SEMESTER –I

HOLISTIC LIFESTYLE & NUTRITION

1. Course description
Programme: M.Sc.
Course Code: P24/NUT/OE/101
Type of course: OE
No. of credits: 2

Max.Hours : 30
Hours per week: 2
Max.Marks: 30

2. Course Objectives:

- To enable the student a have holistic approach for better lifestyle

3. Course Outcomes:

On completion of the course the student will be able to:

CO l: Understand role of foods in preventive care
CO2: Remember the importance to food substitutes for special conditions.

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4. Course content

MODULE 1: DIET AND DISEASES **(15 Hrs)**

1.1 Functional foods: Antioxidants and free radicals. Foods rich in anti-oxidants, Causes of free radicals, cardiovascular disease and fats- lipoproteins, trans fats, n-3, n-6 fatty acids, triglycerides.

1.2 Obesity: Causes and types of Obesity, BMI, management of obesity (surgery), Pseudo grains, roughage, PCOS, Eating disorders, intermittent fasting.

1.3 Salt intake: High blood pressure- causes, ranges, restriction of salt and Dietary management.

MODULE 2: FOOD ALTERNATIVES **(15 Hrs)**

2.1 Food Allergies: Allergies and allergens, foods rich in Allergens, food toxins, school lunch (programs), Eat the rainbow.

2.2 Fermented foods: Introduction, types of fermented foods, importance, principles involved, Probiotics. Role of Probiotics.

2.3 Food alternatives: Types of Artificial sweeteners, Milk alternatives, Gestational diet, Types of Beverages (juices, malted beverages).

5. Reference Books:

1. Apollo Clinical nutrition handbook- Anita Jatana
2. Food Science – B Sri Lakshmi, New Age International Publishers.
3. Text Book of Human Nutrition – Mahtab S Bamji, N PrahladRao, Vinodini Reddy, 2nd edition, Oxford & IBH Publishing Co. Pvt Ltd.

6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local /Regional/National /Global Development Needs	Relevance
Global	This Paper is designed to enable the students to understand the importance of functional foods and superfoods available globally and how they have a good impact on health.

b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	2	The students will develop a skill of identifying the Food additives and artificial sweeteners in the food products.

7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Seminar Presentation	Participative Learning
2.	Quiz	Experiential Learning

8. Course Assessment Plan

Weightage of Marks in Continuous Internal Assessments and End Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
C01	CIA-1 Skill test	End Semester examination
CO2	CIA- 2 Assignment	

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a. Question Paper Pattern

MODEL QUESTION PAPER
HOLISTIC LIFESTYLE & NUTRITION

Course Code:P24/NUT/OE/101 **Max.Marks: 30**
No. of credits : 2 **Time : 1hr**

Answer any Six of the following **6X5= 30 M**

1. Antioxidant
2. Omega - 3 fatty acids
3. Causes of Obesity
4. Beverages
5. Food Allergens
6. Probiotics
7. MDM
8. Intermittent fasting

Prepared by	Checked & verified by	Approved by
Nandini Ms. Nandini Signature of the teaching faculty	Ms. Tabitha Ramona Signature of HoD	Dr. Uma Joseph Signature of Principal

ST.FRANCIS DEGREE COLLEGE FOR WOMEN BEGUMPET

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DEPARTMENT OF NUTRITION

DSC- 1	HUMAN NUTRITION SEMESTER- I	45HRS

Module –1 Principles of Nutrition

Module –2 Pregnancy, Lactation, Infancy and Preschoolers

Module – 3 School Going Children, Adolescents and Geriatrics

- The syllabus contains three Modules.
- Paper should give equal weightage to all Modules.
- Three long question- One question per module with internal choice

SEMESTER – I

HUMAN NUTRITION

1. **Course Description**
   Programme : M.Sc.
   Course Code : P24/NUT/DSC/101
   Course Type : DSC 1
   No. of credits : 3

   Max. Hours : 45
   Hours per week : 3
   Max. Marks : 100

2. **Course Objectives:**

- To understand the role of adequate nutrition in physiological conditions.
- To learn the nutritional requirements and meal management for different age groups.

3. **Course Outcomes:**

On completion of the course the student will be able to:

CO 1: Explain the recommended daily allowances required for diet planning of various age groups and activity involved in meal planning.
CO 2: Define the physiological changes that occur during pregnancy, lactation and the impact of nutrition on the growth and development of children.
CO 3: Discuss the guidelines and modifications for healthy eating habits for school going children, adolescents and the geriatric groups.

4. Course Content :

MODULE 1: PRINCIPLES OF NUTRITION (15 Hrs)

1.1. Energy Balance: Energy value of foods , Estimation of energy value of foods by Bomb Calorimeter and by Benedict's oxy Calorimeter , Factors affecting energy requirements; Factors affecting BMR, SDA, RDA, and derivation of RDA. Physical activity.

1.2. Balanced Diet - Basic five food groups, Nutritional contribution from each group , Balanced diet, Food Pyramid ,Basic principles of meal planning ,Steps in meal planning, food cost.

1.3. Adults -Reference man, Reference woman ,Nutritional requirements of adult man, Nutritional requirements of adult woman

MODULE 2: PREGNANCY, LACTATION, INFANCY AND PRE SCHOOLERS (15 Hrs)

2.1. Pregnancy: Physiological changes, Growth of fetus from conception till term , ,Increase in Nutritional requirements during pregnancy Maternal weight gain and complications of pregnancy

2.2. Lactation: Development of breast, physiology of lactation, Nutritional component of colostrum and mature milk, Increase in Nutritional requirements during lactation, Lactogogues

2.3 Infancy: Growth and development during infancy , Immunization Schedule ,Composition of different types of milk – cow, buffalo, goat and camel, formula milk , Breast feeding Vs bottle feeding, Feeding of Low birth weight and premature infants, Human Milk Banks ,Weaning: Homemade foods Vs commercial foods .

Preschoolers: Milestones and Growth Chart ,Nutritional requirements , Factors to be considered while planning diet for the preschool children

MODULE 3: SCHOOL GOING CHILDREN, ADOLESCENTS AND GERIATRICS (15 Hrs)

3.1. School going children: Nutritional requirements , Packed lunch , Factors to be considered while planning diet for school going children , Influence of television on eating habits of school going children.

3.2. Adolescents: Sequence of developmental changes, Role of hormones on growth, development and maturation , Nutritional requirements during adolescence

Challenges in adolescence: weight control, skipping meals, anorexia, fast foods, ,smoking, alcohol and drug abuse, teenage pregnancy .

3.3 Geriatrics: Physiological changes in aging , Nutritional requirements and Dietary modification , Common diseases affecting geriatric groups , Common disabilities affecting geriatric groups .

5. Reference Books:

1. Mary Kay Mitchell.(2015). Nutrition across the life span. MEDTECH, Scientific international Pvt ltd.
2. Nnakwe, N. (2012). Community nutrition: planning health promotion and diseas prevention. Jones & Bartlett Publishers.
3. Paul Insel, Don Ross et al.,(2013). Discovery nutrition, Library of congress cataloging Jones and Bratlett Publisher
4. Nutrition and the Developing Brain, edited by Victoria Hall Moran, Nicola M. Lowe, CRC Press
5. Sari Edelstein and Judith Sharlin (2009). Essential of life cycle nutrition evidence base approach Jones and Bratlett Publisher.
6. Mahan, L. K., & Raymond, J. L. (2016). Krause's food & the nutrition care process. Elsevier Health Sciences.
7. Shills ME, Olson JA, Shike M & Ross AC. 1999 Modern Nutrition in Health and Disease. Williams & Wilkins
8. Text Book of Human Nutrition- Suryatapa Das, 1st edition, Febrauary-2021
9. Modern Nutrition in Health & Diseases – Eds – Maurice E. Shils, James A.Olson, Moshe Shike, 8th edition, Vol I and II, Willliams & Wilkins Publication.
10. Nutrition and Dietetics – Shubhangini A Joshi, 2nd edition, Tata Mc Graw Hill publication.
11. Food, Nutrition and Diet Therapy – Kathleen Mahan & Krause, Sylvia Escott Stump.
12. Perspectives in Nutrition – Gordon M. Wardlaw, Margaret Kessel, 5th edition, Mc Graw Hill Publication.
13. Nutrition and Metabolism – Nutrition Society Textbook, Eds – Michael J. Gibrey, Ian A Macdonald and Helen, Blackwell publishing.
14. 14.Decisions in Nutrition – Vincent Hegarty.
15. Human Nutrition – Geissler& Powers, 11th edition, Elsevier Publications.
16. Dietetics – B Srilakshmi, 5th edition, New Age International Publishers

6. Syllabus focus

a. Relevance to Local , Regional , National and Global Development Needs

Local/Regional/National /Global Development Needs	Relevance
Regional	Focuses on learning the nutritional requirements for the particular age group of a region.

b. Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	1,2,3,4	Planning balanced diets for the various age groups and physiological condition (pregnancy)

7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Seminar Presentation	Participative Learning
2.	Quiz / Cross word	Experiential Learning
3.	Group Discussion	Participative Learning

8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
CO1	CIA-1	End Semester examination
CO2	CIA-1	
C03	CIA-2 preparation of breakfast foods for adolescents/ school going children	
	CIA -2 MCQ/ fill in the blanks	

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b) Model Question Paper- End Semester Exam

SECTION A - INTERNAL CHOICE			3 Q X 12 M = 36 M	
Question Number	**Question**	**Question**	**CO**	**BTL(Blooms Taxonomy Level)**
1	Module 1	How to estimate the energy value of foods by Bomb Calorimeter and by Benedict's oxy Calorimeter	CO 1	I
2	Module 1	Define the role of Balanced diet , what is meant by Food Pyramid and explain the Basic Principles of mean planning, steps in meal planning.	CO 1	I
3	Module 2	What are the Physiological changes and importance of the increase in nutritional requirements during pregnancy?	CO 2	I
4	Module 2	Explain Growth and development during infancy and discuss the composition of different types of milk – cow, buffalo, goat and camel, formula milk	CO 2	II
5	Module 3	What are the requirements during adolescence, explain the challenges in adolescence in feeding, such as skipping meals, anorexia.	CO 3	I
6	Module 3	Describe the Physiological changes in aging- write about the nutritional requirements and dietary modification in this age group	CO 3	II
SECTION B - ANSWER ANY 4OUT OF 6 (To compulsorily have **ONE** question from **each** module)			4 Q X 6M = 24 M	
7	Module 1	What are the factors affecting BMR	CO 1	I
8	Module 1	Describe the Basic five food groups	CO 1	II
9	Module 2	What are the complications of pregnancy	CO 2	I
10	Module 2	Explain the importance of weaning foods	CO 2	II
11	Module 3	What are the common diseases affecting geriatric groups	CO 3	I
12	Module 3	What are the eating disorders in adolescent age group	CO3	I

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HUMAN NUTRITION
PRACTICAL

Programme : M.Sc.
Course Code: P24/NUT/DSC/101/P
Type of course: DSC- 1
No. of credits : 2

Max. Hours : 30
Hours per week: 3
Max. Marks : 50

Course Objectives:

- To familiarize students with the raw and cooked quantities of food and
- Plan diet for various age groups.

Course outcomes:

- To apply skills to standardize raw and cooked foods to prepare a day's diet
- To analyse the RDA to Calculate Nutritive value, cost

Practical Session

1. Standardization of recipes - Cereal and Pulse- Rice, Upma , Phulka,Chapathi, Kichidi, Idli, Dosa, Dhal with Green Leafy Vegetable
2. Standardization of recipes Beverages and Desserts - Tea, Soup, Juices, Milk Shakes, Porridges, Plain Custard
3. Standardization of recipes- Vegetable and fruits- Vegetable curries and salads
4. Plan a day's diet , Calculate Nutritive value & cost of the menu planned for Adult man/ woman
5. Preparation of the planned diet for Adult man/ woman
6. Plan a day's diet, Calculate Nutritive value & cost of the menu planned Pregnant woman/ Lactating woman
7. Preparation of the planned diet for Pregnant women/ Lactating woman
8. Plan , calculate the nutritive value and cost of a weaning mix
9. Preparation of the planned weaning mix
10. Plan a day's diet , Calculate Nutritive value & cost of the menu planned Preschool/ School going
11. Preparation of the planned diet for School going
12. Plan a day's diet ,Calculate Nutritive value & cost of the menu planned Adolescent Girl/ Boy
13. Preparation of the planned diet for Adolescent Girl/ Boy
14. Plan a day's diet, Calculate Nutritive value & cost of the menu planned Geriatric Woman / Man
15. Preparation of the planned diet for Geriatric Woman / Man

HUMAN NUTRITION
MODEL QUESTION PAPER
PRACTICAL

Course Code: P24/NUT/DSC/101/P **Marks : 50**
No. of credits: 2 **Time: 3 Hrs**

Answer the following

1. Plan a day's diet for the given age group (A, B,C). **15M**
A. Pregnant Mother
B. School Going Child
C. Elderly woman (geriatrics)

a) Write the RDA for the above mentioned age group **5 M**
c) Menu for the day **10 M**

2. Calculate the nutritive value for the planned diet **20M**
a) Calculations

3. Prepare and display the given recipe **10M**

3. Record **5 M**

Prepared by	Checked &Verified by	Approved by
Ms Patricia Signature of the teaching faculty	Ms Tabitha Signature of HoD	Dr.Uma Joseph Signature of Principal

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DEPARTMENT OF NUTRITION

DSC-3	HUMAN PHYSIOLOGY SEMESTER- I	45HRS

Module – 1 Digestive and Excretory System

Module – 2 Blood, Circulatory and Respiratory System

Module – 3 Endocrine System

- The syllabus contains three Modules.
- Paper should give equal weightage to all Modules.
- Three long question- One question per module with internal choice

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SEMESTER – I

HUMAN PHYSIOLOGY

1. Course Description

Programme : M.Sc.
Course Code : P24/NUT/DSC/103
Course Type : DSC- 3
No. of credits : 3

Max. Hours : 45
Hours per week: 3
Max. Marks : 100

2. Course Objectives:

- To enable students to understand the role of different body systems.
- To know anatomy and function of the different organ systems in the utilization of nutrients in the body.

3. Course Outcomes

On completion of the course the student will be able to:

CO 1: Remember and understand the anatomy, functioning of digestive and excretory system.
CO 2: Analyze the general composition, structure, and functions of blood and cardiovascular system, role and abnormalities of respiratory and nervous system.
CO 3: Remember the role of the endocrine system in maintaining homeostasis, role and functions of hormones integrating growth and development and promoting successful reproduction.

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4. Course Content

MODULE 1 : DIGESTIVE AND EXCRETORY SYSTEM **(15 Hrs)**

1.1. Introduction: Structure and functions of a cell. Structure and types of tissues.
1.2. Digestive System: Structure and functions of gastrointestinal tract, Functions of gastrointestinal secretions, Structure and functions of liver, Composition and functions of bile, Role of enzymes in digestion
1.3. Kidney: Structure and Functions of Kidney, Urine formation, Organic constituents of urine, Inorganic constituents of urine, Water and electrolyte balance.
Disorders of Fluid imbalance: Dehydration, edema, Role of hormones in fluid imbalance.

MODULE 2: BLOOD, CIRCULATORY AND RESPIRATORY SYSTEM **(15 Hrs)**

2.1. Heart: Structure and functions of heart and blood vessels , Pulmonary, Systemic and Portal circulation , Blood pressure, Heart rate, Factors affecting BP and heart rate, Regulation of Cardiac output.
2.2. Blood: Blood composition, structure of blood vessels, structure of hemoglobin and function, Plasma proteins; Functions, role in fluid balance. Organic and Inorganic compounds in plasma. Blood Lipids – Chylomicrons, VLDL, LDL, HDL, Cholesterol, Triglycerides. Blood coagulation.
2.3 Respiratory System: Structure and functions of Respiratory system. Mechanism of respiration, Respiratory rate.
Respiratory abnormalities: Hypoxia, Hypercapnia, carbon monoxide poisoning, Asphyxia, Cyanosis, High altitude sickness, Emphysema, Asthma, COPD.

MODULE 3: ENDOCRINE SYSTEM **(15 Hrs)**

3.1. Endocrine glands: Formation and secretion of hormones, Control of hormone secretion, mechanism of hormone action, Pituitary gland: Hormones secreted and their functions, abnormalities.
3.2. Thyroid gland: Structure of thyroid gland, formation of thyroid hormones, functions of thyroid hormones, hypothyroidism, hyperthyroidism, Parathyroid gland: Structure of parathyroid gland, functions of parathormone, hypo and hyper secretion of parathormone.
3.3: Adrenal gland: Structure of adrenal gland, secretions of adrenal cortex and their functions, hypoadrenalism, hyperadrenalism, Secretions of adrenal medulla and their functions,
Islets of Langarhans: Structure of islets of Langarhans, functions of Insulin, deficiency of insulin, functions of glucagon, Testes: Structure and functions of testosterone, Ovaries: Structure and functions of estrogens and progesterone.

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5. Reference Books:

1. Textbook of Medical Physiology – Guyton, 8th edition, HBJ International Edition, WB Sanders.
2. Essentials of Medical Physiology – Anil Baran Singha Mahapatra, 2nd edition, Current Books International.
3. Human Physiology – An Integrated Approach – DU Silverthorne, Prentice Hall.
4. Human Physiology – from cells to system – L Sherwood, 6th edition.
5. Textbook of Biochemistry (for Medical Students) – DM Vasudevan and S Sree Kumari, 4th edition, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi
6. Mahan, L. K., & Raymond, J. L. (2016). Krause's food & the nutrition care process. Elsevier Health Sciences.
7. Shills ME, Olson JA, Shike M & Ross AC. 1999 Modern Nutrition in Health and Disease. Williams & Wilkins

6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local /Regional/National /Global Development Needs	Relevance
National	Human physiology is a study of the various systems of the Body including the digestive, respiratory, nervous, endocrine, excretory also involving the study of tissues, organs etc. This understanding is required for an in-depth knowledge of Nutrition course and developing diet plan for individuals.

b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	1	The skill development can be employed by performing the Experiments on Estimating the Urine sample for the presence of Albumin/sugar etc.
SD	2	The Skill of Estimating the cholesterol, triglyceride content in the blood could be developed through the practical sessions.

7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Seminar Presentation	Participative Learning
2.	Clinical tests with samples	Experiential Learning
3.	Group Discussion	Participative Learning

8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
CO1	CIA-1	End Semester examination
CO2	CIA-1	
C03	CIA-2 seminar presentation	
	CIA-2 Skill test (written)	

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b) Model Question Paper- End Semester Exam

SECTION A - INTERNAL CHOICE			3Q X 12 M = 36 M	
Question Number	**Question**	**Question**	**CO**	**BTL**
1	**Module 1**	Explain the gastric secretions and discuss the mechanism of gastric secretions.	**CO 1**	**II**
2	**Module 1**	Explain the structure and functions of the kidney and discuss the urine formation.	**CO 1**	**II**
3	**Module 2**	Explain the mechanism of respiration along with discussing the oxygen transport.	**CO 2**	**V**
4	**Module 2**	Describe the structure and function of the heart and blood vessels.	**CO 2**	**I**
5	**Module 3**	Describe the structure of thyroid gland, explain the formation of thyroid hormone along with functions of thyroid hormones.	**CO 3**	**I**
6	**Module 3**	Describe the structure of islets of langerhans, mechanism of actions of insulin and glucagon along with regulatory functions.	**CO 3**	**I**
SECTION B - ANSWER ANY 4 OUT OF 6 (To compulsorily have **ONE** question from **each** module)			**4 Q X 6 M = 24 M**	
7	**Module 1**	Mark the Role of enzymes in digestion.	**CO 1**	**V**
8	**Module 1**	List the Organic constituents for urine	**CO 1**	**IV**
9	**Module 2**	Define Hypercapnia	**CO 2**	**I**
10	**Module 2**	Illustrate Blood pressure and abnormalities	**CO 2**	**II**
11	**Module 3**	Identify the Functions of Insulin	**CO 3**	**III**
12	**Module 3**	Elaborate on Hyposecretion of parathormone	**CO 3**	**VI**

HUMAN PHYSIOLOGY
PRACTICAL

Programme : M.Sc.
Course Code: P24/NUT/DSC/103/P
Type of course: DSC 3
No. of credits : 2

Max.Hours : 30
Hours per week: 3
Max.Marks: 50

Course Objectives:

- To acquaint the students with principles of human physiology
- To provide an insight on techniques for analyzing blood and urine

Course Outcomes:

- To be able to apply techniques for Microscopic Examination of various tissues and blood vessels
- To analyze abnormalities in blood and urine

Practical Session

1. Microscopic Examination of various tissues and blood vessels
a. Epithelial
b. Muscular
c. Connective
d. Bone
e. Artery
f. Vein (Specimens)
2. Estimation of blood sample for
a. Enumeration of RBC Count
b. Enumeration of WBC count
3. Determination of blood group and Rh factor.
4. PCV - determination
5. Blood glucose by glucometer method
6. Blood Hemoglobin by Cyanmethhaemoglobin method.
7. Estimation of Urine sample for:
a) Sugar (Benedict's test)
b) Albumin
c) Ketone
8. **Measurement of VITALS:**
a. Measurement of blood pressure by Digital BP monitor
b. Measurement of pulse rate using pulse oxymeter.
c. Measurement of oxygen saturation using pulse oxymeter.

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HUMAN PHYSIOLOGY
MODEL QUESTION PAPER
PRACTICAL

Course Code: P24/NUT/DSC/103/P
No. of credits: 2

Marks : 50
Time: 3 Hrs

1. Identify the given four spotters and write its significance **20M**
2. Identify the abnormal constituent in the given sample and comment on its significance. **20M**
3. Viva **05M**
4. Record **05M**

Prepared by	Checked & Verified by	Approved by
Nandini Ms. Nandini Signature of the teaching faculty	Ms. Tabitha Ramona Name and Signature of HoD	Dr.Uma Joseph Signature of Principal

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DEPARTMENT OF NUTRITION

DSC-4	MEDICAL NUTRITION THERAPY I SEMESTER- I	45HRS

Module 1 - Introduction to Dietetics

Module 2– Energy Imbalance and Febrile Conditions

Module 3 – Gastrointestinal Disorders

- The syllabus contains three Modules.
- Paper should give equal weightage to all Modules.
- Three long questions- One question per module with internal choice

SEMESTER - I

MEDICAL NUTRITION THERAPY-I

1. Course Description

Programme : M.Sc.
Course Code: P24/NUT/DSC/104
Course Type: DSC 4
No. of credits : 3

Max.Hours : 45
Hours per week: 3
Max.Marks: 100

2. Course Objectives:

- To impart in depth knowledge regarding prevalence, etiology, diagnosis, diet and lifestyle management in different diseases.
- To gain knowledge on the methods of assessment of nutritional status among hospitalised patients.

3. Course Outcomes:

On completion of the course the student will be able to:

CO 1: Develop and create skills to conduct detailed nutritional assessments at hospital level to assess health.
CO 2: Analyse the Nutrition support and intervention protocol for critically ill patients
CO 3: Create an understanding about the aetiology, risk factors, clinical features and dietary management of various gastrointestinal disorders .

4. Course Content :

MODULE 1: INTRODUCTION TO DIETETICS (15 Hrs)

1.1 Nutritional Assessment of Hospitalized Patients: Introduction of Dietetics, Principles of Diet Therapy, Role of Dietician, Hospital Diets, Role of Dietician, SGA, MNA, MUST

1.2. Specialized Feeding Methods : Enteral Nutrition- Types – Short term feeding methods, Long term feeding methods, Methods of delivery, Formula feeds. Advantages, Disadvantages and complications. **Parenteral Nutrition:** Types, Composition, advantages, disadvantages and Complications of Parenteral nutrition.

1.3. Surgery : Physiological response, endocrine and metabolic changes . Nutritional care in Pre and Post -operative conditions

MODULE 2 : ENERGY IMBALANCE AND FEBRILE CONDITIONS (15 Hrs)

2.1. Obesity: Definition, types, aetiology, Theories- Fat cell theory and set point theory. Assessment and complications . Management of obesity – Exercise, Diet, Behaviour modification, Pharmacotherapy and Surgery. **Leanness:** Aetiology, complications , Dietary management.

2.2. Burns: Types and severity of burns, Rule of Nine, Metabolic changes in burns, Nutritional support in burns.

2.3. Febrile conditions: Host defence mechanism, Metabolic changes during fever. Short duration -Typhoid- Causes, Clinical features and Dietary management. Long duration – Tuberculosis - Causes, Clinical features and Dietary Management .

MODULE 3 : GASTROINTESTINAL DISORDERS (15 Hrs)

3.1. Gastrointestinal Disorders: Aetiology, Mechanism of Ulcer formation, Symptoms, diagnosis, treatment and dietary management of Peptic ulcer , Diarrhoea – Aetiology, Symptoms, types, treatment-ORS, dietary management. Constipation-Aetiology, symptoms, types, dietary management.

3.2. Inflammatory Bowel Disease : Ulcerative colitis, Crohn's disease, Irritable bowel disease- Aetiology, symptoms, diagnosis, treatment and dietary management.

3.3. Malabsorption Syndrome: Lactose intolerance ,Coeliac disease and Diverticular diseases- Aetiology, symptoms, diagnosis, treatment and dietary management

5. References

1. Clinical Nutrition – Ed Michael J Gibney, Marinos Elia, Olle Ljungqvist and Julie Dowsett.
2. Text Book of Human Nutrition – Mahtab S Bamji, N Prahlad Rao, Vinodini Reddy, 2nd edition, Oxford & IBH Publishing Co. Pvt. Ltd.
3. Food, Nutrition and Diet Therapy – Kathleen Mahan & Krause, Sylvia Escott Stump.
4. Normal and Therapeutic Nutrition - Robinson & Lawler, 17th edition, Mac Millan Publishers.
5. Foods – Nutrition and Health – Dr.VijayaKhader, Kalyani Publishers.
6. Nutrition in Health and Diseases – Anderson, 17th edition.
7. Modern Nutrition in Health & Disease – Eds – Maurice E. Shils, James A. Olson,
8. Moshe Shike, 8th edition, Vol I and II, Williams & Wilkins Publication.
9. Nutrition in clinical Practice – David L. Katz, Lippincott, Williams & Wilkins.
10. Clinical Dietetics and Nutrition – F P Antia and Philip Abraham.
11. Biochemistry – U Satyanarayana, U Chakrapani, Books & Allied (P) Ltd.
12. Perspectives in Nutrition – Wardlaw Kessel, Mc Graw Hills.

6. Syllabus Focus

a. Relevance to Local, Regional, National and Global Development Needs

Local/Regional/National /Global Development Needs	Relevance
Global	Focuses on assessing the individual's nutritional status and providing an individualized nutrition plan for their health condition.

a. Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
EMD	1,2,3,4	Planning therapeutic diets for various disease conditions.

7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Seminar Presentation	Participative Learning
2.	Quiz	Experiential Learning
3.	Group Discussion	Participative Learning

8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
CO1	CIA-1	End Semester examination
CO2	CIA-1	
C03	CIA-2 PPT Presentation	
	CIA -2 Quiz	

SECTION A - INTERNAL CHOICE **3Q X 12 M = 36 M**

Question Number	Question	Question	CO	BTL(Blooms Taxonomy Level)
1	Module 1	Explain about the need for diet modification and describe the modification of normal diets and the types of hospital diets. .	CO 1	II
2	Module 1	What are the various types of feeding methods used in enteral nutrition? Add a note on advantages and disadvantages of enteral nutrition	CO 1	I
3	Module 2	Give the types, and complications and the dietary management of obesity.	CO 2	I
4	Module 2	What are the metabolic changes seen in fever. Give the symptoms and dietary management of long duration fever ?	CO 2	I
5	Module 3	What are the causes, symptoms of Peptic Ulcer? Explain the changes made in the dietary management.	CO 3	I
6	Module 3	Describe Ulcerative Colitis, Crohn's Disease and Irritable Bowel disease.	CO 3	II

SECTION B - ANSWER ANY 4 OUT OF 6 **4Q X 6 M= 24 M**
(To compulsorily have **ONE** question from **each** module)

11	Module 1	Describe the Role of Dietician	CO 1	II
12	Module 1	Explain Parenteral Nutrition	CO 1	II
13	Module 2	Illustrate the Metabolic changes in burns	CO 2	II
14	Module 2	What is the dietary management in Typhoid	CO 2	I
15	Module 3	What is the dietary guidelines for Constipation	CO 3	I
16	Module 3	Explain Coeliac Disease	CO3	II

MEDICAL NUTRITION THERAPY- I
PRACTICAL

Programme : M.Sc. **Max.Hours : 30**
Course Code: P24/NUT/DSC/104/P **Hours per week: 3**
Type of course: DSC 4 **Max.Marks: 50**
No. of credits : 2

Course Objectives:

- To familiarize the students with newer concepts in dietary management of Various disorders and diseases.
- To be able to plan therapeutic diets using Dietary Prescription

Course Outcomes:

CO 1: To apply concepts of therapeutic condition to plan and calculate nutritive value

CO2: To create and prepare a menu based on various dietary disorder.

Practical Sessions

1. Plan a day's diet , Calculate Nutritive value for Surgery
2. Preparation of the planned diet for surgery
3. Plan a day's diet , Calculate Nutritive value for Obesity
4. Preparation of the planned diet for Obesity
5. Plan a day's diet , Calculate Nutritive value for Leanness
6. Preparation of the planned diet for Leanness
7. Plan a day's diet, Calculate Nutritive value for Peptic Ulcer
8. Preparation of the planned diet for Peptic Ulcer
9. Plan a day's diet , Calculate Nutritive value for Ulcerative colitis
10. Preparation of the planned diet for Ulcerative colitis
11. Plan a day's diet, Calculate Nutritive value for Typhoid
12. Preparation of the planned diet for Typhoid
13. Plan a day's diet, Calculate Nutritive value for Tuberculosis
14. Preparation of the planned diet for Tuberculosis
15. Plan a day's diet and Calculate Nutritive value for Burns
16. Preparation of the planned diet for Burns

MEDICAL NUTRITION THERAPY- I
MODEL QUESTION PAPER
PRACTICAL

Course Code: P24/NUT/DSC/104/P **Marks:50**
No. of credits : 2 **Time:3 Hrs**

Answer the following

1. Plan a therapeutic diet for the condition (A, B,C).	**15 M**
A. Obesity (1500 kcal)	
B. Peptic ulcer (1800 kcal)	
C. Ulcerative Colitis(1600 kcal)	
Calculate the dietary prescription and write the nutrient requirement for the given condition	**05 M**
Menu for the day	**10 M**
2. Calculate the nutritive value for the planned diet -	**20 M**
3. Prepare and display Lunch/ Dinner	**10M**
4. Record	**05 M**

Prepared by	Checked & Verified by	Approved by
Ms.Tabitha Ramona Signature of the teaching faculty	Ms. Tabitha Ramona Signature of HoD	Dr.Uma Joseph Signature of Principal

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HYDERABAD-500016

(AN AUTONOMOUS COLLEGE OF OSMANIA UNIVERSITY)

DEPARTMENT OF NUTRITION

DSC- 2	**NUTRITIONAL BIOCHEMISTRY- I** **SEMESTER- I**	**45HRS**

Module –1 Carbohydrates and their Metabolism

Module –2 Amino Acids and their Metabolism

Module – 3 Protein and their Metabolism

- The syllabus contains three Modules.
- Paper should give equal weightage to all Modules.
- Three long questions- One question per module with internal choice.

SEMESTER – I

NUTRITIONAL BIOCHEMISTRY- I

1. Course Description

Programme : M.Sc.
Course Code : P24/NUT/DSC/102
Course Type : DSC 2
No. of credits : 3

Max. Hours : 45
Hours per week: 3
Max. Marks : 100

2. Course Objectives:

- To enable students to understand the role of nutrients in the body.
- To know the classification, functions and metabolism of carbohydrates, amino acids, proteins and nucleic acids.

3. Course Outcomes

On completion of the course the student will be able to

CO 1: Understand the functions of carbohydrates , the metabolic pathways and inborn errors of carbohydrate metabolism.
CO 2: Remember types and structure of amino acids, their metabolism and disorders of aminoacid metabolism.
CO 3: Remember the role of different proteins , their synthesis and transitional changes.

4. Course Content

MODULE 1: CARBOHYDRATES AND THEIR METABOLISM (15 Hrs)

1.1. Introduction: Classification, sources, functions and requirements, Digestion and absorption, Transport, utilization and storage.

1.2. Metabolism: Glycolysis, TCA cycle, Pentose phosphate pathway, Glycogenesis, glycogenolysis, gluconeogenesis, Electron transport chain , alcohol metabolism.

1.3. Inborn errors of Carbohydrate Metabolism: Glycogen storage diseases, Lactose intolerance, Galactosemia, Fructose intolerance.

MODULE 2: AMINO ACIDS AND THEIR METABOLISM (15 Hrs)

2.1. Amino Acids: Classification-chemical composition & Nutritional classification of amino acids,Functions ,

2.2. Metabolism : Proteins-Transamination, oxidative and non oxidative deamination, Decarboxylation, Urea Cyle.

Amino acids - tyrosine, tryptophan, phenylalanine, Metabolism of methionine, leucine and arginine, Urea cycle

2.3. Inborn errors of metabolism: PKU , Tyrosinemia, Maple syrup urine disease, Homocystinuria, Alkaptonuria.

MODULE 3 : PROTEIN AND THEIR METABOLISM (15 Hrs)

3.1.Proteins: Classification- chemical composition & Nutritional classification of proteins Functions , sources , digestion, absorption , transport and storage.

3.2.Protein synthesis - Genetic code, types and site of protein synthesis, Components required , Steps in protein synthesis- Initiation , Translation , Elongation,Termination of peptide Chain.

3.3.Post translational changes: Acetylation, Glycosylation, Hydroxylation and phosphorylation, Chaperones and inhibitors of Protein synthesis.

5. Reference Books:

1. David L. Nelson, Michael M. Cox. L. Lehninger Principles of Biochemistry. Macmillan
2. Murray, R K., Granner, D K., Mayes, P A., & Rodwell, V W. Harper's Illustrated Biochemistry. Lange medical book/ McGraw-Hill.
3. Damodaran, S., Parkin, K. L., & Fennema, O. R. (Eds.). (2007). Fennema's Food Chemistry. CRC press.
4. Shills ME, Olson JA, Shike M & Ross AC. 1999 Modern Nutrition inHealth and Disease. Williams & Wilkins
5. Guyton. Human physiology and mechanism of disease. W.B. Saunders Company
6. Chatterjea MN & Rana Shinde. Textbook of Medical Biochemistry. Jaypee publication.
7. Satyanarayana U. & Chakrapani U. Biochemistry. Books & Allied (P) Ltd.

6. Syllabus focus

a. Relevance to Local , Regional , National and Global Development Needs

Local/Regional/National /Global Development Needs	Relevance
Global	Understanding nutritional biochemistry to establish optimal dietary oand nutritional requirments of both healthy individuals and those infected with illness

b. Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	1, 2,3	Gaining skills in qualitative analysis of biomolecules

8. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Seminar Presentation	Participative Learning
2.	Food samples testing	Experiential Learning
3.	Group Discussion	Participative Learning

9. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
CO1	CIA-1	End semester examination
CO2	CIA-1	
C03	CIA-1 seminar presentation	
	CIA-2- FIB, written test	

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b) Model Question Paper- End Semester Exam

SECTION A - INTERNAL CHOICE			3 Q X 12M = 36M	
Question Number	**Question**	**Question**	**CO**	**BTL(Blooms Taxonomy Level)**
1	**Module 1**	Describe are the the classification of carbohydrates with appropriate example	**CO 1**	**I**
2	**Module 1**	Explain in detail the Glycolysis cycle, along with the energetic.	**CO 1**	**V**
3	**Module 2**	Describe the transamination and decarboxylation of amino acids, with appropriate examples.	**CO 2**	**II**
4	**Module 2**	Explain about PKU and Alkaptonuria.	**CO 2**	**II**
5	**Module 3**	Illustrate in detail about the classification of Proteins and write in detail the process of digestion and absorption. with appropriate examples.	**CO 3**	**II**
6	**Module 3**	Explain about the elongation and termination of peptide chain.	**CO 3**	**II**
SECTION B - ANSWER ANY 4 OUT OF 6 (To compulsorily have **ONE** question from **each** module)			**4Q X 6 M = 24M**	
7	**Module 1**	Explain Alcohol metabolism	**CO 1**	**II**
8	**Module 1**	What is Glycogenesis	**CO 1**	**I**
9	**Module 2**	What are the Functions of nucleic acids	**CO 2**	**I**
10	**Module 2**	Illustrate the Urinary excretion of amino acids	**CO 2**	**II**
11	**Module 3**	Explain Gout	**CO 3**	**II**
12	**Module 3**	Explain Metabolism of tryptophan	**CO3**	**II**

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NUTRITIONAL BIOCHEMISTRY-I
PRACTICAL

Programme : M.Sc.
Course Code: P24/NUT/DSC/102/P
Type of course: DSC 2
No. of credits : 2

Max.Hours : 30
Hours per week: 3
Max.Marks: 50

Course Objectives:

- To acquaint the students with principles, techniques and application of different methods of food analysis
- Ability to apply basic principles of chemistry to biological systems

Course Outcomes:

- To apply the protocol of chemistry to asses macronutrients
- To analyse pigments in blood and urine

Practical Session

I.Qualitative analysis of Carbohydrate

1. Glucose
2. Fructose
3. Xylose
4. Sucrose
5. Maltose
6. Lactose
7. Starch

II.Qualitative analysis of protein

1. Albumin
2. Aliphatic Amino acids – Alanine
3. Aromatic Amino acids – tyrosine
4. Sulphur containing - Cysteine
5. Guanidino group- Arginine

III.Separation of fatty acid by paper chromatography

IV.Separation of Amino acid by paper chromatography

V. Quantitative analysis of Protein

1. Biurette method

VI.Estimation of Total Sugar

1. Estimation of Reducing sugars by Lane and Eyon Method / DNase Method

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NUTRITIONAL BIOCHEMISTRY - I

MODEL QUESTION PAPER

PRACTICAL

Course Code: P24/NUT/DSC/102/P
No. of credits: 2

Marks : 50
Time: 3 Hrs

Answer the following

1. Write the principle **10M**

a. Estimation of reducing sugar by DNS method.

b. TLC

2. Estimate the concentration of the given Sugar solution using the DNS method. **20M**

Concentration of Std. 1 mg/ml

3. Identify the given sugar sample and report your result with flowchart, Broad inference and the structure. **10 M**

4. Viva **05 M**

5. Record **05 M**

Prepared by	Checked & Verified by	Approved by
Ms Indu Bhargavi Signature of the teaching faculty	Ms. Tabitha Ramona Signature of HoD	Dr. Uma Joseph Signature of Principal

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