THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI

REGULATIONS OF THE UNIVERSITY

(Post-graduate Degree course under Allied Health Science) M.Sc., (CLINICAL NUTRITION) Combined Master's Degree and **Dietetic Internship** Program.

In exercise of the powers conferred by Section 44 of the Tamil Nadu Dr.M.G.R.Medical University, Chennai Act 1987 (Tamil Nadu Act 37 of 1987) the Standing Academic Board of the Tamil Nadu Dr.M.G.R.Medical University, Chennai hereby makes the following regulations:-

1. SHORT TITLE AND COMMENCEMENT:-

These regulations shall be called as **"M.Sc.,(CLINICAL NUTRITION)"** of the Tamil Nadu Dr. MGR Medical University, Chennai.

They shall come into effect from the academic year 2012-2013

The regulations framed are subject to modification from time to time by the Standing Academic Board.

2. OVER ALL OBJECTIVES

M.Sc., (CLINICAL NUTRITION) DEGREE COURSE UNDER ALLIED HEALTH SCIENCE is offered to assist Medical and Allied Health Professionals to understand the principles of dietary management and apply, while providing Quality Patient Care in the selected areas of Clinical Specialty in the Hospital and Community.

3. ELIGIBILITY FOR ADMISSION

Candidates for admission to the **M.Sc., (CLINICAL NUTRITION) DEGREE COURSE UNDER ALLIED HEALTH SCIENCES** should have passed Degree in any one of the following courses from a recognized University

- B.Sc., Nutrition Dietetics and Food Service Management
- B.Sc., Food Science and Nutrition
- B.Sc., Clinical Nutrition and Dietetics Food Service Management and Dietetics.

- B.Sc., Home Science (with majors in Nutrition and Dietetics)
- B.Sc., Human Science(with majors in Nutrition and Dietetics)
- B.Sc., Clinical Nutrition(with majors in Nutrition and Dietetics)

4. ELIGIBILITY CERTIFICATE:

Candidate who has passed any qualifying examination as stated in Regulation No.3 above other than the Tamil Nadu Dr. M.G.R. Medical University shall obtain an "Eligibility Certificate" from this University by remitting the prescribed Fees along with the Application Form and required Documents before seeking admission to any one of the affiliated institutions. The application form is available in the University website: www.tnmgrmu.ac.in.

5. REGISTRATION:

A Candidate admitted in the **M.Sc., (CLINICAL NUTRITION) DEGREE COURSE UNDER ALLIED HEALTH SCIENCES** in any one of the affiliated institutions of this University shall register his / her name with this University by submitting the prescribed Application Form for registration duly filled, along with the prescribed Fee and a declaration in the format to the Controller of Examination of this University through the affiliated institution within 30 days from the cut-off date prescribed for admission. The applications should have date of admission of the course.

6. MIGRATION/TRANSFER OF CANDIDATE:

- A student studying in the **M.Sc., (CLINICAL NUTRITION) DEGREE COURSE UNDER ALLIED HEALTH SCIENCES** in any one of the affiliated institution shall be allowed to migrate/transfer to another institution of this University.

Under extraordinary circumstances, the Vice Chancellor shall have the powers to place any migration/transfer of he/she deems fit before the Governing Council and get its approval for grant of permission/ratification for Migration/Transfer to the candidates undergoing the course of study in affiliated institutions of this University.

7. COMMENCEMENT OF THE COURSE:

The academic year for the M.Sc., (Clinical Nutrition) Post-graduate Degree course shall commence from 2nd May / 1st October and the candidates admitted upto 31st May / 31st October will be registered for the course.

**** Resolved in the 43rd SAB dt. 19.12.2011**

8. MEDIUM OF INSTRUCTION:

English shall be the Medium of Instruction for all the Subjects of study and for examinations of the **M.Sc., (CLINICAL NUTRITION) DEGREE COURSE UNDER ALLIED HEALTH SCIENCES**

9. CURRICULUM:

The Curriculum and the syllabus for the course shall be as prescribed in these regulations and are subject to modifications by the Standing Academic Board from time to time.

10. WORKING DAYS IN THE ACADEMIC YEAR:-

Each academic year shall consist of not less than 270 working days

Total No. of days in a year		**365 days**
No. of weekly off (Sundays)	-	52 days
No. of Government Holidays	-	22 days
No. of Holidays	-	21 days
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		95 days

Total No. of working days including Examination period		270 days

11. DURATION OF THE COURSE:

- The duration of certified study for the **M.Sc., (CLINICAL NUTRITION) DEGREE COURSE UNDER ALLIED HEALTH SCIENCES shall** extend over a period of two academic years and six months Residency Training.

➢ The candidate should complete this course in 4 years (double the duration) from the date of joining the course.

12. RE-ADMISSION AFTER BREAK OF STUDY:

The regulations for re-admission are as per the University Common Regulation for Re-admission after break of study for all courses.

13. ATTENDANCE REQUIRED FOR ADMISSION TO EXAMINATION:

No candidate shall be permitted to appear in any one of the paper/subjects of M.Sc**.,(CLINICAL NUTRITION) DEGREE COURSE UNDER ALLIED HEALTH SCIENCES**
Examinations unless he/she has attended the course in the subject for the prescribed period in an affiliated institution recognized by this University and produce the necessary certificate of study, attendance and satisfactory conduct from the Head of the institution.

A candidate is required to put in a minimum of 90% of attendance in both theory and practical separately in each subject before admission to the examination.

14. INTERNAL ASSESSMENT MARKS:

The Internal Assessment should consist of the following points for evaluation:-

i) Theory

ii) Practical

iii) Viva

A minimum of two written examinations shall be conducted in each subject during a year and the average marks of the performances shall be taken into consideration for the award of Internal Assessment marks.

15. CUT-OFF DATES FOR ADMISSION TO EXAMINATIONS:

The candidates admitted upto 31st May / 31st October shall be registered to take up their First Year examinations after fulfillment of the regulations from 15th April / 15th October of the next year.

All kind of admissions shall be completed on or before 31st May / 31st October of the academic year. There shall not be any admissions after 31st May / 31st October, even if seats are vacant

**** Resolved in the 43rd SAB dt. 19.12.2011**

16. COMMENCEMENT OF THE EXAMINATIONS:

- 15th April / 15th October
- If the date of commencement of examination falls on Saturdays / Sundays or declared Public Holidays, the examination shall begin on the next working day. The University paper will be awarded for 100 marks and Internal 50 marks.

17. DISSERTATION & EVALUATION OF DISSERTATION:

a. The topic of the dissertation should be submitted at the end of first year. The candidate should also inform the name of the Guide for the dissertation to the University while submitting the dissertation topic.
b. If any changes in the dissertation topic, the same has to be informed before the end of the first year.
c. The dissertation should be submitted three months well in advance duly signed by the Professor of that branch and the same has to be forwarded to the Controller of Examination through the Dean or Principal of the College three month prior to the Examination.
d. If the dissertation is not approved or rejected by the majority of the examiners, the results shall be withheld till the submission of dissertation is approved. (XXVIII S.A.B. dated 22.12.2004)
e. If the candidate fails in the Written/Practical Examination, but his / her dissertations approved, the approval of the dissertation shall be carried over to the subsequent examinations.
f. For Dissertation 200 Marks, Viva-voce on Dissertation 50 Marks and IA/Presentation 50 Marks – Minimum to pass 150 mark.

g. Evaluator for the Dissertation-Practicing Dietician with minimum of 10years experience in Clinical Nutrition and with Masters Degree in Nutrition and Dietetics (1 External + 1 Internal)

18. MARKS QUALIFYING FOR PASS:

50% of marks in the University Theory Examinations

50% of marks in the subject where Internal evaluation alone is conducted

50% of marks in aggregate in Theory, Practical I.A. & Oral taken together

19. CLASSIFICATION OF SUCCESSFUL CANDIDATE:

A successful candidate:

- Who secures not less than 75% of marks in any subjects shall be declared to have passed on distinction in that particular subject provided she/he passes the whole examinations in the first attempt.
- Who passes the examinations in all subjects at the first appearance obtaining not less than 60% of marks in aggregate shall be declared to have passed the examinations in the first class.
- All the other successful candidate shall be declared to have passed the examination in the second class.
- A candidate passing any of the examination in more than one attempt will be given "Pass Class" irrespective of percentage of marks secured by the candidate in the examinations.

20. CARRY OVER OF FAILED SUBJECTS:

- A candidate has to pass in theory and practical examination in each of the paper.
- If a candidate fails in theory examinations, he/she has to reappear.
- Only three attempts are allowed in each subject including 1st attempt.
- The candidate has to complete the course in double the duration of the course (i.e. 4 years from the date of joining)

21. CONDONATION OF LACK OF ATTENDANCE:

There shall be no condonation of lack of attendance.

22. VACATION:

There is no vacation

23. REVALUATION / RETOTALLING OF ANSWER PAPERS:

Revaluation of answer papers is not permitted. Only retotalling of theory answer papers is allowed, in the failed subjects.

24. RESIDENCY TRAINING

After successful completion of the course (two years/ the candidate is eligible to undergo Residency Training (Hospital posting).

Residency Training for 6 months is compulsory rotation in the following departments.

- Working hours/day -8
- Time allotted for each specialty:

The order of posting	**Time (in weeks)**
General Medicine	1
Surgery	2
OG Obstetrics & Gynaecology	1
Geriatric	1
Oncology	1
Cardiology	1
Gastroenterology ,Hepatology	2
Neurology	1
Pediatrics	2
Endocrinology	3
Nephrology	2
ICU-Cardio, Medical, Surgical, Pediatric	3
Food Service Area (Dietary/Diet Kitchen)	4

(To include store keeping (receiving and holding of provision, stock levels in the stores), supervision of the kitchen area, pre-preparation area and preparation of patient diet and hospital made enteral feeds, quality Control,kitchen hygiene and patient tray service

Objectives:

To enable the students

1. To assess ,evaluate ,monitor and interpret the nutritional problems of different disease conditions of the patients or interpretations of various nutritional case studies in the Hospitals

2. To provide adequate nutritional counseling etc

3. To obtain direct knowledge in hospital settings

4. To evaluate the nutritional needs of patients

EXAMINATION PATTERN – I YEAR

MSc., Clinical Nutrition

S.L.No	Subject	IA		Theory	
		Max	Min	Max	Min
1	Applied Physiology	50	25	100	50
2	Nutritional Biochemistry	50	25	100	50
3	Medical & Food Microbiology	50	25	100	50
4	Advance Nutrition	50	25	100	50
5	Principles of Food Science	50	25	100	50
6	Research Methods and Biostatistics	50	25	100	50

IA-Internal Assessment

EXAMINATION PATTERN – II YEAR

MSc., Clinical Nutrition

S.No	Subject	IA		Theory		Practical	
		Max	Min	Max	Min	Max	Min
1	Applied Nutrition	50	25	100	50	-	-
2	Clinical Nutrition & Dietetics	50	25	100	50	100	50
3	Entrepreneurship and Food Service Management	50	25	100	50	-	-
4	Public Nutrition	50	25	100	50	-	-

II nd YEAR PRACTICAL (Duration)6hrs

2. Clinical Nutrition and Dietetics Practical

Two Therapeutic Diets (25x2) = 50 Marks

(Planning and Preparing)

Viva (External) = 10 Marks

Record (External 10 Marks and Internal 10marks) = 20 Marks

Spotters 5 = 10 Marks

Internal Assessment = 10 Marks

EVALUATION OF DISSERTATION & LOG BOOK

Evaluation of Dissertation	200
Viva/Presentation	50
IA*	50
Total	**300**
Passing Minimum	150

** Resolved in the 43rd SAB Dated 19.12.2011.

*(IA)-Internal Assessment for Log book (Details of Field visit and Residency Program) Total 50 Marks with 20%and 80% weightage respectively

1. Public Nutrition = 25 Marks
2. Residency Program log book = 25 Marks

Record: This includes all the case studies and diet plans as per the practicals schedule

Log Book: Is a register to get it signed by the respective mentors posted under them

Residency Programme(Log book ***)***

SYLLABUS FOR M.SC.,(CLINICAL NUTRITION)

Ist YEAR

BRIEF SUBJECT TITLE TO BE COVERED

S.No. Subjects

1. Applied Physiology
2. Nutritional Biochemistry
3. Medical & Food Microbiology
4. Advance Nutrition
5. Principles of Food Science
6. Research Methods and Biostatistics

II YEAR

1. Applied Nutrition
2. Clinical Nutrition& Dietetics
   Clinical Nutrition & Dietetics Practical
3. Entrepreneurship and Food Service Management
4. Public Nutrition
   Dissertation

POST SECOND YR (RESIDENCY TRAINING)

Residency Programme : Duration - 6 months

Nutrition assessment (SGA /MUST/MNA/SOAP /CASE SPECIFIC) of 70 cases from the above departments, and detailed case study of 30 patients-cAssociation ABCD (SGA /MUST/MNA/SOAP /Case Specific), 3 Day Recall, Food Exchange Calculations, and Dietary Recommendations and Conclusion Completion of **the RD Residency Training** as per RD Internship of Indian Dietetic Association (IDA) **Log book** is compulsory (emphasis to be given to the following

1. Anemia
2. Pregnancy and Lactation
3. Enteral and Parenteral nutrition
4. Cancer patient i) Chemo Therapy ii) Radiation Therapy
5. Cardio vascular diseases
6. Gastro Intestinal Diseases
7. Liver Diseases
8. Pancreatitis
9. Pediatric-
   i) Inborn Errors of Metabolism PKU/MSUD/GSD/GA etc
   ii) T-1DM
   iii) Underweight child
   iv) Feeding difficulties
   v) Failure to thrive
   vi) Overweight & Obesity
   vii) Nephritis, Chronic Renal Failure
   viii) Cancer
10. Diabetes Mellitus-i) T-1 DM ii) T-2DM iii) GDM iv) Diabetes With complications
11. Weight management: i) Overweight & Obesity: Adult cases

    ii) Underweight: Adult cases
12. Renal Diseases- Acute and Chronic Renal Failure

    i) Conservative treatment

    ii) Renal replacement therapy

a) Dialysis -Hemodialysis, Peritoneal dialysis
b) Transplant

13.Critically ill in ICU

I YEAR

PAPER I - *APPLIED PHYSIOLOGY*

Unit I INTRODUCTION TO PHYSIOLOGY

1. **Introduction**
2. **Physiology as a discipline**
3. **How Cells Join Together**

1.3.1. Body Systems

4. **Physiology of growth and development**
5. **Physiology of ageing**

1.5.1 Age Related Changes

1.5.2 Theories of Ageing

1.5.3 Modulating Process of Ageing

1.5.4. Nutrition and Physiology

Unit II Cell and Blood

2.1. **Introduction**

2.2 Cell: The Basic Unit of Life

2.2.1 Discovery of Cell

2.2.2 Cell Theory

2.2.3 Unicellular and Multi cellular Organisms

2.3 Structure of Cell

2.3.1 Eukaryotic Cell and Organization

2.3.2 Prokaryotic Cell and Organization

2.4. Cell Cycle

2.4.1 Mitosis

2.4.2 Meiosis

2.5. Tissue and Their Functions

2.5.1. Epithelial Tissue

2.5.2 Connective Tissue

2.5.3. Muscle Tissue

2.5.4 Nervous Tissue

2.6 Blood

2.6.1 History and Milestones

2.7. Blood Composition

2.7.1 The Plasma

2.7.2 Blood Cells

2.8. Erythropoiesis

2.8.1 Regulation of Erythropoiesis

2.9 Blood Groups

2.9.1 Abo Blood Grouping System

2.9.2 Rh Blood Grouping System

2.10 Anaemia

2.11 Haemostasis

Unit 3

3.1 Introduction

3.2 The Immune System

3.3 Non Specific Defence Mechanism

3.3.1 External Defence Mechanism

3.3.2 Internal Defence Mechanism

5.6 Regulation of Respiration

5.6.1 Neural Control of Respiration

5.6.2 Chemical Control of Respiration

5.7 Internal Respiration

5.8 Respiratory Adjustments

5.9 Artificial Respiration

Unit 6 Physiology of Gastrointestinal System

6.1 Introduction

6.2 Description of the Gastrointestinal Tract

6.3 Mouth

6.3.1 Tongue

6.3.2 Teeth

6.4 Salivary Glands

6.5 The Pharynx

6.6 The Esophagus

6.7 The Stomach

6.7.1 Structure of the Stomach

6.7.2 Functions of the Stomach

6.7.3 Composition and Functions of Gastric Juice

6.7.4 Mechanism of Secretion of Gastric Juice

6.8 The Pancreas

6.8.1 Structure of the Pancreas

6.8.2 Functions of the Pancreas

6.8.3 Mechanism of Pancreatic Secretion

6.9 The Liver and Billiard System

6.9.1 Liver-Structure and Functions

6.9.2 The Gall Bladder and the Bile Ducts

6.10 The Small Intestine

6.11 The Large Intestine

6.12 Movements of the Gastrointestinal Tract

6.13 Gastrointestinal Hormones

6.14 Absorption and Utilization of Carbohydrates, Proteins and Fats

6.14.1 Absorption and Utilization of Carbohydrates

6.14.2 Absorption and Utilization of Proteins

6.14.3 Absorption and Utilization of Fats

6.15 Some Common Disorders of the Digestive System

Unit-7 Physiology of Renal System

7.1 Introduction

7.2 Organs of the Urinary System

7.3 Kidney: Structure and Functions

7.3.1 Gross and Microscopic Structure of Kidney and Nephron

7.3.2 Functions of the Kidney

7.3.3 How the Kidney Works

7.3.4 Counter Current Mechanism

7.3.5 Non-Excretory Functions of Kidney

7.4 Ureters

7.5.The Urinary Bladder

7.6 The Urethra

7.7 Constituents and Examination of Urine

7.7.1 Normal and Abnormal Constituents of Urine

7.7.2 Examination of Urine

7.8 Renal Function Tests

10.4.1 Organs involved in Taste Perception

10.4.2 Mechanism of Taste Perception

10.5 A Sense of Smell-Olfaction

Unit XI Physiology of the Endocrine Glands

11.1 Introduction

11.2 Hormones

11.3 Endocrine Glands

11.4 The Pituitary Gland

11.4.1 Anterior Pituitary

11.4.2 Posterior Pituitary

11.5 The Thyroid Gland

11.6 The Parathyroid Glands

11.7 The Pancreas

11.9 The Pineal Gland

11.10 The Thymus Gland

11.11 Kidney as an Endocrine Gland

Unit-12 the Reproductive System

12.1 Introduction

12.2 The Reproductive System

12.3 The Female Reproductive System

12.3.1 External Genitalia

12.3.2 Internal Organs

12.3.3 Menstrual Cycle

12.3.4 Accessory Glands-Breast or Mammary Glands

12.4 The Male Reproductive System

12.4.1 What Is The Male Reproductive System?

12.4.2 Male Puberty

12.5 Growth and Development during Pregnancy?

12.5.1 The Placenta

12.5.2 Foetal Growth and Development

12.6 Physiology of Lactation

12.6.1 Anatomy of the Mammary Gland

12.6.2 Physiology of Lactation

12.7 Role of Hormones in Reproduction

12.8 Disorders of the Reproductive System

12.8.1 Disorder of the Female Reproductive System

12.8.2 Disorder of the Male Reproductive System

12.9 Contraception

12.10 Common Tests during Pregnancy?

References:

- K Sembulingam, Prem Sembulingam. Essentials of Medical Physiology.
- Garrows. Textbook of Physiology.

PAPER – II -NUTRITIONAL BIOCHEMISTRY

- Unit 1 : Carbohydrates
- Unit 2 : Lipids and Proteins
- Unit 3 : Vitamins
- Unit 4 : Enzymes and Coenzymes
- Unit 5 : Digestion, Absorption and Transport of Carbohydrates, Lipid and Proteins
- Unit 6 : Carbohydrate Metabolism
- Unit 7 : Lipid Metabolism
- Unit 8 : Protein and Nucleic Acid Metabolism
- Unit 9 : Antioxidants
- Unit 10 : Vitamins and Minerals
- Unit 11 : Hormones

Nutritional Biochemistry

Unit I Carbohydrates

1.1 Introduction

1.2 Introduction to Nutritional Biochemistry

1.2.1 Meaning and Importance of Nutritional Biochemistry

1.2.2 Development of Nutritional Biochemistry

1.2.3 Contemporary Interests in Nutritional Biochemistry

1.3 Chemistry of Carbohydrates

1.4 Monosaccharide's

1.4.1 Isomerism of Monosaccharide's

1.4.2 Properties of Monosaccharide's

1.5 Oligosaccharides

1.6 Polysaccharides

Unit-2-Lipids and Proteins

2.1 Introduction

2.2 Chemistry of Lipids-Introduction

2.3 Lipids – Structure and Classification

2.3.1 Fatty Acids (Saturated and Unsaturated)

2.3.2 Neutral Fats

2.3.3 Phospholipids

2.3.4 Steroids

2.3.5 Eicosanoids

2.4 Chemical Properties of Fatty Acids and Neutral Fats

2.4.1 Chemical Properties of Fatty Acids

2.4.2 Chemical Properties of Neutral Fats

2.5 Chemistry of Proteins and Nucleic ~~Acid~~

2.6 Amino Acids – Structure, Classification and Properties

2.6.1 Classification of Amino Acids

2.6.2 Properties and Chemical Reactions of Amino Acids

2.6.3 Peptides - Classification and Biologically Important Peptides

2.7 Proteins – Structure, Classification and Properties

2.7.1 Classification of Proteins

2.7.2 Structure of Proteins

2.7.3 Physio - Chemical Properties of Proteins

2.8 Structure and Classification of Nucleic Acids

Unit-3- Vitamins

3.1. Introduction

3.2 Vitamins – Introduction and Classifications

3.3 Structure and Properties of Water Soluble Vitamins

3.3.1 Thiamin (Vitamin B1)

3.3.2 Riboflavin (Vitamin B2)

3.3.3 Niacin (Vitamin B3)

3.3.4 Pantothenic Acid (Vitamin B5)

3.3.5 Pyridoxine (Vitamin B6)

3.3.6 Cyanocobalamin (Vitamin B12)

3.3.7 Biotin (Vitamin H)

3.3.8 Folic Acid (Vitamin B)

3.3.9 Ascorbic Acid (Vitamin C)

3.4 Structure and Properties of Fat Soluble Vitamins

3.4.1 Vitamin A (Retinol and Related Compounds)

3.4.2 Vitamin D (Cholecalciferol and Related Compounds)

3.4.3 Vitamin E (Tocopherols)

3.4.4 Vitamin K

Unit-4-Enzymes and Coenzymes

4.1 Introduction

4.2 Introduction to Enzymes and Coenzymes

4.3 Nomenclature and Classification of Enzymes

4.4 Specificity of Enzymes

4.5 Mechanism of Enzyme Activity

4.6 Enzyme Kinetics

4.7 Factors Affecting Enzyme Activity

4.8 Enzyme Inhibition

4.9 Role of Enzymes and Coenzymes in Metabolism

4.10 Isozymes

4.11 Enzymes in Clinical Diagnosis

Unit-5 Digestion, Absorption and Transport of Carbohydrates, Proteins and Lipids

5.1 Introduction

5.2 Digestion, Absorption and Transport-Basic Concept Digestion

5.3 Digestion

5.3.1 Digestion in Mouth

5.3.2 Digestion in the Stomach

5.3.3 Role of Pancreas in Digestion

5.3.4 Role of Bile in Intestine

5.4 Digestion of Food Materials

5.4.1 Digestion of Carbohydrates

5.4.2 Digestion of Proteins

5.4.3 Digestion of Lipids

5.4.4 Digestion of Nucleic Acids

5.5 Absorption and Transport

5.5.1 Absorption of Carbohydrates

5.5.2 Absorption of Proteins

5.5.3 Absorption of Lipids

Unit -6- Carbohydrate Metabolism

6.1 Introduction

6.2 Carbohydrate Metabolism: An Overview

6.3 Glycolysis

6.3.1 Glycolytic Pathway

6.3.2 Fate of Pyruvate

6.3.3 Energy Production in Glycolysis

6.3.4 Regulation of Glycolysis

6.4 Oxidation of Pyruvate of Acetyl CoA

6.4.1 Reactions Involved In the Oxidation of Pyruvate to Acetyl CoA

6.4.2 Regulation of Pyruvate Dehydrogenase

6.4.3 Genetic Defect in Pyruvate Dehyrogenase

6.5 Citric Acid Cycle

6.5.1 Functions of Citric Acid Cycle

6.5.2 Reaction of the Citric Acid Cycle

6.5.3 Regulation of the Citric Acid Cycle

6.5.4 Generation of High Energy Phosphates (From Oxidation of Glucose)

6.5.5 Anaplerotic Reactions

6.6 Gluconeogenesis

6.6.1 Functions of Gluconeogenesis

6.6.2 Gluconeogenesis-Substrates

6.6.3 Gluconeogenesis-Pathway

6.6.4 Regulation of Gluconeogenesis

6.7 Metabolism of Glycogen

6.7.1 Glycogenesis

6.7.2 Regulation of Glycogenesis

6.7.3 Glycogenolysis

6.7.4 Regulation of Glycogenolysis

6.7.5 Regulation of Glycogen Metabolism

6.7.6 Glycogen Storage Diseases

6.8 Hexose Monophosphate Pathway

6.8.1 Metabolic Reactions in the HMP Pathway

6.8.2 Regulation of HMP Pathway

6.8.3 Metabolic Significance of HMP Pathway

6.9 Entry of Other Sugars into Glycolytic Pathway

6.10 Regulation of Blood Glucose Level

6.11 Electron Transport Chain

6.11.1 Mitochondrial Electron Transport Chain

6.11.2 Transfer of Electrons

6.11.3 Components of Electrons Transport Chain

6.11.4 Electron Transport Inhibitors

6.11.5 Oxidative Phoshorylation

Unit -7- Lipid Metabolism

7.1 Introduction

7.2 Lipid Metabolism – I

7.2.1 Oxidation of Fatty Acids

7.2.2 Oxidation of Mono and Poly Unsaturated Fatty Acids

7.2.3 Lipogenesis-Synthesis of Fatty Acids

7.2.4 Metabolism of Eicosanoids

7.3 Lipid Metabolism-Ii

7.3.1 Metabolism of Triacylglycerols

7.3.2 Synthesis of Phospholipids

7.3.3 Metabolism of Cholesterol

7.3.4 Lipoprotein Metabolism

7.4 Hyperlipoproteinemias

7.5 Ketosis

Unit-8-Amino Acid and Nucleotide Metabolism

8.1 Introduction

8.2 Amino Acid Metabolism

8.2.1 Transamination Reaction

8.2.2 Deamination Reaction

8.2.3 Urea Cycle

8.2.4 Metabolism of Carbon Skeletons of Amino Acids

8.2.5 Biosynthesis of Nonessential Amino Acids

8.2.6 Synthesis of Specialized Products from Amino Acids

8.2.7 Decarboxylation Reaction and Biogenic Amines

8.2.8 Non-Protein Function of Amino Acids

8.3 Nucleotide Metabolism

8.3.1 Purine Nucleotide Synthesis-De Novo Synthesis

8.3.2 Salvage Pathway for Purines

8.3.3 Degradation of Purine Nucleotides

8.3.4 Pyrimidine Synthesis

8.3.5 Regulation of Deoxyribonucleotide Synthesis

Unit-9-Antioxidants

9.1 Introduction

9.2 Antioxidants and Free Radicals

9.3 Role of Oxygen Free Radicals

9.4 Production of Oxygen Free Radicals

9.5 Physiological Mechanisms to Limit Free Radical Damage

9.6 Free Radical in Human Pathology and Disease

9.7 Natural and Diet-Derived Antioxidants

Unit-10-Vitamins and Minerals

10.1 Introduction

10.2 Vitamins

10.3 Fat-Soluble Vitamins

10.3.1 Vitamin A

10.3.2 Vitamin D

10.3.3 Vitamin E

10.3.4 Vitamin K

10.4 Water-Soluble Vitamins

10.4.1 Energy-Releasing Water-Soluble Vitamins
10.4.1.1 Thiamin (Vitamin B1)

10.4.1.2 Riboflavin (Vitamin B2)

10.4.1.3 Pyridoxine (Vitamin B6)

10.4.1.4 Niacin

10.4.1.5 Pantothenic Acid

10.4.1.3 Biotin

10.4.2 Hematopoietic Water Soluble Vitamins

10.4.2.1 Folic Acid

10.4.2.2 Cyanocobalamin (Vitamin B12)

10.4.3 Other Waste Soluble Vitamins

10.4.3.1 Ascorbic Acid (Vitamin C)

10.5 Minerals – An Introduction

10.5.1 Macro Minerals

10.5.1.1 Calcium

10.5.1.0 Phosphorous

10.5.1.3 Magnesium

10.5.2. Micro Minerals

10.5.2.1 Iron

10.5.2.2 Iodine

10.5.2.3 Zinc

10.5.2.4 Selenium

10.5.2.5 Copper

10.5.2.3 Chromium

10.5.2.7 Cobalt

10.5.2.8 Manganese

Unit-11- Hormones

11.1 Introduction

11.1 The Endocrine System

11.2 Regulation of Endocrine System

11.3 Mechanism of Hormone Action

11.3.1 The Target Cell Concept

11.3.2 Hormone Receptors

11.3.3 Classification of Hormones

11.4.4 Signal Transduction

11.4.5 Signal Generation

11.4.6 G Protein-Coupled Receptors (GPCR)

11.4.7 Second Messengers

11.5 Biochemical Role of Hormones

11.5.1 Pancreas

11.5.2 Thyroid

11.5.3 Parathyroid

11.5.4 Adrenal Medulla

11.5.5 Adrenal Cortex

11.5.6 Hypophysis (The Pituitary Gland)

Unit-12- Inborn Errors of Metabolism

12.1 Introduction

12.2 Inborn Errors of Metabolism – General Concepts

12.3 Disorders of Protein Metabolism

12.3.1 Alcaptonuria

12.3.2 Phenylketonuria (Phenylpyruvic Oligophrenia)

12.3.3 Tyrosinemias

12.3.4 Glutaric aciduria

12.3.5 Arginemia (Hyperargininemia)

12.3.6 Homocystinuria (Homocysteinemia)

12.3.7 Histidinemia

12.3.8 Primary Hyperoxaluria

12.3.9 Cystinuria (Cystine –Lysinuria)

12.3.10 Cystinosis

12.3.11 Maple Syrup Urine Disease (Msud)

12.4 Disorders of Carbohydrate Metabolism

12.4.1 Pentosuria (Essential Pentosuria)

12.4.2 Fructosuria (Essential Fructosuria)

12.4.3 Hereditary Fructose Intolerance

12.4.4 Galactosemia

12.4.5 Hereditary Lactose Intolerance

12.4.6 Glycogen Storage Disease

12.5 Disorders of Lipid Metabolism

12.5.1 Gaucher's Disease (Glucosyl , Cermaide , Lipidosis)

12.5.2 Niemann-Pick Disease (Sphingomyelin Lipidosis)

12.5.3 Tay-Sach's Disease (Tsd) (Ganglioside Lipidosis)

12.5.4.Fatty acid Oxidation Defects

12.6 Haemoglobinopathies

12.6.1 Sickle Cell Anaemia

12.6.2 Thalassemias

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PAPER – III - MEDICAL AND FOOD MICROBIOLOGY

Unit 1 : Microbiology of Foods
Unit 2 : Food Safety – Basic Concept
Unit 3 : Occurrence and Growth of Microorganisms in Foods
Unit 4 : Food Spoilage
Unit 5 : Food Hazards of Microbial Origin
Unit 6 : Food Contaminants
Unit 7 : Food Adulteration
Unit 8 : Risk Analysis
Unit 9 : HACCP – A Food Safety Assurance System
Unit 10 : Food Regulations – Standards and Quality Control

Medical & Food Microbiology

Unit 1

1.1 Introduction

1.2 Food Microbiology – Basic Concept

1.3 History of Food Microbiology

1.4 Role of Microbiology in Biotechnology

1.5 Role of Microorganisms in Fermented Food

1. Fermented Baked Preparations
2. Fermented Vegetable Foods
3. Fermented Soya Bean Products
4. Fermented Dairy Products
5. Other Fermented Food Preparations
6. Economically Important Fermentation Products
7. Other Uses of Microbes in Industry

Unit 2

2.1.Introduction

2.2 Food Safety and Importance of Safe Food

2.3 Factors Affecting Food Safety

1. Physical Hazard
2. Biological Hazard
3. Chemical Hazard

2.4 Microorganisms in Foods

1. Bacteria
2. Fungi
3. Yeasts
4. Moulds
5. Viruses
6. Parasites

2.5 Recent Concerns of Food Safety

1. Prions
2. Concerns of Genetically Modified Foods
3. Concern of Dioxin-Contaminated Foods

Unit 3

3.1 Introduction

3.2 Microbiology of Air, Water and Soil

3.3 Sources of Foods Contamination

3.4 Factors affecting the growth of Microorganisms

1. Nutrition
2. Oxygen
3. Temperature

4. Moisture Requirement- The Concept of Water Activity

5. Osmotic Pressure

6. Hydrogen Iron Concentration –Ph

7. Light

3.5 Control and Destruction of Microorganisms

Unit 4

4.1 Introduction

4.2 Factors Responsible for Food Spoilage

4.3 Chemical Changes due to Spoilage

4.4 Spoilage of Different Foods

1. Spoilage of Meat
2. Spoilage of Poultry and Poultry Products
3. Spoilage of Fish and Other Sea Foods
4. Spoilage of Fruit and Vegetables
5. Spoilage of Cereals and Cereal Products
6. Spoilage of Milk and Milk Products
7. Spoilage of Soft Drinks, Fruit Juices, and Fruit Preserves
8. Miscellaneous Products

Unit 5

5.1 Introduction

5.2 Food Borne Diseases

1. Types of Food Borne Diseases

5.3 Food Borne Intoxications

1. Staphylococcal Poisoning
2. Bacillus Cereus Poisoning
3. Botulism

5.4 Food Borne Infections

1. Salmonellosis
2. Shigellosis (Bacillary Dysentery)
3. Vibrio Parahaemolyticus Gastroenteritis
4. Enter Pathogenic Escherichia Coli Diarrhoea
5. Hepatitis A
6. Shellfish Poisoning

5.5 Food Borne Toxic Infections

1. Clostridium Perfringens Gastroenteritis
2. Enterotoxigenic Escherichia Coli Gastroenteritis
3. Cholera
4. Listeriosis
5. Yersinia Enterocolitica Gastroenteritis
6. Campylobacter JejuniDiarrhoea

5.6 Mycotoxins

1. Aflatoxicosis
2. DeoxynivalenolMycotoxicosis
3. Ergotism

5.7 Food Borne Diseases due to Naturally Occurring Toxicants

1. Lathyrism
2. Veno-Occlusive Diseases (Vod)
3. Epidemic Dropsy

5.8 Reporting and Investigations of Food Borne Diseases

Unit 6

6.1 Introduction

6.2 Food Contamination

6.3 Naturally Occurring Toxicants

1. Toxicants in Animal Foods
2. Toxicants in Plant Foods

3. Anti-Nutritional Factors in Foods

6.4 Environmental Contaminants

1. Biological Contaminants
2. Pesticide Residues
3. Veterinary Drug Residues
4. Heavy Metals

6.5 Miscellaneous Contaminants

Unit 7

7.1 Introduction

7.2 Food Adulteration

7.3 Food Commonly Adulterated

7.4 Common Adulterants

7.4.1. Classification of Adulterants

7.5 Harmful effects of Adulterants

7.6 Methods for Detection of some Adulterants

Unit : 8

8.1 Introduction

8.2 Risk Analysis : The New Paradigm in Food Safety Assurance

8.3 Risk Assessment

8.31.Risk Assessment of Chemical Agent

8.3.2.Risk Assessment of Biological Hazard

8.4 Risk Management

8.4.1. Elements of Risk Management

8.4.2. General Principle of Risk Management

8.5 Risk Communication

8.5.1 .Role and Responsibilities for Risk Communication

8.5.2. Principle of Risk Communication

Unit: 9

9.1 Introduction

9.2 HACCP-An Effective Food Safety Assurance System

9.3 Need for HACCP

9.4 Benefits of HACCP

9.5 Principle of HACCP

9.6 Guidelines for Application of HACCP Principles

9.6.1.Premilinary Tasks in Development of HACCP Plan

9.6. 2.Applying the HACCP Principles

9.7 The HACCP Status in India

9.8 HACCP Case Studies

Unit :10

10.1 Introduction

10.2 Food Standards and Regulations in India

10.3 The Prevention of Food Adulteration Act 1954

10.4 Compulsory National Legislations

10.5 Voluntary Based Product Certifications

10.6 Regulations Relate to Gm Foods

10.7 International Organizations and Agreements in the area of Food Standardization and Quality Control.

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PAPER IV - ADVANCE NUTRITION

Unit**1.** Understanding nutrition

Unit 2.Human energy requirements

Unit 3. Carbohydrates

Unit 4. Proteins

Unit 5. Lipids

Unit 6. Water

Unit 7.Fat soluble vitamins: vitamin A, D, E & K

Unit 8.Water soluble vitamins: B complex vitamins and vitamin C

Unit 9.Minerals (macro minerals): calcium, phosphorus, magnesium, sodium, potassium, chloride

Unit 10.Minerals (micro minerals): iron, zinc, copper, selenium, chromium, manganese, iodine and fluorine

Unit 11.Food components other than essential nutrients

Unit 1.Understanding Nutrition

1.1Introduction

1.2Nutrition Science: Basic concepts

1.3History of Nutrition

1.3.1. Identification of food factors and discovery of water soluble vitamins

1.3.2. Discovery of other essential nutrients

1.3.3. Expanding frontiers of nutrition

1.3.4. The Indian Nutrition Scenario

1.4Nutritional Requirements

1.4.1 Definition of concepts in relation to human nutritional requirements

1.4.2 Basic terminology in relation to nutritional requirements

1.5Methods for studying the nutrition Requirements

1.5.1 Population survey of dietary intakes of nutrients

1.5.2 Growth studies

1.5.3 Depletion and repletion studies

1.5.4 Nutrient balance studies

1.5.5 Use of isotopically labeled nutrients: Nutrient turnover

1.5.6 Obligatory losses of nutrients

1.6National and international recommendations on Nutrient Requirements

1.6.1 Recommendations for Indian by the Indian council of Medical Research

1.6.2 FAO / WHO expert committee recommendations

1.6.3 Dietary references intakes of USA and Canada

1.6.4 Goals of National and international requirements estimates and RDAs

1.6.5 Dietary Guidelines

Unit 2. Human Energy Requirements

2.1Introduction

2.2 Energy: Some Basic Concepts

2.3 Definition and components of energy requirement

2.4Factors affecting energy expenditure and requirement

2.4.1 Factors affecting the BMR

2.4.2 Factors affecting the thermic effect of food

2.4.3 Factors affecting the energy expended in physical activity

2.5Methods of estimation of energy expenditure and requirements

2.5.1 Direct calorimetry

2.5.2 Indirect calorimetry

2.5.3 Double labeled water (DLW) Technique

2.5.4 Heart Rate Monitoring (HRM) Method

2.5.5 Factorial estimation of total energy expenditure

2.6Energy Requirements and dietary energy recommendations

2.6.1 Energy requirements of infants (from Birth to 12 months)

2.6.2 Energy requirement for children and adolescents

2.6.3 Energy requirement of adults

2.6.4 Energy requirement during pregnancy

2.6.5 Energy requirement during lactation

2.7 Energy imbalance: An overview

Unit 3.Carbohydrates

3.1 Introduction

3.2Classification of carbohydrates

3.2.1 Classification on the basis of degree of polymerization (DP)

3.2.2 Classification based on digestive fate of carbohydrates

3.3Functions

3.4Digestion and absorption

3.5Metabolic utilization of carbohydrates

3.6Regulation of blood glucose concentration

3.7Dietary fibre

3.7.1 Components of dietary fibre

3.7.2 Properties of fibre

3.7.3 Effects of dietary fibre

3.7.4 Potential health benefits of dietary fibre

3.7.5 Recommended intake of fibre

3.8 Resistant starch

3.8.1 Factors influencing RS content of foods

3.8.2 Potential health benefits

3.9 Fructo Oligosaccharides (FOS)

3.10 Glycemic index (GI)

3.10.1 Factors affecting GI of foods

3.10.2 GI in chronic diseases

3.11 Carbohydrate requirement

3.11.1 Modification of carbohydrate intake for specific disorder

Unit 4. **Proteins**

4.1 Introduction

3.12 Proteins – An overview

3.12.1 Classification

3.12.2 Food sources

3.12.3 Digestion, absorption and transport

3.12.3.1 Digestion

3.12.3.2 Absorption

3.12.3.3 Transport of amino acids

3.13 Functions

3.14 Methods of determination of proteins and amino acid content in foods

3.15 Improvement of quality of protein in the diet

3.16 Methods of estimating and assessing protein requirments at different stages of life cycle

3.17 Nutritional requirements and recommended allowances for proteins and amino acids

3.18 Protein deficiency

Unit 5. Lipids

5.1 Introduction

5.2 Fats: Some basic facts

5.3 Types of fats and its metabolism

5.3.1 Classification of fats and fatty acids

5.3.2 Digestions of fats

5.3.3 Absorption of fats

5.3.4 Transport and storage of fats in the body

5.4 Functions of fat and oils

5.5 Nutritional requirements of fats and oils

5.5.1 Adults

5.5.2 Pregnancy and lactation

5.5.3 Infancy

5.5.4 Young and older children

5.5.5 Choice of cooking medium in the context of n-3 and n-6 fatty acid ration in Indian diets

5.6 Excessive fat intake

5.6.1 Changing trends in dietary intake

5.6.2 Eating out

5.6.3 Diseases: Association and preventive measures

Unit 6. Water

6.1Introduction

6.2Water: An essential but overlooked nutrient

6.2.1 Functions of water in the body

6.3Water distribution and compartments of body water

6.3.1 Compartments of body water

6.3.2 Forces influencing water distribution

6.4Water Balance

6.4.1Water intake
6.4. 2Water output (Losses of body water)
6.4.3.Regulation of water balance

6.5Requirements of water

6.6Disturbances in fluid balance

6.6.1 Dehydration

6.6.2 Edema

Unit 7. Fat Soluble Vitamins: Vitamin A, D, E & K

7.1Introduction Physiological role, Bioavailability and requirements, food sources deficiency and toxicity

7.2Interaction with other nutrients

Unit 8. Water Soluble Vitamins: B complex Vitamins and Vitamin C

8.1Introduction

8.2Physiological role, Bioavailability and requirements, food sources, deficiency and toxicity

8.3Interaction with other nutrients

Unit 9. Minerals (Macro Minerals): Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chloride

9.1 Introduction

9.2 Physiological role, Bioavailability and requirements, food sources, deficiency and toxicity

9.3 Interaction with other nutrients

Unit 10 Minerals (Micro Minerals): Iron, Zinc, Copper, Selenium, Chromium, manganese, iodine and fluorine

10.1 Introduction

10.2 Physiological role, Bioavailability and requirements, food sources, deficiency and toxicity

10.3 Interaction with other nutrients

Unit 11. Food components other than essential nutrients

11.1 Introduction

11.1.1 Functional foods

11.1.2 Classification

11.2 Bioactive substances from plant food

11.3 Non-glycerides in edible oils

11.3.1 Probiotics and prebiotics

11.3.2 Definition and characteristics

11.3.3 Probiotics: Dietary sources and their mode of action / effects

11.3.4 Prebiotics: Dietary sources and their mode of action / health effects

11.4 Polyphenols

11.4.1 Definition and classification

11.4.2 Bioavailability of polyphenols

11.4.3 Influence of polyphenols on macronutrients and minerals

11.4.4 Health benefits of polyphenols

11.5 Phytoestrogens

11.5.1 Dietary sources and chemical forms

11.5.2 Physiological effects

11.6 Other dietary factors with anti nutritional effects

11.6.1 Protease inhibitors

11.6.2 Saponins

11.6.3 Amylase inhibitors

11.6.4 Lectins or hemagglutinins

11.6.5 Phytates

11.7 Health benefits of other dietary factors with anti-nutritional effects

References:

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- Swaminathan S.: Advanced Textbook On Food & Nutrition Vol. 1 & N (2nd Ed. Revised _ Enlarged) Bapp Co. 1985.
- Robinson. Basic Nutrition And Diet Therapy (8th Edition)
- Shills And Young. Modern Nutrition In Health And Disease.
- International Life Sciences Institute Present Knowledge in Nutrition – latest edition
- Latest Edition is preferred

Journals:
1. Nutrition Reviews
2. Journal of Nutrition
3. American Journal of Clinical Nutrition
4. British Journal of Nutrition
5. European Journal of Clinical Nutrition
6. International Journal of Vitamin and Nutrition Research
7. International Journal of Food Science and Nutrition
8. Nutrition Research
9. Ann NutrMetab

PAPER V - PRINCIPLES OF FOOD SCIENCE

Unit**.1.**Evaluation of quality of foods

Unit**.**2.Changes in food during cooking

Unit3.Starch

Unit4.Grams, dhals and nuts

Unit5.Vegetables and fruits

Unit6.Milk and milk product

Unit**7**.Eggs

Unit8.Meat and poultry

Unit 9.Fish

Unit10. Sugar

Unit11.Fats and oil

Unit12.Spices &condiments

Unit13.Beverages

Unit14.Effect of processing on nutritive value of food

Unit15.Improving nutritive value of food through different methods

Unit16.Food preservation

Unit17.Food additives

Unit18.Food package

Unit 1.EVALUATION OF QUALITY OF FOODS:

1.1 Sensory Evaluation of foods

1.1.1 Factors affecting acceptability of foods; planning and conducting acceptability studies. Use of sensory organs in the evaluation of foods- visual, tactile, olfactory and gustatory.

1.1.2 Principles of objective evaluation; Selection of taste panel, types of tests needed.

1.1.3 Principles of Subjective evaluation; Methods for objective evaluation- recent studies; improvised methods for laboratory studies.

1.2 Physical & Objective methods

1.2.1. Physical characteristics like color appearance. Texture, density, volume, tenderness. viscosity and surface tension, moisture loss and weight. microscopic examination

Unit 2.CHANGES IN FOOD DURING COOKING:

2.1. Colloidal chemistry

2.1.1. Preparation of colloids, gel formation. Stabilization of colloids.

2.2. Food emulsion,

2.2.1. Emulsifier, stabilizer, preparation of mayonnaise

2.3. Browning reaction

2.3.1. Enzymatic, non-enzymatic reaction in foods

Unit 3 STARCH

3.1. Sources – uses, gelatinization of flours, starch as thickening agents. Gluten formation. Factors affecting it, retro gradation of starch

3.2. Bread making

3.2.1. Role of ingredients- methods of bread making, quick breads and leavening agents

Unit 4 .GRAMS, DHALS AND NUTS

4.1. Composition, method of processing and cooking effects of processing such as cooking, decortication

4.2. Germination and fermentation

Unit 5.VEGETABLES AND FRUITS

5.1. Structure, texture, pigments and acids in vegetable and fruits. Cellulose and hemicellulose. pectin substances, jams and jelly

5.2. Changes in cooking

5.3. Browning reactions – enzymatic and non-enzymatic browning.

Unit 6.MILK AND MILK PRODUCT

6.1. Composition and constituents of milk, physical and chemical properties

6.2. Coagulation of milk protein

6.3. Cream butter and cheese making

Unit 7.EGGS

7.1. Structure, composition and selection

7.2. Coagulation of egg protein

7.3. Factors affecting coagulation of egg protein, foam formation, factors affecting foam formation

7.4. Uses of egg in cookery-leavening agent, emulsification, coating agent, thickening agent

Unit 8. MEAT AND POULTRY

8.1. Structure, cuts of meat and constituents of meat
8.2. Post mortem changes
8.3. Methods of cooking meat
8.4. Tenderness and juiciness

Unit 9.FISH

9.1. Kinds of fish, constituents

9.2. Selection and cooking

Unit 10. SUGAR

10.1. Sources, uses, properties, crystallization of sugar, stages of sugar cookery

10.2. Sugar cookery

10.2.1. Amorphous and crystalline candies, fondant, fudge and caramels,

10.2.2. Indian sweet preparations

Unit 11.FATS AND OILS

11.1. Sources and extraction of edible fats and oils.

11.2. Characteristics of fats and oils.

11.3. Physical and chemical properties of oils and fats.

11.4. Changes during storage and cooking.

11.5. Uses of fats shortening value and flakiness

Unit 12.SPICES & CONDIMENTS

12.1. Classification, uses in cookery

12.2. Buying, storage and care

12.3. Flavouring extracts, Indian spices & herbs, household and medicinal value

Unit 13 .BEVERAGES

13.1. Classification, functions

13.1.1. Soups - classification, stocks, preparation, types and uses

13.1.2. Tea / Coffee – types, uses, preparation

13.1.3. Fruit juices – functions, preparation, how to prevent browning& bitterness

13.1.4. Chocolate& cocoa – manufacture, storage, uses and preparation

13.1.5. Different appetizers

Unit 14. EFFECT OF PROCESSING ON NUTRITIVE VALUE OF FOOD

14.1 Parboiling of rice and malting of grains, puffed and flake cereals

Unit 15. IMPROVING NUTRITIVE VALUE OF FOOD THROUGH DIFFERENT METHODS

15.1Germination, Fermentation, Combination of foods

Unit 16.FOOD PRESERVATION

16.1 Principles, food spoilage, causes, types of spoilage

16.2. Methods of preservation

16.2.1 Bacteriostatic, bactericidal

16.2.2 Temperature, low and high temperature

16.2.3 Preservatives

16.2.4 Osmotic pressure

16.2.5 Radiation

Unit 17.FOOD ADDITIVES

17.1 Definition

17.2 Needs for food additives

17.3 Different food additives

17.4 Additives and food safety, unintentional additives

Unit 18 FOOD PACKAGING

18.1 Introduction

18.2 Packaging : Concepts, Significance and Functions

18.3 Classification of Packaging Materials

18.4 Packaging Methods

18.5 Interactions between Packaging and Food – Toxicity Hazards

18.6 Labeling Requirements and Bar Coding

18.6.1Nutrition Labeling and Nutrition Claims

18.6.2 Coding of Food Product

18.7 Packaging Laws and Regulation

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14. Srilakshmi B. (2006) : Food Science, New Age International (P) Ltd. Publishers, New Delhi.

15. Potter, N. and Hotchkiss, J.H. (2007) : Food Science, Fifth ed., CBS Publishers and Distributors, New Delhi.

16. N. ShakuntalaManay; M. ShadaksharaSwamy (2008) : Foods, Facts and Principles. Third Edition Tata McGraw – Hill Publishing Co. Ltd., New Delhi.

Website, e-learning resources:

www.fao.org – Food and agricultural organization

www.wfp.org - world food programme

www.foodsafetycouncil.org - International food safety council

www.cfsan.fda.gov – Center for food safety and applied nutrition

Journals

1. Food Technology Abstracts, Central Food Technological Research Institute Mysore.

2. Food Technology, Journal of The Institute Of Food Technology, Illinois, USA.

3. Food Digest, CFTRI Mysore.

4. Journal of Agriculture and Food Chemistry.

5. Cereal Science.

6. Indian Food Industry AFSTI, CFTRI, Mysore.

7. Journal of Food Science And Technology CFTRI, Mysore.

8. Indian Food Packer, All Indian Food Preserves Association, Delhi.

9. Journal of Dairy Science.

10. Advances in Food Research

PAPER VI - RESEARCH METHODOLOGY

Research Methods and Biostatistics

Unit 1 : Basic Concepts
Unit 2 : Formulation of Research Problem
Unit 3 : Design Strategies in Research -Descriptive Studies
Unit 4 : Design Strategies in Research-Analytic Studies I
Unit 5 : Design Strategies in Research -Analytic Studies Ii
Unit 6 : Project Proposal
Unit 7 : Data Collection
Unit 8 : Data Collection: Tools and Techniques-I
Unit 9 : Data Collection: Tools and Techniques-Ii
Unit 10 : Presentation and Summarization of Data-I
Unit 11 : Presentation and Summarization of Data-Ii
Unit 12 : Measures of Disease Frequency and Association
Unit 13 : Reference Values and Validity of Diagnostic Tests
Unit 14 : Hypothesis Testing -I

Unit 1

1.1 Introduction
1.2 Epidemiology-Concept, Definition, Purpose Aim, Developments .
1.3Descriptive Variables for Health of the Community
1.4Biostatistics
1.5What is Research and Scientific Approach? Scope of Research in Nutrition & Research Process

Unit 2

2.1introduction

2.2selection of a Suitable Problem

2.3 Specifying objectives of Research Problem

2.4 Formulating Hypothesis, what is Hypothesis & forms of Hypothesis

2.5 The Design of Research

2.6 Sample Size Considerations

Unit 3

3.1 Introduction

3.2 Design Strategies in Epidemiological Research

3.3 Descriptive Studies-Correlational Studies, Case Study, Cross Sectional Study

Unit 4

4.1 Introduction

4.2 Analytical Studies

4.3 Observational Studies- Cohort ,Case Control, Analytical Cross Sectional Studies

4.4 Experimental /Interventional Studies-Issues in Design and Conduct of Trials.

Unit 5

5.1 Introduction

5.2 Descriptive Research- Main Steps. Correlational Studies- Basic Issues, Case Study Method

5.3 Observational Studies- Issues in the Design of Case Control Studies, Issues in Design of Cohort Studies

5.4 Experimental Research-3 Characteristics, Steps of Experimental Research.

5.5 Designs of Experimental Study.

Unit 6

6.1 Introduction

6.2 Concept & Method of Sampling

6.3 Probability, Non Probability Sampling

6.4 Choice of Sampling Method

6.5 Characteristics of Good Sample

Unit 7

7.1 Introduction

7.2 Scales of data Measurement

7.3 Characteristics of Good Research Tool-Validity, Usability, Reliability

7.4 Types of tools & their uses – Questionnaires, Rating Scale, Attitude Scale & Tests.

Unit 8

8.1 Introduction

8.2 Types of tools & their uses- Interview , Observation & Documents.

Unit 9

9.1 Introduction

9.2 Concept of Data Collection

9.3 Methods of data collection -Asking Questions, observing behaviour, utilization of existing records and data

9.4 Ensuring the quality of data.

Unit 10

10.1 Introduction

10.2 Types of data: Quantitative and Qualitative

10.3 Processing of Quantitative Data

1.Data Processing

2. Coding of Data

3. Preparing a Master Chart

10.4 Tabulation and Organization of Quantitative Data

1. Frequency Distribution

2. Cumulative Frequency Distribution

3. Contingency Tables

13.3 Parametric Tests

1. Sampling Distribution of Means-Large Samples, Confidence Intervals and Levels of Significance , Small Samples, Degree of Freedom

2. Application of Parametric Tests-Application of Z-Test, Two-Tailed and One-Tailed Tests, Application of T-Test, Application of F-Test, Factor Analysis

13.4 Non-Parametric Tests and Application of Chi-Square Tests

1. Application of Chi-Square Tests

. 2. Application of Median Tests

Unit 14: 14.1 Introduction

14.2 Introduction to Spss

14.3 Features of Spss for Windows

14.4 Get Yourself acquainted with Spss

14.5 Menu Commands and Sub-Commands

14.6 Basic Steps in Data Analysis

14.7 Defining, Editing, and Entering Data

14.8 Data File Management Function

14.8.1.Merging Data Files

14.8.2.Aggregate Data

14.8.3.Split File

14.8.4.Select Cases

14.9. Running a Preliminary Analysis

14.9.1. Six Characteristics of a Dataset

14.9.2.Data Transformation

14.9.3. Graphical Presentation of Data

14.10. Understanding Relationship Between Variable : Data Analysis

14.10.1.Parametric Test

14.10.2.Non-Parametric Tests

14.11.Spss Production Facility

14.12.Stastical Analysis System (SAS)

14.13.Nudist

Reference ***Research Methodology*** By C.R Kothari

SECOND YEAR

S.No.	**Subjects**
1.	Applied Nutrition
2.	Clinical Nutrition& Dietetics
3	Clinical Nutrition& Dietetics Practical
4.	Entrepreneurship and Food Service Management
5.	Public Nutrition
6.	Dissertation

RESIDENCY PROGRAMME Duration – 6 Months

II YEAR /SECOND YEAR

PAPER I –APPLIED NUTRITION

Unit1**.**Menu Planning

Unit2.Pregnancy and lactation

Unit3.Infants and preschool children

Unit 4.Older children and adolescents

Unit 5. Geriatric population

Unit 6.Sports nutrition

Unit 7.Nutritional requirements for special conditions

Unit 8. Nutritional regulation of gene expression-epigenetics &nutrigenomics

Unit 9.Immuno nutrition

Unit 10.Functional foods and nutraceuticals in health & disease

UNIT 1. MENU PLANNING

1.1Introduction

1.2Menu planning

1.2.1 Rationale for menu planning

1.3Factors affecting food choice

1.3.1 Nutritional factors

1.3.2 Other factors

1.4Exchange list vs food composition tables for menu planning

1.4.1 Steps in the development of exchange list

1.5Planning of Adults

1.5.1 Recommended Dietary Allowances

1.5.2 Planning for adults: Some menu plans and dietary guidelines

1.5.3 Planning a low cost menu

UNIT 2. PREGNANCY AND LACTATION

2.1Introduction

2.2Pregnancy and lactation – Critical stages in the lifecycle

2.3Physiological changes during pregnancy

2.3.1 Expansion in plasma volume and red cell mass

2.3.2 Hormonal profile in pregnancy

2.3.3 Organ functions

2.3.4 Placental transfer of nutrients

2.3.5 Maternal weight gain

2.4Nutritional needs during pregnancy

2.5 Maternal nutrition and foetal outcome

2.5.1 Pre pregnancy weight and foetal outcome

2.5.2 Pre pregnancy height and foetal outcome

2.5.3 Body mass index

2.5.4 Weight gain during pregnancy and foetal outcome

2.5.5 Maternal dietary intake and foetal outcome

2.5.6 Non-nutritional factors: Antenatal care, age, heavy physical work and intra uterine infections

2.6 Nutritional assessment and guidance in prenatal care

2.7 Common concerns during pregnancy

2.7.1 High risk pregnancies

2.7.2 Management of high risk pregnancies

2.8 Lactation

2.8.1 Physiology of lactation

2.8.2 Human milk composition and infant growth and development

2.8.3 Malnutrition – Effects of milk and effects on mothers

2.9 Maternal nutrition during lactation

2.9.1 Nutrient requirements during lactation

2.9.2 Dietary Management

2.9.3 Other concerns during breastfeeding

UNIT 3 INFANTS AND PRESCHOOL CHILDREN

3.1 Introduction

3.2 Growth and development

3.2.1 Physiological changes

3.2.2 Growth monitoring

3.2.3 Health monitoring

3.3 Nutrient needs and recommended dietary allowances

3.4 Diet and feeding patterns

3.4.1 Feeding 0-6 months infant

3.4.2 Feeding 6-12 months infant

3.4.3 Feeding preschoolers

3.5 Problems of infants and preschoolers nutrition

UNIT 4. OLDER CHILDREN AND ADOLESCENTS

4.1 Introduction

4.2 Older children and adolescents

4.2.1 Changes in physical development and body composition

4.2.2 Sexual maturity

4.2.3 Psycho-social change

4.3 Nutrient needs and recommended dietary intakes

4.4 Diet and dietary patterns

4.5 Problems of older children and adolescent nutrition

UNIT 5. GERIATRIC POPULATION

5.1 Introduction

5.2 Definition of old age

5.3 Nutrition and ageing

5.4 Physiological changes associated with ageing

5.5 Changing body composition and techniques for measuring body composition

5.5.1 Changing body composition

5.5.2 Techniques for measuring body composition

5.6 Nutritional requirements and dietary modifications in the diet of the elderly

5.7 Guidelines for planning balanced diets for elderly

UNIT 6. SPORTS NUTRITION

6.1 Introduction

6.2 Evolution and growth of sports nutrition as a discipline

6.3 Anthropometric and physiological measurement

6.3.1 Various techniques for measuring body composition

6.3.2 Work capacity

6.4 Physical fitness

6.4.1 Parameters of fitness

6.4.2 Fitness tests

6.5 Nutritional demands of sports and dietary recommendations

UNIT 7. NUTRITIONAL REQUIREMENTS FOR SPECIAL CONDITIONS

7.1 Introduction

7.2 Calamity and emergency management

7.3 Information required for management of emergencies

7.3.1 Nutrient requirements during emergencies

7.3.2 Major nutritional deficiency diseases in emergencies

7.3.3 Monitoring assessment and surveillance of nutritional status and relief measures in emergencies

7.4 Nutritional requirements for extreme environments

7.4.1 General adaptive mechanisms to environmental extremes and role of nutrition in successful acclimatization

7.4.2 Health Hazards associated with high altitude

7.4.3 Nutritional requirements in high altitude

7.4.4 Nutritional requirements in cold and polar environment

7.4.5 Nutritional requirements in hot environments

7.4.6 Nutritional requirements for space missions

7.5 Nutritional considerations in brief for the following:

7.5.1 Military, naval personnel

7.5.2 Emergencies such as drought, famine, floods etc.

UNIT 8. NUTRITIONAL REGULATION OF GENE EXPRESSION-EPIGENETICS & NUTRIGENOMICS

8.1 Introduction

8.2 Gene Expression – An overview

8.3 Role of specific nutrients in controlling gene expression

8.3.1 Proteins

8.3.2 Lipids

8.3.3 Fuel molecules and lipogenesis

8.3.4 Minerals

8.3.5 Vitamins

UNIT 9. IMMUNO NUTRITION

9.1 Role of specific nutrients in immune suppression

9.2 Role of nutrients in Immune promotion

UNIT 10. FUNCTIONAL FOODS AND NUTRACEUTICALS IN HEALTH & DISEASE

10.1 History

10.2 Definition
10.3 Classification
10.4 Physiological effects, effects on human health and potential applications in risk reduction of diseases

Reference:

- Briggs, G. M. &Doirs K. Collaway: Bogery Nutrition And Physical Fitness (9th Ed.) Saunders, Philadelphia, 1979.
- Chaney, M. S. Rose M.L. &Wischi J. C. Nutrition, Houghton Mifflim, Boston, 1979.
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- Robinson, Lawler: Normal & Therapeutic Nutrition (17th Ed.) Macmillan Publishing Co. 1986.
- Swaminathan S.: Advanced Textbook On Food & Nutrition Vol. 1 & N (2nd Ed. Revised _ Enlarged) Bapp Co. 1985.
- Robinson. Basic Nutrition And Diet Therapy (8th Edition)
- Shills And Young. Modern Nutrition In Health And Disease.
- Krause' s Food and Nutrition Therapy 2010, 12th Edition
- Whitney and Rolfes 2002 Understanding Nutrition
- Chandra, R.K. (ed) (1992): Nutrition and Immunology. ARTS Biomedical. St. John's Newfoundland.
- International Life Sciences Institute Present Knowledge in Nutrition – latest edition
- Wildman, R.E.C. ed. (2000) Handbook of Nutraceuticals and Functional Foods, CRCPress, Boca Raton.
- Gibson Principles of Nutrition Assessment Oxford Press
- Baeurle, P.A. (ed) (1994) Inducible Gene Expression. Part I: Environmental Stresses and Nutrients. Boston: Birkhauser
- Indian Council of Medical Research. Nutritive Value of Indian Foods – Latest Publication.
- Indian Council of Medical Research. Recommended Dietary Intakes for Indians – Latest Recommendations.
- World Reviews of Nutrition and Dietetics.
- WHO Technical Report Series

Latest Editions of the above is preferred

Journals:

1. Nutrition Reviews
2. Journal of Nutrition
3. American Journal of Clinical Nutrition
4. British Journal of Nutrition
5. European Journal of Clinical Nutrition
6. International Journal of Vitamin and Nutrition Research
7. International Journal of Food Science and Nutrition
8. Nutrition Research
9. Ann NutrMetab

PAPER II -CLINICAL NUTRITION & DIETETICS

UNIT 1.Medical nutrition therapy and nutritional care in disease

UNIT 2. Nutritional intervention - Diet Modifications

UNIT 3 .Nutrition education and dietetic counseling

UNIT 4. Interactions between drugs, food nutrients and nutritional status

UNIT 5. Nutrition management in critical care

UNIT 6. Nutrition management in infection and fevers

UNIT 7. Nutritional management in physiological stress

UNIT 8. Nutrition management Gastro Intestinal Disorders

UNIT 9. Nutrition management in diseases of the liver, pancreas and biliary system

UNIT 10.Nutrition management of metabolic disease : i) Diabetes & Hypoglycemia

UNIT 11.Nutrition management of metabolic disease-ii: Gout and Inborn Errors of Metabolism

UNIT 12.Nutritional management in weight imbalance

UNIT 13.Nutrition management in coronary heart disease (CHD)

UNIT 14.Nutrition management renal disease

UNIT 15.Nutrition management in cancer

UNIT 16.Nutrition management in diseases of nervous system, and musculo skeletal system

UNIT 17 .Nutrition management in allergy

UNIT -1 MEDICAL NUTRITION THERAPY AND NUTRITIONAL CARE IN DISEASE

1.1. Definition
1.2. Dietitian as part of the Medical Team and Outreach Services
1.3. Nutritional Screening
1.4. The Nutritional Care Process:

1.4.1. Nutritional Assessment
1.4.2. Nutritional diagnosis
1.4.3 .Nutritional Intervention
1.4.4 Monitoring & Evaluation
1.4.5. Documentation

UNIT -2 NUTRITIONAL INTERVENTION - DIET MODIFICATIONS

2.1. Adequate normal diet as a basis for therapeutic diets
2.2. Diet Prescription
2.3. Modification of Normal Diet
2.4. Nomenclature of Diet Adequacy of Standard Hospital Diets
2.5. Psychological factors in feeding the sick person

UNIT 3.NUTRITION EDUCATION AND DIETETIC COUNSELING

3.1. Dietitian as part of the Medical Team and Outreach Services.
3.2. Clinical Information - Medical History and Patient Profile Techniques of obtaining relevant information, Retrospective information, Dietary Diagnosis, Assessing food and nutrient intakes, Lifestyles, Physical activity, Stress, Nutritional Status. Correlating Relevant Information and identifying areas of need.
3.3. The Care Process - Setting goals and objectives short term and long term, Counselling and Patient Education, Dietary Prescription.
3.4. Motivating Patients.
3.5. Working with -

3.5.1. Hospitalized patients (adults, pediatric, elderly, and handicapped), adjusting and adopting to individual needs.

3.5.2. Outpatients (adults, pediatric, elderly, handicapped), patients' education, techniques and modes.

3.6. Follow up, Monitoring and Evaluation of outcome, Home visits

3.7. Maintaining records, Reporting findings, Applying findings, Resources and Aids for education and counselling

3.8. Education for individual patients, Use of regional language, linguistics in communication process, counselling and education.

UNIT 4. INTERACTIONS BETWEEN DRUGS, FOOD NUTRIENTS AND NUTRITIONAL STATUS

4.1. Effect of drugs on Food and Intake, Nutrient Absorption, Metabolism, and Requirements.

4.2. Drugs affecting intake of food and nutrients

- 4.2.1. Absorption
- 4.2.2. Metabolism and excretion
- 4.2.3. Nutritional status

4.3. Summary of action of common drugs

4.4. Effect of food, nutrients and nutritional status on absorption and metabolism of drugs

UNIT 5. NUTRITION MANAGEMENT IN CRITICAL CARE

5.1. Nutritional screening and nutritional status assessment of the critically ill.

5.2. Nutritional requirements according to condition

5.3. Nutritional support systems: Enteral and parenteral nutrition support

- 5.3.1 Enteral Nutrition
  - 5.3.1.1 Site
  - 5.3.1.2 Size-tube
  - 5.3.1.3 Feeds-Type
  - 5.3.1.4 Complications
- 5.3.2 Parenteral nutrition
  - 5.3.2.1 Type
  - 5.3.2.2 Composition
  - 5.3.2.3 Complications

UNIT 6.NUTRITION MANAGEMENT IN INFECTION AND FEVERS

6.1 Defense mechanism
6.2 Metabolic changes during infection
6.3 Classification and etiology of fever/infection
6.4 Fever: Typhoid
6.5 Chronic disease
  6.5.1 Tuberculosis
  6.5.2 HIV & AIDS

UNIT 7. NUTRITIONAL MANAGEMENT IN PHYSIOLOGICAL STRESS

7.1. Normal cellular processes, injury and response of cells to injurious agents, cellular adaptations
7.2. Stress and Physiologic Effects.
7.3. Nutrition in wound healing
7.4. Surgery: Pre and post-surgical dietary management
7.5. Burns
  7.5.1. Classification
  7.5.2. Complication
  7.5.3. Dietary management
7.6. Trauma: Dietary management
7.7. Sepsis: Dietary management with or without MODS

UNIT 8. NUTRITION MANAGEMENT G I DISEASES

8.1. Pathophysiology Of GI Tract Diseases - Anatomic, Physiologic and Functional Changes, Impact On Nutritional Status
8.2. Diseases of Esophagus and Stomach

  8.2.1. Esophagitis
  8.2.2. Dyspepsia
  8.2.3. GERD
  8.2.4. Peptic Ulcer
  8.2.5. Gastritis
  8.2.6. Gastrectomy -Dumping Syndrome

8.3. Intestinal Diseases
  8.3.1. Flatulence
  8.3.2. Diarrhoea
  8.3.3. Constipation, Hemorrhoids, Diverticular disease

8.3.4. Deuodinal Ulcer
8.3.5. Inflammatory Bowel Disease,- Crohn's disease Ulcerative Colitis
8.3.6. Irritable bowel syndrome
8.3.7. Colostomy
8.3.8. Ileostomy

8.4. Malabsorption Syndrome
8.4.1. Celiac Sprue, Tropical Sprue
8.4.2. Steatorrhoea
8.4.3. Intestinal Brush border deficiencies (Acquired Disaccharide Intolerance)
8.4.4. Protein Losing Enteropathy

UNIT 9. NUTRITION MANAGEMENT IN DISEASES OF THE LIVER, PANCREAS AND BILIARY SYSTEM

9.1. Pathophysiology of Liver Diseases- Progression Of Liver Disease Metabolic And Nutritional Implications, Role Of Specific Nutrients And Alcohol
9.2. Nutritional care in Liver disease in the context of results of specific Liver Function Tests.
9.3. Viral Hepatitis, Cirrhosis of Liver, Hepatic Encephalopathy, Wilson's disease.
9.4. Liver Transplant
9.5. Diseases of Gall Bladder and Pancreas.- Pathophysiologic Changes, Metabolic And Nutritional Implications
9.5.1 Biliary Dyskinesia
9.5.2 Cholelithiasis,
9.5.3 Cholecystitis,
9.5.4 Cholecystectomy
9.5.5 Pancreatitis
9.5.6 Zollinger- Ellison Syndrome.

UNIT 10. NUTRITION MANAGEMENT OF METABOLIC DISEASE-I : DIABETES & HYPOGLYCEMIA

10..1. Prevalence & Classification
10..2. Etiology
10..3. Physiological symptoms and disturbances
10..4. Diagnosis & tests used
10..5. Complications

10..6. Management of Diabetes Mellitus

10.6.1 Nutritional Therapy

10.6.1.1 Diet Plan-Food exchange list, Glycemic Index, CHO counting

10.6.1.2 Meal planning with and without Insulin, during sickness

10.6.1.3 Sweeteners and Sugar Substitutes

10.6.2 Drugs and Insulin

10.6.3 Exercise

10.6.4 Hypoglycemia -classification, symptoms, fasting state hypoglycemia, Postprandial or reactive hypoglycemia, Early alimentary and late reactive hypoglycemia, Idiopathic hypoglycemia

10.6.4.1 Dietary treatment in reactive hypoglycemia

UNIT 11. NUTRITION MANAGEMENT OF METABOLIC DISEASE- II: GOUT AND INBORN ERRORS OF METABOLISM

11.1. Gout

11.1.1 Role of protein & purine

11.1.2 Etiology

11.1.3 Symptoms & complication,

11.1.4 Management

11.1.4.2. Diet

11.1.4.2. Drug

11.2. Inborn errors of metabolism

11.2.1 PKU

11.2.2 MSUD

11.2.3 Tyrosinemia

11.2.4 Homocystinuria

11.2.5 Glycogen storage Disorder

11.2.6 Galactosemia

11.2.7 Glutaricaciduria

11.2.8 Other Types

UNIT12. NUTRITIONAL MANAGEMENT IN WEIGHT IMBALANCE

12.1. Regulation of food intake and pathogenesis of obesity and malnutrition and starvation.

12.2. Weight Imbalance-Prevalence and Classification
12.3. Guidelines for Calculating Desirable body weight
12.4. Control of appetite and food intake - Neural control, hormonal control, insulin, estrogen and other peptides and hormones.
12.5. Obesity

- 12.5.1. Etiology
- 12.5.2. Energy balance
- 12.5.3. Theories, Physiology of the obese state
- 12.5.4. Health risks
- 12.5.5. Management

  - 12.5.5.1. Diet and lifestyle modification
  - 12.5.5.2. Evaluation of some common diets-Atkins
  - 12.5.5.3. Pharmacological Management
  - 12.5.5.4. Surgical Management
  - 12.5.5.5. Preventive aspects

12.6. Underweight

- 12.6.1. Etiology
- 12.6.2. Diet management

12.7. Nutrition management in eating disorders

- 12.7.1. Anorexia Nervosa
- 12.7.1. Bulimia

UNIT 13. NUTRITION MANAGEMENT IN CORONARY HEART DISEASE (CHD)

13.1. Pathogenesis, role of nutrients in prevention - metabolic and nutritional implications, dyslipidemias.
13.2. Coronary Heart Disease (CHD)

- 13.2.1. Prevalence
- 13.2.2. Etiology & risk factors
- 13.2.3. Diagnostic tests
- 13.2.4. Nutrition management

13.3. Common disorders of CHD and Nutrition management

- 13.3.1. Dyslipidemias
- 13.3.2. Atherosclerosis
- 13.3.3. Hypertension- DASH diet

13.3.4. Ischemic heart disease –Angina, Myocardial Infarction

13.3.5. Congestive Heart failure

13.3.6. Rheumatic Heart Disease

UNIT 14. NUTRITION MANAGEMENT RENAL DISEASE

14.1 Diseases of the renal system - etiology and pathogenesis - changes in function with progression of diseases, metabolic and nutritional implications

14.2 Clinical and metabolic manifestations

14.3 Diagnostic test

14.4 Types

14.4.1. Acute and Chronic Nephritis

14.4.2. Nephrotic syndrome

14.5 Renal failure-acute and chronic renal failure

14.5.1. Acute and Chronic Nephritis

14.5.2. ESRD

14.6 Nephrolithiasis –Types and management

UNIT 15. NUTRITION MANAGEMENT IN CANCER

15.1. Cancer - Carcinogenesis - pathogenesis and progression of cancer, role of nutrients, foodstuffs and food additives in cancer. therapies and their clinical and metabolic implications.

15.2. Types

15.3. Symptoms

15.4. Diagnosis

15.5. Cancer therapies and treatment - side effects and nutritional implications

15.6. Dietary management

UNIT 16. NUTRITION MANAGEMENT IN DISEASES OF NERVOUS SYSTEM, AND MUSCULO SKELETAL SYSTEM

16.1. Dysphagia

16.2. Epilepsy

16.3. Hyperkinetic Behaviour Syndrome

16.3.1. Etiology, dietary treatment in above conditions

16.4. Arthritis, Osteoporosis

UNIT17. NUTRITION MANAGEMENT IN ALLERGY

17.1. Definitions, symptoms, mechanism of food allergy
17.2. Diagnosis - History, Food record
17.3. Biochemical and Immuno testing (Brief)
17.4. Elimination diets
17.5. Food selection
17.6. Food Allergy in infancy - Milk sensitive enteropathy; Colic, Intolerance to breast milk
17.7. Prevention of Food Allergy.

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1. Anderson L., M. V. Dibble, P. R. Turkki, H. S. Mitchell and H. J. Rynbergen Nutrition in Health and Disease, 17th ed., J. B. Lippincott Co., Philadelphia, 1982.
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5. Kraus M. V. and L. K. Madan: Food, Nutrition and Therapy, W. B. Saunders Company, London, 12th Edition 2010.
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9. Suitor, Coo Woo and Moo F.. Hunter: Nutrition, Principles and Application in Health Promotion, J.. Boo Lippincott Co., Philadelphia, 1980..
10. Whitney, E. N. and C. B..Cataldo: Understanding Normal and Clinical Nutrition, West Pub. S1. Paul, 1983.
11. Willims, S.. R.: Nutrition and Diet Therapy, 4th ed., The C. V. Mosby Co., S1. Louis, 1981.
12. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
13. Thomas, B.: Manual of Dietetic Practice, 1996.

14. Shills And Young. Modern Nutrition In Health And Disease
15. L. MatareseGottschlich Contemporary Nutrition Support Practice, Saunders 1998
16. ASPEN; Nutrition Support, Dietetics

*Latest editions preferred

Journals and Other Reference Series

1. Nutrition Update Series
2. World Review of Nutrition and Dietetics
3. Journal of the American Dietetic Association
4. American Journal of Clinical Nutrition
5. British Journal of Nutrition
6. European Journal of Clinical Nutrition
7. Nutrition Reviews

PAPER – III

CLINICAL NUTRITION & DIETETICS PRACTICAL

Session 1: Introduction

Practical1: Preparation of a Ready – Reckoner for calculating portion volume, conversion of cooked to raw equivalent and nutrient content of various foods.

Practical 2: Planning using the Exchange List and the Food Composition Table and ready reckoner for healthy individual-– Vegetarian, Non-Vegetarian.

Practical 3: Standardization common staple-rice,chapathi,idli,dosa, porridge

Practical 4Plan and prepare weaning foods

Practical 5: Plan and prepare nutrient rich recipe -High protein

Iron rich recipe

Session 2: Nutrition Assessment

Practical 1: Assessing Nutrition status using ABCD parameters. Learn to use the available resources for assessment and to include for pediatric ,pregnant, geriatric and adult man and woman for assessment

Practical 2: Using different Malnutrition assessment tools-SGA,MUST etc

Session 3:Modified diet- Liquid

Practical 1: Planning and preparation of liquid diet

Practical 2: Preparation of formulas for enteral feeding-Home based, combination feeds, supplement feeds.

Practical 3. Planning enteral feed plan for hyper catabolic condition and adult and pediatric patient

Practical 4.Market survey of commercial nutritional supplements and nutritional support

Session 4: Nutrition Management in Weight management,Pre & post Bariatric Surgery

Practical 1. Assessing requirements and planning diet for obese and underweight individual

Practical 2. Preparing nutrient dense -high calorie and high protein recipes

Preparing high fiber low calorie recipes

Session 5: Nutrition Management of Gastro Intestinal Disease

Practical 1 Assessing and Planning diets for the following conditions-Gastro intestinal Disorders-IBD, IBS, Celiac Disease, Lactose intolerance

Practical 2 Prepare low residue diet, low fat diet

Practical 3 Plan and prepare diet for those who have fat and protein malabsorption

Practical 4. Market survey for commercial feeds for infants with lactose intolerance and using the same plan a pediatric diet a 7 month old child

Session 6: Nutrition Management of Metabolic disease-Diabetes

Practical 1. Prepare food exchange list

Practical 2. Assessing and planning diet for patients with Type I and II diabetes with & without complications and on different modalities of treatment

Practical 3.Prepare sweets using artificial sweeteners and meal exchange

Session 7: Nutrition Management of Diseases of Liver and Pancreas

Practical 1: Planning diet for compensated and decompensated liver failure condition

Practical 2: Preparing high carbohydrate and nil fat recipe

Practical 3: Preparing protein free/nil protein recipe/drink

Session 8: Nutrition Management of Cardio Vascular Disease

Practical 1: Planning diet for Acute Myocardial Infarction and Hypercholesterolemia condition

Practical 2: Planning diet for individual with Hypertension .Prepare snacks with salt substitute

Session 9. Nutrition Management of Renal Disease-Pediatric & adult patients

Practical 1: Planning diet for adult renal failure patient on conservative management

Practical 2: Planning diet for Patients on HD & PD

Practical 3: Planning diets- Low calcium, low oxalate and low purine diet

Practical 4: Planning diet for post transplant renal patient

Session 10 Nutrition Management in post Burns , Cancer and HIV

Practical 1: Assessment and planning diet for post burn condition

Practical 2: Assessment and planning diet for HIV with & without comorbidities. Preparing ready to eat snacks

Practical 3:Assess factors contributing for poor nutritional status in cancer patients and plan diet based on the treatment

Session 11: Nutrition Management in Diseases of Nervous System & IBM

Practical 1: Planning Ketogenic diet Preparing a very high fat and very low carbohydrate snack

Practical 2: Planning diet for GSD type-1

Note: Work out one case under each session for planning nutritional care

RECORDING PRACTICAL WORK

The practical manual for the course is actually a workbook. It contains not only the background information and concepts necessary for you to conduct the exercises, but it also serves as a practical file or workbook. You are expected to write your observations, calculations, results, inference, conclusions etc. related to a particular activity in the record itself.

CLINICAL NUTRITION& DIETETICS RECORD

Complete Record Pertaining to Clinical Nutrition & Dietetics Practical

PAPER – IV

ENTREPRENEURSHIP AND FOOD SERVICE MANAGEMENT

Unit 1 : History and Development of Food Service System
Unit 2 : Planning a Food Service Unit
Unit 3 : Setting up a Food Service Unit
Unit 4 : Entrepreneurship and Food Service Management
Unit 5 : Menu Planning: Focal Point of all Activities in Food Service Establishment
Unit 6 : Food Purchasing and Storage
Unit 7 : Quantity Food Production -Planning and Control
Unit 8 : Quantity Food Production -Kitchen Production
Unit 9 : Food Management: Records and Controls
Unit 10 : Delivery and Service- Goals and Issues
Unit 11 : Delivery and Service: Styles
Unit 12 : Delivery and Service in Different Systems
Unit 13 : Administrative Leadership
Unit 14 : Staff Planning and Management
Unit 15 : Personnel Functions: Work Productivity
Unit 16 : Plant and Equipment Maintenance
Unit 17 : Plant - Sanitation and Safety
Unit 18 : Issues in Food Safety
Unit-19- Issues in Food and Worker Safety and Security

Entrepreneurship and Food Service Management

Unit 1

1.1 Food Service Establishments

1.2 Structure

1.2.1 History and Development

1.2.2 Factors affecting Development

1.2.3 Recent Trends

1.3 Types of Food Service Establishments

1.3.1 Commercial Establishments

1.3.2 Non-Commercial Establishments

1.4 Approaches to Food Service Management

1.4.1 Traditional Approach

1.4.2 Classical Approach

1.4.3 Scientific Approach

1.4.4 Management by Objectives

1.4.5 Systems Approach

1.4.6 Quantitative Approach

1.4.7 Behavioral and Human Relations Approach

1.4.8 Contingency Approach

1.4.9 Just in Time

1.4.10 Total Quality Management Approach

1.5 Managing and Organization

1.5.1 Processes involved

1.5.2 Principles of Management

1.5.3 Functions of Management

Unit -2- Planning a Food Service Unit

2.1 Introduction

2.2 The Management Process

2.3 Planning

2.3.1 Steps in Planning

2.3.2 Types of Plan

2.4. Preparing a Planning Guide or Prospectus

2.5.1 Application for a License

2.5.2 Rules regarding Grading of Hotels and Restaurants

2.6 Systems approach in Food Service

Unit-3-Setting up a Food Service Unit

3.1 Introduction

3.2 Layout and Design: Definition

3.2.1 Factors Influencing Layout Design

3.3 Planning Team

3.4 Planning of a Layout : Various Phases

3.4.1 Gathering Information of Development of a Prospectus

3.4.2 Determining Work Centers

3.4.3 Equipment

3.4.4 Developing Overall Plan

3.5 Architectural Features

3.6 Evaluation of Plans

3.7 Energy and Time Management

3.8 Financial Status Analysis

Unit-4- Entrepreneurship and Food Service Management

4.1 Introduction

4.2 A Conceptual Perspective of Entrepreneurship

4.2.1 Defining Entrepreneurship

4.2.2 Who is an Entrepreneur?

4.2.3 Characteristics of Successful Entrepreneurs

4.3 .1 The Creative Process

4.3.2 Business Requirements for Food Products

4.4.1 What and Entrepreneur Needs to Consider

4.4.2 Marketing

4.4.3 Developing the Business Plan

4.4.4 Determine the Resources Needed

4.4.5 Entrepreneurship Development and Training

4.5.1 Approaches to Entrepreneurship Development

4.5.2 The Selective Method

4.5.3 The Shotgun Approach

4.5.4 The Multiplier Method

4.5.5 Intervention as an Approach

4.6 Merchandising Skills Specially for Entrepreneurs

4.6.1 know your Client

4.6.2 Responding to Request

4.6.3 Marketing your Business

4.6.4 Pros and Cons of Yellow Pages Advertising

4.6.5 Client Feedback

4.6.6 Competition

Unit-5- Food Management: Menu Planning –Focal Point of all Activities in Food Service Establishments

5.1 Introduction

5.2 The Importance of Menu and Menu Planning in Food Service Organization

5.2.1 Definition and Functions of a Menu

5.2.2 The Need for Menu Planning

5.2.3 Knowledge and Skills Required for Planning Menu

5.3 The Types of Menu and its Applications

5.3.1 Types of Menu

5.3.2 Uses of Menus

5.4 Steps in Menu Planning and its Evaluation

5.4.1 Construction of Menu

5.4.2 How to Plan a Menu?

5.4.3 Characteristics of a Good Menu

5.4.4 Display a Menu

5.4.5 Evaluation of Menu

Unit-6-Food Management: Purchase and Storage

6.1 Introduction

6.2 Purchasing: A Food Management Activity

6.3 The Market and the Buyer

6.3.1 The Buyer

6.3.2 The Vendor of the Supplier

6.4 Mode of Purchasing

6.4.1 Centralized Purchasing

6.4.2 Group Purchasing

6.5. Methods of Purchasing

6.5.1 Informal or Open Market Buying

6.5.2 Formal or Competitive Bid Buying

6.5.3 Other Types of Purchasing Methods

6.6 Identifying needs and amounts to buy

6.6.1 Minimum Stock Level

6.6.2 Maximum Stock Level

6.6.3 Quantity of Foods to be bought

6.7 Receiving and inspecting Deliveries

6.8 Storage Space

6.8.1 Dry Storage

6.8.2 Low Temperature Storage

6.9 Store Room Management

Unit-7-Food Management : Quality Food Production-Planning and Control

7.1 Introduction

7.2 Principles of Food Productions

7.3 Food Production Systems Management

7.3.1 Menu

7.3.2 Ingredient Control

7.3.3 Production forecasting

7.3.4 Production Scheduling

7.4 Production Control

7.4.1 Use of Standardized Recipes

7.4.2 Developing a Programme for Recipe Standardization

7.5 Safeguard in Food Production

7.5.1 Quality Control in Food Preparation and Cooking

7.5.2 Controlling Microbiological Quality of Food

Unit-8-Quantity Food Production: Kitchen Production

8.1 Introduction

8.2 General procedures used in Institutional and Commercial Food Production

8.2.1 Collecting Ingredients

8.2.2 Selection of Food

8.2.3 Weighing and Measuring

8.2.4 Preliminary Treatment of Food

8.2.5 Food Production to Achieve Consumer Satisfaction

8.3 Cookery Process and their Application to Quantity Production

8.3.1 Moist Heat Method

8.3.2 Dry Heat Method

8.3.3 Combination Method

8.4 Types of Equipments

8.4.1 Cooking Equipments

8.4.2 Mechanical Processing Equipment

8.4.3 Non-Cooking: Refrigeration Equipment

Unit-9-Food Management Records and Controls

9.1 Introduction

9.2 Records and Controls: Basic Concept

9.3 Records necessary for a Catering Unit

9.3.1 Budget

9.3.2 Types of Budget

9.3.3 Purchase Records

9.3.4 Receiving Records

9.3.5 Storage Records

9.3.6 Production Records

9.3.7 Service Records

9.3.8 Income and Expenditure Records

9.4 Reviewing Actual Performance Reports

9.4.1 Daily Food Cost Report

9.4.2 Cumulative Food Cost Report

9.4.3 Daily Cumulative Food Cost Report

9.4.4 Profit and Loss Statement

9.5 Cost Control

9.5.1 Factors affecting Cost Control

9.5.2 Determining Selling Price of Food

9.5.3 Checklist for Cost Control

Unit -10- Food Management: Delivery and Service-Goals and Issues

10.1 Introduction

10.2 Food Service Systems

10.3. A Food Service Systems Model and its Significance

10.3.1 Components of a Food Service System

10.3.2 Significance of the Food Service System Model

10.4. Methods of Delivery Service System

10.4.1 Centralized Delivery System

10.4.2 Decentralized Delivery System

10.4.3 Centralized Vs. Decentralized

10.5 Choice of Delivery Systems and Services attached to Io

10.5.1 Choice of Delivery /Service Systems

10.5.2 Types of Services

10.6 Uses of Disposables in the Service area

Unit -11- Food Management: Delivery and Service Styles

11.1 Introduction

11.2 Different Types of Service in Food Service Establishments

11.2.1 Table and Counter Service

11.2.2 Self Service

11.2.3 Tray Service

11.3 Types of Service in a Restaurant

11.3.1 Silver Service

11.3.2 Plate Service

11.3.3 Cafeteria Service

11.3.4 Buffet Service

11.4 Specialized Forms of Service

11.5 Hospital Tray Service

11.5.1 Floor/Room Service

11.5.2 Airline Tray Service

11.5.3 Rail Service

11.5.4 Home Delivery

11.5.5 Catering and Banquet

11.5.6 Lounge Service

Unit -12-Food Management: Types of Food Service Systems

12.1 Introduction

12.2 Introduction to Food Service Systems

12.3 Types of Service Systems

12.3.1 Conventional

12.3.2 Commissary

12.3.3 Ready Prepared

12.3.4 Assembly/Serve

12.4 Distribution and Serve in Food Service System

12.4.1 Conventional Food Service System

12.4.2 Commissary Food Service System

12.4.3 Ready Prepared Food Service System

12.4.4 Assembly/Serve Food Service System

12.2 Conduct and Appearance of Service Unit Personnel

Unit-13-Personnel Management: Leadership

13.1 Introduction

13.2 Leadership

13.2.1 Definition

13.2.2 Components of Leadership

13.2.3 Approaches to Leadership

13.3 Who are Leaders?

13.3.1 Qualities

13.3.2 Attitude and Behavior

13.3.3 Values

13.3.4 Tasks of Leaders

13.4 Leadership Styles

13.4.1 Effective Leadership

13.4.2 Communication-The Key to Effective Leadership

13.4.3 Applications to Food Service Management

Unit-14- Personnel Management: Staff Planning and Management

14.1 Introduction

14.2 Staff Planning and Management

14.2.1 Approaches to Staff Management

14.2.2 Issues in Planning and Management

14.2.3 Steps in Planning

14.2.4 Staff Scheduling

14.3 Employment Process

14.3.1 Determining Staff Requirements

14.3.2 Establishment Policies for Recruitment

14.3.3 Outlining Procedures

14.4 Staff Recruitment and Selections

14.4.1 Recruitment

14.4.2 Selection

14.5 Staff Placement

14.5.1 Documenting Contract

14.5.2 Induction

14.6 Staff Training

14.6.1 Need for Training

14.6.2 Areas of Training

14.6.3 Training Process

14.6.4 Evaluation and Appraisal

14.7 Laws Governing Staff Planning and Management

14.7.1 Employee Laws

14.7.2 Trade Union Contracts and Negotiations

Unit-15-Personnel Function-Work Productivity

15.1 Introduction

15.2 Meaning and Definition of Productivity

15.3 Understanding Formal Relationships and Duties

15.3.1 Vertical Division of Labour

15.3.2 Horizontal Division of Labour

15.3.3 Line and Staff Division of Labour

15.3.4 Departmentalization

15.3.5 Organization Chart

15.3.6 Coordination

15.4 Design of Jobs

15.4.1 Job Analysis

15.4.2 Job Descriptions

15.4.3 Job Titles

15.4.4 Job Enrichment

15.5 Work Design

15.6 Work Measurement in Food Service Operations

15.7 Productivity Improvement

15.7.1 Productivity Measures

15.7.2 Quality Circles

Unit-16-Plant and Equipment Maintenance

16.1 Introduction

16.2 Plant and Equipment in Food Services

16.2.1 Definition

16.2.2 Classification

16.3 Types of Plant and Equipment

16.3.1 Plant

16.3.2 Equipment

16.4 Maintenance of Plant and Equipment

16.4.1 General Case and Maintenance

16.4.2 Cleaning Systems

16.4.3 Planning for Maintenance

16.5 Safety Concerns

16.5.1 Safety Measures in Food Service Operations

16.6 Checks and Inspections

16.6.1 Procedures

16.6.2 Schedules

16.7 Equipment Suppliers

Unit-17-Plant Sanitation and Safety

17.1 Introduction

17.2 Sanitation and Safety

17.2.1 Definitions

17.2.2 Sanitation in Food Services

17.2.3 Sanitation and Public Health

17.2.4 Plant Sanitation and Safety

17.3 Consideration Necessary for and Efficient Cleaning Programme

17.3.1 Three Methods to Wash, Rinse and Sanitize Food Contact Surfaces

17.4 Post Cleaning Care and Cleaning of Premises and Surroundings

17.5 The-3-E’s of Safety

17.5.1 Safety Engineering

17.5.2 Safety Education

17.5.3 Safety Enforcement

17.6 Standards, Policies and Schedules

17.6.1 Standards

17.6.2 Policies

17.6.3 Schedules

Unit-18-Issues in Food Safety

18.1 Introduction

18.2 Microbiology and Food Safety

18.2.1 Microorganisms in Foods

18.2.2 Growth of Bacteria and the Factors that affect the Growth of Microorganisms

18.2.3 Control of Microbial Growth in Foods

18.3 Food Borne illness

18.3.1 Types of Food Borne illnesses

18.3.2 Control of Food Borne illnesses

18.4 Modes of Disease Transmission

18.4.1 Routes of Disease Transmission

18.4.2 Source of Contamination

18.5 Conditions that could lead to Food Spoilage

18.5.1 Categorization of Food on the Basis of their Shelf Life or Perish ability and Conditions that could lead to Food Spoilage

18.5.2 Signs of Spoilage in Fresh, Dry and Preserved Foods

18.6 Importance of Pest Control

18.6.1 Classification of Pesticides

18.6.2 Precautions to be taken while handling Pesticides

18.7 Hygienic Food Handling

18.7.1 Procedures in Food Preparation which affect the Microbial Count

18.7.2 Cooked Food and Microbial Contamination

Unit-19-Issue in Worker Safety and Security

19.1 Introduction

19.2 Personal Hygiene and Sanitary Practices

19.2.1 Health of Staff

19.2.2 Sanitary Practices

19.3 Sanitation Training and Education for Food Service Workers

19.3.1 Sanitation Training and Education

19.3.2 Who should be trained?

19.3.3 What a Training Program me should include?

19.3.4 Employment Practice

19.4 Hazard Analysis and Critical Control Point (HACCP)

19.5.1 Why accidents should be prevented?

19.5.2 How accidents take place?

19.5.3 Types of accidents

19.5.4 Precautions to Prevent Accidents

19.6 Sanitation Regulations and Standards

19.6.1 Control of Food Quality, Adulteration and Misbranding

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PAPER V - PUBLIC NUTRITION

UNIT-1.Concept and scope of community nutrition.

UNIT-2.Nutrition and national development

UNIT-3.Nutrition and national development

UNIT 4.Nutritional status

UNIT 5.Nutritional problems in india

UNIT 6 .Strategies to overcome malnutrition

UNIT 7.Nutrition intervention programs

UNIT 8.Role of national and international organization to combat malnutrition

UNIT 9.Nutrition education

UNIT 10.Hazards to community health and nutritional status

UNIT-1.CONCEPT AND SCOPE OF COMMUNITY NUTRITION.

UNIT-2.NUTRITION AND NATIONAL DEVELOPMENT

2.1. Relation of nutrition to national development economic development, Industrial development and agricultural development

UNIT-3.FOOD AVAILABILITY AND FACTORS AFFECTING FOOD AVAILABILITY ANDINTAKE.

3.1. Agricultural production, post-harvest handling (storage & treatment), marketing and distribution
3.2. Industrialization
3.3. Population
3.4. Economic, regional and socio-cultural factors.
3.5. Strategies for augmenting food production
3.6. Control of Food losses- Agencies to control food losses
3.7. Food security and adequacy of diets.

UNIT- 4.NUTRITIONAL STATUS

4.1. Determinants of nutritional status of individual and

populations

4.2. Nutrition and Non-nutritional indicators

4.2.1 Socio-cultural, Biologic, Environmental, Economic

4.3. Assessment of nutritional status of individuals

4.3.1. Meaning, need, objectives and importance, methods

UNIT-5.NUTRITIONAL PROBLEMS IN INDIA

5.1. Common nutritional problems – Ecology, prevalence ,clinical manifestation, consequences treatment of malnutrition
5.2. Malnutrition and infection

UNIT- 6STRATEGIES TO OVERCOME MALNUTRITION

6.1. Measures to overcome malnutrition in India
6.2. National nutrition policy and action plan
6.3. Nutrition education.
6.4. Agricultural planning role of food technology,
6.5. Environmental sanitation and health
6.6. Nutrition intervention programs
6.7. Food fortification and enrichment

UNIT 7.NUTRITION INTERVENTION PROGRAMS

7.1. Objectives and operation
7.2. Different programs

7.2.1. Pre-school feeding programs, SLP, SNP, ANP and other programs. Organized by the governmental and non-governmental agencies

UNIT 8. ROLE OF NATIONAL AND INTERNATIONALORGANIZATION TO COMBAT MALNUTRITION

8.1. International organizations concerned with food and nutrition FAO, WHO, UNICEF, CARE, AFPRO, CWS, CRS, World Bank and others.
8.2. National organizations concerned with food and nutrition – NIN,CFTRI, ICMR, ICAR, CHEB,NIPCCD,DFRL,NGOs

UNIT 9 NUTRITION EDUCATION

9.1. Meaning, methods and importance of nutrition education
9.2. Training workers in nutrition education programs
9.3. Principles of planning, executing and evaluating nutrition education programs

UNIT 10. HAZARDS TO COMMUNITY HEALTH ANDNUTRITIONAL STATUS

10.1. Adulteration in food
10.2. Pollution of water, air
10.3. Toxins present in food

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- Documents and Reports published by the International Vitamin A Consultative Group

- Documents and Reports of the International Nutritional Anemia Consultative Group SCN News, UN ACC/SCN Subcommittee on Nutrition.

- National Family Health Survey reports

PUBLIC NUTRITION FIELD VISIT

1. Community Oriented Experience in selected village/community on any Vulnerable group

   Assessing Nutritional status of any 1 of the vulnerable groups(minimum 10 subjects- if pregnant/lactating mother)

   Visit to centers of ICDS CENTRE/BALWADI

2. Observations regarding the above to be entered in the LOG BOOK

LOG BOOK Format **is given in Appendix-A**

ASSESSMENT PATTERN

50% of marks in the University Theory Examinations

50% of marks in the subject where Internal evaluation alone is conducted

50% of marks in aggregate in Theory, Practical I.A. & Oral taken together

A) **Internal assessment of practical component**

Unlike the theory component, the practical will have 50% weightage from internal assessment. The internal assessment of the practical will be done by the respective teaching faculty located at the hospital. There are no formal question papers to assess the component. Passing in internal assessment of the practical is a prerequisite for appearing in the term-end examination. A student will have to secure at least 50% marks in practical assessment to be declared as pass in internal assessment component. If the student fails to secure pass marks, he/she will have to repeat all the practical activities of related paper.

B) **Term-End Practical Examination**

For term-end practical examination, there will be one internal and one external examiner. The internal examiner will be from the same programme study centre and the external examiner may be from the university or other medical institution (in the area of clinical nutrition/dietetics)in the city. The examiners will be decided by head of the department of nutrition in consultation with the university.

RESIDENCY TRAINING PROGRAMME

At the end of the 2nd Year theory and Practical Examinations- 6 Months Residency Training Program is compulsory.

DISSERTATION

Dissertation and Residency Training-

The dissertation shall be carried out under the supervision of the guide appointed to each learner by the programme in charge/coordinator at the respective programme study centre. After completing the dissertation (thesis), the *report* is to be submitted to the University for Evaluation. Students will have to appear for a viva-voce to defend their thesis and on successful completion of the course the M.Sc.,Clinical nutrition degree shall be awarded.

Duration of Residency Training for six months, in the Dietetic Department of a recognized hospital/institution, for the award of M.Sc.Clinical Nutrition degree is compulsory. The Residency Training report will be prepared and submitted by the learner for evaluation at the University.

Log Book For Residency Training Program

As per Appendix B

DISSERTATION

1)Consult the Programme Incharge for Assignment of Dissertation Guide/Counselor: The programme in charge shall make arrangements to provide suitable counselor/guides to students (on one to one basis) for undertaking the dissertation i.e. research work. Student may also identify their guide on their own from the programme study center or an expert from outside (with relevant research and subject background) whom they would want to have as a guide for their Dissertation. Under such circumstances, consult the programme incharge for allotment. In case of an external counselor/guide, the student would make the necessary arrangements to provide the bio-data of the expert to the programme in charge who would ensure the qualifications/experience/expertise of the guide meets the requirement of the programme (an supervisor/guide/counselor must have a doctoral degree in the area of nutrition, dietetics, health or the relevant area Or Masters degree in Nutrition and Dietetics, in case of a Master Degree the supervisor must have relevant experience for a specified time of minimum10 years in clinical nutrition)

2) Consult with Dissertation Guide/Counselor: Once the dissertation guide is assigned, the student shall consult the counselor for possible research areas for the dissertation.

3) Select an Area of Study and Relevant Topic: Identify a research area and the specific topic for research and define the problem or point of interest to be addressed. Discuss the proposed topic with this guide/advisor and refine as necessary.

4) Review Literature: Review the literature available related to the topic of the dissertation and consult with the counselor/guide concerning the chosen topic including the method of approach and ways to evaluate the results.

5) Prepare and Submit the Dissertation Proposal: Prepare a Dissertation proposal and submit the same to the counselor by the given deadline as per

University guidelines with information to the programme in charge. The student will be notified of what changes are necessary before final approval will be granted by the counselor.

6) Conduct the Study: Only after receiving the dissertation approval (from the guide the student may proceed to develop the dissertation, conduct it and begin writing.

7) Communicate Regularly with Dissertation Counselor/Guide: Share the experiences, report on the data collected, report the difficulties/problems encountered to the counselor. Discuss the data analysis and other issues. Give them copies of your chapters as they are completed for review and comment.

8) Submit First Draft: Submit the entire first draft to the counselor for review and feedback. Please be sure that the draft is in proper style and format, and has been carefully proofread for spelling, grammar, punctuation and format. Make the necessary changes as suggested.

9) Submit the final Manuscript: Submit the bound copy of the word-processed, printed dissertation to the programme incharge for necessary action.

10**) Number of copies submitted:** 4 copies of dissertation shall be submitted 2 months prior to the commencement of the examination on the prescribed date to the Controller of Examination of this University.

Appendix-A

Format : For Public Nutrition Visit activity LOG BOOk

Page:-1

Name of Student
Academic Year

Name of the Institute/Study center:

Page-2 onwards
I .Community Oriented Program
Area visited:
Date of visit & details:
Study Group for Nutrition survey selected:
Study conducted: Enclose detailed study (typed)

Supervisor:
Signed with date

II.Visit to Centers

1.ICDS CENTRE

Place
Date

Record: Observations & activities
Activities of center+ records maintained etc

Signed with date
ICDS centre staff

2.BALWADI CENTRE

Place
Date
Children: Numbers,gender,Age,NS,
Activities of center+ records maintained etc

Record: Observations & activities

Signed with date
BALWADI centre staff

Finally should be checked and signed by

- Student
- Supervisor

Appendix-B

Part -1 Format: For Public Nutrition Visit activity **LOG BOOK**

Part-II **Format of Log Book for Residency Training Program**

Part-I

Format: For Public Nutrition Visit activity **LOG BOOK**

Page:-1

Name of Student:

Academic Year:

Name of the Institute/Study center:

Certificate

This is to certify that this log book is the bonafide work of

_____

_____

_

during the period _____

Director of Study center/Program Coordinator

I .Community Oriented Program

Area visited:

Date of visit & details:

Study Group for Nutrition survey selected:

Study conducted: Enclose detailed study (typed)

Supervisor:
Signed with date

II.Visit to Centers

1.ICDS CENTRE

Place
Date

Record: Observations & activities
Activities of center+ records maintained etc

Signed with date
ICDS center staff

2.BALWADI CENTRE

Place
Date of Visit:

Record: Observations & activities

- Record and assess (gender, Age) Nutrition Status of children
- Activities of center+ records maintained etc

Signed with date
BALWADI center staff

Finally should be checked and signed by
Student
Supervisor
Director of Study center
Part II

Format of Log Book for Residency Training Program

M.Sc CLINICAL NUTRITION INTERN'S LOGBOOK

Name of Student Intern:……..

Academic Year :……

Name of the Institute/Study center:……

Dear Graduate,

This Logbook was designed for use as a documentation tool that traces your activities, acquired competencies as well as graded evaluations through the Internship period

The log book is vital evidence in deciding on both your suitability and eligibility to be awarded with the M.Sc. graduation document, and will need to be kept safely and returned in its original form to the Program coordinator.

Program Plan

• The program consists of 6 months of supervised practice hours in clinical, community, and food service management.
• Each week is generally divided into Six 8-hour days.
• Student should complete all rotations. Given in syllabus

Certificate

This is to certify that this log book is the bonafide work of

_____

_____

during the period _____

Director of Study center/Program Coordinator

Placement Details

Name of Hospital	**Placement Period:**
	From to
	From to
	From to

Activity log of Placement& rotations

POSTING INFORMATION:

Area Of Posting _____

Posting Period: _____ To _____

Name of Department: _____

Name of the supervisor:_____

SUMMARY OF KEY POSTING ACTIVITIES

Weekly Timetable	**Summary For Each Posting**
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

Clinical Duties:

a) No. of outpatient sessions/week :
_____
b) No. of Ward rounds sessions/week:
_____
c) No of Nutrition Screening performed/week:
_____
d) No of Nutrition Assessment performed/week:
_____
e) No of Diet Planning and counseling Sessions done under supervision
_____

Food Service related activities: Areas

a) Store
b) Production
c) Distribution
d) Management

Formal departmental educational activities/week:

a) Lectures: _____

b) Journal club meetings

c) Audit meetings

d) Research meetings

e) Others

f) Cases presented

g) Workshop/camps

Mini Project:

- Subject related to clinical nutrition/Dietetics to fulfill IDA RD Board eligibility
- Typed & bound copy should be submitted –two copies

Cases for Nutrition Care to be completed: Minimum 100

That covers the cases under different rotations

- Diabetic 30
- Critical care 10
- Pediatric 10
- Surgical 20
- Medical 30

Format given for NC case

Completed case study for one case for all the category listed in the Residency training should be completed and after correction should submit in bound copy-**three numbers**

Note: Attendance should be maintained in the respective posting rotations' register

Signed by the supervisor

Appendix-C

CASE STUDY FORMAT

Patient ID-: Age: Gender: M/F

Date of admission___ Hospital No: _____Ward_____ Bed No_____ Unit_____

CC: (Chief Complaint)

What the pt was complaining of on admission to the hospital (or arrival at the outpatient clinical), in the patient's own words, not in medical terms.

HPI: (History of the Present Illness)

Describe the course of events occurring prior to the patient's admission, which caused him/her to seek medical care. This should be presented in chronological order with the earliest events first and those immediately preceding admission last.

PMH:(Past Medical History)

Discuss medications which the patient is taking at home; known diseases including disease duration; prior hospitalizations; previous surgeries (including the reason for the procedure).

FH: (Family History)

Diseases of grandparents, parents, siblings and children.

DD (Demography Data): Education, occupation, income, place of residence, language, Life style- exercise, recreational activities, smoking, alcohol

PE: (Physical Exam)

Include pertinent physical findings such as (but not limited to): hydration - edema, ascites, dehydration, overhydration; motor limitations, especially of hands; impairment of sight, hearing or speech; blood pressure, pulse, respiration and temperature, etc.

ASSESSMENT:

Problem list/diagnoses.

HOSPITAL COURSE or Patient Treatment Course:

Discuss in chronological order the events occurring during the course of the patient's hospitalization. The following information should be included: treatment plans (medical and nutritional), abnormal laboratory values, medications (type of drug, dosage, indications for use and any drug-nutrient interactions. Also indicate for what condition each drug was prescribed.), surgeries, complications, etc. Also, include final diagnoses and the prognosis. This is a summary section and not a day-by-day account of what happened to the patient.

There may be multiple dates depending on hospital course and length of stay. Some case study patients will not be in the hospital in this case give a chronological history of what happened based on the information available. You may not have enough information to complete each section, if that is the case indicate not applicable.

Use the following format:

Date (include summary of the following at each interval of nutrition assessment and follow-up)

Diagnosis (be sure to include any changes)

Medications (current for date)

Labs (may include multiple results from last nutrition assessment up to current date)

Diet or nutrition order (current or history from last nutrition assessment)

Medical treatment plan (from point of last nutrition assessment to current date)

Brief nutrition assessment (as above)

Medical Nutrition Therapy plan (as above)

THEORETICAL DISCUSSION OF DISEASE PROCESSES:

Include discussion of all disease processes.

Cover the pathophysiology of the disease, pertinent laboratory findings (serum chemistry, hematology, urinalysis, etc.) and compare to patient's values; common diagnostic test/procedures used, with a brief description of what each test evaluates; usual medical/ surgical/ dietary treatment and commonly prescribed drugs, including drug classification and indications for use.

In these discussions, be sure to indicate how the patient's hospitalization compares to the theoretical course of the disease, diagnostic tests and treatments.

FINAL NUTRITIONAL CARE PLAN:

Include the following information: sex, age, height, weight (actual, usual, ideal, %IBW, %UBW, recent weight changes and causes, if known; intentional or unintentional, %weight lost or gained). Is patient obese, normal weight or underweight?

Visceral protein status: serum albumin and total lymphocyte count.

(PN :use desirable instead of Ideal with reference to weight ; %DBW instead of %IBW)

Nutritional diagnoses:

Include PES statement (Problem, Evidence, signs/symptoms)

DIET HISTORY:

Assess the following:

Changes in dietary habits due to current medical problems

Chewing/swallowing abilities

Loss of teeth/dentures

Changes in taste/smell

Change in appetite

Presence of nausea/vomiting

Presence of constipation/diarrhea

Food allergies/intolerances

Food aversions

Food likes/dislikes

Previous instruction on therapeutic diet/comprehension/compliance

Voluntary attempts at dietary changes

Use of dietary supplements

Routine exercise

Physical handicaps/assistance feeding

EVALUATION OF LABORATORY FINDINGS:

Discuss lab findings and clinical significance they may have on the patients diagnosis, condition or outcome. Address final labs or how they have changed from beginning to end of case study.

REVIEW OF MEDICATIONS AND FOOD/NUTRIENT INTERACTIONS:

Discuss side effects of medications that the patient may be experiencing and strategies to minimize or correct problems

EVALUATION OF PHYSICAL OR CLINICAL FINDINGS:

Presence of physical or clinical findings that could be affecting diagnosis, condition, nutrition status or outcome as well as tolerance to current diet orders (includes p.o., EN or PN).

ENERGY REQUIREMENTS:

Use the method of the facility to which you are assigned. Show all calculations.

PROTEIN REQUIREMENTS:

Describe how these were determined.

DIET ORDER:

If diabetic or renal exchanges, tube feeding or TPN are used, calculate total kcals and kcals from CHO, protein and fat. Also, compute grams of CHO, protein, fat and if necessary, milligrams of Na^+ and K^+ and ccs of fluid.

In addition, discuss patient's tolerance to the diet in terms of appetite, % meal ingested, presence of nausea, vomiting or diarrhea. If the patienttis receiving a tube feeding, include an I& O record, residual volumes, nausea, vomiting, stool frequency and consistency. If patient is receiving TPN, indicate I& O record, serum glucose, urine sugar and acetone, and liver enzymes.

DIET THERAPY:

Discuss the goals of dietary treatment. Based on these goals, the calculated energy and protein requirements, diet order and the patient's medical condition, is the diet order appropriate? Integrate all the information and support your position! Answering only "yes" or "no" is inadequate.

Further, if the order is not appropriate, what would you recommend and why?

NUTRITIONAL GOALS:

Develop short-term and long-term goals for the management of the patient's diet. For each goal, there should be at least one objective detailing how the goal will be achieved. List the most important goals first.

(In short Residency program log book has to include details of cases studied as per the format provided during the residency program in the various departments countersigned by the Heads of each department / supervising Dietician, Different Nutrition assessment formats, formulas regularly used in nutrition assessment ,biochemical parameters with their interpretation relevant to nutritional management, Drug and nutrient reactions related the cases studied, Diabetic and renal exchange list ,Food sources of Vitamin & Minerals, Conversion Formulas of common nutrients (mgs to mmols, ug to IU))

BIBILIOGRAPHY:

Use acceptable journal abbreviations. References should be cited in numerical order as they occur in the text. If the same reference is used later in the text, use the original number with which it was designated. Do not assign another number.