ST.FRANCIS DEGREE COLLEGE FOR WOMEN BEGUMPET

HYDERABAD-500016

(AN AUTONOMOUS COLLEGE OF OSMANIA UNIVERSITY)

DEPARTMENT OF NUTRITION

DSC-8	**MEDICAL NUTRITION THERAPY -II** **SEMESTER- II**	**45 HRS**

Module 1 - Nutritional Management for Hepatobiliary and Pancreatic Disorders

Module 2– Nutritional Management for Renal Disorders and Cancer

Module 3 – Nutritional Management for Degenerative Metabolic Disorders

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

SEMESTER –II
MEDICAL NUTRITION THERAPY -II

1. Course Description

Programme : M.Sc.
Course Code: P24/NUT/DSC/204
Type of course: DSC 8
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 life style management in acute and chronic diseases.
- To gain knowledge to recommend and provide appropriate nutritional care for prevention or and treatment of various diseases.

3. Course Outcomes

After the successful completion of the course, the student will be able to:

CO1: Understand the etiology, risk factors, clinical features and dietary management of Hepatic and Pancreatic Disorders.

CO 2: Understand the physiology and the dietary intervention in Renal disorders and Cancer.

CO 3: Apply knowledge of nutrition in dealing with metabolic conditions.

4. Course Content

MODULE1: NUTRITIONAL MANAGEMENT FOR HEPATOBILIARY AND PANCREATIC DISORDERS **(15 Hrs)**

1.1 Liver: Liver function Tests. Hepatitis- Types, Etiology, symptoms, diagnosis and dietary management . Fatty Liver, NAFLD. Cirrhosis of Liver, Hepatic Coma, Liver Transplant

1.2 Gallbladder: Etiology, symptoms, diagnosis and dietary management of: Cholecystitis and Cholelithiasis.

1.3 Pancreas : Etiology, symptoms, diagnosis and dietary management of Acute Pancreatitis, Chronic Pancreatitis

MODULE2: NUTRITIONAL MANAGEMENT FOR RENAL DISORDERS AND CANCER **(15 Hrs)**

2.1Kidney: . Etiology, symptoms, diagnosis and dietary management of: Acute and Chronic Glomerulonephritis, Nephrosis.

2.2Renal Failure: Etiology, symptoms, diagnosis and dietary management ofAcute Renal Failure, Chronic Renal Failure. Urinary calculi, Dialysis - Types , advantages ,disadvantages and Dietary management , Kidney Transplant,

2.3 Cancer : Types, mechanism , Etiology, metabolic changes, treatment (drugs, chemotherapy and radiotherapy) , Nutritional management of cancer

MODULE3: NUTRITIONAL MANAGEMENT FOR DEGENERATIVE METABOLIC DISORDERS **(15 Hrs)**

3.1 Diabetes Mellitus: Types, metabolic changes , Etiology, symptoms, diagnosis Complications , Treatment – exercise, hypoglycemic drugs, insulin and diet, Dietary Management – Role of fibre, glycemic index, food exchange list.

3.2 Thyroid Gland : Dietary management in Hypothyroidism and Hyperthyroidism . Polycystic Ovarian Syndrome, Gout

3.3 Heart : Risk Factors,Role of Fat in the development of Atherosclerosis, Dietary Management of Cardio Vascular Diseases. Hypertension- Causes,Types, Symptoms and Dietary management.

5. Reference Books:

1. Clinical Dietetics and Nutrition – F P Anita and Philip Abraham.
2. Food, Nutrition and Diet Therapy – Kathleen Mahan & Krause, Sylvia EscottStump.
3. Normal and Therapeutic Nutrition – Robinson & Lawler, 17th edition, Mac MillanPublishers.
4. Clinical Nutrition – Ed Michael J Gibney, MarinosElia, OlleLjungqvist and JulieDowsett.
5. Basics of Clinical Nutrtion, 2nd Edition, Joshi, Jaypee Publishers .
6. Foods – Nutrition and Health – Dr.VijayaKhader, Kalyani Publishers.
7. Nutrition in Clinical Practice – David L. Katz, Lippincott, Williams & Wilkins.
8. Text Book of Human Nutrition – Mahtab S Bamji, N PrahladRao, Vinodini
9. Reddy, 2nd edition, Oxford & IBH Publishing Co. Pvt. Ltd.
10. Nutrition in Health and Diseases – Anderson, 17th edition.
11. Modern Nutrition in Health & Disease – Eds – Maurice E. Shils, James A.
12. Olson, Moshe Shike, 8th edition, Vol I and II, Williams & Wilkins Publication.
13. Biochemistry – U Satyanarayana, U Chakrapani, Books & Allied (P) Ltd.
14. Principles and Applications in Health Promotion – Sintor& Crowley, 2nd edition.
15. Perspectives in Nutrition – WardlawKessel, McGraw Hills.

6 Syllabus Focus

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

Local/Regional/National /Global Development Needs	Relevance
Global	To identify various aetiological factors in different disease conditions and learn to modify the various nutrients through diet .

b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
EMP	1.2.3	Planning and preparation of therapeutic diets in various degenerative and metabolic diseases.

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 andEnd Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
CO1	CIA-1	End Semester examination
CO2	CIA-1	
C03	CIA-2 Assignment	
	CIA -2 Fill in the Blanks	

b) Model Question Paper- Model Question Paper

SECTION A - INTERNAL CHOICE			3 Q X 12 M = 36 M	
Question Number	**Question**	**Question**	**CO**	**BTL(Blooms Taxonomy Level)**
1	Module 1	What are the types of Jaundice? Mention the diagnostic tests and dietary management of the same	CO 1	I
2	Module 1	What are Cholecystitis and Cholelithiasis? What are the symptoms? What kind of diet would you suggest for the condition?	CO 1	I
3	Module 2	Write about the structure and function of the kidney. What is the etiology, symptoms, and diagnosis of Acute and Chronic Glomerulonephritis?	CO 2	I
4	Module 2	Why is kidney transplant necessary? What diet would you suggest to a patient with Acute Renal Failure?	CO 2	I
5	Module 3	Define Glycaemic Index. Write about the treatment for Diabetic Mellitus.	CO 3	IV
6	Module 3	Define Glycaemic Index. Write about the treatment for Diabetic Mellitus.	CO 3	IV
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	Write about Liver Cirrhosis	CO 1	I
8	Module 1	Define Viral Hepatitis	CO 1	I
9	Module 2	Explain about Kidney stones	CO 2	II
10	Module 2	Classify dialysis types	CO 2	IV
11	Module 3	Define Hypertension	CO 3	I
12	Module 3	Explain about Gout	CO 3	V

SEMESTER-II
MEDICAL NUTRITION THERAPY -II
PRACTICAL

Programme: MSc. **Max.Hours: 30**

Course Code: P24/NUT/DSC /204/P **Hours per week: 4**

Course Type: DSC 8 **Max.Marks: 50**

No .of Credits: 2

COURSE OBJECTIVES:

Course Objectives:

1. To familiarize the students with newer concepts in dietary management of various disorders and diseases.

Course Outcomes:

- Apply concepts of therapeutic condition to plan and calculate nutritive value
- Create and prepare menu based on various dietary disorder

Practical Sessions

1. Plan a day's diet , Calculate Nutritive value for Viral Hepatitis
2. Preparation of the planned diet for Viral Hepatitis
3. Plan a day's diet , Calculate Nutritive value for Cirrhosis of Liver
4. Preparation of the planned diet for Cirrhosis of Liver
5. Plan a day's diet , Calculate Nutritive value for Nephritis
6. Preparation of the planned diet for Nephritis
7. Plan a day's diet, Calculate Nutritive value for Nephrosis
8. Preparation of the planned diet for Nephrosis
9. Plan a day's diet , Calculate Nutritive value for Renal Failure
10. Preparation of the planned diet for Renal Failure
11. Plan a day's diet, Calculate Nutritive value for Renal Calculi
12. Preparation of the planned diet for Renal Calculi

13. Plan a day's diet, Calculate Nutritive value for Cancer
14. Preparation of the planned diet for Cancer
15. Plan a day's diet and Calculate Nutritive value for Diabetes with Hypertension/Nephropathy /Atherosclerosis
16. Preparation of the planned diet for Diabetes with Hypertension/Nephropathy /Atherosclerosis

MEDICAL NUTRITION THERAPY -II

MODEL QUESTION PAPER

PRACTICAL

Course Code: P24/NUT/DSC/204/P **Marks : 50**
No. of credits: 2 **Time: 3Hrs**

Answer the following

1. Plan a therapeutic diet for the condition (A, B,C). **15 M**

A. Renal failure

B. Viral hepatitis

C. Diabetes with hypertension

I. Calculate the dietary prescription and write the nutrient requirement for the given condition. **5M**

II. Menu for the day **10 M**

2. Calculate the nutritive value for the planned diet - **20 M**

3. Prepare and display Lunch/ Dinner **10 M**

4. Record **5 M**

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

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DEPARTMENT OF NUTRITION

DSC-6	**NUTRITIONAL BIOCHEMISTRY-II** **SEMESTER- II**	**45HRS**

Module 1- Lipids And their Metabolism and Intermediary Metabolism

Module 2– Vitamins

Module 3 – Minerals

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

SEMESTER –II
NUTRITIONAL BIOCHEMISTRY-II

1. **Course details:**

Programme : M.Sc. **Max.Hours :45**
Course Code: P24/NUT/DSC/202 **Hours per week: 3**
Type of course: DSC-6 **Max.Marks: 100**
No. of credits: 3

2. **Course Objectives:**

- To enable students to understand the role of nutrients in the body.
- To know the classification, functions and metabolism of lipids, vitamins, and minerals.

3. **Course Outcomes:**

After the successful completion of the course, the student will be able to

CO 1: Remember lipid, fatty acid and cholesterol synthesis and metabolism in human body
CO 2: Understand the abnormalities of lipids and functions fat soluble vitamins
CO 3: Understand the role of vitamins and water regulation, minerals, trace elements

4. Course Content

MODULE 1 : LIPIDS AND THEIR METABOLISM AND INTERMEDIARY METABOLISM

(15 Hrs)

1.1 Lipids&Fatty Acids : Classification, Types, Sources and functions , Digestion and absorption, Deposition, storage and mobilization, role of essential fatty acids and Lipoproteins , Triglycerides and Cholesterol, Role of Lipotropic factors.

1.2 Metabolism: Oxidation and Synthesis of fatty acids , Biosynthesis of triglycerides and phosphatides, Synthesis of Cholesterol, Breakdown and excretion - Bile pigments and bile salts.

1.3 Inborn Errors of Lipid Metabolism: Gaucher's disease, Niemann's picks disease, Tay-sach's, Fabry's disease , Hyperlipoproteinemia,Intermediary Metabolism- Interrelationship between carbohydrate, fat and protein metabolism , Metabolic Changes during starvation.

MODULE 2 : VITAMINS

(15 Hrs)

2.1 Fat Soluble Vitamins: Sources , Functions, Metabolism, transport, utilization, storage, and deficiency of: Vitamin A , Vitamin D , Vitamin E , Vitamin K

2.2 Water Soluble Vitamins (B Complex): Sources, Functions, metabolism, transport, utilization, storage, and deficiency of: Thiamin , Riboflavin ,Niacin, Pantothenic acid, Biotin.

2.3 Water Soluble Vitamins (B Complex and C): Sources, Functions, metabolism, transport, utilization, storage, and deficiency of: Folic Acid , Pyridoxine , Vitamin B12, and Ascorbic acid.

MODULE 3: MINERALS

(15 Hrs)

3.1.Macro Minerals : Sources, functions, absorption, utilization, metabolism and deficiency of Calcium, Phosphorous, Sodium, Potassium. Essential roles - Role of calcium in ossification and bone growth, Inter-relationship between parathormone and vitamin D in the regulation ofcalcium and phosphorus metabolism.

3.2.Micro Minerals : Sources, functions, absorption, utilization, metabolism and deficiency manifestation of Iron,Iodine,Fluorine and Zinc.

3.3.Trace Minerals: Sources, functions, absorption, utilization, metabolism and deficiency manifestation of Copper, Cobalt, Manganese, Selenium and Chromium.

5. Reference Books:

1. A Textbook of Biochemistry – A.V.S.S. Rama. Rao, 9th edition, UBS Publisher's Distribution Pvt. Ltd.
2. Nutritional Biochemistry – Tom Brody, 2nd edition, Academic Press
3. Biochemistry – U Satyanarayana, U Chakrapani, Books & Allied (P) Ltd.
4. Textbook of Biochemistry (for Medical Students) – DM Vasudevan and S SreeKumari,4th edition, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi.
5. Textbook of Medical Biochemistry – M N Chatterjee, RanaShinde, 7th edition, Jaypee Brothers.
6. Textbook of Medical Biochemistry – S Ramakrishnan, K G Prasannan, R Rajan, 3rd edition, Orient Longman.
7. Harper's Illustrated Biochemistry – Robert K Murray, Daryl K Granner, Peter A Mayes, Victor W Rodwell, 26th edition, McGraw Hills.
8. Experimental Biochemistry – A Student Companion – B SashidharRao, Vijay Deshpande, I K International Pvt. Ltd. Clinical Biochemistry – Nagini.
9. Principles of Biochemistry – Leihninger A L, CBS Publishers and Distributors.
10. Nutritional Science – B. Sri Lakshmi, New Age International Publishers, 2nd edition.
11. 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 Needs	Understanding nutritional biochemistry to establish optimal dietary and nutritional requirements to avoid various nutritional deficiency disorders

b) Components on Skill Development/Entrepreneurship Development/Employability

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

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 andEnd 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 Quiz, MCQ	

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	Explain the role Oxidation of fatty acids.	CO 1	V
2	Module 1	Explain in detail the classification, sources and functions of the lipids.	CO 1	V
3	Module 2	List out the various sources Vitamin A, mention its functions and deficiencies.	CO 2	IV
4	Module 2	List out the various sources Thiamin, mention its functions and deficiencies.	CO 2	IV
5	Module 3	What are the factors affecting calcium absorption Role of calcium in ossification and bone growth	CO 3	I
6	Module 3	Explain the role of iodine in human nutrition.	CO 3	V
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	Classification of lipids	CO 1	I
8	Module 1	What is the meaning of Ketosis	CO 1	V
9	Module 2	Explain Cachexia	CO 2	V
10	Module 2	at are the Metabolic Changes during starvation	CO 2	I
11	Module 3	List the role of Vitamin B12	CO 3	IV
12	Module3	Explain Fluid and electrolyte balance	CO 3	V

c) Question Paper Blueprint

NUTRITIONAL BIOCHEMISTRY-II

PRACTICAL

Programme: B.Sc.
Course Code: P24/NUT/DSC /202/P
Course Type: DSC-6
No .of Credits: 2

Max.Hours: 30
Hours per week: 4
Max.Marks: 50

Course objectives

1. To enable students to understand techniques involved in estimation of minerals and vitamins

Course Outcomes

- Understand the metabolism of nutrient molecules in physiological conditions
- Develop skills and knowledge in various quantitative techniques.

PRACTICAL SESSIONS:

1) Estimation of Moisture
2) Estimation and extraction of total lipid content.
3) Estimation of Ash Content
4) Preparation of Ash Solution
5) Estimation the following Minerals

A. Iron
B. Calcium
C. Phosphorous

6) Estimation of Vitamin -C using Titrimetric method - in Synthetic and Food sources.
7) Estimation of Sodium by flame photometry
8) Estimation of Potassium by flame photometry
9) Estimation of Beta carotene in carrots.

NUTRITIONAL BIOCHEMISTRY – II

MODEL QUESTION PAPER

PRACTICAL

Course Code: P24/NUT/DSC/202/P **Marks:50**

No. of credits: 2 **Time: 3Hrs**

Answer the following

1.	Write the principle : 2	**10M**
2.	Estimate the amount of iron present in the given food sample	**20M**
3.	Qualitative analysis of amino acids	**10M**
4.	Viva	**5M**
5.	Record	**5M**

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

SEMESTER –II

PRINCIPLES OF FOODS

1. Course Description

Programme: M.Sc.
Course Code: P24/NUT/DSC/201
Course Type: DSC- 5
No. of credits: 3

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

2. Course Objectives

- To provide an understanding of composition of various food stuffs.
- To familiarize students with changes occurring in various food stuffs as a result of processing and cooking.

3. Course Outcomes

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

CO 1: Define the structural composition and the effect of cooking on cereals and principles involved in the selection of fruits and vegetables.

CO 2: Outline the structure and composition of milk and protein rich foods.

CO 3: Understand the role of fats and sugar in the food composition table.

4. Course Content

MODULE 1: CEREALS, VEGETABLES AND FRUITS **(15 Hrs)**

1.1. Cereals: Starch: functions and properties , Gelatinization, factors affecting gelatinization Changes in cooked starches – gel formation, retrogradation, syneresis , Cereal protein – gluten, factors affecting gluten formation , Nutrient changes during different treatment methods of cereal grains .Role of natural leavening agents , Role of yeast .

1.2. Vegetables: Water insoluble and Water soluble pigments , Factors affecting plant pigments on cooking: acid, alkali, metals, heat , Flavour compounds: terpenoids, flavonoids, Sulphur compounds and other volatile flavor compounds

1.3 Fruits: Enzymatic Browning and its prevention, Physio – Chemical changes in Fruits and Vegetables- Ripening, Respiration and Textural changes .

MODULE 2: ANIMAL FOODS (PULSES, MILK, FLESH FOODS) (plant and animal proteins) **(15 Hrs)**

2.1 Pulses: Decortication, Soaking and germination of pulses , Fermentation of pulses , Roasting and Puffing ,Effect of cooking treatments on the nutrient composition, quality and quantity of legumes.

Milk: Composition and Nutritive Value of Milk , Types of milk , Properties of milk proteins – effect of heat, acid and phenolic compounds on milk.

2.2. Egg: Composition and Nutritive Value of egg , Egg as a binding, foaming and emulsifying agent , Quality and Grading of Eggs

2.3. Meat: Post mortem changes in meat – rigor mortis, curing, ageing and tenderization , Changes during cooking of meat. Poultry: Advantages of white meat .Fish: Classification, Characteristics of fresh fish, Spoilage, Nutritional importance of fish.

MODULE 3: FATS AND OILS, SUGARS **(15 Hrs)**

3.1. Fats: Properties of fats and oils , Emulsions, Fat as emulsifying agent , Fat as leavening and shortening agent

3.2. Rancidity: Types, mechanism and prevention , Factors affecting amount of fat absorbed during cooking , Fat replacers

3.3. Sugar: Types of sugar, Sugar crystallization and caramelization, Factors affecting crystallization, Stages of sugar cookery, preparation of candies – crystalline and non crystalline.

5. References

1. Food Science – Norman N Potter, Joseph H. Hotchkiss, 5th edition, CBS Publishers & Distributors, New Delhi.
2. Food Facts and Principles – ShakuntalaManay, New Age International Publishers.
3. Food Science – B Sri Lakshmi, New Age International Publishers.
4. Fruit and Vegetable Preservation – Principles & Practices – R P Srivastava, Sanjeev Kumar. 3rd edition, international Book Distributing Co., Lucknow.
5. Food Science, Chemistry and Experimental Foods – Dr.M.Swaminathan, The Bangalore Printing & Publishing Co. Ltd., Mysore
6. essentials of food science, Vickie, Elizabeth , fifth edition, 1998.
7. elementary food science, Louis,Ernest , American book warehouse.
8. Food science, Charley Helen,
9. Food, the chemistry of its components, 6th edition, Tom Coultate, 2014
10. Food processing and preservation, B. Sivasankar, 2002.

6. Syllabus Focus

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

Local /Regional/National /Global Development Needs	Relevance
Local	Students understand the importance of homegrown foods, locally available and it the nutritive value of the seasonal foods.

b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	1,2,3	Knowledge on the science of foods, will help in enhancing skills of students.

7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Field trip	Experiential learning- visit to food industry, to understand the processing techniques involved in food items
2.	Seminar presentation , group discussion	Participative Learning
3.	Quiz, MCQ, FIB	Experiential learning

8. Course Assessment Plan

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

CO	Continuous Internal Assessments CIA - 40%	End Semester Examination-60%
CO1	CIA1-Written Exam	External end semester exam
CO2	CIA1-Written Exam	
CO3	CIA2 -Skill test – prepare a sugar based snack item CIA-2 written test	

b) Model Question Paper - End Semester Exam

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

Question Number	Question	Question	CO	BTL(Blooms Taxonomy Level)
1	Module 1	What is Gelatinization, factors affecting gelatinization.	CO 1	I
2	Module 1	Define the post-harvest changes that occur in fruits. What are the different artificial methods of ripening	CO 1	I
3	Module 2	Explain the structure, composition and nutritive value of an egg.	CO 2	V
4	Module 2	What are post mortem changes occurring in meat. Write a note on curing, aging and tenderization	CO 2	I
5	Module 3	Explain the mechanism of Rancidity, types, and its prevention	CO 3	V
6	Module 3	Explain the factors affecting crystallization. Write a note on the different stages of sugar cookery	CO 3	V

SECTION B - ANSWER ANY 4 OUT OF 6 **4 Q X 6 M = 24 M**

(To compulsorily have **ONE** question from **each** module)

7	Module 1	Explain the Properties of starch	CO 1	V
8	Module 1	What are the Water soluble pigments in fruits	CO 1	I
9	Module 2	How is the Grading of eggs done	CO 2	I
10	Module 2	Classify fish and how to select fish	CO 2	II
11	Module 3	What are Emulsions, explain	CO 3	I
12	Module 3	What are the types of sugars	CO 3	I

PRINCIPLES OF FOODS

PRACTICAL

1. Course Description

Programme: M.Sc.
Course Code: P24/NUT/DSC/201/P
Course Type: DSC- 5
No. of credits: 2

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

Course objectives

1. To familiarize students with changes occurring in various foodstuffs as a result of processing and cooking

Course Outcomes:

- To be able to analyze the structural changes occurring on application of heat on different food groups.
- To be able to understand structural features of foods

PRACTICAL SESSIONS:

1. Gelatinization of different types of starches
2. Estimation of gluten formation in wheat flour.
3. Effect of heat, acid, alkali on vegetables and fruit pigments.
4. Pectin strength in fruits.
5. Structural properties of egg white and yolk , preparation of a stable emulsion and foaming properties of egg.
6. Effect of heat and acid on milk proteins
7. Identification of food pigments by paper chromatography
8. Estimation of free fatty acids in different oils
9. Smoking points of different oils, rancidity in oils
10. Different stages of sugar cookery.

PRINCIPLES OF FOODS

MODEL QUESTION PAPER

PRACTICAL

Course Code: P24/NUT/DSC/201/P **Marks: 50**

No. of credits: 2 **Time: 3 Hrs**

Answer the following

1. Identify the different the pigments in the given fruit and vegetables, using paper chromatography.

OR **20M**

2. Write and display the different stages of sugar cookery

3. Gelatinization of starches **25M**

3. Record **5 M**

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

SEMESTER II
RESEARCH METHODOLOGY

1. Course Description:

Programme : M.Sc. **Max Hours: 45**

Course Code: P24/NUT/DSC/203 **Hours per week: 3**

Type of course: DSC-7 **Max Marks: 100**

No. of credits: 3

2. Course Objectives:

- To understand the importance of research design.
- To impart in depth knowledge on collection, compilation and analysis of data.

3. Course Outcomes:

After the successful completion of the course, the student will be able to:

CO 1: Understand the basics of research with respect to report writing and thesis writing.

CO 2: Understand the types, tools and methods to conduct research and learn different sampling techniques

CO 3: Analyze and apply the appropriate statistical technique for the measurement/ scale and design.

4. Course Content

MODULE1 : BASICS OF RESEARCH **(15 Hrs)**

1.1. Research: Definition of research, Characteristics of research, Criteria of good research, classification of research: Application perspective, objectives perspective and mode of enquiry perspective, Merits and demerits of scientific research , Types of research - Historical research, Ex-post facto research, laboratory experiments, Field experiments, survey research, evaluative research Case study research, operational research, participatory research

1.2. Research Strategies in the field of Food And Nutrition- Descriptive studies(Correlation, Case studies, Cross-sectional surveys) Analytical studies (Observational, Case-control, Cohort studies – Prospective and Retrospective) Experimental studies (Clinical /Intervention trials including Randomized controlled trials)

1.3 Research Design and report writing - Steps of quantitative research: Conceptual phase, design and planning, empirical or analytical phase and dissemination and communication phase, Research design: Concepts, problem statement, Review of literature, objective of the study, formulation of hypothesis and its types, Report writing – Types of reports: Technical and descriptive, Research Abstract: Definition, guidelines for writing abstract, Technical Thesis: Definition, parts, steps in writing thesis.

MODULE 2: SAMPLING DESIGN AND METHODS OF DATA COLLECTION **(15 Hrs)**

2.1.Sampling: Definition, Meaning, Aim, Characteristics of good sample , Sampling- Basis, Advantages, Limitations and Benefits ,Survey- Meaning, Advantages, Disadvantages, Types and Quality , Census and sample survey , Steps in sampling design, Types of Sampling:Random Sampling - Simple random sampling, Stratified random sampling, Systematic sampling, Cluster sampling . Non random sampling methods -Judgment sampling, Convenience sampling, Quota sampling, Volunteer sampling and Snowball sampling, Sampling errors:Sampling and Non sampling errors , Sample size and its determination , Sampling distribution and Importance.

2.2 Data collection: Types of Data- Primary Data and Secondary Data, Advantages and Disadvantages, Difference between Primary Data and Secondary Data, Ethical responsibilities of a researcher: informed consent, confidentiality, protection from risk and injury, plaigirism, debriefing

2.3 Methods of collecting primary data: Questionnaire, Interview, Schedule, Observation, Inventories, Checklist, Drafting of questionnaire, training of interviewers, Ranking and Rating Scales, Criteria for evaluation of instruments – reliability and validity, compilation of the data collected: Geographical, Chronological, Qualitative and Quantitative , Tabulation of data: parts of a table, general rules of tabulation, types of tables, Diagrammatic representation of data, Graphic representation of data.

MODULE 3: STATISTICAL METHODS (15 Hrs)

3.1.Statistical Methods: Measures of central tendency: mean, median and mode, their relative advantages and disadvantages. Measures of dispersion: Mean deviation, standard deviation, Coefficient of variation, percentile.

3.2 Correlation and regression: Types: Positive and negative, Linear and non-linear, simple and multiple, partial and total, method of studying correlation: Scatter diagram, Graphic method and coefficient of correlation and its interpretation ,Karl Pearson's Coefficient correlation and Spearman's Rank correlation , Regression analysis using regression lines and equations, Difference between correlation and regression.

3.3 Parametric and non parametric tests:Parametric Tests: Advantages and Disadvantages, T test-types and interpretation, F test and its interpretation and Anova One way and two Way, non parametric tests: Advantages and Disadvantages,Chi-square test: Contingency tables, , difference between Parametric and non parametric tests.

5. References

1. Statistical Methods – S P Gupta, Sultan Chand and Sons Publishers, New Delhi.
2. Research Methodology – methods and techniques – C R Kothari, Wiley Eastern Limited, Madras.
3. Resesarch Methodology (Concepts, Methods, Techniques and SPSS)-Dr.Priri R. Majhi, Dr.Prafull K. Khatua, II Edition , Himalaya Publishing House, Pvt. Ltd. 2015.
4. A Handbook of Methodology of Research – Dr.Rajammal P Devadas and Dr. K Kulandaveil, Sri Ramakrishna Mission, Coimbatore.
5. Research Methods in Social Science – B H V Sharma, D Ravindra Prasad, P Satyanarayana, Sterling Publications.
6. Biostatistics – SundaraRao., 7th edition, Jaypee Brothers medical Publishers
7. Methods in Biostatistics- B.K. Mahajan, 2010
8. Manual of Biostatistics- JP Baride, AP Kulkarni, RD Mazumdar, Jaypee Publishers
9. Methodology of research in Social science – O.R. Krishnaswami and M. Ranganatham, 2nd revised edition, , Himalaya Publishing house ltd, 2015.

6 Syllabus Focus

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

Local/Regional/National /Global DevelopmentNeeds	Relevance
Global	The course gives an understanding of the basics in research and how research can be conducted using various tools for quantitative and qualitative data collection. It helps them understand the concept of sampling and how should a sample be selected. The students can analyze the data using various statistical tools after studying the subject

b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	1	Reading and understanding a research paper

SD	2	Analyzing a research paper for various data collection tools and sampling techniques
SD	3	Hands on learning of various statistical tools

7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Reading a research article	Experiential Learning
2.	Presentation	Participative Learning
3.	Software and excel sheet training	Participative Learning

8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments andEnd Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
CO1	CIA-1	End Semester examination
CO2	CIA-1	
C03	CIA-1 Writing a review article	
	CIA2- Exercise (problem solving)	

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	Define Research. Explain the various phases and steps in conducting a quantitative Research	CO 1	I
2	Module 1	Illustrate the different Research strategies in the field of food and nutrition.	CO 1	II
3	Module 2	Define Sampling. What are the characteristics of a good sample? Discuss the advantages and limitations of the same.	CO 2	I
4	Module 2	Explain the types of data. What are the advantages and disadvantages? Briefly mention about the different methods of collecting data.	CO 2	V
5	Module 3	Write in detail about measures of central tendency with example. Discuss the advantages and disadvantages.	CO 3	IV
6	Module 3	Calculate the correlation coefficient from following data and interpret	CO 3	VI
SECTION B - ANSWER ANY 4 OUT OF 6 (To compulsorily have **ONE** question from **each** module)				5 Q X 2 M = 10 M
7	Module 1	Write about Ex-facto research	CO 1	I
8	Module 1	Discuss about Case study research	CO 1	I
9	Module 2	What are the types of Survey	CO 2	I
10	Module2	Ex[\plain rules of tabulation	CO 2	II
11	Module 3	Define 't' Test	CO 3	I
12	Module 3	Discuss about Chi square test	CO3	I

SEMESTER II
RESEARCH METHODOLOGY
PRACTICAL

Programme: M.Sc.

Course Code: P24/NUT/DSC /203/P

Course Type: DSC 7

No .of Credits: 2

Max Hours: 30

Hours per week: 4

Max Marks: 50

Course objectives

1. To familiarize the students with newer concepts in research.
2. To enable the students to analyze the data for the project work with the Statistical techniques.
3. To be able to apply statistical methods related to community nutrition and sensory evaluation techniques.

Course Outcomes

- The students will understand the significance of statistics and research methodology in nutrition research.
- The students will understand the types, tools and methods of research.
- They will develop the ability to construct data gathering instruments appropriate to the research design

PRACTICAL SESSIONS

1. Tabulation of Raw Data
2. Diagrammatic representation of Raw Data
3. Graphical representation of Raw Data
4. Calculation of mean
5. Calculation of Median
6. Calculation of Mode
7. Calcu;ation of Mean deviation
8. Calculation of Standard Deviation
9. Calculation of Coefficient of Correlation and its interpretation using Karlpearsons coefficient method.

10. Calculation of Coefficient of Correlation and its interpretation using SpearmansRank method
11. Calculation of one sample based t- test and its interpretation
12. Calculation of Paired t- test and its interpretation
13. Calculation of Chi square test and its interpretation
14. Calculation of ANOVA (one way)and its interpretation
15. Calculation of ANOVA (Two way)and its interpretation

RESEARCH METHODOLOGY

MODEL QUESTION PAPER

PRACTICAL

Course Code: P24/NUT/DSC /203/P **Marks : 50**

No. of credits: 2 **Time: 3 Hrs**

Answer the following

1. What is standard deviation? Mention the steps in calculation of standard deviation. Compute the standard deviation for the following weights in KG of six students 35,42,60 30, 45,52. **25M**
2. Represent the following subdivided bar diagram on percentage basis of the following data. **10M**

Particulars	2001	2002	2003
Cost per chair . Wages	9	15	21
b. Other costs	6	10	14
c. Polishing	13	5	7

3. Calculate the arithmetic mean of weights of the students in a class 66,43, 60, 50, 55,52, 40,49. **10M**
4. Record **5M**

Prepared by	Checked&Verifiedby	Approved by
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