 10		
- Definition, objectives, Growth and scope of dietetics - Objectives of diet therapy - Hospital Dietary services- role and functions - Nutrition Support – Need, Interdisciplinary Nutrition Support Team, Functions and Responsibilities of Team Members - Dietitian – Qualification, Specializations of Dietitian, , Responsibilities, Code of Ethics - Qualities of dietary counsellor - Dietitian’s tools and records - Dietary counselling – Meaning, needs, principles, types, process - Indian Dietetic Association, Requirements for Registered Dietitian									
UNIT: II		THERAPEUTIC ADAPTATIONS OF NORMAL DIET					No. of Hours: 10		
- Principles and Classification of Therapeutic Diets- Routine Hospital Diet – - Fluid, Soft and Regular diet, Pre-operative and Post-operative diets - Enteral Nutrition - Access- Nasogastric, Nasoduodenal or Nasojejunal - PEG/Jejunostomy, Formula and Administration, Complications - Parenteral Feeding – Access, Formula and Administration, Complications									

UNIT: III	DIETARY MANAGEMENT IN DEFICIENCY DISEASES	No. of Hours: 10
• Protein Calorie Malnutrition • Vitamin A Deficiency • Iron Deficiency Anemia • Iodine Deficiency Disorders • Osteoporosis		
UNIT: IV	DIETARY MANAGEMENT IN GASTRO-INTESTINAL DISEASES	No. of Hours: 15
• Diarrhoea • Constipation • Gastritis • Peptic Ulcer • Dumping Syndrome • Inflammatory Bowel Diseases- Ulcerative Colitis, Crohn's Disease • Irritable Bowel Syndrome		
UNIT: V	DIETARY MANAGEMENT IN SPECIAL CONDITIONS	No. of Hours: 15
• Food Allergy • Febrile Conditions –Typhoid and Tuberculosis • Cancer • Acquired Immuno Deficiency Syndrome • Burns • High altitude nutrition – Acclimatization, hydration, nutritional problems and altitude sickness, dietary management of mountaineers • Space travel and nutrition - Space physiology, space food system, dietary intake for space flight • Sea voyage and Nutrition – Sea sickness. Deep sea diving. Hyperbaric conditions. Effect of high partial pressures of gases in the body. Hyperbaric oxygen therapy, health problems and dietary management • Emergency feeding – emergency situations arising from famine, earthquake, flood and Tsunami. • Institutional problems in emergencies • Nutritional relief and rehabilitation – Organization involved, Food Distribution Strategies.		

Total Hours		60
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS 1. Gopalan.C. Ramasastri, B.V and Balasubramaniam, S.C., Nutritive value of Indian foods, National Institute of nutrition, Hyderabad, 2020 2. Srilakshmi. B, Dietetics, New Age international(p) ltd., 2020 3. Joshi. A.S., Nutrition and Dietetics, McGraw Hill, 2021 4. Bamji. M., Krishnaswamy. N., Textbook on Human Nutrition, Oxford and IBH publishing, IV Edition, 2019 5. Anita, F. P., Clinical Dietetics, IV Edition, Oxford University press, 2002. 6. Sue Rodwell Williams, Nutrition and Diet Therapy, Times Mirror Mosby College Publishing, St. Louis Toronto, Basin, 1989 REFERENCES 1. Raymond, J.L., Marrow. K, Krause and Mahan's Food and Nutrition Care Process, Elsevier, XV Edition, 2020 2. Whitney, E., Rolfes, R.S Understanding Nutrition, Cengage Learning, 2018 3. Mahan, L, K., Escott-Stump, S., Krause's Food, Nutrition and Diet Therapy, WB Saunders, 14 Edition, 2017 4. Shills, E.M, Olson, A.J. and Shike, M.C. Modern Nutrition in Health and Diseases, Shea and Febiger, Philadelphia, vol. II, 1994 JOURNALS 1. British Journal of Nutrition 2. International Journal of Food and Nutritional Sciences 3. Journal of American Dietetic Association 4. Indian Journal Medical Research 5. Indian Journal of Nutrition and Dietetics 6. American Journal of Clinical Nutrition WEB RESOURCES https://swayam.gov.in/ https://www.nin.res.in https://cftri.res.in		

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: III		Course Category: Major Discipline MJD 10					Semester: V		
Course Title: CLINICAL NUTRITION & DIETETICS PRACTICAL – I							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	-	-	4			60	50	50	100
Course Objective		To enable the students to - Examine nutritional concerns and principles of planning for different age groups - Obtain an insight into the chemistry of major nutrients and physiologically important compounds							
Course Outcome		After successful completion of this course, students will be able to: - Assess the modifications of normal diet and plan diets for therapeutic purposes - Apply the knowledge acquired to human nutrition and dietetics							
CONTENT									
CLINICAL NUTRITION									
Exercise 1: General Laboratory Instructions									
Exercise 2: Urine – Composition, Method of Urine Specimen Collection and Preservation									
Exercise 3: Physical Parameter of Urine Analysis									
Exercise 4: Qualitative Analysis of Normal Urine – Inorganic Constituents Test for Chloride, Sulphate, Calcium, Phosphorous and Ammonia									
Exercise 5: Qualitative Analysis of Normal constituents of Urine – Organic Constituents Test for Urea, Uric Acid and Creatinine									
Exercise 6: Qualitative Analysis of Abnormal Constituents of Urine Test for Reducing Sugar, Protein, Haemoglobin, Ketone Bodies and Bile Salts									

DIETETICS

Exercise 1: Principles of Planning Diet, Food Exchange List

Exercise 2: Planning and Preparation of Liquid, Soft Diet and Blenderised Feed for Tube Feeding

Exercise 3: Planning and Preparation of 5 Protein rich recipes for PEM

Exercise 4: Planning and Preparation of 5 Vitamin A rich recipes for Vitamin A Deficiency

Exercise 5: Planning and Preparation of 5 Iron rich recipes for Iron Deficiency Anaemia

Exercise 6: Planning and Preparation of diet for Peptic Ulcer

Exercise 7: Planning and Preparation of diet for Burns

Exercise 8: Planning and Preparation of diet for AIDS

Exercise 9: Planning and Preparation of diet for Cancer

ASSIGNMENTS/ACTIVITIES TOWARDS INTERNAL ASSESSMENT

- Visiting hospital and evaluating Hospital Diets
- Group discussions on diets for various disease conditions at household levels

Total Hours**60****PEDAGOGY**

Tutorial and practice. Assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: III		Course Category: Major Discipline MJD11					Semester: V		
Course Title: WINTER INTERNSHIP – INDUSTRIAL TRAINING							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
			4			60	25	75	100
Course Objective		To enable the students to: • Develop skills in planning and preparing therapeutic diets. • Learn techniques in diet counselling and feeding of patients. • Plan and prepare appropriate diets for therapeutic conditions							
Course Outcome		After successful completion of this course, students will be able to: • Learn to prepare hospital diets • Plan diets based on dietary principles • Set up diet trays and calculate nutrients • Plan and prepare appropriate diets for therapeutic conditions • Apply knowledge in counselling for disease conditions.							
CONTENT									
INTERNSHIP A phase of training where in a graduate is expected to conduct actual practice in a hospital industry for a period of 30 Days so as to acquire job-oriented skills									
ASSESSMENT Interns shall maintain a record book which shall be verified and certified by the training authority under whom he or she works during his/her internship period. An objective evaluation of his/her knowledge, skills and attitude during training will be recorded by the center in-charge and monitored by faculty in-charge and marks shall be allotted accordingly • Hospital authority - 75 • Internal Assessment & Viva Voce – 25									

**DIETARY INTERNSHIP - MULTISPECIALTY REPUTED HOSPITAL
FOR ONE MONTH**

- Observe different sections in the dietary department
- Observe and prepare organization set up
- Prepare a layout of the dietary department
- Take up hospital rounds with the senior dietitian to assist patient dietary requirement
- Read and comprehend case sheets of patients in critical care, paediatric care, diabetes care, dialysis ward, CVD ward, maternity ward etc.
- Screening of patients for nutritional status & recording diet history of patients
- Calculate nutritive value of planned diet
- Develop normal dietary approaches considering the nutraceutical properties of food groups
- Setting up diet tray in the dietary kitchen department
- Follow up of patient's case sheet and diet history
- Experience and practice outpatient diet counselling and group counselling
- Preparation of diet counselling materials like charts PowerPoint models and videos
- Maintenance of dietary internship logbook & Internship report writing
- Receive students feedback of the internship

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: III		Course Category: Minor Discipline MID 5					Semester: V		
Course Title: FITNESS AND SPORTS NUTRITION							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Identify assessment techniques for sports persons - Understand the special nutritional requirements for physical activities related to sports and exercise							
Course Outcome		After successful completion of this course, students will be able to: - Prescribe nutritional therapy to sportspersons - Provide nutritional support according to training and activity							
CONTENT									
UNIT: I		BODY COMPOSITION ASSESSMENT & TESTING					No. of Hours: 10		
Kinanthropometry - Somatotyping - Body Composition Assessment - Height, Weight, BMI, Densitometry, Surface Anthropometry, Absorptiometry, Hydration Assessment Techniques - Biochemical Assessment - Clinical Assessment - Dietary Assessment Physiological testing - Components of Physiologic Assessment - Assessment of Aerobic Capacity, Maximal Oxygen Uptake, Anaerobic Power,									

Muscular Strength, Flexibility, Muscle Endurance		
UNIT: II	PHYSICAL FITNESS & EXERCISE PHYSIOLOGY	No. of Hours: 15
Physical Fitness - Types of Fitness - Components of Physical Fitness – Methods and Benefits Exercise - Types and Factors affecting exercise - Exercises to strengthen different parts of the body Exercise Physiology - Biomechanics - Muscular Adaptations to Exercise– Endurance and Resistance Training - Cardio-Pulmonary adaptations to Exercise - Effects of Training on Cardio-Pulmonary System		
UNIT: III	NUTRITIENS FOR SPORTSPERSONS	No. of Hours: 15
- Importance of Nutrition in Sports Energy - Energy Metabolism and Factors affecting Energy Requirement in Athletes Carbohydrates - Role of Carbohydrates Before, During and After Exercise, Carbohydrate Loading Proteins - Requirements for Exercise, Factors affecting Requirement Lipids - Requirements Vitamins and Minerals - Role of Vitamins in Athletic Performance – Thiamine, Riboflavin, Niacin, Vitamin A, D & E Role of Minerals in Athletic Performance - Ca, Fe, Zn, Mg Role of Water and Electrolytes – Requirements, Fluid and Electrolyte Balance in Thermoregulation during Exercise, Effect of Dehydration in Exercise Performance		
UNIT: IV	NUTRITIONAL MANAGEMENT FOR SPORTSPERSONS	No. of Hours: 10
- Pre-Event Meal - Diet for Different Sports - Event Recovery Food		

- Guidelines For the Travelling Athlete - Nutrition for Special Population: Child Athlete, Ageing Athlete, Athletic Diabetes, Differently Abled, Vegetarians - Dealing with Cramps, Stitch, GI Distress - Eating Disorders – Types, Prevalence, Risk Factors, Effect on Sports Performance, Treatment and Prevention - Female Athletic Triad		
UNIT: V	ERGOGENIC AIDS AND SUPPLEMENTS	No. of Hours: 10
- Sports Foods - Cereal Bars, Energy Bars, Sports Drinks, Carbohydrate Gels, Liquid Meal Replacements - Use of Performance Enhancing Substances among Athletes - Anabolic Steroids, Types of Protein Supplements - Creatine, Beta- Alanine, Glutamine, Branched Chain Amino Acids, Beta Hydroxyl Beta Methyl Butyrate (HMB), Whey Proteins, Caffeine, Glycerol, Bicarbonate, Citrate - World Anti- doping Agency (WADA)-Anti Doping Rules and Regulations.		
Total Hours		60
PEDAGOGY	Lecture, tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS - Misra. A., Sports Nutrition and Balanced Diet, Sports Publication, 2022 - Sangangouda. K.M., Allauddin. M., Pasodi. M.S., Sports Nutrition, Khel Sahitya Kendra, 2018 - Srilakshmi. B, Suganthi. V, Ashok, K.C, Exercise Physiology, Fitness and Sports Nutrition, New Age International, New Delhi, 2017 - Bhide. G., Mandalika. S., Nutritional Guidelines for Sportspersons, Jaypee Publishers, I edition, 2018		
REFERENCES Williams. M.H, Nutrition for Health, Fitness and Sports, 7th edition, McGraw Hill International Edition, 2005		

2. Mc Ardle Katch & Katch, Sports and Exercise Nutrition, Lippincott Williams and Wilkins, 2005
3. Gibney. J.M., Macdonald. I.A. and Roche. H.M., Nutrition and Metabolism, Blackwell Publishing Company, Bangalore, Reprint 2004.

JOURNALS

1. Journal of International Society of Sports Nutrition
2. Journal of Sports Science and Nutrition
3. Journal of Exercise and Nutrition

WEB RESOURCES

<https://swayam.in/>

<https://yas.gov.in>

<https://www.ignou.ac.in>

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: III		Course Category: Major Discipline MJD12					Semester: VI		
Course Title: CLINICAL NUTRITION IN LIFESTYLE DISEASES							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Identify causative factors and metabolic changes in various disease/disorders - Understand the rationale of prevention of various diseases/disorders							
Course Outcome		After successful completion of this course, students will be able to: - Comprehend the basic concepts in nutrition and health - Discern the treatment modalities in management/ prevention of various diseases/disorders							
CONTENT									
UNIT: I		WEIGHT MANAGEMENT					No. of Hours: 5		
Aetiology, Clinical Symptoms, Diagnosis and Treatment of - Underweight - Overweight - Obesity Emerging trends in weight managementTechnology in weight management (apps, wearable devices)									
UNIT: II		DIABETES MELLITUS					No. of Hours: 10		
Aetiology, Types, Clinical Symptoms, Diagnosis and treatment of Diabetes Mellitus									

○ Complications – Cataract and Retinopathy, Neuropathy, Nephropathy, Diabetic Coma, Hypoglycemia and Ketoacidosis		
UNIT: III	CARDIOVASCULAR DISEASES	No. of Hours: 15
Aetiology, Clinical Symptoms, Diagnosis and Treatment of • Hypertension • Hyperlipidemia • Atherosclerosis • Ischemic Heart Disease • Congestive Cardiac Failure		
UNIT: IV	KIDNEY DISEASES	No. of Hours: 15
Aetiology, Clinical Symptoms, Diagnosis and Treatment of • Glomerulonephritis • Nephrosis • Acute Renal Failure • Chronic Renal Failure • Urolithiasis • Dialysis and Kidney Transplantation		
UNIT: V	LIVER, GALL BLADDER AND PANCREATIC DISEASES	No. of Hours: 15
Aetiology, Clinical Symptoms, Diagnosis and Treatment of • Jaundice • Viral Hepatitis • Cirrhosis • Cholecystitis • Cholelithiasis • Pancreatitis		
Total Hours		60
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	

TEXTBOOKS

1. Joshi. A.S., Nutrition and Dietetics, McGraw Hill, 2021
2. Bamji. M., Krishnaswamy. N., Textbook on Human Nutrition, Oxford and IBH publishing, IV Edition, 2019
3. Antia, F. P., Clinical Dietetics, IV Edition, Oxford University press, 2002.

REFERENCES

1. Raymond, J.L., Marrow. K, Krause and Mahan's Food and Nutrition Care Process, Elsevier, XV Edition, 2020
2. Whitney, E., Rolfes, R.S Understanding Nutrition, Cengage Learning, 2018
3. Mahan, L, K., Escott-Stump, S., Krause's Food, Nutrition and Diet Therapy, WB Saunders, 14 Edition, 2017
4. Shills, E.M, Olson, A.J. and Shike, M.C. Modern Nutrition in Health and Diseases, Shea and Febiger, Philadelphia, vol. II, 1994
5. Sue Rodwell Williams, Nutrition and Diet Therapy, Times Mirror Mosby College Publishing, St. Louis Toronto, Basin, 1989

JOURNALS

1. British Journal of Nutrition
2. International Journal of Food and Nutritional Sciences
3. Journal of American Dietetic Association
4. Indian Journal Medical Research
5. Indian Journal of Nutrition and Dietetics
6. American Journal of Clinical Nutrition

WEB RESOURCES

<https://swayam.gov.in/>

<https://mohfw.gov.in/>

<https://www.icmr.gov.in/>

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: III		Course Category: Major Discipline MJD12					Semester: VI		
Course Title: CLINICAL NUTRITION IN LIFESTYLE DISEASES							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Identify causative factors and metabolic changes in various disease/disorders - Understand the rationale of prevention of various diseases/disorders							
Course Outcome		After successful completion of this course, students will be able to: - Comprehend the basic concepts in nutrition and health - Discern the treatment modalities in management/ prevention of various diseases/disorders							
CONTENT									
UNIT: I		WEIGHT MANAGEMENT					No. of Hours: 5		
Aetiology, Clinical Symptoms, Diagnosis and Treatment of - Underweight - Overweight - Obesity Emerging trends in weight managementTechnology in weight management (apps, wearable devices)									
UNIT: II		DIABETES MELLITUS					No. of Hours: 10		
Aetiology, Types, Clinical Symptoms, Diagnosis and treatment of Diabetes Mellitus									

○ Complications – Cataract and Retinopathy, Neuropathy, Nephropathy, Diabetic Coma, Hypoglycemia and Ketoacidosis		
UNIT: III	CARDIOVASCULAR DISEASES	No. of Hours: 15
Aetiology, Clinical Symptoms, Diagnosis and Treatment of • Hypertension • Hyperlipidemia • Atherosclerosis • Ischemic Heart Disease • Congestive Cardiac Failure		
UNIT: IV	KIDNEY DISEASES	No. of Hours: 15
Aetiology, Clinical Symptoms, Diagnosis and Treatment of • Glomerulonephritis • Nephrosis • Acute Renal Failure • Chronic Renal Failure • Urolithiasis • Dialysis and Kidney Transplantation		
UNIT: V	LIVER, GALL BLADDER AND PANCREATIC DISEASES	No. of Hours: 15
Aetiology, Clinical Symptoms, Diagnosis and Treatment of • Jaundice • Viral Hepatitis • Cirrhosis • Cholecystitis • Cholelithiasis • Pancreatitis		
Total Hours		60
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	

TEXTBOOKS

1. Joshi. A.S., Nutrition and Dietetics, McGraw Hill, 2021
2. Bamji. M., Krishnaswamy. N., Textbook on Human Nutrition, Oxford and IBH publishing, IV Edition, 2019
3. Antia, F. P., Clinical Dietetics, IV Edition, Oxford University press, 2002.

REFERENCES

1. Raymond, J.L., Marrow. K, Krause and Mahan's Food and Nutrition Care Process, Elsevier, XV Edition, 2020
2. Whitney, E., Rolfes, R.S Understanding Nutrition, Cengage Learning, 2018
3. Mahan, L, K., Escott-Stump, S., Krause's Food, Nutrition and Diet Therapy, WB Saunders, 14 Edition, 2017
4. Shills, E.M, Olson, A.J. and Shike, M.C. Modern Nutrition in Health and Diseases, Shea and Febiger, Philadelphia, vol. II, 1994
5. Sue Rodwell Williams, Nutrition and Diet Therapy, Times Mirror Mosby College Publishing, St. Louis Toronto, Basin, 1989

JOURNALS

1. British Journal of Nutrition
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3. Journal of American Dietetic Association
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5. Indian Journal of Nutrition and Dietetics
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Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: III		Course Category: Major Discipline MJD 13					Semester: VI		
Course Title: DIET FOR LIFESTYLE DISEASES							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Understand Nutrition Support System in Medical Nutrition Therapy - Identify therapeutic modifications of diet for treating various disease conditions							
Course Outcome		After successful completion of this course, students will be able to: - Discern the principles of diet therapy for various ailments and diseases - Calculate the modifications of normal diet for therapeutic purposes							
CONTENT									
UNIT: I		DIET IN WEIGHT MANAGEMENT					No. of Hours: 5		
Underweight, Overweight and Obesity - Associated Health Risks - Psychological screening - Emotional eating, food-related disorders - Diet Screening - Diet history and food frequency questionnaires - Nutritional Strategies - Cognitive-behavioral therapy, mindful eating - Role of supplements in weight management - efficacy of weight loss drugs, safety and ethical concerns - Developing individualized diet plans									
UNIT: II		DIETARY MANAGEMENT IN DIABETES MELLITUS					No. of Hours: 10		
- Introduction to Diabetes - Nutritional Requirements									

• Dietary guidelines – ○ Food Exchange Lists ○ Glycaemic Index ○ Carbohydrate Counting ○ Calorie Counting and Distribution ○ Diet and Insulin • Artificial Sweeteners		
UNIT: III	DIETARY MANAGEMENT IN CARDIOVASCULAR DISEASES	No. of Hours: 15
Introduction, Nutritional Requirements, Dietary guidelines • Hypertension • Atherosclerosis • Dyslipidemia • Myocardial Infarction • Ischaemic Heart Disease • Congestive Cardiac failure		
UNIT: IV	DIETARY MANAGEMENT IN RENAL DISEASES	No. of Hours: 15
Introduction, Nutritional Requirements, Dietary guidelines • Glomerulonephritis • Nephrosis • Acute and Chronic Renal Failure • Urolithiasis • Dialysis, Kidney Transplantation		
UNIT: V	DIETARY MANAGEMENT IN LIVER, GALL BLADDER AND PANCREATIC DISEASE	No. of Hours: 15
Introduction, Nutritional Requirements, Dietary guidelines • Jaundice • Viral Hepatitis • Cirrhosis • Cholecystitis • Cholelithiasis • Pancreatitis		

Total Hours		60
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS		
1. Gopalan.C. Ramasastri, B.V and Balasubramaniam, S.C., Nutritive value of Indian foods, National Institute of nutrition, Hyderabad, 2021 2. Srilakshmi. B, Dietetics, New Age international (p) ltd., 2020 3. Joshi. A.S., Nutrition and Dietetics, McGraw Hill, 2021 4. Bamji. M., Krishnaswamy. N., Textbook on Human Nutrition, Oxford and IBH publishing, IV Edition, 2019 5. Bisht, P, Community Nutrition in India, Star Publications, 2017 6. Antia, F. P., Clinical Dietetics, IV Edition, Oxford University press, 2002.		
REFERENCES		
1. Cappellini, B., Marshall. D., Parsons. E., The Practice of the Meal, Food, Families and the Market Place, Routledge, I Edition, 2016 2. Abraham. B., Nutrition through Lifecycle, New Age International, 2016 3. Brown. E.J., Nutrition through Lifecycle, Wadsworth Publications, VI Edition, 2016 4. Williams. S.R., Schlenker.E., Essentials of Nutrition and Diet Therapy. Mosby College publishing, VIII Edition, 2003 5. Whitney, E., Rolfes, R.S Understanding Nutrition, Cengage Learning, 2018		
JOURNALS		
1. British Journal of Nutrition 2. International Journal of Food and Nutritional Sciences 3. Journal of American Dietetic Association 4. Indian Journal of Medical Research 5. Indian Journal of Nutrition and Dietetics 6. American Journal of Clinical Nutrition		
WEB RESOURCES		
https://swayam.gov.in/		
https://www.nin.res.in		
https://cftri.res.in		

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: III		Course Category: Major Discipline MJD 14					Semester: VI		
Course Title: CLINICAL NUTRITION AND DIETETICS PRACTICAL - II							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
			4		--	90	50	50	100
Course Objective		To enable the students to: - Examine nutritional concerns and principles of planning for different age groups - Obtain an insight into the chemistry of major nutrients and physiologically important compounds							
Course Outcome		After successful completion of this course, students will be able to: - Assess the modifications of normal diet and plan diets for therapeutic purposes - Apply the knowledge acquired to human nutrition and dietetics							
CONTENT									
NUTRITION Exercise 1: General Laboratory Instructions Exercise 2: Centrifuge - Components and Operation Exercise 3: Colorimeter – Components and Operation Exercise 4: Haematological Indices of Blood Exercise 5: Demonstration of Blood Collection and Preservation Exercise 6: Quantitative Estimation of Glucose in Blood Exercise 7: Quantitative Estimation of Cholesterol in Blood Exercise 8: Quantitative Estimation of Blood Urea Exercise 9: Visit to Clinical Laboratory									

DIETETICS

Exercise 1: Planning and Preparation of diet for managing weight – Underweight and Obesity

Exercise 2: Planning and Preparation of diet for Diabetes Mellitus – IDDM/NIDDM

Exercise 3: Planning and Preparation of diet for Hypertension and Atherosclerosis

Exercise 4: Planning and Preparation of diet for Nephritis

Exercise 5: Planning and Preparation of diet for Nephrosis

Exercise 6: Planning and Preparation of diet for Cirrhosis

ASSIGNMENTS/ACTIVITIES TOWARDS INTERNAL ASSESSMENT:

- Visiting hospital and evaluating Hospital Diets
- Group discussions on diets for various disease conditions at household levels

Total Hours**90****PEDAGOGY**

Tutorial and practice. Assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: III		Course Category: Major Discipline MJD15					Semester: VI		
Course Title: FOOD SERVICE MANAGEMENT							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: • Create an understanding of the organizational aspect and space allocation in food service institutions. • Develop managerial skills among the students							
Course Outcome		After successful completion of this course, students will be able to: • Understand the functional areas of food service operations • Comprehend the operational characteristics of different types of food service							
CONTENT									
UNIT: I		CLASSIFICATION OF FOOD SERVICE INSTITUTIONS					No. of Hours: 10		
• Food Service Industry - Definition – types of catering- Hotel, Motel, Restaurant, Cafeteria and chain hotels. • Welfare - Hospital, School lunch, Residential establishment and Industrial catering. • Transport - Air, Rail, Sea and Space, Miscellaneous – Contract and outdoor									
UNIT: II		PHYSICAL PLANT AND FOOD PURCHASE					No. of Hours: 10		
• Kitchen - Layout of kitchens, types of kitchens – Planning of Receiving preparation, storage and service area with relevant too spacing. • Food Purchase- Procedures and Factors involved in the selection of food									

UNIT: III	QUANTITY FOOD SERVICE AND EQUIPMENT	No. of Hours: 15
• Quantity Food Service ○ Definition and objectives ○ Food Service Systems ○ Styles of service - waiter service, self – service, vending ○ Mechanics of waiter service • Equipment ○ Classification, factors involved in selection, use and care of major equipment, traditional and modern equipment		
UNIT: IV	MENU PLANNING	No. of Hours: 10
• Menu planning ○ Origin of menu and importance of menu planning. ○ Types of menu- table d’hote menu, a la carte, Dujour, theme, static, cycle. French classical menu. ○ Use of menus, construction of menus, Menu Design, Factors affecting menu planning. • Standardisation of Recipes • Portion control • Computer applications in menu planning		
UNIT: V	MANAGEMENT	No. of Hours: 15
• Definition, principles, Functions and tools of management, qualities of a good leader, styles of leadership. • Personnel Management- Recruitment, selection and induction. • Financial management- Cost control- methods of food cost control, Book- keeping; advantages of the double entry system. • Sanitation and Safety – Sanitation of Plant and Kitchen Hygiene, Personal Hygiene, First aid principles and practice, Health and Safety at work. Use of fire extinguishers		
Total Hours		60
PEDAGOGY	Lecture, tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS		

1. Kaufman, R., Mega planning- Practical tools for Organisational Success, Sage Publications Inc, 2000.
2. Singh Y, P. Effective Food Service Management, Anmol publications Pvt Ltd, New Delhi, 2002.
3. Stephen, B, , Williams, S, R, “Bill Jardine, and Richard, J, N, Introduction to Catering,
4. Ingredients for Success, Delmar- Thomson learning, 2001.
5. Yadav, C, P. Management of Hotel and Catering Industry, Anmol publications Pvt Ltd and Institute of sustainable development, Lucknow, New Delhi, 2003
6. Mohini Sethi and Surjeet Malham, “Catering Management – an integrated approach”, 2nd edition, Wiley Eastern Limited, New Delhi, Reprint 2018.

REFERENCES

1. West B.B. wood, L. Revised by Harger V.F. Shugart, G.S. Payne Palacio, J. (1989): Food Service Institution, 6th Ed. Macmillan Publishing Co., New York.
2. T.N. Chhabra, Principles & Practice of Management, Published by Dhanpat Rai & Co.(P)Ltd, Reprint 2006, ISBN: 81-7700-032-2.
3. Mamoria .C/B and Gankar.S.V, Personnel Management, Published by Himalaya Publishing House, 23rd Edition, 2003, 583-633.
4. Koontz, H., ODonnel, C., Weihrich, H. (1983): Essentials of Management, Indian Ed.
5. Palacio J.P. Harger, V. Shugart, G and Thesis, (1994) Introduction to Food Service MacMillan Pub. Co. New York.
6. R D Agarwal, Organisation and Management, Published by Tata McGraw-Hill Publishing Company limited, ISBN 0-07-451506-3.
7. Dinkar Pagare, Business Organisation and Management, Published by Sultan Chand & Sons, Reprint 2002, ISBN 81-7014-675-5

JOURNALS

1. Journal of Food Service Management & Education
2. Journal of Service Management
3. Journal of Food Service Business Research
4. Journal of Food Service

WEB RESOURCES

<https://swayam.in>
<https://www.ignouindia.in>
<https://egyankosh.ac.in/>

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Major Discipline MID 6					Semester: VII		
Course Title: HOSPITAL ADMINISTRATION							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Gain knowledge in hospital functions and administration - Comprehend the use of technology in patient admission, transfer, billing and discharge procedures							
Course Outcome		After successful completion of this course, students will be able to: - Understand the management of resources in hospitals - Apply skills in maintaining medical records for patient admission, transfer, billing and discharge procedures							
CONTENT									
UNIT: I		INTRODUCTION TO HOSPITALS					No. of Hours: 15		
- History of Hospitals in India - Development of Hospital Service in India - Classification of Hospitals - Private (Personal) - Partnership - Private (family) trust - Cooperative society - Private Limited company - Public Limited company - Organizational Structure of different types of hospitals and its functions. - Factors influencing hospital utilization									

UNIT: II	PATIENT CARE SERVICES	No. of Hours: 10
• Patient counselling, admission, transfer, billing and discharge procedures • Objectives, functions, policy and procedures, organization of Outpatient -In patient - Emergency Services -Operation theatre -Intensive care -Super specialty • Staffing • Quality indicators • Daily planning and scheduling of work • Managing time: waiting time and total time spent by a patient		
UNIT: III	SUPPORTIVE AND ALLIED SERVICES	No. of Hours: 15
Objectives, Significance, Functions, Structure, Procedures, Organization and Staffing of: • Lab services • Radiology and Imaging services • Blood bank services • Telemedicine • Pharmacy services • Medical records services- Medical records – Format, Contents-Administrative Issues- Types of medical forms -Standardization in record keeping. • Auxiliary services – Housekeeping- Laundry-Stores • Bio Medical waste management • Health Insurance		
UNIT: IV	DIETARY SERVICES	No. of Hours: 10
• Management of Dietary Department • Diet Planning for hospital diets • Purchasing, storage and quantity food production, patient compliance, food production, serving to patient- tray and trolley service, plate waste management, washing and garbage disposal		
UNIT: V	EVALUATION OF HOSPITAL SERVICES	No. of Hours: 10
• Steps in evaluation. • Techniques of Hospital Service Evaluation • Indicators of Hospital Efficiency and Effectiveness • Hazard and Safety in a Hospital Setup		

• Evaluation of Quality of Hospital Services • Total Quality management TQM • ISO Certification for hospitals • National Accreditation Board for Hospitals (NABH) • Hospital audit – Meaning and importance			
<table> <tr> <td>Total Hours</td><td>60</td></tr> </table>		Total Hours	60
Total Hours	60		
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning		
TEXTBOOKS 1. Gupta.J.D, Hospital Administration & Management: A Comprehensive Guide, Jaypee Brothers 2023 2. Joshi.DC., Joshi.M, Hospital Administration II Edition, Jaypee Brothers, 2022 3. Goel. S.L, Management Techniques and Good, Governance in Health Care System and Hospital Administration, Deep and Deep Publications Pvt., Ltd. 2010 4. Subhramyam. BV, Hospital Management and Administration, Principles & Practices including Law, CBS Publishers, 2018 5. Sakharakar B M, Principles of Hospital Administration and Planning, 2009, 2nd Edition, Jaypee Brothers Medical Publishers (p) Ltd REFERENCES 1. Sharma. Y., Sarma. RK., Gomes.L.A, Hospital Administration: Principles & Practice I Edition, Jaypee Brothers , 2013 2. Francis. CM., De Sousa. MC, Hospital Administration, III Edition Jaypee Brothers 2004 3. Goel, S., Gupta.A.k, Singh.A , Hospital administration: A Problem solving approach, I Edition, Elsevier India, 2014 4. Sudhir Andrews, Front Office Management and Operations, 2008, Tata McGraw – Hill Publishing Company Ltd. 5. Chand. M, Managing Hospitality Operations, 2009, First Edition, Anmol Publications Pvt. Ltd. New Delhi. JOURNALS 1. Journal of Hospital Administration 2. Journal of Healthcare Management 3. Journal of Hospital Management & Health Policy WEB RESOURCES https://nabh.co https://icmr.nic.in https://swayam.in			

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Major Discipline MJD16					Semester: VII		
Course Title: MEDICAL NUTRITION THERAPY IN CRITICAL CARE							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Understand the importance of immune supplements in critical care - Rationalise the etiology, patho-physiology and nutritional management of critical care patients							
Course Outcome		After successful completion of this course, students will be able to: - Understand the physiology, metabolism and special nutritional requirements of the critically ill. - Gain knowledge about the importance of nutritional assessment in critical care patients							
CONTENT									
UNIT: I		RHEUMATIC, NEUROLOGICAL AND PULMONARY DISORDERS					No. of Hours: 10		
Etiology, Symptoms, Complications, Clinical Parameters, Diagnostic Tools and Medical Nutrition Therapy of: - Rheumatoid Arthritis, Osteoarthritis and Gout - Alzheimer’s Disease, Parkinsonism, Autism, Multiple sclerosis and Epilepsy - Asthma, Bronchitis - Chronic Obstructive Pulmonary Disease - Cystic Fibrosis									
UNIT: II		INBORN METABOLIC AND ENDOCRINE DISORDERS					No. of Hours: 10		
Etiology, Symptoms, Complications, Clinical Parameters, Diagnostic Tools and Medical Nutrition Therapy of: Phenyl Ketonuria, Maple Syrup Urine Disease, Galactosemia, Essential Fructosuria									

- Disorders of Sulphur Amino Acid Metabolism – Homocystinuria, Cystathionine Beta Synthase Deficiency, Methionine synthase reductase deficiency - Gaucher's, Tay- Sach's , Hypertriglyceridemia, Nieman-Pick's disease - Polycystic Ovarian Syndrome - Thyroid Related Disorders		
UNIT: III	BURNS, INJURY, ONCOLOGY AND SURGERY CONDITIONS	No. of Hours: 15
BURNS - Definition, classification, complications - Dietary management - objectives, macronutrients, micronutrients, general considerations. INJURY/ TRAUMA - Definition, Metabolic, physiological and hormonal response to Injury - Dietary management - objectives, macronutrients, micronutrients, general considerations. SURGERY - Definition, Metabolic, physiological and hormonal response to surgery: - Dietary management - objectives, preoperative and postoperative nutritional care, macronutrients, micronutrients, general considerations CANCER - Etiology & Diagnosis - Medical treatments and their side effects - Dietary management - Cancer prevention and nutrition components - Types – oral, esophagus, gastric, lungs, breast and ovarian cancers		
UNIT: IV	COMPLEMENTARY NUTRITION IN CRITICAL CARE	No. of Hours: 10
- Methods of Nutritional status assessment of the critically ill, nutritional support systems and other life saving measures of the critically ill, Complications of critically ill patients - Acid base abnormalities, electrolyte fluid abnormalities, ventilator support, ventilator associated pneumonia, nosocomial pneumonia		

• Role of immune enhancers, conditionally essential nutrients, Immune suppressants, protein supplements, • Special diets in critical care, Role of selected bioactive constituent - Beta glucan/ Arabinoxylan/ Resistant starch, Bioactive peptides and GABA, Omega-3 fatty acids, CLA, Phytosterols, poly phenols, Carotenoids and Isoflavones		
UNIT V	INSTRUMENTATION IN NUTRITION	No. of Hours: 15
Spectrophotometer • Principles, methodology and application of Spectroscopy • Types – Ultra-Violet, visible, Infra- Red, Nuclear Magnetic Resonance, Electron Spin Resonance, atomic absorption, plasma emission spectroscopy Chromatography • Principles, methodology and application of Chromatography • Types - Gel filtration, ion exchange, affinity, thin layer, gas, high performance liquid chromatography, gas liquid chromatography, paper chromatography Electrophoresis • Principles and application of Electrophoresis • Types - Native, Capillary electrophoresis, Sodium Dodecyl Sulphate-Polyacrylamide gel electrophoresis (SDS PAGE), Agarose electrophoresis, 2 D Gel electrophoresis Application of Polymerase Chain Reaction, Colorimetric, Flame photometry and respirography Non-invasive methods for assessment • Advantages and Limitations of Radiological, Bone Mineral Density, Electro Cardiogram, Electro Encephalogram, Nuclear Magnetic Resonance		
Total Hours		60
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	

TEXTBOOKS

1. Joshi. A.S., Nutrition and Dietetics, McGraw Hill, 2021
2. Bamji. M., Krishnaswamy. N., Textbook on Human Nutrition, Oxford and IBH publishing, IV Edition, 2019
3. Antia, F. P., Clinical Dietetics, IV Edition, Oxford University press, 2002.

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3. Mahan, L, K., Escott-Stump, S., Krause's Food, Nutrition and Diet Therapy, WB Saunders, 14 Edition, 2017
4. Shills, E.M, Olson, A.J. and Shike, M.C. Modern Nutrition in Health and Diseases, Shea and Febiger, Philadelphia, vol. II, 1994
5. Sue Rodwell Williams, Nutrition and Diet Therapy, Times Mirror Mosby College Publishing, St. Louis Toronto, Basin, 1989

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Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Major Discipline MJD 17					Semester: VII		
Course Title: RESEARCH METHODOLOGY AND BIOSTATISTICS							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to - Understand the types, tools and methods of research - Develop skill in collecting, processing, organizing and interpreting data							
Course Outcome		After successful completion of this course, students will be able to: - Analyse systematic methods for data collection, data processing and data analysis & develop skills for scientific research writing - Design a research proposal in the appropriate scientific style							
CONTENT									
UNIT: I		RESEARCH TYPES, VARIABLES AND HYPOTHESIS					No. of Hours: 15		
- Meaning and definition of research - Hallmarks of scientific research - Steps in Research Process - Types and Methods of Research - Cross Sectional and Longitudinal Research; Applied & Basic Research; Quantitative & Qualitative Research; Deductive & Inductive Research; Descriptive & Analytical; Experimental Designs - Facets of Interdisciplinary Research - Research Ethics with reference to ICMR & ICSSR - Variables – Meaning; Types of variables									

Hypothesis – Meaning, Attributes of a sound hypothesis; Types of Hypotheses- Null and Alternative Hypothesis – Critical region – p-value; Type I and Type II errors		
UNIT: II	METHODS OF DATA COLLECTION AND SAMPLING DESIGNS	No. of Hours: 15
Methods of Data Collection - Primary and secondary data - Selection of appropriate method for data collection. Sampling Designs - probability sampling and non-probability sampling - sampling and non-sampling errors. - measurement and scaling techniques- quantitative and qualitative data, goodness of measurement scales.		
UNIT: III	BIO STATISTICS AND DESCRIPTIVE METHODS	No. of Hours: 10
- Bio statistics- concept and its scope in public health research. - Descriptive methods - Measures of central tendency - arithmetic mean, median and mode. - Measures of dispersion - range, mean deviation and standard deviation. measures of skewness and kurtosis - Measures of relationship- covariance, karl pearson's coefficient of correlation and rank correlation.		
UNIT: IV	PROCESSING AND ANALYSIS OF DATA	No. of Hours: 10
- Processing Operations. Problems In Processing Data. - Data Analysis - Parametric and non-parametric tests – difference - Types of Parametric Tests – Paired t test, Unpaired t test, One way ANOVA - Non-Parametric Tests – Chi- square Test - Biostatistics with statistical software- MS-excel, SPSS, graph pad prism software and other statistical calculators available in web.		
UNIT: V	INTERPRETATION AND SCIENTIFIC RESEARCH WRITING	No. of Hours: 10
- Interpretation- techniques and precautions. - Preparation of a research proposal.		

• Report writing- steps, types and significance. • Mechanics and precautions for writing a research report. • Presentation of research report - tabulation and organization of data, graphical presentation of data. • Research Report: Basic Components of a Research Report- Preliminary pages, Introduction, Review Of Related Literature, Methodology, Results, Discussion, Summary, Conclusion, and recommendation, Abstract, Foot note, End note, Bibliography styles with special emphasis on APA style. • Research paper writing	
Total Hours	
60	
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning
TEXT BOOKS	
1. Ranjit Kumar, Research Methodology, 4th Edn, Pearsons, India, 2023 2. Y.K. Singh and Dr. R.B. BajPai, Methodology Data presentation, APH Publishing Corporation 3. Pannerselvam R: Research Methodology 2 nd Edition PHI Learning Pvt Ltd-2024 4. Kothari C.R. (2019), Research Methodology: Methods and Techniques 4th Edition, New Age International Publishers, New Delhi. 5. Gupta.S.P, Statistical Methods, Sultan Chand & Sons, 2023 6. Daniel WW, Biostatistics: A Foundation for Analysis of Health Sciences, John Wiley Publishers-2009 7. Rosner B & Rosner R: Fundamentals of Biostatistics by. Cengage Learning Inc. 2010 8. Baldi B and Moore DS: The Practice of Statistics in Life Sciences, W.H. Freeman Publishers, 2014 9. MS Excel for Dummies by Greg Harvey Paperback 2016 10. Daniel WW, Biostatistics: A Foundation for Analysis of Health Sciences, John Wiley Publishers-2009	
REFERENCES	
1. Trochim W., Donnelly J.P. And Arora K., (2015), Research Methods: The Essential Knowledge Base, Cengage Learning. USA. 2. Blaxter L, Hughes C And Tight M (2010), How To Research – 4th Edition. Mcgraw Hill, UK	

3. Pounis G. (2018), Analysis in Nutrition Research: Principles of Statistical Methodology and Interpretation of the Results, Academic Press Publishers, USA.

JOURNALS

Journal of Survey, Statistics & Methodology

Journal of Statistical Approaches in Research

Annals of Statistics

WEB RESOURCES

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www.ignou.ac.in

www.epgpathshala.in

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Major Discipline MJD 18					Semester: VII		
Course Title: FOOD LAWS AND REGULATIONS							Course Code:		
Credit s	Credit Distribution			No. of Hours / Week	Total Hours		End Semester Exam Maximum Marks		
4	Lectur e	Tutoria l	Practical / practice	6	Theor y	Lab Sessio n	CI A	ES E	Total Mark s
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to • Get insight on National and international Food Laws • Understand the rules and regulations regarding licensing, and registration procedures related to food and its safety							
Course Outcome		After successful completion of this course, students will be able to: • Able to locate and interpret government regulations regarding the manufacture and sale of food products • Develop entrepreneurial skills utilising prevailing laws and regulations in manufacture and marketing of food products • Design HACCP protocols and analyse the critical points							
CONTENT									
UNIT: I		FOOD SAFETY AND STANDARDS ACT, 2006					No. of Hours: 10		
• Essential Commodities Act ○ Fruit Products Order ○ Meat Food Products Order ○ Vegetable Oil Products Order ○ Edible Oils Packaging (Regulation) Order ○ Solvent Extracted Oil, De-Oiled Meal and Edible Flour (Control) Order ○ Milk and Milk Products Order ○ Cold storage order • GRAS and permissible limits for chemical preservatives and legal aspects for γ – irradiations • Infant milk substitute, feeding bottles and infant food act									

• Compulsory National Legislations. • Newer approaches to food safety • Prevention of Food Adulteration Act (PFA)		
UNIT: II	FOOD SAFETY AND STANDARDS REGULATIONS, 2011	No. of Hours: 20
• Food Safety and Standards (Packaging) Regulation • Food Safety and Standards (Fortification of Foods) Regulations, • Food Safety and Standards (Organic Food) Regulation • Food Safety and Standards (Alcoholic Beverages) Regulations • Food Safety and Standards (Food or Health Supplements, Nutraceuticals, Functional Foods and Novel Food) Regulations • Regulations Related to GM Foods • Food Safety and Standards (Advertising and Claims) Regulations • Packaging and labelling rules and regulations: List of ingredients, nutritional information, special label declarations, claims-Health, nutrition, nutrient led claims, use of words and phrases on label, barcoding of food products • Food Safety and Standards (Import) Regulation • Compliances under the Food Safety and Standard Act, 2011		
UNIT: III	FOOD CONTROL SYSTEM	No. of Hours: 5
National - Voluntary Based Product Certifications • BIS • AGMARK • FSSAI • ISI • ISO 22000 series Export inspection council International Food Control Systems/ Laws, Regulations and Standards • FAO • CODEX Alimentarius Commission: History, Members, Standard mechanisms: setting and Advisory JECFA, JEMRA, JMPR, APEDA		

• WTO agreements: SPS/TBT • Role of OIE, IPPC		
UNIT: IV	HACCP - A FOOD SAFETY ASSURANCE SYSTEM	No. of Hours: 15
• Definition, Importance, Principles, Need Benefits of HACCP • Guidelines for Application of HACCP Principles • Determination of CCP • Preliminary Tasks in Development of HACCP Plan • Applying the HACCP Principles, Problems in implementing HACCP • The HACCP Status in India • Importance of TQM, GMP and GLP • Mode of work and duties of food inspectors		
UNIT: V	LICENCING, REGISTRATION AND ANALYSIS	No. of Hours: 10
Licencing and registration • Central license, State license, Registration • Responsibilities of the FBO, Role of Designated officer, Food Safety Officer and Food Analyst Rights of Food Inspectors Food testing laboratories in India • Municipal labs, FDA Labs, central food testing labs, labs of export inspection council, central grain analysis lab, quality control labs of companies, Quality control labs of consumer cooperatives and private testing labs. • The role and functions of Referral labs, FSSA notified laboratories, State Food Laboratories Laboratory sampling and analysis • Receiving legal samples, sample custody and sample custodian. • Storage of sample • Required documentation and registration, • Analyses as per FSS Rules and Regulations		
Total Hours		60
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	

TEXT BOOKS

1. Alli. I, Food Quality Assurance: Principle & Practices, 2023, Taylor & Francis Publishing
2. Mathur.P, Textbook on Food Safety & Quality Control, 2018, The Orient Black Swan
3. Food Quality Testing & Evaluation Study Guide for IGNOU students, BMAP Eduservices 2024
4. Principles of Food Safety & Quality Management, Study Guide for IGNOU students, BMAP Eduservices 2024

REFERENCES

1. Rao.E.S, Food Quality Evalauation, Variety Book Publisher, 2014
2. Ramaswamy. A, Food Science & Quality Control, Book Enclave, 2023
3. Kumar. S, Food Quality Management, Textbook for UG & PG Students, Notion Press2024

JOURNALS

1. Journal of Food Quality
2. Food Quality & Preference journal
3. Journal of Food Quality & Hazard Control

WEB RESOURCES

<https://fssai.gov.in>

www.foodsafety.tn.gov.in

<https://niftem-t.ac.in>

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Minor Discipline MID 7A					Semester: VII		
Course Title: HERBAL NUTRITION							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to - Identify the common herbs used as food, their botanical classification and culinary use - Understand knowledge on herbs and their drug interactions, toxicity and herbal product regulations							
Course Outcome		After successful completion of this course, students will be able to: - Acquire more knowledge about the common herbs, their nutritional properties and their regulations - Gains an understanding about the healing properties of common medicinal plants and their use in traditional healthcare systems							
CONTENT									
UNIT: I		INTRODUCTION					No. of Hours: 10		
- Definition of herbs, herbal Nutrition, Selection, identification and authentication of herbs - Processing of herbal raw material. - Introduction to Medicinally important Plant parts: Flowers, Fruits, Leaves, Stem and its modifications (underground and aerial), Roots. - Importance of medicinal plants – role in human health care – health and balanced diet									
UNIT: II		MEDICINAL PLANTS: FARM TO STORE					No. of Hours: 15		
Study of some medicinally important families with reference to systematic position									

- Diagnostic features and medicinal uses only: Meliaceae, Myrtaceae, Apiaceae, Asclepiadaceae, Solanaceae, Lamiaceae, Euphorbiaceae, Zingiberaceae, Musaceae and Poaceae. - Cultivation methods – Crop protection – Harvesting – Storage and Protection – Marketing and utilization - Export of medicinally important (General aspects)		
UNIT: III	NUTRITIONALLY SIGNIFICANT HERBS	No. of Hours: 10
- Nutritional content of common Indian herbs, Phenolic content, Carotenoids, minerals and essential oils. - Significance of common herbs, culinary herbs, cooking methods of herbs - - Basil, Cherril, Chimes, Cilantro, Dill, Mint, Oregano, Parsley, Rosemary, Sage, Tarragon, Thyme, Lemongrass, Scallions		
UNIT: IV	PLANTS IN EVERYDAY LIFE	No. of Hours: 15
- Plants in day today life – Ocimum sanctum, Centella asiatica, Solanum trilobatum, Cassia auriculata, Aloe vera. - Nutritive and medicinal value of some fruits (Guava, Sapota, Orange, Mango, Banana, Lemon, Pomegranate) - Nutritive and medicinal value of some vegetables - Greens (Moringa, Solanum nigrum) Cabbage		
UNIT: V	HERBAL DIETARY SUPPLEMENTS	No. of Hours: 10
- Common herbal dietary supplements, possible side effects and drug interactions – Black cohosh, Cranberry, Curcumin, Echinacea, Garlic, Ginkobiloba, Ginseng, Goldenseal, Green tea extract, Kava-kava, Milk thistle, Saw paletto, St.John’s wort, Valerian - Pharmacokinetics of herbal supplements.		
Total Hours		60
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	

TEXT BOOKS

1. Gokhale, S.S., C.K.Kokate and A.P. Purohit (1994) Pharmacognosy. Nirali Prakashan. Pune.
2. Farooqi, A.A., and B.S. Sreeramu (2004). Cultivation of Medicinal and Aromatic Crops. University Press (India) Pvt. Ltd., Hyderabad.

REFERENCES

1. Mukherjee, P.W. Quality Control of Herbal Drugs: An Approach to Evaluation of Botanicals. Business Horizons Publishers, New Delhi, India, 2002.
2. Herb Nutrient and drug interactions: Clinical implications and therapeutic strategies (2008) Mitchell Bebel Stargrove Jonathan Treasure Dwight L. McKee, Published by Elsevier - Health Sciences Division

JOURNALS

International Journal of AYUSH

Journal of AYUSH

AYUSH: International Research Journal

WEB RESOURCES

<https://ayush.gov.in>

<http://www.naturaldatabase.com>

<https://www.aafp.org>

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: II		Course Category: Minor Discipline MID 7B					Semester: IV		
Course Title: FUNCTIONAL FOODS AND NUTRACEUTICALS FOR HEALTH							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	4	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Develop an understanding of the concept and classification of functional foods and nutraceuticals - Appreciate of the potential health benefits of functional foods and nutraceuticals.							
Course Outcome		After successful completion of this course, students will be able to: - Address the prevention and treatment of important diseases using targeted health promoting functional foods and nutraceuticals - Evaluate and understand health claims related to functional foods							
CONTENT									
UNIT: I		FUNCTIONAL FOODS					No. of Hours: 10		
Functional Foods - Definitions, classification, sources and Bioactive components of functional foods - Types of functional foods: whole foods, enriched foods, enhanced foods, fortified foods, modified foods - Functional foods of animal origin and plant origin - Health benefits of Functional foods - Advantages and disadvantages of functional foods									
UNIT: II		NUTRACEUTICALS					No. of Hours: 15		
Nutraceuticals Definitions, Sources									

• Classification of nutraceuticals - based on food sources, chemical nature and mechanism of action Plant metabolites • Functions, sources - Alkaloids, phenols, Terpenoids. • Concept of cosmoceuticals and aquaceuticals Animal metabolites • Functions, Sources - chitin, chitosan, glucosamine, chondroitin sulphate and other polysaccharides of animal origin Difference between functional foods and nutraceuticals		
UNIT: III	PHYTOCHEMICALS, ANTI-OXIDANTS & DIETARY SUPPLEMENTS	No. of Hours: 15
Phytochemicals • Definition, Sources & mode of action • Classification of Phytochemicals • Health benefits Anti-oxidants • Definition and Mechanism of action • Classification of antioxidants • Health benefits Dietary Supplements • Definitions, Sources • Health Benefits		
UNIT: IV	PROBIOTICS, PREBIOTICS AND SYNBIOTICS	No. of Hours: 10
Probiotics • Definition, types, sources • Characteristics of a good probiotic • Health benefits of probiotics • Recent advances in probiotics Prebiotics • Definition, types, sources		

• Health benefits of prebiotics • Recent advances in prebiotics • Prebiotic ingredients in foods Synbiotics • Definitions and health benefits		
UNIT: V	FUNCTIONAL FOODS AND NUTRACEUTICALS IN HEALTH AND DISEASES	No. of Hours: 10
Role in health and management of diseases • Functional foods– diabetes mellitus, hypertension, CVD and cancer • Nutraceuticals – ○ Cognitive decline ○ Arthritis, Bronchitis, circulatory problems, hypoglycemia, nephrological disorders, Liver disorders, Osteoporosis, Psoriasis and Ulcers		
Total Hours		60
PEDAGOGY	Lecture, tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS 1. Kommu.S., Thirumurugan.R., Madupohju.B, Textbook of Nutraceuticals & functional foods, Notion Press, 2024 2. Ahmed.S.M, Textbook of Nutraceuticals & Dietary Supplements, Notion Press, 2024 3. Mittal.A., Pradhan.P., Agrahari. S.K., Jain .A, Textbook of Dietary Supplements and Nutraceuticals, Notion Press 2023 4. Zavar.L.R., Pingale.P.L., Rane. B.R, Textbook of Dietary Supplements and Nutraceuticals, Everest Publishing House, 2023 5. Rudrapal.M., Bhattacharya. S, Dietary Supplements and Nutraceuticals, PharmaMed Press, 2023		
REFERENCES 1. Wildman, R. E. (2016). Handbook of Nutraceuticals and Functional Foods. CRC Press 2. Gibson, G. R. and Williams, M. C. (2001). Functional Foods Concept to Product. CRC Press.		

3. Vatter, D.A. and Maitin V.(2016). Functional Foods, Nutraceuticals and Natural Products, Concepts and Applications. DEStech Publications, Inc
4. Gupta, R. C. (2016). Nutraceuticals: Efficacy, Safety and Toxicity. Academic Press.
5. Schmidl K Mary and Labuza P. Essentials of Functional Foods, Theodore, Aspen Publishers Inc., Maryland. 2000
6. Goldberg. I, Functional Foods: Designer Foods, Pharma Foods (2004) - Goldberg I.
7. Cicero. A.F.G., Colletti. A Hand book of Nutraceuticals for Clinical Use, Springer, 2019

JOURNALS

1. Journal of Functional Foods & Nutraceuticals
2. Journal of Functional Foods
3. Journal of Nutraceuticals, Functional & Medical foods

WEB REFERENCES

www.ncbi.nlm.nih.gov

<https://icmr.nic.in>

<https://dbtindia.gov.in>

www.indiascienceandtechnology.gov.in

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Minor Discipline MID 8A					Semester: VII		
Course Title: DIABETES CARE AND MANAGEMENT							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to • Equip with the knowledge and skills necessary to provide high-quality care to diabetic patients • Learn about diagnosis of diabetes, dietary advice for diabetics, monitoring and management of diabetes							
Course Outcome		After successful completion of this course, students will be able to: • Understanding the diagnosis, management and care of patients with diabetes. • Design diet plans and management techniques for diabetics							
CONTENT									
UNIT: I		ETIOLOGIC CLASSIFICATION OF DIABETES MELLITUS					No. of Hours: 10		
• Type-1 Diabetes mellitus • Type-2 Diabetes mellitus • Other specific types of Diabetes • Gestational Diabetes mellitus									
UNIT: II		EPIDEMIOLOGY AND RISK FACTORS					No. of Hours: 10		
• Reasons for increasing prevalence									

Major risk factors for type 2 diabetes mellitus		
UNIT: III	PATHOPHYSIOLOGY AND CLINICAL FEATURES OF DIABETES	No. of Hours: 10
- Normal insulin metabolism - Pathogenesis of Type-1 Diabetes mellitus: Genetic susceptibility, autoimmunity and environmental factors - Pathogenesis of Type-2 Diabetes mellitus: Genetic factors, Constitutional factors, Insulin resistance, Impaired insulin secretion, Increased hepatic glucose synthesis - Clinical features of Type-1 and Type-2 Diabetes mellitus - Contrasting features of type 1 and type 2 diabetes mellitus		
UNIT: IV	COMPLICATIONS OF DIABETES	No. of Hours: 15
Acute Metabolic Complications - Diabetic Ketoacidosis (DKA) - Hyperosmolar Hyper Glycaemic Non-Ketotic Coma - Hypoglycaemia Late Systemic Complications - Atherosclerosis - Diabetic Microangiopathy - Diabetic Nephropathy - Diabetic Neuropathy - Diabetic Retinopathy - Infections		
UNIT: V	DIAGNOSIS AND TREATMENT OF DIABETES	No. of Hours: 15
Diabetic Parameter (Principle Of Test, Reference Value, Interpretation) Urine testing - Glucosuria, Ketonuria		

- Blood sugar estimation - Fasting, PP, Random
- Oral glucose tolerance test
- Glycosylated haemoglobin test
- Insulin and C-peptide assay (ELISA)

Management of Diabetes

Dietary Management

- Dietary guidelines
- Designing and developing diet plans
- Nutrition for the diabetic child & Adult
- Dietary fibre and nutraceuticals
- Artificial Sweeteners

Therapeutic Management

- Oral Hypoglycaemic Drugs
- Insulin Therapy
- DAFNE

Lifestyle Management

- Role of exercise & yoga
- Lifestyle changes

Counselling for Diabetics

- Changes in food habits, Dietary dos and don'ts, timely meal adherence
- Sites for injection, Insulin related complications, tips for maintaining blood glucose levels, importance of periodic check-up
- Lifestyle changes, self-examination for wounds & injuries

The Diabetes Prevention Programme (DPP)

Genetic counselling for family

Total Hours		60
PEDAGOGY	Lecture and tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	

TEXTBOOKS

1. Joshi. A.S., Nutrition and Dietetics, McGraw Hill, 2021
2. Bamji. M., Krishnaswamy. N., Textbook on Human Nutrition, Oxford and IBH publishing, IV Edition, 2019
3. Antia, F. P., Clinical Dietetics, IV Edition, Oxford University press, 2002.

REFERENCES

1. Raymond, J.L., Marrow. K, Krause and Mahan's Food and Nutrition Care Process, Elsevier, XV Edition, 2020
2. Whitney, E., Rolfes, R.S Understanding Nutrition, Cengage Learning, 2018
3. Mahan, L, K., Escott-Stump, S., Krause's Food, Nutrition and Diet Therapy, WB Saunders, 14 Edition, 2017
4. Shills, E.M, Olson, A.J. and Shike, M.C. Modern Nutrition in Health and Diseases, Shea and Febiger, Philadelphia, vol. II, 1994
5. Sue Rodwell Williams, Nutrition and Diet Therapy, Times Mirror Mosby College Publishing, St. Louis Toronto, Basin, 1989

JOURNALS

1. Journal of Diabetes
2. Journal of Diabetes and Metabolic Disorder
3. Diabetologia
4. Indian Journal of Diabetes Research

WEB RESOURCES

www.nhm.gov.in

<https://mohfw.gov.in/>

<https://www.icmr.gov.in/>

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Minor Discipline MID 8B					Semester: VII		
Course Title: FOOD - QUALITY CONTROL & ADULTERATION							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to - Understand international and national laws regulating food quality control - Comprehend the various tests to be undertaken for identifying adulteration							
Course Outcome		After successful completion of this course, students will be able to: - Interpret government regulations regarding the manufacture and sale of food products - Analyse food components for quality tests							
CONTENT									
UNIT: I		INTRODUCTION TO FOOD QUALITY					No. of Hours: 10		
- Food Quality Control – Definition, Objectives, - Principles of Quality control of food –Raw material control, processed control and finished product inspection									
UNIT: II		DETERMINATION OF FOOD QUALITY & QUALITY CONTROL					No. of Hours: 20		
- Methods for determining quality - Subjective and objective methods. - Sensory assessment of food quality-appearance, colour, flavour, texture and taste, different methods of sensory analysis, preparation of score card, panel criteria, sensory evaluation room. - Hazard Analysis and Critical Control Point System (HACCP): Introduction, the need for HACCP - Principles of the HACCP System and application of HACCP									

UNIT III	FOOD ADULTERATION AND ADDITIVES	No. of Hours: 15
FOOD ADULTERATION • Definition, Food Commonly Adulterated food, Common Adulterants • Classification of Adulterants, Harmful effects of Adulterants • New adulterants in Foods FOOD ADDITIVES • Classification & characteristics • Permissible level of additives in food manufacturing and processing		
UNIT IV	METHODS OF DETECTING ADULTERANTS	No. of Hours: 20
• Means of Adulteration • Methods of Detection of Adulterants in the following Foods – Household and laboratory testing • Milk and milk products • Oils and fats • Sugar and confectionary		
UNIT V	CONSUMER PROTECTION	No. of Hours: 10
• Consumer education, consumers problems rights and responsibilities, copra 1986, tips for wise purchasing, redressal measures how to give complaints and proforma of complaints • Role of voluntary agencies such as, Agmark, I.S.I. • Food safety officer - powers, procedures, • Role of food analyst, Food Inspectors • Quality control laboratories of companies, private testing laboratories, Quality control laboratories of consumer co-operatives		
Total Hours		60
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS 1. Alli. I, Food Quality Assurance: Principle & Practices, 2023, Taylor & Francis Publishing		

2. Mathur.P, Textbook on Food Safety & Quality Control, 2018, The Orient Black Swan
3. Food Quality Testing & Evaluation Study Guide for IGNOU students, BMAP Eduservices 2024
4. Principles of Food Safety & Quality Management, Study Guide for IGNOU students, BMAP Eduservices 2024

REFERENCES

1. Rao.E.S, Food Quality Evalauation, Variety Book Publisher, 2014
2. Ramaswamy. A, Food Science & Quality Control, Book Enclave, 2023
3. Kumar. S, Food Quality Management, Textbook for UG & PG Students, Notion Press2024

JOURNALS

1. Journal of Food Quality
2. Food Quality & Preference journal
3. Journal of Food Quality & Hazard Control

WEB RESOURCES

<https://fssai.gov.in>

www.foodsafety.tn.gov.in

<https://niftem-t.ac.in>

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Major Discipline MJD19					Semester: VIII		
Course Title: PUBLIC HEALTH AND NUTRITION							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Understand the causes / determinants and consequences of nutritional problems in a community - Familiarize students with various approaches to nutrition and health interventions, programmes and policies							
Course Outcome		After successful completion of this course, students will be able to: - Developing the skills of nutritional relief and response during emergencies and disasters - Analyze the role of various National and International agencies in combating malnutrition							
CONTENT									
UNIT: I		INTRODUCTION TO PUBLIC HEALTH NUTRITION					No. of Hours: 15		
- Concept & Scope of Public Health & Community Nutrition, Ecology of Health - Health indicators - mortality (infant & maternal), morbidity, disability and various health organizations, Malaria and AIDs Control- WHO, UNICEF. - Nutritional Policy and Planning- Aims, Government guidelines and Policy, Governmental and Non -Governmental organization - Programmes in Community Health & Nutrition - Programme Planning: Diagnosis of a Problem, Setting Objectives, Suitability & Relative Cost of Various Alternatives, Programme Implementation & Administration. - Health Communication: Concepts, Scope, Elements and Models of communication, Communication Process - Approaches and Barriers to communication, Communication for Extension Education and Development - Role of Public Health Nutritionists									

UNIT II	HEALTH CARE SYSTEMS	No. of Hours: 10
• Introduction to Indian Healthcare system • National Health Programmes - objectives, action plan, targets, operations, achievements and constraints • National Health Policy, National Population policy, Family planning programmes in India, Census, other data sources & its impact on health planning in India • Primary healthcare in India with special reference to Maternal and Child Health care • Availability & Distribution of Nutrition & Health Care Delivery Services in India • Health service development in India • Recent reforms and challenges • Innovations and good practices in healthcare delivery		
UNIT: III	DETERMINANTS OF FOOD CONSUMPTION AND NUTRITIONAL BEHAVIOUR OF COMMUNITY	No. of Hours: 10
DETERMINANTS OF FOOD CONSUMPTION • Impact of Population Explosion on Quality of Life, Family Size, Nutrition • Agricultural Production, Storage & Distribution • Role of Science & Technology in increasing Food Production • Economic & Socio- Cultural Factors NUTRITION AND BEHAVIOUR • Factors affecting Food Habits & Behaviour • Modification of faulty Food Behaviour of a Community • Economics of Malnutrition • Food based interventions- Fortification, Supplementation, Genetic improvement of foods, their characteristics and uses for different target groups • Nutrition education- Objectives and Channels, • Approaches to Learning - Participative Learning & Action (PLA), Participatory Rural Appraisal (PRA), Information Education and Communication (I.E.C)		
UNIT: IV	NUTRITIONAL PROBLEMS OF THE COMMUNITY AND PROGRAMMES	No. of Hours: 15
NUTRITIONAL PROBLEMS • Global perspectives in malnutrition, Protein energy malnutrition, vitamin A deficiency, Anaemia, Iodine deficiency disorder, Fluorosis and their Control and Management		

Schemes and Programmes to Combat Nutritional Problems		
• Prophylaxis Programmes (Prevention of Nutritional Blindness, Anaemia Control Programme, Iodine Prophylaxis Programme) • Mid-day Meal Programmes (Concept, Relevance, Objectives, Components, Organization and Implementation)- • ICDS Programme (Concept, Relevance, Objectives, Components, Supplementary Nutrition, Immunization, Health Check-ups, Treatment of Minor Ailments and Referral Services)		
UNIT: V	PUBLIC HEALTH LAWS, MONITORING AND EVALUATION OF PUBLIC HEALTH & NUTRITION PROGRAMMES	No. of Hours: 10
PUBLIC HEALTH LAWS		
• Health Acts in India: Medical termination of pregnancy Act, pre-natal diagnostic techniques Act., Employee State Insurance Act • Sexual health, human rights and law: Gender-based violence (including medical violence - forced sterilisations, forced abortions, harmful treatments of fertility, Female genital Mutilation, Article 377 • Laws regarding HIV disclosure, • Bio-medical waste rules, • Transplantation of human organs Act • Surrogacy Regulation Bill • Epidemic Diseases Act • Essential Services Maintenance Act • International Health Regulations		
PROGRAMMES & THEIR ROLE		
• Organization of Existing Programmes • Nutritional Surveillance – Objectives, Indicators in Nutritional Surveillance & their Characteristics, Data Sources, Agencies for Nutritional Surveillance in India. • National and International Agencies for Community Nutrition - WHO, UNICEF, NIN, ICAR, FAO, CSIR • Role of NGOs & Voluntary Agencies • Evaluation of various health programs - Special Nutritional Program, Mid- day meal, ICDS, IDD, Immunization.		
Total Hours		60

PEDAGOGY	Lecture, tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning
TEXT BOOKS 1. Gibson R S. (2005). Principles of Nutritional Assessment. 2nd ed. Oxford University Press 2. PARK'S Textbook of Preventive & Social Medicine, 26/ED, Banarsidas Bhanot Publishers 2021 3. Michael J. Gibney, Barrie M. Margetts, John M. Kearney, Lenore Arab Public Health Nutrition 4. John Wiley & Sons, Mar 2013, The Management of Nutrition in Major emergencies, WHO in collaboration with UNHCR, International Federation of Red Cross and Red Crescent societies and WFP 2000, WHO Publication 5. Pingali, Prabhu & Aiyar, Anaka & Abraham, Mathew & Rahman, Andaleeb. (2019). Indian Food Systems towards 2050: Challenges and Opportunities. 10.1007/978-3-030-14409-8_1. 6. Reh, Emma. (1976), Manual on Household Food Consumption Surveys. FAO. Nutritional studies, No.18. Rome. 7. McLaren, D.S. (Ed.). (1983), Nutrition in the Community. John Wiley and sons, New York. 8. Shukla, P.K. (1982), Nutritional Problems of India – Prentice Hall of India Pvt. Ltd., New Delhi. REFERENCES 1. Norell SE (1998): Workbook of Epidemiology. Oxford: University Press, New York. 2. Jelliffe. D.B. (1996), The Assessment of Nutritional Status in the Community – WHO Monograph Series – No.53. Geneva. 3. Boyle. M.A Community Nutrition in Action – An Entrepreneurial Approach (7th Edition), Cengage Learning JOURNALS 1. Journal of Public Health 2. Indian Journal of Community Health 3. Indian Journal of Public Health Research & Development 4. Indian Journal of Preventive and Social Medicine WEB RESOURCES https://www.hsc.wvu.edu https://swayam.gov.in/ https://www.who.in	

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Major Discipline MJD 20					Semester: VIII		
Course Title: TECHNIQUES IN DIET COUNSELLING							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to • Comprehend the principles of counselling • Determine and translate nutrient needs into menus for individuals and groups across the lifespan, in diverse cultures and religions							
Course Outcome		After successful completion of this course, students will be able to: • Interpret and apply nutrition concepts to evaluate and improve the nutritional health of individuals with medical conditions • Demonstrate diet counselling techniques to facilitate behaviour change and lifestyle modification and acquire skills to establish a diet clinic with use of technology							
CONTENT									
UNIT: I		INTRODUCTION TO DIET COUNSELLING					No. of Hours: 10		
Diet Counselling • Definition, Expectations, goals, scope and limits • Types - Directive and non-directive counselling • The Counselling Process: Techniques for obtaining relevant information Clinical Information • Medical History and General Profile • Dietary Diagnosis - Assessing food and nutrient intakes • Lifestyles, physical activity, stress • Nutritional Status Correlating relevant information and identifying areas of need • Stage I: Problem exploration and clarification • Stage II: Developing new perspectives and setting goals									

• Stage III: Implementation, evaluation and follow up Counselling strategies • Individual and Group counselling, Evaluation and follow up		
UNIT: II	QUALITIES AND SKILLS OF A DIETARY COUNSELLOR	No. of Hours: 15
Dietary Counsellor • Qualities of dietary counsellor • Characteristics of counsellor • Characteristics of target group • Ethics and obligations of dietary counsellor Basic Counselling Skills • Observation Skills and Questioning ◦ Communication Skills (Listening, Feedback, Non-Verbal) ◦ Making Notes and Reflections Counselling Interview • History Taking, Interviewing (Characteristics, Types, Techniques) • Counselling to special group – children, adolescent and elderly • Dietitian's tools and records • Practical considerations in giving dietary advice and counselling ◦ Factors affecting and individual food choice. ◦ Communication of dietary advice ◦ Consideration of behaviour modification ◦ Motivation		
UNIT: III	APPROACHES, APPLICATIONS & ETHICS IN COUNSELLING	No. of Hours: 15
Approaches to Counselling • Theories - Psychoanalysis; Behaviouristic; Humanistic; Cognitive Client-Counsellor Relationship • The Counsellor as a Role Model • The Counsellor's Needs • Counsellor Objectivity/Subjectivity • Emotional Involvement • Counsellor Limits in Practice Counselling Ethics • Need for Ethical Standards • Ethical Codes and Guidelines • Rights of Clients • Dimensions of Confidentiality • Dual Relationships in Counselling Practices • The Counsellor's Ethical and Legal Responsibilities • Ethical Issues in the Assessment Process Application of Counselling • Mental health set up, health care set up and Clinical set up		

• Practitioner v/s client managed care • Communication and negotiation skills • Conceptualizing entrepreneur skills and behaviour		
UNIT: IV	PATIENT COUNSELLING TECHNIQUES & EDUCATION AIDS	No. of Hours: 10
Counselling Techniques • Developing resources and aids for patient education and counselling • Preparation of counselling aids- charts, leaflets, posters • Use of ICT methods Patients' education • Techniques and modes • Follow up • Monitoring and Evaluation of outcome • Consultations Clients/Patients - Adjusting and adopting to individual needs of • Hospitalised patients (Adults, Paediatric, Elderly, Handicapped) • Digestive disorders • Hypertension • Diabetes • Atherosclerosis • Hepatitis • Cirrhosis • Outpatients (adults, paediatric, elderly, handicapped)		
UNIT V	COMPUTER APPLICATIONS IN DIET COUNSELLING	No. of Hours: 10
Computer application • Use of computers by dietitian • Dietary computations • Dietetic management • Education/ training • Information storage • Administrations • Research Execution of software packages • Straight line, frequency table, bar diagram, pie chart, • Preparation of dietary charts for patients • Statistical computation- mean, median, standard deviation, correlation and regression test		
Total Hours		60
PEDAGOGY	Lecture, tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	

TEXT BOOKS

1. F.P. Antia, Clinical Dietetics and Nutrition, Oxford University press, IV edition 2002
2. Srilakshmi. B, Dietetics, New Age International(p) ltd., IX Edition, 2023
3. Bhatt D.P (2008), Health Education, Khel Sahitya Kendra, New Delhi
4. Robinson, C.H, Normal and Therapeutic Nutrition, Macmillan USA; XVII Revised Edition, 2006

REFERENCES

1. Mahan LK and Escott-Stump S (2007): Krause's Food and Nutrition Therapy. 12th Ed. WB Saunders Company, London
2. Zeeman, F.J Application of Clinical Nutrition. Englewood Cliffs, Prentice Hall International Inc, 1998
3. Thomas. B, Blackwell Manual of Dietetic Practice. II Edition, Oxford, New York, 1995
4. Gelso Charles,J. and Fretz Bruce, R. Counselling Psychology, a PRISM Indian edition Harcourt Brace College Publishers, 1995
5. Gibney MJ, Margetts BM, Kearney JM, Arab L (2004) Public Health Nutrition Blackwell Publishing Co. UK
6. Williams SR (1989): Nutrition & Diet Therapy, 6th Ed. Times Mirror/Mosby College Publishing, St. Louis

JOURNALS

1. British Journal of Nutrition
2. International Journal of Food and Nutritional Sciences
3. Journal of American Dietetic Association
4. Indian Journal Medical Research
5. Indian Journal of Nutrition and Dietetics
6. American Journal of Clinical Nutrition

WEB RESOURCES

<https://swayam.gov.in/>

<https://mohfw.gov.in/>

<https://www.icmr.gov.in/>

<https://idaindia.com>

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Major Discipline					Semester: VIII		
Course Title: RESEARCH PROJECT							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
12	Lecture	Tutorial	Practical/ practice	18	Theory	Lab Session	CIA	ESE	Total Marks
	-	-	12		-	-	100*	100	200
*CIA: Guide Valuation -50 + Viva Voce 50 = 100									
INSTRUCTIONS • Guide Allocation shall be decided by Lottery Draw Method • This draw should be held within first month of the third semester itself. • The candidate shall be required to submit THREE copies of the Dissertation. • The last date for receipt of dissertation report shall be 15th March									
DISSERTATION DESCRIPTION • Page limit, cover to cover – 100 pages excluding appendices • Font size 12, times New Roman font, 1.1/2 spacing • Number of Graphs to be maintained within 15 • Number of Plates to be limited to 10 • Bibliography to follow - only APA style									
INSTITUTIONAL ETHICAL COMMITTEE • Institutional Ethical Committee should approve and provide ethical clearance for the research work undertaken by the student									
THRUST AREAS OF RESEARCH Food Related Studies • Development of New Food Product • Scope / Role of Food Service Institution in Tourism Industry • Novel Food/ Functional Food Development									

Nutrition and Health

- Epidemiological study related to diseased conditions
- Nutritional Assessment for various disorders / deficiency/ special groups
- Supplementation study –in vivo – indigenous herbs

Community Health

- Evaluation of Governmental Programmes
- NGO – Role and Functioning
- Community Nutrition Education

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Major Discipline MJD 21					Semester: VIII		
Course Title: ADVANCES IN NUTRITION							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to - Understand the role of nutrition in preventive, promotive and curative health care - Obtain an insight into the current advances in the field of Nutrition							
Course Outcome		After successful completion of this course, students will be able to: - Comprehend the intricate relationship between genes and nutrition - Develop protocols based on modern techniques of personalized nutrition to design diet plans							
CONTENT									
UNIT: I		INTRODUCTION TO NUTRIGENOMICS, NUTRIGENETICS AND EPIGENETICS					No. of Hours: 10		
- Definition and scope - Historical background - Key concepts: genes, nutrients, nutrigenetics and their interactions, Nutrigenomics, Epigenomics, Epigenetics and Nutrition - Epigenetic mechanisms									
UNIT: II		GENETIC VARIATIONS AND NUTRITIONAL RESPONSES					No. of Hours: 20		
- Nutritional regulation of gene expression. - Impact of diet on gene expression - Effect of genetic variations in nutrient metabolism - Role of specific nutrients in controlling gene expression.									

• Relation between food and medicine in controlling of diseases		
UNIT: III	PERSONALIZED NUTRITION	No. of Hours: 5
• Modern Techniques of nutritional assessment – ◦ Biomarkers in nutrition ◦ Digital tools and apps • Using AI to create personalized nutrition plans • Personalised nutrition through gut microbiota • Integration of genetic data with dietary recommendation • Practical applications in personalized nutrition ◦ AI In Health and Nutrition ◦ Diet Computations Using Computer Applications ◦ Use Of Technology in Dietary Practices ◦ Digital health for personal nutrition ◦ Personalized nutrition: ethical issues, regulations and customer protection		
UNIT: IV	GUT MICROBIOTA IN NUTRITION AND HEALTH	No. of Hours: 15
• Microbiome, Microbiota, Microbiota diversity and health, • Role of food, nutrients and drugs on modulation of gut microbiota, • Effect of the gut microbiota on diseases ◦ Metabolic ◦ Immune Related ◦ Autism ◦ Stress		
UNIT: V	EMERGING TRENDS IN NUTRITION	No. of Hours: 10
• Understanding terminologies – Artificial Intelligence, Electronic Health Records, Automated Nutrition applications, • Definition, concept, importance, components of nutrition informatics ◦ Applications in healthcare and nutrition • Future Trends and Innovations ◦ Emerging technologies in AI and nutrition ◦ Potential future applications ◦ Challenges and opportunities		
Total Hours		60

PEDAGOGY	Lecture, tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning
TEXT BOOKS 1. Ross. J RH (2022) Role of Nutrigenomics in Modern-day Healthcare and Drug Discovery, Manohar Publishers & Distributors 2. Galanakis, C. M, (2018) Trends in Personalized Nutrition, Elsevier Inc 3. Kok. F., Bouwman. L., Desiere. F (2008), Personalized Nutrition: Principles and Applications, CRC Press 4. Joshi Y K. (2008) Basics of Clinical Nutrition 2nd ed. Jaypee Brothers Medical Publishers REFERENCES 1. Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier 2. 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. 3. Gibney MJ, Elia M, Ljungqvist & Dowsett J. (2005) Clinical Nutrition. The Nutrition Society Textbook Series. Blackwell Publishing Company 4. Garrow, J.S., James, W.P.T. and Ralph, A. (2000) Human Nutrition and Dietetics. 10th ed. Churchill Livingstone. 5. Marian M, Russel M, Shikora SA. (2008) Clinical Nutrition for Surgical Patients. Jones and Bartlett Publishers. 6. McClave, S.A., Taylor, B.E., Martindale, R.G., Warren, M.M., Johnson, D.R., 7. Braunschweig, C., McCarthy, M.S., Davanos, E., Rice, T.W., Cresci, G.A. and Gervasio, J.M. (2016). JOURNALS 1. The British Medical Journal 2. The American Journal of Clinical Nutrition 3. British Journal of Nutrition WEB RESOURCES https://nutrigenomedb.org www.ncbi.nlm.nih.gov www.nature.com	

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Major Discipline MJD 22					Semester: VIII		
Course Title: MATERNAL AND CHILD NUTRITION							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: • Be familiar with physiological changes & realise the importance of nutritional care and nourishment during pregnancy and lactation • Understand the specific needs of children and the effects of various diseases on their nutritional status and requirements at these stages of life cycle							
Course Outcome		After successful completion of this course, students will be able to: • Understand the inter-relationship between nutrition, growth and development during life cycle • Be competent to recommend / provide appropriate nutritional care based on pathophysiology, prevention/ and treatment of the various diet-related disorders/ diseases							
CONTENT									
UNIT: I		CHANGING CONCEPTS IN MATERNAL AND CHILD NUTRITION					No. of Hours: 10		
• Importance of nutrition prior to and during pregnancy. • Pre-requisites for successful outcome. Effect of undernutrition on mother-child dyad including pregnancy outcome and Maternal and Child Health – Short term and long term. • Physiology and endocrinology of pregnancy and embryonic and foetal growth and development • Nutritional requirements during pregnancy • Adolescent Pregnancy • Pregnancy and AIDS, Pregnancy and TB • Intra-uterine growth retardation, critical windows of development and programming concepts • Complications of pregnancy and management and importance of antenatal care.									

• Congenital malformations, foetal alcohol syndrome and gestational diabetes mellitus		
UNIT: II	LACTATION AND INFANT FEEDING	No. of Hours: 20
• Development of mammary tissue and role of hormones • Physiology and endocrinology of lactation – Synthesis of milk components, let down reflex, role of hormones, lactational amenorrhea, effect of breast feeding on maternal health • Human milk composition and factors affecting breastfeeding and fertility, maternal nutritional status and milk composition. • Management of lactation – Prenatal breastfeeding skills education. Rooming in, problems – sore nipples, engorged breast, inverted nipples • Exclusive breastfeeding, Breast Milk Banks • Baby friendly Hospitals Initiative Unit • Breast feeding in the age of AIDS, Cancer – ○ Feeding of infants and children ○ Dietary management • Key issues in infant Feeding		
UNIT: III	INFANT PHYSIOLOGY, PRETERM AND LBW INFANTS	No. of Hours: 10
• Growth and development during infancy, childhood and adolescence. ○ Normal pattern of growth and development ○ Norms/standards for growth ○ Growth monitoring and promotion, growth faltering, Failure to thrive • Implications for feeding and management		
UNIT: IV	NUTRITIONAL CONSIDERATIONS FOR SPECIAL CONDITIONS AMONG INFANTS & CHILDREN	No. of Hours: 10
• Nutritional Management of Inborn Errors of Metabolism - PKU, Maple syrup urine disease, Homocystinemia, Tyrosinemia, Galactosemia, Glycogen storage disorder • Diarrhoea and constipation - causes, consequences, management • Epilepsy and dietary approaches – ketogenic diet, atkins and recent advances • Role of diet and nutritional challenges in developmental disabilities- autism spectrum disorders, cerebral palsy, Attention deficit, hyperactivity disorder • Type 1 DM – Impact on growth and management • Nephrotic syndrome and CKD in children - Impact on growth and management • Food Allergies		

UNIT: V	MALNUTRITION IN MOTHERS & CHILDREN	No. of Hours: 10
- Etiology and management - Consequences of malnutrition on physical development, mental development, cognitive development. - Effect of deficiencies of specific nutrients - Current Nutrition and Health Status of Women and Children in India. - Policies and programmes for promoting maternal and child nutrition & health at International, national and state level - Concept of small family, methods of family planning, merits and demerits		
Total Hours		60
PEDAGOGY	Lecture, tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS		
J. Bhatia, Z.A. Bhutta, S.C. Kalhan Maternal and Child Nutrition: The First 1,000 Days Karger Medical and Scientific Publishers, 2013 - Duggan., Watkins., Nutrition in Pediatrics, Barnes & Noble 2017 - Suraj Gupte, Pediatric Nutrition, 2021		
REFERENCES		
- WHO/ University of California, Davis (1998) Complementary Feeding of Young Children in Developing Countries. Review of Current Scientific Knowledge. Geneva, WHO. - Lusty T., Diskett, P. (1977) OXFAM's Practical Guide to Selective Feeding Programmes. OXFAM Practical Guide No. 1, Oxford, OXFAM Health Unit - UNICEF (1997). The Care Initiative: Assessment, Analysis and Action to improve care for Nutrition. New York, UNICEF - WHO (1999) Management of severe malnutrition. A manual for physicians and other senior health workers. Geneva - WHO (1999) Nutrition for Health and Development: Progress and Prospects on the Eve of the 21st century. WHO/NHD/99.9. Geneva		
JOURNALS		
- Maternal & Child Nutrition - Journal of Maternal & Child Health - Journal of Health, Population and Nutrition		
WEB RESOURCES		
https://poshan.ifpri.info www.frontiersin.org https://mohfw.gov.in/ https://www.icmr.gov.in/		

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: Major Discipline MJD 23					Semester: VIII		
Course Title: FOOD PRODUCT DEVELOPMENT & ENTREPRENEURSHIP							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	6	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to - Understand the knowledge base for product development - Develop skills in Shelf-life assessment and Product evaluation							
Course Outcome		After successful completion of this course, students will be able to: - Design and develop processes to improve existing products or new products - Evaluate products based on sensory evaluation of foods							
CONTENT									
UNIT: I		DESIGNING NEW PRODUCTS					No. of Hours: 10		
- Types of Food Products - Principles and Purpose of New Product Development - Product Design Specifications - New Food Product Development (NPD) Process – - Idea Generation - Idea Screening - Concept Development & Testing - Marketing Strategy & Business Analysis - Product Development - Test Marketing - Product Launch - Product Management & Planning									

UNIT: II	RECIPE DEVELOPMENT	No. of Hours: 15
• Market Availability & Food Choices – Definition and types – ○ Traditional Foods, Weaning Foods, Convenience Foods- RTE, RTS, Extruded foods, IMF Foods, Speciality Products, Health foods, Nutritional Supplements, Functional Foods, Nutraceuticals, Designer Foods, Sports Foods, Foods for Defence Services, Space foods, Flight foods, Sea Voyage foods • Recipe Selection Criteria • Recipe Optimization • Use of Traditional Recipes, Modification • Standardization • Recent development in Food Ingredients – Additives, Flavourings, Colourings, Emulsifiers, Stabilizer and Sweeteners • Involvement of consumers, chefs and recipe experts		
UNIT: III	SENSORY EVALUATION	No. of Hours: 15
SENSORY CHARACTERISTICS OF FOOD • Appearance, Colour, Flavour, Taste, Texture and Consistency CONDUCTING SENSORY TESTS • Training Panel Members • Testing Laboratory – Preparation of Samples, Techniques of Smelling and Tasting, Testing Time, Design of Experiment • Reasons for Testing Food Quality • Tasting Procedures- Chewing, Nibbling, Slurping, Mouth Rinsing. • Organoleptic Evaluation- Flavour, Colour, Clarity, Viscosity, Texture, Smelling Procedures EVALUATING A NEW PRODUCT • Product matching, product improvement, process change, quality control, storage stability, product grading and rating, consumer acceptance and preference TYPES OF TESTS • Difference Tests, Rating Tests, Sensitivity Tests, Descriptive Tests • Threshold tests- Absolute, Recognition, Differential, Terminal • Discrimination tests- Paired comparison, Duo Trio difference, Triangular difference, Single Sample test, Two Alternative Forced Choice Test		

• Descriptive Tests- Simple Descriptive, Descriptive with Rating, Flavour profile, Dilution Profile Technique • Interpretation of scores • Application of Software in interpreting Scores		
UNIT: IV	FOOD QUALITY EVALUATION AND PERFORMANCE TESTING	No. of Hours: 10
FOOD QUALITY EVALUATION • Physical, Chemical, Nutritional, Functional, Microbial • Food Product stability; Changes in Sensory Attributes and Effects of Environmental Conditions • Shelf-life Evaluation methods • Rapid Diagnostic Methods and kits to test food quality and safety • Developing Packaging Systems for Maximum Stability and Cost Effectiveness; Interaction of Package with food FOOD LABELLING PERFORMANCE TESTING • Product Performance Testing – Meaning • Market Positioning, Developing Test Market Strategies • Various Tools and Methodologies to evaluate consumer attitudes • Preferences and Market Acceptance Factors		
UNIT V	DEVELOPING ENTREPRENEURSHIP	No. of Hours: 10
ENTREPRENEUR – Definition & Types • Skills of an entrepreneur ENTREPRENEURSHIP – Definition & Types • Communication in Entrepreneurship • Advertising new products • Demand, Sales and Product MINISTRY OF SMALL AND MICRO ENTERPRISES (MSME) – • Functions ENTREPRENEURSHIP DEVELOPMENT PROGRAMME • A brief overview of Entrepreneurship development programme • Entrepreneurship development Cell –		

Objectives, Eligibility, duration, funding, disbursement, processing methodology, terms & conditions		
Total Hours		60
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS - Ranganna S (2006): Hand Book of Analysis and Quality Control for Fruits and Vegetables Products, 2nd Ed. Tata McGraw- Hill Publishing Company Limited, New Delhi. - Avantina . S , Food Product development, CBS Publishers Pvt Ltd, 2018 - Sharma. A (2018): Food Product Development, CBS Publishers - Gilbert. K, Prusa. K (2021) Food Product Development Manual, Simple Book Publishing REFERENCES - Lyon, D.H.; Francombe, M.A.; Hasdell, T.A.; Lawson, K. (eds) (2002): Guidelines for Sensory Analysis in Food Products Development and Quality Control. Chapman and Hall, London. - Lawless, H.T. and Klein, B.P. (2001): Sensory Science Theory and Applications in Foods. Marcel Dekker Inc. New York. - Piggott, J.R. (ed) (2008): Sensory Analysis of Foods. Elsevier Applied Science, London. - Graf. E., Saguy. I.S, Food Product Development: From Concept to Marketplace, Springer New York, 2011 JOURNALS International Journal of Food Design Journal of Food Products Marketing Research & Development of Functional food Products WEB RESOURCES https://niftem-t.ac.in https://www.dcmsme.gov.in https://www.mofpi.gov.in		

Programme / Class: B.A/B.Sc/B.COM (Offered to the students of other Departments)							Department: HOME SCIENCE		
Year: I/II		Course Category: Multi-Discipline MLD 1					Semester: I/II/III		
Course Title: FUNDAMENTALS OF FOOD PRESERVATION							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
3	Lecture	Tutorial	Practical/ practice	4	Theory	Lab Session	CIA	ESE	Total Marks
	3	-	-		60	-	25	75	100
Course Objective		To enable the students to: • Comprehend the principles of food preservation • Utilize its application in food preparation • Understand the usage of food adjuncts in food cookery							
Course Outcome		After successful completion of this course, students will be able to: • Gain an understanding of the different techniques of food preservation • Compare the advantages of different convenience foods • Acquire basic skills to establish a food preservation start-up unit							
CONTENT									
UNIT: I		FOOD PRESERVATION					No. of Hours: 10		
• Definition, objectives and principles of food preservation • Different methods of food preservation									
UNIT: II		SUGARS, SALTS, FATS & OILS					No. of Hours: 15		
Sources, Types, Selection, Storage, functions, nutritional aspects and adulteration of • Sugar • Salt • Fats & oils									
UNIT: III		FOOD ADJUNCTS					No. of Hours: 10		
Origin, Selection, Storage, functions, nutritional aspects and adulteration of • Spices, condiments									

• Herbs • Extracts & concentrates		
UNIT: IV	PRESERVED PRODUCTS	No. of Hours: 15
Composition, manufacture, selection, cost, storage, uses and nutritional aspects of • Jam, Jelly, Marmalade • Squashes • Candied Preserves • Sauces, Ketchup • Pickles • Vathals, Vadams		
UNIT V	CONVENIENCE FOODS	No. of Hours: 15
Types, advantages & health consequences of • Ready to cook • Ready to serve • Ready to eat • Fast foods		
Total Hours		60
PEDAGOGY	Lecture, tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXTBOOKS 1. Sivasankar. B, Food Processing and Preservation, Prentice Hall India Learning Private Limited, 2002 2. Subbulakshmi. G, Udipi. A.S, Ghurge SP, Food Processing and Preservation, New Age International Private Limited, 2021 3. Srivastava. RP, Kumar. S: Fruit And Vegetable Preservation: Principles and Practices III Edition, 2019		
REFERENCES 1. Handbook On Fruits, Vegetables & Food Processing with Canning and Preservation NPCB Board, III Edition, Asia Pacific Business Press Inc, 2012 2. The Complete Technology Book on Processing, Dehydration, Canning, Preservation of Fruits & Vegetables (Processed Food Industries) 4th Revised Edition, 2019, NIIR Project Consultancy Services		

WEB RESOURCES

www.egyankosh.in

<https://www.swayam.in>

www.ugcmoocs.inflibnet.ac.in

Programme / Class: BSC. CLINICAL NUTRITION AND DIETETICS							Department: HOME SCIENCE		
Year: IV		Course Category: MULTI DISCIPLINARY COURSE MLD 2					Semester: I/II/III		
Course Title: CULINARY NUTRITION							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
3	Lecture	Tutorial	Practical/ practice	4	Theory	Lab Session	CIA	ESE	Total Marks
	3	-	-		60	-	25	75	100
Course Objective		To enable the students to - Combine the art of cooking with the science of nutrition - Learn basic food preparation, transforming a food product according to the principles of Nutrition							
Course Outcome		After successful completion of this course, students will be able to: - Gain the knowledge and abilities needed to discover and prepare the nutritional components of food - Create meals that promote health and well-being							
CONTENT									
UNIT: I		INTRODUCTION TO FOOD AND NUTRITION					No. of Hours: 10		
- Definitions - Health, Nutrition, Nutritional Status, Diet - Concepts of Food, Optimum Nutrition, Food Guide Pyramid, My Plate - Importance of nutrition in promoting overall wellness - Integration of nutrition with lifestyle choices - The relationship between Nutrition and Health - Brief overview of Functions - Macronutrients : Carbohydrates, Proteins, Lipids and Water - Micronutrients : Vitamins and Minerals									
UNIT: II		CULINARY PRINCIPLES OF FOOD PREPARATION					No. of Hours: 15		
- Food Groups and Their Importance - Chemical Changes in Cooking: Maillard Reaction, Caramelization - Factors affecting food selection - Pre-Preparation Techniques - Vegetables - Methods of improving nutritional quality of food – Supplementation, Fortification, Enrichment - Plating and Presentation of food – Garnishing									

UNIT III	CULINARY SKILLS AND TECHNIQUES	No. of Hours: 15
• Personal Hygiene in the Kitchen • Cooking Methods and techniques • Flavour Development and Seasoning • Developing balanced and varied menus for family		
UNIT IV	VEGAN FOODS	No. of Hours: 10
• Plant-Based Diets - Health and Environmental benefits • Essential Nutrients in Plant-Based Diets • Substituting Animal Products with Plant-Based Alternatives		
UNIT V	WELLNESS NUTRITION	No. of Hours: 10
• Role of Nutrition in Managing Health Conditions • Nutritional impact on brain health • Dietary guidelines for promoting mental health • Role of nutrition in preventing cognitive decline • Understanding Food Allergies and Intolerances • Adapting Recipes for Food Allergies		
Total Hours		60
PEDAGOGY	Lecture, tutorial. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS 1. Marcus, J.B Culinary Nutrition: The Science and Practice of Healthy Cooking, Academic Press, 2013 2. Trakselis L.J., Stein, E.M Culinary Nutrition Principles and Applications, 2nd Edition, American Technical Publishers, 2019		
REFERENCES 1. Eaton,M.A, Rouslin.J., Ware, B.J Nutrition: A Culinary Approach 3rd Edition, Kendall Hunt Publishing, 2011 2. Negi.J Fundamentals of Culinary Art (Theory and Practice of cooking), S. Chand Publishers, 2013		
WEB RESOURCES • https://swayam.in • https://www.nin.res.in • https://cftri.res.in • Youtube. chef deena’s kitchen • Youtube. Chef damu • Youtube. Sanjeev kapoor khazana		

Programme / Class: BSC. CHEMISTRY							Department: HOME SCIENCE		
Year: I		Course Category: Minor Discipline MID (for Students of Chemistry Department)					Semester: I		
Course Title: LIFESPAN NUTRITION – I							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	5	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to: - Acquire knowledge on the growth and development and nutritional needs from birth till adolescence - Understand the basic concepts of diet, gain experience in planning, preparing and serving of meals for various age groups at different income levels based on nutritional status							
Course Outcome		After successful completion of this course, students will be able to: - Comprehend the changes during various stages of growth and development from birth till adolescence - Developing expertise to plan diet for each stage of life according to the guidelines for dietary needs							
CONTENT									
UNIT: I		BASIC PRINCIPLES OF MEAL PLANNING					No. of Hours: 10		
- Explanation of terms: Health, RDA, Adequate intake, Balanced diet. Food exchange list, food guide pyramid, menu, meal planning, Indian Food Plate - Vegetarian diets - classification of vegetarianism. - Quality of various nutrients - proteins, fats, minerals, vitamins, fibres and antioxidants. - Principles of planning meals - Factors affecting meal planning									
UNIT: II		NUTRITION DURING INFANCY					No. of Hours: 15		
- Growth and development - Use of growth chart to monitor development.									

• Advantages of breast feeding. • Nutrition factors of human milk. • Difference between human and animal milk. • Artificial feeding. • Factors to be considered in bottle feeding. • Feeding problems – tooth decay, underfeeding, lactose intolerance, colic, diarrhoea, constipation • Nutritional requirements. • Weaning ○ Definition, Need and use ○ Points to be considered in introducing weaning foods ○ Problems in weaning. ○ Types of supplementary foods		
UNIT III	NUTRITIONAL NEEDS FOR PRESCHOOL CHILDREN	No. of Hours:10
• Growth and development • Nutritional requirements • Dietary guidelines • Feeding problems – Dental Decay, Pica, • Nutritional Problems – Obesity, Protein Energy Malnutrition, Vitamin A		
UNIT: IV	NUTRITIONAL NEEDS FOR SCHOOL CHILDREN	No. of Hours: 10
• Nutritional requirements • Dietary Guidelines • Meals for school children – Importance of Breakfast, Healthful food choices • Nutritional problems – Underweight, Avoidant/Restrictive Food Intake Disorder(ARFID), constipation, dental caries, obesity, infection • Packed Lunch – Points to be considered in planning		
UNIT: V	NUTRITIONAL NEEDS FOR ADOLESCENTS	No. of Hours: 15
• Nutritional requirements • Dietary guidelines • Special needs for girls during menarche - Food habits • Nutritional problems- obesity, eating disorders, osteoporosis, anaemia, under nutrition, premenstrual syndrome, PCOD		
Total Hours		60

PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning
TEXT BOOKS 1. Bamji.M, Krishnaswamy. N, Textbook on Human Nutrition, Oxford and IBH Publishing, IV Edition, 2019 2. Khanna. K., Gupta.S., Passi. H.J., Seth.R., Mahna.R., Puri. S Textbook of Nutrition & Dietetics, Elite Publishing House, II Edition, 2020 3. F.P. Antia, Clinical Dietetics and Nutrition, Oxford University press, IV edition 2002. 4. Srilakshmi. B, Dietetics, New Age International(p) ltd., IX Edition, 2023 5. Joshi.A.S Nutrition & Dietetics, Mc Graw Hill, 2021 6. Abraham.S Nutrition Through Lifecycle, New Age International, 2016 REFERENCES 1. Gopalan.C. Ramasastri, B.V. and Balasubramaniam, S.C., Nutritive Value of Indian foods, National Institute of Nutrition, Hyderabad, 2021 2. Brown. E. J, Nutrition Through Lifecycle, Wadsworth Publication, VI Edition, 2016 3. Williams S.R., Schlenker.E, Essentials of Nutrition and Diet Therapy, Mosby College Publishing, St. Louis Toronto, Basin, VIII Edition, 2003 4. Whitney. E, Rolfes R.S, Understanding Nutrition, Cengage Learning, 2018 5. Worthington Roberts, Bonnie S & others - "Nutrition in Pregnancy & Lactation", III Edition, Times Mirror Mosby College, St. Louis, 1996. 6. Cappellini. B,Marshall.D,Parsons. E, The Practice of the Meal: Food, Families and the Market Place, Routledge, I Edition, 2016 7. Robinson, C.H, Marilyn Lawler. M, Normal and Therapeutic Nutrition, Macmillan USA; XVII Revised Edition, 1990 8. Guthrie H.A. & Others, "Introductory Nutrition", 1986, 6th ed. Times Mirror/Mosby College Pub. St.Louis. JOURNALS 1. British Journal of Nutrition 2. International Journal of Food and Nutritional Sciences 3. Journal of American Dietetic Association 4. Indian Journal Medical Research 5. Indian Journal of Nutrition and Dietetics 6. American Journal of Clinical Nutrition WEB RESOURCES https://swayam.gov.in/ https://mohfw.gov.in/ https://www.icmr.gov.in/	

Programme / Class: BSC. CHEMISTRY							Department: HOME SCIENCE		
Year: I		Course Category: Minor Discipline MID (for Students of Chemistry Department)					Semester: II		
Course Title: LIFESPAN NUTRITION -II							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	5	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		60	-	25	75	100
Course Objective		To enable the students to - Acquire knowledge on the nutritional needs of individuals at different age levels - Understand the basic concepts of diet, gain experience in planning, preparing and serving of meals for various age groups at different income levels based on nutritional status							
Course Outcome		After successful completion of this course, students will be able to: - Comprehend the changes during various stages of adulthood - Develop proficiency to plan diet for each stage of adulthood according to the dietary guidelines							
CONTENT									
UNIT: I		NUTRITIONAL NEEDS OF ADULTS					No. of Hours: 10		
- Reference man and reference woman in relation to occupation. - Dietary guidelines to reduce the cost of a meal. - Nutritional requirements									
UNIT: II		NUTRITION DURING PREGNANCY					No. of Hours: 15		
- Normal growth and weight gain - Physiological changes - Dietary modifications. - General dietary problems. - Complications during various stages of pregnancy. - Nutritional requirements - Diet planning									

UNIT: III	NUTRITIONAL NEEDS DURING LACTATION	No. of Hours: 10
• Physiology of lactation • Milk output and factors affecting it • Dietary guidelines • Nutritional requirements. • Diet planning		
UNIT: IV	NUTRITIONAL NEEDS DURING OLD AGE	No. of Hours: 10
• Physiological changes • Nutritional requirements. • Dietary guidelines • Nutritional, health concerns & complications and their management • Factors contributing to longevity		
UNIT: V	NUTRITION PROGRAMMES FOR WOMEN AND CHILDREN	No. of Hours: 15
• Nutrition intervention programmes: - Supplementary feeding, School lunch, Anaemia & Vitamin A prophylaxis, Goitre control programs, ICDS, food supplementation, fortification & enrichment. • National and International bodies involved in Food and Nutrition Security – WHO, UNICEF, ICMR, NIN		
Total Hours		60
PEDAGOGY	Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning	
TEXT BOOKS 1. Bamji.M, Krishnaswamy. N, Textbook on Human Nutrition, Oxford and IBH Publishing, IV Edition, 2019 2. Khanna. K., Gupta.S., Passi. H.J., Seth.R., Mahna.R., Puri. S Textbook of Nutrition & Dietetics, Elite Publishing House, II Edition, 2020 3. F.P. Antia, Clinical Dietetics and Nutrition, Oxford University press, IV edition 2002. 4. Srilakshmi. B, Dietetics, New Age International(p) ltd., IX Edition, 2023 5. Joshi.A.S Nutrition & Dietetics, Mc Graw Hill, 2021 6. Abraham.S Nutrition Through Lifecycle, New Age International, 2016		

REFERENCES

1. Gopalan.C. Ramasastri, B.V. and Balasubramaniam, S.C., Nutritive Value of Indian foods, National Institute of Nutrition, Hyderabad, 2021
2. Brown. E. J, Nutrition Through Lifecycle, Wadsworth Publication, VI Edition, 2016
3. Williams S.R., Schlenker.E, Essentials of Nutrition and Diet Therapy, Mosby College Publishing, St. Louis Toronto, Basin, VIII Edition, 2003
4. Whitney. E, Rolfes R.S, Understanding Nutrition, Cengage Learning, 2018
5. Worthington Roberts, Bonnie S & others - "Nutrition in Pregnancy & Lactation", III Edition, Times Mirror Mosby College, St. Louis, 1996.
6. Cappellini. B,Marshall.D,Parsons. E, The Practice of the Meal: Food, Families and the Market Place, Routledge, I Edition, 2016
7. Robinson, C.H, Marilyn Lawler. M, Normal and Therapeutic Nutrition, Macmillan USA; XVII Revised Edition, 1990
8. Guthrie H.A. & Others, "Introductory Nutrition", 1986, 6th ed. Times Mirror/Mosby College Pub. St.Louis.

JOURNALS

1. British Journal of Nutrition
2. International Journal of Food and Nutritional Sciences
3. Journal of American Dietetic Association
4. Indian Journal Medical Research
5. Indian Journal of Nutrition and Dietetics
6. American Journal of Clinical Nutrition

WEB RESOURCES

<https://swayam.gov.in/>

<https://mohfw.gov.in/>

<https://www.icmr.gov.in/>

Programme / Class: BSC. CHEMISTRY							Department: HOME SCIENCE		
Year: II		Course Category: Minor Discipline MID (for Students of Chemistry Department)					Semester: III		
Course Title: LIFE SPAN NUTRITION PRACTICAL							Course Code:		
Credits	Credit Distribution			No. of Hours/ Week	Total Hours		End Semester Exam Maximum Marks		
4	Lecture	Tutorial	Practical/ practice	5	Theory	Lab Session	CIA	ESE	Total Marks
	4	-	-		-	90	50	50	100
Course Objective		To enable the students to: • Develop skills to plan balanced diets for various stages of Life cycle/Activity/Income groups • Understand the application of Excel and Diet Software in nutrient calculation							
Course Outcome		After successful completion of this course, students will be able to: • Application of the acquired knowledge in planning & preparing diets for various stages of life cycle • Acquiring proficiency in handling diet software in nutrient calculation							
CONTENT									
Exercise 1: General Laboratory Rules Exercise 2: Planning and preparation of one serving meal for adult men and women based on activities / income levels Exercise 3: Planning and preparation of weaning foods for infants Exercise 4: Planning and preparation of one serving meal for pre-school child. Exercise 5: Planning and preparation of one serving meal/packed lunch for school going children Exercise 6: Planning and preparation of one serving meal/packed lunch for Adolescents Exercise 7: Planning and preparation of one serving meal for a pregnant woman Exercise 8: Planning and preparation of one serving meal for a lactating woman Exercise 9: Planning and preparation of one serving meal for senior citizen									
ASSIGNMENTS/ACTIVITIES TOWARDS INTERNAL ASSESSMENT • Presentations on critiquing select trends in food and diet • Group discussions on Dietary Myths and Facts									
Total Hours							60		
PEDAGOGY		Lecture, tutorial and practice. Seminar / term papers / assignments / presentation / industrial visit / self-study or a combination of these can be used. ICT mode should be preferred. Session should be interactive in nature to enable peer group learning							

VALUE ADDED COURSE
HEALTH & WELLNESS, YOGA EDUCATION, SPORTS AND
FITNESS

Credits: 2

Learning Objectives:

- Describing Health & Wellness programs and services offered , how to access them, and their value to their well-being.
- Learn that principles of nutrition are all important parts of overall wellness.
- To learn the basic concept of wellbeing.
- Demonstrate how to get healthy and stay healthy using multiple strategies.
- Identify healthy behaviors and practices that help to avoid and reduce health risks.
- Yoga education to practice mental hygiene.
- Yoga education to integrate moral values
- Yoga education to possess emotional stability.
- Learn the physical fitness management.

UNIT-I HEALTH & WELLNESS

Define and differentiate health and wellness - Components of health wellness and their relationship between physical activity - Local, demographic, societal issues and factors affecting health and wellness.

Diet and nutrition for health & wellness - Essential components of balanced diet for healthy living with specific reference to the role of carbohydrates, proteins, fats, vitamins & minerals

-malnutrition, under nutrition and over nutrition.

UNIT-II MANAGEMENT OF HEALTH AND WELLNESS

Meaning & importance of various dimensions of wellness. Relationship of physical fitness in achieving wellness. Drugs, doping and wellness. Role of diet and exercise in health management.

UNIT-III YOGA EDUCATION

Meaning and definition of yoga and its aims and objectives - Basic principles of yoga and its importance in our daily life - Yoga for mental attitude - Mind, body, breath and emotional level for higher plan of living.

UNIT-IV YOGA PRACTICES

Types and limbs of yoga - Yoga postures - Asana - Breathing Practices - Pranayama - Relaxation-Meditation- Mudra.

UNIT-V FITNESS ACTIVITIES

Types of fitness activities - Outdoor activities - Basic movement patterns. Indoor activity - Aerobics/Dance Fitness, Resistance Training for fitness.

Reference:

1. Physical Activity and Health by Claude Bouchard, Steven N. Blair, William L. Haskell.
2. Mental Health Workbook by Emily Attached & Marzia Fernandez , 2021.
2. Mental Health Workbook for Women: Exercises to Transform Negative Thoughts and Improve WellBeing by Nashay Lorick, 2022
3. Lifestyle Diseases: Lifestyle Disease Management, by C. Nyamb ichu & Jeff Lumiri, 2018.
4. Physical Activity and Mental Health by Angela Clow & Sarah Edmunds , 2013.
5. The Fitness Mindset by Brian Keane
6. Health Promotion: Mobilizing Strengths to Enhance Health, Wellness, and Well-being [1 ed.] F.A. Davis Company.
7. Yoga RX: A Step-by-Step Program to Promote Health, Wellness, and Healing for Common Ailments, Broadway.
8. Advanced Hatha Yoga: Classic Methods of Physical Education and Concentration [1 ed.], Inner Traditions.
9. Yoga and Physical Education, National Council of Educational Research and Training (NCERT), India.
10. Wealth First: Winning at Weight Loss and Wellness.
11. Administration of Health and Physical Education Programme. Bucher , Charles A.
12. Treaties of Hygiene and Public Health, Ghosh, B.N.
13. Principles of Public Health Administration 2003, Hanlon, John J.
14. The School Health and Health Education , Turner, C.E.
15. Health Education (National Education Association of U.T.A.), Moss et.al.
16. The School Health Education (Harber and Brothers, New York), Nemir A.
17. Nutrition Encyclopedia, edited by Delores C.S. James, The Gale Group, Inc.
18. The Stone Age Health Programme: Diet and Exercise as Nature Intended. Angus and Robertson, Boyd-Eaton S. et al (1989)
19. Stress, How Your Diet can Help: The Practical Guide to Positive Health Using Diet, Vitamins, Minerals, Herbs and Amino Acids, Thorons , Terras S. (1994).