Syllabus developed
According to NATIONAL EDUCATION POLICY 2020
C.B.C.S.
for
M.Sc. (Home Science)
MASTER OF SCIENCE [HOME SC. (FOOD & NUTRITION)]

Semester-VII

Theories/ Practical	Major	Subject Name	Credit 28
Theory	1	Research Methodology I	4
Theory	2	Basics of Food Science	4
Theory	3	Human Physiology	4
Theory	4	Food Service Management	4
Practical	1	Food Service Management	4
Elective/Minor		Nutrition of Health & Physical fitness	4
		or	
		Guidance & Counselling	4
		or	
		Communication & Extension in Home Science	4
Research/Project			4

Semester-VIII

Theories/ Practical	Major	Subject Name	Credit 24
Theory	1	Research Methodology II	4
Theory	2	Nutrition Epidemiology and Geriatric Nutrition	4
Theory	3	Food Microbiology	4
Theory	4	Dietary Counselling and Patient Care	4
Practical	1	Dietary Counselling and Patient Care	4
Research/Project			4

Semester-IX			
Theories/ Practical	**Major**	**Subject Name**	**Credit 24**
Theory	1	Food Processing and Preservation	4
Theory	2	Functional Foods, Biodynamic Principles and Nutraceuticals	4
Theory	3	Biochemistry I - Biomolecules and Energetics	4
Theory	4	Clinical and Therapeutic Nutrition	4
Practical	1	Clinical and Therapeutic Nutrition	4
Research/Project			4
Semester-X			
Theories/ Practical	**Major**	**Subject Name**	**Credit 24**
Theory	1	Paeditric Nutrition	4
Theory	2	Nutrition in Specific Diseases and Disorder in Community	4
Theory	3	Nutrition for Health and Physical Fitness	4
Theory	4	Biochemistry II - Nutritional Biochemistry	4
Practical	1	Biochemistry II - Nutritional Biochemistry	4
Research/Project			4

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SUBJECT : HOME SCIENCE

MASTER OF SCIENCE [HOME SC. (FOOD & NUTRITION)]

Semester : VII

Paper : First

Subject- Research Methodology - I

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objectives

1. To have a basic knowledge about Research and its Methodologies
2. To identify and define appropirate Research problmes

Unit I Introduction to Research

a. Meaning, definition, nature and area of Research in Home Science.

b. Objectives, scope of Research and types of Research.

c. Significance and limitation of Research.

Unit II Selection of Research Problem

a. Definition and identification of Research problem.

b. Selection of research problem.

c. Importance of problem formulation.

d. Source and types of research problem.

Unit III Methods and tools of Data Collectiion

a. Meaning and definition of data.

b. Sources and types of data.

c. Importance and limitation of data.

d. Methods and tools of data collection.

Unit IV Sampling Design

a. Meaning and definition of sampling.

b. Merit and demerit of sampling.

c. Characteristics of good sample design.

d. Classification of sampling techniques.

References:

1. C.R. Kothari, Research methodology, methods and techniques Wiley eastern Ltd.- new
2. C.B. Gupta V. Gupta An introduction to statistical methods Vikas Publishing House Pvt. Ltd.
3. D.N Elhance, fundamentals of statistics

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Semester : VII

Paper : Second

Subject : Basic of Food Science

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objectives:

1. Obtain knowledge of different food groups, their composition and role in diet.
2. To gain knowledge of different plant and animal derived foods and their nutritive values and properties.

Unit I Introduction and concept of food science

a. Basic concept of food, nutrition nutrients and therapeutic diet.
b. Carbohydrates- Introduction and functions of carbohydrate.
c. Classification of carbohydrate.
d. Occurrence and Biochemical importance of carbohydrate.
e. Sources daily requirement and effect of too high and low CHO on health.

Unit II Lipids

a. Introduction and general functions of Lipids.
b. Classification of Lipids.
c. Essential and Non-Essential fatty acids and their importance.
d. Sources, daily requirement and nutritional significance of PUFA, MUFA, SFA and W-3 fatty acids.

Unit III Proteins and amino acids

a. Introduction, origin and functions of proteins.
b. Meaning of amino acids and their classification.
c. Essential and non-essential amino acids.
d. Factors affecting protein bio availability including anti-nutritional factors.
e. Source acids daily requirement and assessment of protein quality (BV, PER, NPU)

Unit IV Vitamins and minerals

a. Define vitamins and minerals.

b. History of vitamins and minerals.

c. Types and uses of vitamins and minerals.

References:

1. Food science, Chemistry and Experimental foods by M. Swaminathan
2. Food Science by Norman.N.Potter.
3. Experimental study of Foods by Griswold R.M.)
4. Food Science by Helen Charley
5. Foundation of Food Preparation by A.G. Peckam
6. Modem Cookery for teaching and trade. volume 1&11, Thangam Longmars Lud Philip. Orient
7. Food Fundamentals by MacWiliams, John Willy and son's, New York. & Food Facts & Principles by Shakunthala munay & Shadakhraswamy,
9. Food Science by Srilakshmi, second edition,2002

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Semester : VII
Paper : Third
Subject : Human Physiology

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objectives

1. Advance their understanding of some of the relevant issues and topics of human physiology
2. Understand alterations of structure and function in various organs and systems in disease conditions

Unit I **Cell structure and Function**

a. Levels of cellular organization
b. Tissues and systems in brief :cell membrance, transport across cell membrance and intercellular communication

Unit II **Endocrine System**

a. Endocrine glands-structure, function, role of hormones, regulation of hormonal secretion-Emphasis on physiology of diabetes and stress hormones
b. Functions and role of skin, eye, nose and tonque in perception of stimulli

Unit III **Digestive System**

Structure and function. Role of liver, pancreas and gall bladdler and their dysfunctions.

Respiratory System

Structure and function. Role of lungs in exchange of gasses. Transport of axygen and $Co_{2.}$

Unit IV **Blood formation, composition, blood clotting and halmostasis**

Formation and function of plasma protein, use of blood for investigation and diognosis of specific disorders.

The Excreatory System

a. Structure and function of nephron-urine formation-role of kidney in maintaing Ph of blood.
b. Water electrolytes and acid base balance, diuretics.

REFERENCES

1. Jain, A.K. Textbook of Physiology
2. Wilson, K.J.W. and Waugh, A. (1986).
3. Gonong, W.F. (1985) Review.

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MASTER OF SCIENCE [HOME SC. (FOOD & NUTRITION)]
Semester : VII
Paper : Fourth
Subject : Food Service Management

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objectives :

1. To develop a knowledge base in key area of food service management
2. To Impart necessary expertise function as a food service manager
3. To equip individual to start their own food service unit leading to entrepreneurship

Unit I Introduction to Food service System

a. Definition of food service system.
b. Objectives of food service system.
c. Types of food service system.

Unit II Menu Planning

a. Definition of menu planning.
b. Principals of menu planning.
c. Steps Involved in planning a menu.
d. Types of menu.
e. Importance and factors considered while planning menu.

Unit III Standarduzation of recipe

a. Introduction and definition of standardization of recipe.
b. Standard recipe format.
c. Importance and uses standard recipe.

Unit IV Food serving and management

a. Introduction and meaning of food serving.
b. Responsibilities of server.
c. Service control factors.
d. Definition of management.
e. Principles of management.
f. Stepes and techniques of effective management.

REFRENCE

1. Sathe, A.Y., A First Course in Food Analysis,1999."Sethi,.
2. Mohini, Catering Management :An Integrated Approach,2015."Sethi,.
3. Mohini, Fasting and Feasting – Then and Now,2008."Sethi, Mohin, Institutional

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MASTER OF SCIENCE [HOME SC. (FOOD & NUTRITION)]
Semester : VII
Subject : Food Service Management

Course : Major (Compulsory) **Credit - 4 (Practical)**

1. Standardization of at least 2 recipes in each of the following category
   a. Cereal and cereal products
   b. Pulses & Grains
   c. Vegetables & Fruits.
   d. Meat, chicken and other fleshy foods.
   e. Milk and its products.
2. Planning and preparation of menu for various occasions and to calculate amount of each food ingredients
3. Calculate Various Cost - food cost, labor cost, operating cost and overhead cost of a home-made dishes.
4. Visits to catering establishment (Any one) welfare/ commercial/ transport catering.

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Semester : VII
Subject : Nutrition for Health and Physical Fitness

Course : Minor (Elective) **Credit - 4 (Theory)**

Objective :

1. To Introduce the fundamental concept of physical education, Health and Fitness
2. To provide a general understanding on nutrition, first aid and stress management
3. To familiarize the students regarding yoga and other activities for developing fitness

Unit I **Concept of Physical education and health**

a. Definition, Aims and Objectives of physical education.

b. Modren concept of health, physical fitness and wellness.

c. Components and types of physical fitness.

Unit II **Yoga and Stress Management**

a. Asanas and its effects

- Padmasana
- Halasana
- Bhujangasana
- Shavasana
- Vajrasana
- Trikonasana
- Padahasthasana

b. Postoral deformities- corrective measures.

c. Stree management and relaxtion techniques.

Unit III **Role of Macronutrients**

a. **Energy -** Release of energy from macronutrients, Energy metabolism during excersise and Energy requirements for physically active persons.

b. **Carbohydrate and Proteins -** Effect of exercise on carbohydrate metabolism, pre, during and post CHO intake in diet and amino acid metabolism during exercise, effect of protein on exercise performance, ingestion of protein before and after exercise.

c. **Lipids -** Fat metabolism during exercise with special reference to the type and intensity of exercise. Nutritional strategies to enhance oxidation of fat during exercise.

Unit IV Effect of exercise on fluid and electrolyte balance:

a. Fluid imbolances- dehydration and over hydration and importance of sports drinks.

b. Micronutrients and exercise.

c. Nutritional problems in physically active person.

REFERENCES

1. Harold M Barrow “Man and Movement: Principles of Physical Education” published in Great Britain by Henry Kimpton Publishers, London.
2. Jesse Peoring Williams “The Principles of Physical Education” Published by College Book House, Shivaji Road, Meerut.
3. William D McArdle, Frank I Katch and Vitor I Katch, Essential of Exercise Physiology, Second edition, New York: LipincoffWelliams and wilkins, 2000
4. Arthar C. Guyton, Physiology of Human Body, Philadelphia: Saunders Company, 1972.
5. Melwin H. Williams. Nutrition for Health Fitness and sport. McGraw Hill Company, Newyork: 1995

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Semester - VII
Course Name : Guidance and Counselling

Course : Minor (Elective) **Credit - 4 (Theory)**

Course Outcome

1. To understand the principles and strategics for guidance and counselling across the life span
2. To learn the concept of guidance counselling and therapy, its process, qualities and responsiblities of counsellors

Unit I **Concept of Guidance & Counselling -** Meaning, Principles, Nature and Need of Guidance, Characteristics, Objectives and Process of Counselling.

Unit II **Types of Guidance -** Meaning, Steps, Principles & Advantages of Educational, Vocational & Personal guidance.

Unit III **Types of Counselling -** Psychological Counselling, Psychotherapeutic, Clinical, Marriage, Vocational, Students & Placement.

Unit IV **Techniques of Counselling -** Interview Techniques, Group Counselling Techniques, Diagnostic and Clinical Techniques.

Selected Readings

1. Ram Nath Sharma, Rachana Sharma, (2018) Guidance & Counselling in India, Atlartic publishers and Dist.
2. Asha K Kinra (2008), Guidance & counselling, Dorling Kindersley (India) Pvt. Ltd., Jai Narain Vyas University, Jodhpur

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MASTER OF SCIENCE [HOME SC. (FOOD & NUTRITION)]

Semester : VII

Subject- COMMUNICATION AND EXTENSION IN HOME SCIENCE

Course : Minor (Elective) **Credit - 4 (Theory)**

Objectives:

1. To develop an understanding regarding the Extenson process
2. To develop an understanding regarding various types of media and their role in Home Science Extension

Unit I Introduction to Extension Education in Home Science

a. Objectives of extension education.
b. Principles of extension education.
c. Functions of extension worker.
d. Qualities of extension worker.
e. Role of extension worker.
f. Role of Home Science extension education in national development.

Unit II Extension Teaching Methods

a. Methods of Extension Teaching.
b. Audio Aids.
c. Visual Aids.
d. Audio-Visual Aids.
e. Adoption and innovation of diffusion.

Unit III Introduction to Communication

a. Origin, Concept, definition, nature of Communication.
b. Models of communication.
c. Levels of communication and Channel of Communication.
d. Effective communication- Frame of reference, perception, fidelity, communication gap, time lag, empathy, homophily, hetrophily.
e. Functions of communication & Problems of Communication.

Unit IV Developmental Communication & Appropriate Technology for Women

a. Understanding the role of traditional and modern media in developmental communication.
b. Participatory approach in developmental communication (PRA & RRA).
c. Transfer of technology and factors affecting TOT.
d. Role and status of women in Rural development.
e. Need of Appropriate technology for women.

References:

1. Ray, G.L., Extension Communication and management, 1999, Nays Prakashan, Calcutta.
2. Tiwari, LP : Communication, Technology and Development, 1987.
3. Indian Ministry of Information & Broad Casting : Mass Media in India, 1985.
4. Dhama, O.P. & Bhatnagar, O.P. : Education and Communication for Development, 1987.

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MASTER OF SCIENCE [HOME SC. (FOOD & NUTRITION)]

Semester : VIII

Paper : First

Subject- Research Methodology - II

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objectives:

1. To develop an ability in students to design a research report and assist the students to collect and analyze data
2. To enable the students to generalise the data and justify the result with the help of statistical analysis

Unit I Hypothesis

a. Meaning and definition of hypothesis.
b. Characteristics or requirements of good hypothesis.
c. Kinds of hypothesis and sources of hypothesis.
d. Methods of testing the significance of hypothesis.

Unit II Research Report

a. Meaning of Research report.
b. Types of Research report.
c. Presentation or layout of research report.
d. Characteristics of a good research report.

Unit III Analysis and Presentation of Data

a. Meaning and importance of content analysis.
b. Classification and tabulation of data.
c. Types of data Presentation.
d. Advantages or disadvantages of data presentation.

Unit IV Measure of Central Tendency

a. Meaning and importance of Measures of Central Tendency.
b. Measures of dispersion- Range, Mean deviation, SD, Quartile deviation, C.V., skewness and kurtosis.

Reference:

1. C.R. Kothari, Research methodology, methods and techniques Wiley eastern Ltd.- new.
2. C.B. Gupta V. Gupta An introduction to statistical methods Vikas Publishing House Pvt. Ltd.
3. Kulbir Singh, Sidhu Methodology of Research in education, sterling Publisher Pvt. Ltd. New Delhi.
4. Arun Kumar, Research Methodology, Anard Publications, Meerut.

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Semester : VIII

Paper : Second

Subject : Nutrition Epidemiology and Geriatric Nutrition

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objectives

1. Understand the multifaceted aspects of aging
2. Understand the specific needs of elderly and effects of various diseases on nutritional status and nutritional requirements at these stage of life cycle.

Unit I The Ageing Society

a. Introduction to geriatric nutrition : The Ageing process and changes associated with ageing process.
b. Physiological Changes : Body composition, gastrointestinal, cardiac, renal, muscular, skeletal, neural (including brain and spinal cord), changes and impact on health and nutritional status.

Unit II Common molecular theories of ageing and nutritional Interventions

a. Factors influencing ageing : Endogenous and Exogenous.
b. Benefits of calorie restriction and exercise.
c. Nutritional requirements for senior citizens.
d. Promoting successful ageing - traditional and modern method.

Unit III Nutritional and Helath Status of elderly

a. Factors influceing food consumption and nutritional status of elderly
b. Under nutrition in the elderly, gastrointestinal disturbances, cardiac, renal, respiratory diseases, mental changes including depression, dementia, Parkinsons, Alzheimers, bone and muscle related abnormalities.
c. Role of Nutrition in prevention of age related diseases.

Unit IV Assessment of Nutritional Status

a. Mini-nutrition index, Assessment of frailty.
b. Policies and programmes of government pertaining to the elderly
c. Promoting fitness and well bieing - Use of various modern and traditional approches.

REFERENCES

1. Mahan, L.K. and Escott-Stump, S. (2000): Krause's Food Nutrition and Diet Therapy, 10'' Edition, W.B. Saunders Ltd.
2. Shils, M.E., Olson, J.A., Shike, M. and Ross, A.C. (1999): Modern Nutrition in Health and Disease. 9th Edition, Williams and Wilkins.
3. Escott-Stump, S. (1998): Nutrition and Diagnosis Related Care, 4'' Edition, Williams and Wilkins.
4. Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics, 10th Edition, Churchill Livingstone.
5. Williams, SR. (1993): Nutrition and Diet Therapy, 7th Edition, Times Mirror/Mosby College Publishing.

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MASTER OF SCIENCE [HOME SC. (FOOD & NUTRITION)]
Semester : VIII
Paper : Third
Subject : Food Microbiology

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objectives

1. To list the major food spoilage microorganisms
2. To analyze mathods used to control or distroy microorganisms commonly found in food
3. To understand the role of beneficial microoganisms in food proccesing

Unit I **Food Microbiology**

a. Introduction to Food Microbiology and its relevance to everyday life.
b. General cheracteristics of Bacteria, Fungi, Virus, Protozoa and algae.

Unit II **Microorganisms Important in Food**

a. Microoragnism Present in different foods.
b. Microbes in foods and fermented food.
c. Importance of Micro-organism in food-primary sources of micro-organisms in food Intrensis and extrinsic parameters of food affecting microbial growth. Isolation and detection of microorganism in food and prevention measures.

Unit III **Contimination and Spoilage of different kinds of foods.**

Contimination and Spoilage of some food products like- cerelas, fruits, vegetables, meat and milk products-kind, sources and prevention.

Unit IV **Food in Relation to Diseases**

a. Food poisoning and intoxication, bacterial-bacillus, clostridium botulinum, clostridium perfringens, E.coli, salmonella, shigelle.
b. Non-bacterial-protozoa, fungi, virus, algae-characteristics and pervention measures.
c. Indicators of food and water sefety and quality.

REFERENCES

1. Frazier : Food Microbiology, Sumathi Mudambi : Food Science
2. R. Anathanarayan & C.H. Jayaram : Text Book microbilolgy
3. Pike, R.L. and Brown, H.L. : Nutrition, An Integrated Approach, New York

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SUBJECT : HOME SCIENCE
MASTER OF SCIENCE [HOME SC. (FOOD & NUTRITION)]
Semester : VIII
Paper : Fourth
Subject : Dietary Counselling and Patient Care

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objective :-

1. To develop an understanding of the role of nutrtion in various deseases.
2. To develop and understanding of the role of dietitians

Unit I **Role of a Dietician in Hospital and Community.**

a. Team Approach to nutritional care, ethical code and resposnsibility.

b. Diet counselling and features of counselling psychology.

Unit II **Diet Counselling Skill**

a. Tactics and Techniques of counselling.

b. Evaluating and understanding the client attitude, how to identify and express your feelings towards the client.

c. Counselling Techniques.

Unit III **Therapeutic relationship**

a. Psychology of feeding the patients- Assessment of needs, education of the patient and follow up and establishing repport with the patient family member.

b. Concept and principles in communication and their application in developing skill in counselling, communication and interview skills.

Unit IV **Methods of Assessment Techniques**

a Eliciting clinical information- Medical History, Assessment of diet- profile, Techniques of obtating relevant information.

b Dietary Assessment- 24 hour recell method, food diary, list of food likes and dislikes, food frequency questionair.

REFERENCES

1. Anita, F. P. Clinical Dietetics and Nutrition, Oxford Univ. Press UJ ed. 1989.
2. Gelso Charles, J. and Fretz Bruce, R. Counselling Phychology, A PRISM Indian Addition Horcourt College Publishers, 1995.
3. Srilaksmi, B. Dietetics, New Age International (P) Ltd. 1997.

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Semester : VIII
Subject : Dietary Counselling and Patient Care

Course : Major (Compulsory) **Credit - 4 (Practical)**

1. Assessment of Nutritional status by Direct and indirect methods
2. Assessment of Nutritional status by Dietary Assessment method - 24 hour dietary recall method, food diary and FFQ.
3. Planning of Exchange list of Cereals, Puslses, Milk, Fruits, Vegetables and Meat products.
4. Educating the local community regarding Nutrition education programme.

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Semester : IX
Paper : First
Subject : Food Processing and Preservation

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objectives

1. To Impart systematic knowledge of basic and applied aspacts in food processing and food laws
2. It enables the students to understand knowledge about processing of different food products and their different techniques

Unit I **Basic concept of Food processing and preservation**

Introduction, concept scope and principles of food processing and Preservation. principle and preservation by low temperature: refrigerator, freezing and dehydrofreezing; cold storage and frozen foods, changes during freezing-physical and chemical changes , processing and preservation by drying, factors affecting drying rate, types of drying techniques (freeze drying and vaccum drying).

Unit II **Different methods of processing and presaervation**

a. Processing and Presaervation by Heat : (bleaching, pasteurization, UHT processing, Heating, Canning, Microwave cooking, changes during microwave cooking and advantages)
b. Different between microwave and conventional heating.
c. Processing by Non-thermal method: Irradiation and High pressure.

Unit III **Food processing Equipments**

a. Material Handling, cleaning and grading, food grain storage, Milling.
b. Separation Techniques: filteration, agitation and mixing.
c. Baking, Roasting, Frying. Extrusion technology (principles and types of extruders).

Unit IV **Government and Trade Standards for Quality**

a. Food Laws and Regulation - PFA, FPO and Food safety Act 2006. BIS standards, Compulsory National Legislation Act, Essential Commodities Act.
b. Rules and regulation for setting up a processing unit.

REFERENCES

1. Arsbel WB, Copley MJ and Morgan AI. 1973. Food Dehydration. 2nd Ed.
2. Tesrosier NW and James N. 1977. Technology of Food Preservation. 4th Ed.
3. Fellows PJ. 2005. Food Processing Technology: Principles and Practice. 2nd Ed.
4. Jelen P. 1985. Introduction Food Processing. Prentice Hall.

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Semester : IX

Paper : Second

Subject : Functional Foods, Biodynamic Principles and Nutraceuticals

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objectives: This course is designed tom enable students to :

a. Gain knowledge about functional foods, biodynamic principles & nutraceuticals

b. Have thorough understanding about the health effects

Unit I Introduction, History and Classification- Probiatics prebiotic, symbiotic, nutrients and non nutrient.

Unit II **Potential health benefits of the following biodynamic principles**

Definition, Chemistry, Sources, Metabolism and bioavailability, effect of processing, physiological effects, effects on human health and potential applications in risk redaction of diseases.

Unit III **Perspective for food application for -**

a. Polyphones: flavonoids, catechins, Tannin curcumin

b. Phytoestrogens/ Isoflavones.

c. Phylosterols.

d. Glucosinolates.

e. Pigments- Lycopence, Carotenoids.

f. Other components-phytates, protease inhibitors saponins, amylase inibitors, haemagglutinins.

Unit VI **Non-nutrient effect of specific nutrients**

a. Proteins, peptides and nucleotides, conjugated linoleic acid and n-3 fatty acids, vitamins and minerals

b. Active biodynamic principles in spices, condiments and other plant materials

References:

1. Cho S.S. and Dreher, M.L. (2001) Handbook Dietary Fibre,Marcel Dekker Inc Newyork

2. Yurawecz, M.P., M.M. Mossoba, J.K.G Kramer, M.W. Pariza and G.J. Nelson eds 1999 Advance in Conjugated Linoleic Acid Research, Vol.1. AOCS Press Champaign

3. Wildman, R.E.C.ed. 2000 Hanbook of Nutraceuticals and functional Foods, CRC Press, Boca Raton

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Semester : IX

Paper : Third

Subject : Biochemistry I - Biomolecules and Energetics

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objective

The objective of the Course is to provide students with an understanding of bimolecules, the basic building blocks that are vital for various life forms, focusing on their key properties, biological roles and functions.

Unit I Introduction and Biomolecules in their cellular environment

a. Introduction and Historical Background of Biochemistry and Biomolecules.

b. The Cellular basis of life, structure and function of a cell and its subcellular components (eukaryotes and prokaryotes)

c. Importance and Application of biochemistry.

Unit II Amino Acids and peptides

a. Introduction, general nature, classification & Importance of Amino Acids.

b. Peptide bond, biological Importance of peptides.

c. Introduction to chromatography, Separation of Amino acids by paper Chromatography.

Unit III Chemistry of Carbohydrates and Lipids

a. Introduction, Classification and functions of Carbohydrates and Lipids.

b. Structure of Glucose, Isomerism, Keto aldo, D- and L- isomerism, optical isomerism, epimerism, anomerism.

c Fatty acids, Essential Fatty acids, Reaction of lipids, Triacylgycerol, Phospholipids, glycolipids.

Unit IV Chemistry of Nucleic Acids and Coenzymes-

a. Introduction to Nucleic acids, Nucleotide, biological importance of nucleotide, Essential Fatty Acids, Reactions of lipids Cholestrol, Protagladian, Lipoproteins, DNA & RNA structure and Functions.

b. Coenzymes and their role in metabolism.

REFERENCES

1. West, B.S, Todd, W.R. Neson, H.S. and Van Brugger, T.T. Test book of Biochemistry, Oxford L.B.H. Publishing Co., New Delhi

2. Weite, A., Handler, P and Smith, E.L.: Principles of Biochemistry, McGraw Hill book Company

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SUBJECT : HOME SCIENCE

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Semester : IX

Paper : Fourth

Subject : Clinical and Therapeutic Nutrition

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objective

1. To understand the effect of various diseare on nutritional status, nutritional and dietary requirements
2. To be able to recommend and provides appropriate nutrition for prevention and treatment of various disorders

Unit I Introduction to Clinical Nutrition

a. Introduction to Nutrients, Nutrition, functions of food, definition of nutrition, nutrients & energy, adequacy, optimum & good nutrition, malnutrition.

b. Food Guide- Basic five food groups and how to use food guide according to RDA.

Unit II Adaptation of Therapeutic diets

a. Concept, Principles and objectives of Therapeutic diets.

b. Routine Hospital Diets, Normal and General Diets, Liquid Diet, Soft Diet, Mode of feeding, Oral feeding, Tube of Eternal feeding, Peripheral vein Feeding.

Unit III Nutrition In Metabolic and Gastrointestnal Diseases

a. Introduction prevalence, Etiology and classes to Diabetes Mellitus, Hypertension.

b. Metabolic Aberration, Symptoms, Diagnosis and Complication.

c. Dietary Management, Different Therapies for management, Education and prevention.

d. Disorders of the Esophagus and stomach- Esophagitis, Hiatus, Hernia, Esophageal, Reflux, Achalasia, Esophageal obstruction, Indigestion gastritis peptic ulcer. Disorders of small intestine and colon Diarrhea, constipation, irritable colon syndrome, crone's disease, diverticulosis ulcerative colitis

Unit IV Nutrition in Cardiovascular and Renal Diseases

a. Introduction, Prevalence, Type in both cardiovascular and Renal diseases.

b. Dietary Management in CVD and manifestation, Dietary Management during End stage renal disease (ESRD) and in Dialysis.

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1. Anita, F.P.: Clinical Dietetics and Nutrition, Oxford Univ. Press UJ ed. 1989
2. Shills, M.E. and Young, V.R.: Modern Nutrition in Health and Disease
3. K.M. Varghese Company, Bombay, VIIed. 1988
4. Joyar M.C and Keteroon: Nutrition and Disease Comparative Aspects of Nutrition and Metabolic Diseases- CRC Press

Syllabus developed
According to NATIONAL EDUCATION POLICY 2020
C.B.C.S.
for
SUBJECT : HOME SCIENCE
MASTER OF SCIENCE [HOME SC. (FOOD & NUTRITION)]
Semester : IX
Subject : Clinical and Therapeutic Nutrition

Course : Major (Compulsory) **Credit - 4 (Practical)**

1. Planning and Preparation of Hospital diets -
   a. Normal Diet b. Soft Diet
   c. Clear Liquid Diet d. Full Liquid Diet
2. Planning, Preparation and Calculation of whole day menu for GI track diseases - Diarrhoea, Constipation, Gastritis and Irritable colon syndroms.
3. Planning, Preparation and Calculation of whole day menu for CVD diseases - Atherosclerosis and Hypertension.
4. Planning, Preparation and Calculation of menu for End stage renal diseases (ESRD) and in Dialysis.

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SUBJECT : HOME SCIENCE

MASTER OF SCIENCE [HOME SC. (FOOD & NUTRITION)]

Semester : X

Paper : First

Subject : Peadiatric Nutrition

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objective :- On successful completion of the course students will be able to:

1. Demonstrate a thorough knowledge of the theory of human nutrition and dietetics as it applies to paediatrics
2. Demonstrate understanding of the aetiology, pathophysiology and clinical features of paediatric diseases and conditions that require dietary modification
3. Apply knowledge of food, nutrition, dietetics and health to the nutritional care of child

Unit I **Introduction to Peadiatrics:**

a. Define overview of Peadiatric Nutrition.

b. Normal pattern of growth in children, failure to thrive and understand short stature.

c. Factors affecting growth of child.

Unit II **Physiology of Infant Nutrition:**

a. Influence of Nutrition on growth & development.

b. Nutritional requirements in the different periods of childhood.

c. Preventional Assessment in children.

Unit III **Artificial Nutrition in Peadiatrics:**

a. Concept of Nutritional Therapy, Evaluation of patients in need of Nutritional support.

b. Dietary products used for sick children or children with special needs.

c. Artificial Nutrition at Home and Nutritional Supplements to support the concentional diet.

d. Role of Probiotic and prebiotic in Child Nutrition.

Unit IV **Feeding Patterns:**

a. Breast Feeding / Formula feeding (Birth 6 month)

b. Complementarty and Early Diet (6 month- 2 years of age)

REFERENCES

1. Ronald E, Kleinmal MD, Frank R, Grur. Pediatric Nutrition, American Academy of Pediatrics. 2020.
2. American Academy of Pediatrics. Pediatric Nutrition Handbook (6 Ed.). 2009.

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SUBJECT : HOME SCIENCE
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Semester : X
Paper : Second
Subject : Nutrition in Specific Disease and Disorders in Community

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objective :- Understand the etiology, physiological and metabolic anamalies of acute and chronic diseases and patient needs

1. Know the effect of the various diseases on nutritional status and food requirement

2. Be able to recommend and provide appropriate nutritional care for prevention and treatment of the various diseases

Unit I **Understanding the Terms: Nutrition, Health, Disease and Disorders.**

Concept of Health care, Levels of health care, primary health care, health care delivery system and role of public health nutritionist in health care delivery system.

Unit II **Assessment of Nutritional Status in Community**

a. Nutritional Assessment - Introduction, Goals and Objectives.

b. Methods of Nutritional Assessment

c. Biochemical tests and clinical signs for Nutritional deficiencies.

d. Dietary Assessment and Diet Survey.

Unit III **General Nutritional Problems in Community**

Histrocial background, prevence, etiology, bio-chemical and clinical manifestations, prevention and theropeutic for the following:

a. Protein Energy malnutrition b. Vit 'A' deficiency
c. Iodione deficiency disorders (IDD) d. Iron deficiency anaemia (IDA)

e. Vitamin deficiency - Beriberi, Riboflivin deficiency, Pallagra, Folic acid and B_{12} deficiency, Scurvy, Rickets and ostemalacia.

Unit IV **Nutritional management in common aliments**

Nutritional requirement in different conditions

a. Diarrhoea

b. Constipation

c. Fever

d. Weight management

REFERENCES

1. Sumathi Mudambi : Food Science
2. Pike, R.L. and Brown, H.L. : Nutrition, An Integrated Approach, New York
3. John Willy and Sons: Energy and Protein Requirements.
4. Srilakshmi, B. Dietetics New Age International (P) Ltd. 1997.

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SUBJECT : HOME SCIENCE
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Semester : X
Paper : Third
Course Name : Nutrition for Health and Physical Fitness

Course : Major (Compulsory) **Credit - 4 (Theory)**

Course Outcome : This course will prepare students to :

1. Understand the components of health and fitness and the role of nutrition in these.
2. Make nutritional, dietary and physical activity recommendation fitness and well-being.
3. Develop ability to evaluate fitness and well being

Unit I Energy

a. Release of energy from macronutrients,

b. Energy metabolism during excersise.

c. Energy requirements for physically active persons.

Unit II Carbohydrate and Proteins

a. Effect of exercise on carbohydrate metabolism, pre, during and post CHO intake in diet.

b. Amino acid metabolism during exercise, effect of protein on exercise performance, ingestion of protein before and after exercise.

Unit III Lipids

a. Fat metabolism during exercise with special reference to the type and intensity of exercise.

b. Nutritional strategies to enhance oxidation of fat during exercise.

c. Lipoproteins and exercise and CVD risk.

Unit IV Effect of exercise on fluid and electrolyte balance:

a. Fluid imbalances- dehydration and over hydration and importance of sports drinks.

b. Micronutrients and exercise.

c. Nutritional problems in physically active person.

REFERENCES

1. Mohan L.K. & Ecott-Stump S. Krause's Food, nutrition and Diet Therapy, 10 Edition. W.B Saunders Ltd. (2000).
2. Whitney K.N. & Rolfes S.R. ; Understanding Nutrition, 8th Edition. (1999).

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Semester : X

Paper : Fourth

Subject : BIOCHEMISTRY II - NUTRITIONAL BIOCHEMISTRY

Course : Major (Compulsory) **Credit - 4 (Theory)**

Objectives

1. To develop understanding about biochemistry of carbohydrate, lipids and protein.
2. To understand the role of enzyme and hormones in our body.

Unit I **Introduction to Nutritional Biochemistry and Carbohydrate Metabolism**

a. Introduction and Importance of Nutritional Biochemistry.
b. Development of Nutritional Biochemistry.
c. Introduction to Metabolism and types of Metabolic reactions.
d. Major Pathways of Carbohydrate Metabolism, Glycolysis, TCA Cycle and Glyconeogenesis.
and coenzymes in metabolism.

Unit II **Lipid and Amino Acid Metabolism**

a. Lipids: Introduction, oxidation of fatty acids, lipid metabolism- metabolism of triglycerides, metabolism of cholestrol, fatty acid biosynthes ketone bodies and bile asids.
b. Amino Acid: Introduction, Amino acid metabolism, transamination and Deamination reaction, Urea cycle, Biosynthesis of nonessential amino acids, plasma protein and its functions.

Unit III **Enzymes and Co-enzymes**

a. Introduction to Enzymes and Co-enzymes, classification of Enzymes.
b. Specificity of Enzymes mechanism of enzymes action, enzyme kinetics.
c. Factors affecting enzyme activity, enzyme inhibition, role of enzymes

Unit IV **Hormones and Nucleic Acid**

a. Hormones: Introduction, The endocrine system, regulation of the endocrine system, biochemical role and functions of hormones.
b. Nucleic Acid: Breif history and functions of Nucleic acid and Nucleotides, Mechanism and structure of DNA and RNA. Regulation of and breakdown of purine and pyrimidine nucleotides.

REFERENCES

1. West, B.S, Todd, W.R. Neson, H.S. and Van Brugger, T.T. Test book of Biochemistry, Oxford L.B.H. Publishing Co., New Delhi
2. Weite, A., Handler, P and Smith, E.L.: Principles of Biochemistry, McGraw Hill book CompanyLehninger, A.L.: Biochemistry: North Publishing Inc. N.Y. Centeron. Abrahim and Schepartg:
3. Biochemisrty: Bernard Students Philadelphia
4. Harper, H.A.Rodweel. V.W. and Vayes, P.A. Jange marngen: Review of Physiological Chemistry
5. Pike, R.L. and Brown, H.L. : Nutrition an integrated Approach, john wiley and sons, III Edition, New York, 1984

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Semester : X
Subject : BIOCHEMISTRY II - NUTRITIONAL BIOCHEMISTRY

Course : Major (Compulsory) **Credit - 4 (Practical)**

1. Estimation of Calcium and Protein.
2. Colorimetric and flurometric: Iron, total and free cholesterol, Vit. A & C, riboflavin
3. Chromatography: Paper Separation of amino acids, Column Separation of lipids (only demonstration)
4. Blood analysis: Blood count, DLC, I- hemoglobin – blood indices and Urine analysis: Glucose detection