



Dr.M.G.R.
Educational and Research Institute
(DEEMED TO BE UNIVERSITY)
(An ISO Certified Institution)
University with Graded Autonomy Status
Maduravoyal , Chennai - 600 095



FACULTY OF ALLIED HEALTH SCIENCE

B.Sc., CLINICAL NUTRITION

Regulations, Curriculum and Syllabus

2020



C. B. Palanivelu
REGISTRAR
Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
Periyar E.V.R. High Road,
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Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the **Faculty of Allied Health Sciences**, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical speciality. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2020-21. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

- a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science) should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:
 - i) Physics, Chemistry, Biology (Eligible for all AHS courses)
 - ii) Physics, Chemistry, Botany and Zoology (Eligible for all AHS courses)
 - iii) Physics, Chemistry, Biology, biochemistry (Eligible for all AHS courses)
 - iv) Physics, Chemistry, Biology, nutrition dietetics (for B.Sc., Clinical nutrition only)

- v) Physics, Chemistry, Mathematics (for B. Optometry only)
- b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the B.Sc., Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Basic nutrition, Applied Microbiology, Family meal management, Clinical Nutrition, Advanced Nutrition, Physiology, Allied chemistry, Physics, English and Communication skills, Introduction to Computers, and Pharmacology.
- Specialized training in the concerned speciality will be offered during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective speciality.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80% attendance in Theory and Practical separately. Each semester shall be taken as a unit for the purpose of calculating the attendance. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

- a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.

b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

16. Pattern of Semester - End Examination (University/Department):

EXAMINATION PATTERN-

SEMESTER-I AND SEMESTER-II (FOR ALL SPECIALITIES)

THEORY

MARKS- 60 Marks

DURATION -2¹/₂ Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

Theory 20 Marks

Practical 5 Marks

TOTAL

100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory

80 marks

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

Based on CAT Exams (I, II, III & Model)

20 marks

TOTAL

100 Marks

Practicals Pattern

1. Spotters
2. Viva (Theory &Practicals)
3. Charts/stations
4. Record

80 marks

20 marks

20 marks

20 marks

20 marks

Internal assessment

20 marks

- Attendance
- Based on CAT exams
- Log book

TOTAL

100 Marks

17. Marks Qualifying for a Pass:

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- 40% minimum in the University End-Semester Theory examination
- 40% minimum in the University End-Semester Practical examination
- 40% of marks in the subject where internal evaluation alone is conducted
- 40% of aggregate of theory, practical and internal assessment taken together

18. Classification of successful candidates:

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19. Revaluation of answer papers

There shall be revaluation and retotaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and retotaling.

20. Carry- over of failed subjects

- 1) A candidate has to pass in theory and practical examinations separately in each of the paper.
- 2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)
- 3) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,
 - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
 - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.
- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.
 - ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.
- f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.

- g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE
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FACULTY OF ALLIED HEALTH SCIENCES
SCHEME OF EXAMINATION
Semester-I
(B.Sc., CLINICAL NUTRITION AND DIETETICS)

TOTAL HOURS –

TOTAL HOURS : 330

S. No	PAPER	Hours per semester		Evaluation (Marks)				
				Continuous assessment (Internals)		End Semester Examination (University/ Department Exams)		Total
		Theory	Practical	Theory	Practical	Theory	Practical	
1	Basic Nutrition (UE)	40 hours	20 hours	20	05	60	15	100
2	Physiology –I (UE)	40 hours	20 hours	20	05	60	15	100
3	Biochemistry –I (UE)	40 hours	20 hours	20	05	60	15	100
4	Food Microbiology –I (UE)	40 hours	20 hours	20	05	60	15	100
5	Family Meal Management –I (UE)	40 hours	20 hours	20	05	60	15	100
6	English (IE)	30 hours	-	-	-	50	-	50

UE	University Exams
IE	Internal Examinations

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE

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FACULTY OF ALLIED HEALTH SCIENCES
SCHEME OF EXAMINATION
Semester-II
(B.Sc., CLINICAL NUTRITION AND DIETETICS)

TOTAL HOURS –
TOTAL HOURS : 420

S. No	PAPER	Hours per semester		Evaluation (Marks)				
				Continuous assessment (Internals)		End Semester Examination (University/ Department Exams)		Total
		Theory	Practical	Theory	Practical	Theory	Practical	
1	Diet Therapy (UE)	40 hours	20 hours	20	05	60	15	100
2	Physiology –II (UE)	40 hours	20 hours	20	05	60	15	100
3	Biochemistry –II (UE)	40 hours	20 hours	20	05	60	15	100
4	Food Microbiology –II (UE)	40 hours	20 hours	20	05	60	15	100
5	Family Meal Management –II (UE)	40 hours	20 hours	20	05	60	15	100
6	Quantity Food Production (UE)	40 hours	20 hours	20	05	60	15	100
7	Advance Nutrition (IE)	30 hours	-	-	-	50	-	50
8	Computer Science (IE)	30 hours	-	-	-	50	-	50

UE	University Exams
IE	Internal Examinations

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE

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FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

Semester–III

(B.Sc., CLINICAL NUTRITION AND DIETETICS)

Total Hours: 420 Hrs

S.No	PAPER	Hours / Semester		Evaluation (Marks)				
		Lecture	Practical	Continuous assessment (Internals)		End Semester Examination (University/ Department Exams)		Total
				Theory	Practical	Theory	Practical	
1.	Basic Dietetics (UE)	60	-	20	-	80	-	100
2.	Basic Dietetics- practical(UE)	-	120	-	20	-	80	100
3.	Food science - Theory (UE)	60	-	20	-	80	-	100
4.	Food science - Practical(UE)	-	120	-	20	-	80	100
5.	Medical Ethics and Bio safety (IE)	30	-	-	-	50	-	50
6.	Psychology(IE)	30	-	-	-	50	-	50

UE	University Exams
IE	Internal Examinations

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FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

Semester-IV

(B.Sc., CLINICAL NUTRITION AND DIETETICS)

Total Hours: 420 Hrs

S.No	PAPER	Hours / Semester		Evaluation (Marks)				
		Lecture	Practical	Continuous assessment (Internals)		End Semester Examination (University/ Department Exams)		Total
				Theory	Practical	Theory	Practical	
1.	Advanced Dietetics (UE)	60	-	20	-	80	-	100
2.	Advanced Dietetics Practical(UE)	-	120	-	20	-	80	100
3.	Personnel Management - Theory (UE)	60	-	20	-	80	-	100
4.	Personnel Management - Practical(UE)	-	120	-	20	-	80	100
5.	Basics And Advanced Life Support(IE)	30	-	-	-	-	50	50
6.	Sociology(IE)	30	-	-	-	-	50	50

UE	University Exams
IE	Internal Examinations

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE

(Deemed to be university)

FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

Semester–V

(B.Sc., CLINICAL NUTRITION AND DIETETICS)

Total Hours: 450 Hrs

S.No	PAPER	Hours / Semester		Evaluation (Marks)				
		Lecture	Practical	Continuous Assessment (Internals)		End Semester Examination (University/ Department Exams)		Total
				Theory	Practical	Theory	Practical	
1.	Clinical Nutrition I- (UE)	60	-	20	-	80	-	100
2.	Clinical Nutrition I - Practicals (UE)	-	120	-	20	-	80	100
3.	Community nutrition (UE)	60	-	20	-	80	-	100
4.	Community Nutrition-Practicals (UE)	-	120	-	20	-	80	100
5.	Environmental Science And Community Medicine (IE)	30	-	-	-	50	-	50
6.	Bio-Statistics and Research Methodology(IE)	30	-	-	-	50	-	50
7.	Hospital Management/ Applied clinical research (Elective) (IE)	30	-	-	-	50	-	50

UE	University Exams
IE	Internal Examinations

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE

(Deemed to be university)

FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

Semester–VI

(B.Sc., CLINICAL NUTRITION AND DIETETICS)

Total Hours: 390 Hrs

S.No	PAPER	Hours / Semester		Evaluation (Marks)				
		Lecture	Practical	Continuous Assessment (Internals)		End Semester Examination (University/ Department Exams)		Total
				Theory	Practical	Theory	Practical	
1.	Clinical Nutrition II - Theory (UE)	60	-	20	-	80	-	100
2.	Clinical Nutrition II -Practical (UE)	-	180	-	20	-	80	100
3.	Dietetics and Counseling- Theory (UE)	60	-	20	-	80	-	100
4.	Dietetics and Counseling-Practical (UE)	-	180	-	20	-	80	100
5.	Healthcare and Basic principles (IE)	30	-	-	-	50	-	50
6.	Hospital Management/ Applied clinical research (Elective) (IE)	30	-	-	-	50	-	50

UE	University Exams
IE	Internal Examinations

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE

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FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

Semester–VII

Project/Dissertation

S.No	Paper	Hours / Semester		Evaluation (Marks)				Total
		Lecture	Practical	Continuous assessment (Internals)		End Semester Examination		
				Project	Viva	Project	Viva	
1.	Project/ Dissertation(UE)	-	-	100	-	100	-	200

UE	University Exams
IE	Internal Examinations

SEMESTER – VII & VIII (FOR ALL SPECIALITIES)

Internship -12 months

SEMESTER I

S.No	SUBJECT
1	BASIC NUTRITION (UE)
2	PHYSIOLOGY-I(UE)
3	BIOCHEMISTRY- I (UE)
4	FOOD MICROBIOLOGY –I (UE)
5	FAMILY MEAL MANAGEMENT – I (UE)
6	ENGLISH(IE)

SEMESTER – I

BASIC NUTRITION (UE)

OBJECTIVES

To enable the students to:

- To understand the relation between nutrition and health.
- To acquire knowledge about the main nutrients and its functions in the body.
- To understand the modifications in nutrient and dietary requirement for various diseases.

UNIT-I

- Introduction to Nutrition: Health, Food, Functions of food, Nutrients, Nutrition, Scope of Nutrition, Health, Nutrients, Nutritional status, Visible symptoms of good health, Malnutrition.

UNIT-II

- Carbohydrates: Composition, Classification, functions, Sources, digestion, absorption and transport. Components of dietary fibre, Role of fiber in health and disease.
- Protein: Composition, classification, functions, sources, requirements, digestion, absorption and transport, protein quality evaluation.
- Lipids: Composition, Classification, functions, sources, requirements, digestion, absorption and transport.

UNIT-III

- Water and Electrolytes: Water, Sodium, Potassium: Distribution of water and Electrolytes, Functions, Sources, Requirements, Water balance, Maintenance of water balance, Water depletion, Water excess, Distribution of Electrolytes, Maintenance of Electrolyte balance.

UNIT IV

- Energy: Unit of energy, sources, determination of energy expenditure, energy value of foods, Measurement of total energy requirement, Resting energy expenditure, Physical Activity Level (PAL), Factors affecting PAL, Basal Metabolic Rate, determination of BMR, SDA.

PRACTICALS

- 1) Planning and Nutritive value calculation and preparation of macro nutrient rich dishes
 - a. Carbohydrate- Starch, Fiber
 - b. Protein
 - c. Fat
- 2) Planning and Nutritive value calculation and preparation of micro nutrient rich dishes
 - a. Vitamins- Vitamin A, Vitamin C, Thiamine, Riboflavin and Niacin
 - b. Minerals- Calcium, Iron, Zinc, Phosphorus, Potassium

Recommended book

1. Modern Nutrition in Health and Disease 10th edition by Maurice E. Shils
2. Robinson. Basic Nutrition And Diet Therapy (8th Edition)
3. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
4. Antia, F.P (1973): Clinical dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.

PHYSIOLOGY-I

OBJECTIVES OF THE COURSE:

At the end of this course the students should be able to:

- Comprehend basic terminologies used in the field of Human Physiology
- Define and describe basic Physiological processes governing the normal functioning of the human body.
- Apply this knowledge in their Allied Health Science practice.

CONTENTS

UNIT I

General Physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Nerve and muscle

- Nerve structure, classification of nerve fibers,
- Muscles- classification , structure ,Neuro-Muscular junction(NMJ).
- Muscle contraction-mechanism,types.

Blood and body fluids

- Body fluid volumes,compartments, and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes –Morphologyand functions
- Leucocytes-Morphology and functions
- Platelets-Morphology and functions
- Blood groups.

UNIT II

Digestive system

- Salivary glands -Nerve supply, functions of saliva.
- Gastric juice-composition &functions of gastric juice.
- Pancreatic juice- composition, functions and regulation of pancreatic juice.
- Bile- composition, functions of bile and bile salts.
- Succus entericus and small intestinal movements.
- Deglutition, vomiting, functions of large intestine.

Excretory system

- Structure of Nephron and its blood supply, Juxtaglomerular Apparatus(JGA).
- Formation of urine-Filtration, Reabsorption and secretion.
- Counter-Current mechanism
- Micturition.

PRACTICAL & VIVA VOCE

- Microscope
- Estimation of Hemoglobin
- RBC
- WBC
- Spotters

Recommended book

1. Basics of Medical Physiology (Third edition) by D. Venkatesh/ H.H. Sudhakar

Reference books

1. Medical physiology for under graduates by Indhu Khurana,
2. Text Book of Physiology by A.K. Jain for BDS.

BIOCHEMISTRY-I(UE)

OBJECTIVES:

At the end of this course the students should be able to:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests

CONTENTS

UNIT I - CARBOHYDRATES

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates:

- Digestion and Absorption of carbohydrates,
- Steps of Glycolysis and energetics,
- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism
- Galactosemia.
- Diabetes mellitus ,

Bioenergetics:

- Importance of ATP, Outline of respiratory chain.

UNIT II - LIPIDS

- Classification of lipids,
- Essential fatty acids,
- Functions of cholesterol,
- Triglycerides,
- Phospholipids

Metabolism of Lipids:

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,

- Lipid profile, hyper cholesterolemia

Unit III – VITAMINS

Vitamins, its classification

- Vitamin A
- Vitamin D
- Vitamin E & K
- Vitamin B complex
- Vitamin C

Unit IV - ENZYMES

- Definition,
- Classification,
- Coenzymes,

Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOCE

1. Reactions of Glucose
2. Reactions of Fructose
3. Reactions of Maltose
4. Reactions of Lactose
5. Tests for Sucrose
6. Tests for Starch
7. Identification of unknown Carbohydrates

SPOTTERS

- **CRYSTALS**
 - Maltosazone
 - Lactosazone
 - Glucosazone/Fructosazone
- **REAGENTS**
 - Benedict's reagent

- Barfoeds reagent
- Foulgers reagent
- Seliwanoff reagent
- Fouchets reagent
- **CHEMICALS**
 - Sodium Acetate
 - Phenylhydrazine
 - α Naphthol
- **STRUCTURES.**
 - Structure of Cholesterol
 - Structure of Glucose
 - Structure of Fructose
- **VITAMINS**
 - Carrots
 - Rickets
 - Scurvy
 - Egg

Text books Recommended :

- Textbook of Biochemistry for Paramedical Students By Dr.P.Ramamoorthy
- Essentials of Biochemistry by U. Sathyanarayana

Reference books :

- Text book of Biochemistry for Medical students by DM vasudevan, Sreekumari S, Kannan Vaidyanathan. 7th Edition
- Harper's Illustrated Biochemistry – 30th Edition.

FOOD MICROBIOLOGY- I (UE)

OBJECTIVES:

At the end of the semester the students should be able to

- Understand the basic concepts of food microbiology.
- Understand the basic fundamental aspect of food microbiology and study the common disease caused by them.

UNIT I

Food Microbiology

- Introduction to food microbiology and its relevance to everyday life - General characteristics of Bacteria, Fungi, Virus, Protozoa & Algae.

Growth of micro-organisms

- Growth curve, effect of environmental factors in growth of micro organism- pH, water activity, oxygen availability, temperature and others.

UNIT II

Primary sources of micro organisms in foods

- Physical and chemical methods used in the destruction of micro organisms, pasteurization and sterilization

UNIT III

Fundamentals of control of micro-organisms in foods

- Extrinsic & intrinsic parameters affecting growth and survival of organisms.
- Use of high & low temperature, controlling moisture as water content, freezing, freezing-drying, irradiation and use of preservatives in food.

PRACTICALS

SPOTTERS

1. Study of equipments in a microbiology lab.
2. Identification of culture media.
3. Gram staining
4. Identifications of important moulds & yeast in food items.

RECOMMENDED BOOK:

1. William. C. Frazier – Food Microbiology

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.

2. Subhash Chandra Parija – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan, Bhat, Satish Patwardhan – Handbook of Practical examination in Microbiology

FAMILY MEAL MANAGEMENT I (UE)

OBJECTIVES:

To enable students to:

- Learn the principles of meal planning
- Acquire knowledge on planning meals for different age groups

UNIT I

Menu Planning

- Balanced Diet, Food groups, Food guide, food pyramid, My Plate, Low cost balanced diets RDA, Basic principles of menu planning, Points to be considered while planning menu.

UNIT II

Nutrition in pregnancy

- Physiological changes, Relationship between maternal and foetal nutrition, Impact of nutritional deficiency on the outcome of pregnancy, Nutritional and food requirements, Dietary guidelines, Dietary problems, Complications of pregnancy, GDM.

UNIT III

Nutrition during Lactation

- Physiology of lactation, Hormonal control of lactation, Let Down Reflex, Nutritional and food requirements, Factors affecting volume & Composition of breast milk, Breast feeding and its advantages, Pre-term milk (PTM), Expressed Breast Milk (EBM), Drip Breast Milk (DBM), Common problems during breast feeding.

UNIT IV

Nutrition during Infancy

- Growth & development, LBW, Small for Gestational Age and Pre term baby, Nutritional requirements, Artificial feeding, Hazards of Bottle feeding, Feeding of the Preterm and LBW babies, Weaning, Feeding problems in weaning, Family Pot Feeding, Low cost supplementary foods, ARF.

PRACTICAL

1. Basic principles of meal and menu planning.
2. Daily food guide – Basic five food groups, food pyramid, my plate, use of food groups, food costing.
3. Plan and prepare a diet for Sedentary pregnant woman, Lactating mother (0 – 6 months) and
4. Infant (0 – 6 months). Prepare weaning foods.

RECOMMENDED BOOK:

1. Nutrition and Diet Therapy Corroll lutz & Karen Przytulski Japee, 14Th edition
2. Therapeutic Paediatric Nutrition Madhu Sharma Japee,1st edition,2011
3. Diet Management Rekha Sharma Elsevier,4th edition,2011
4. Food and Nutrition L.C.Gupta,Kusum Gupta,Abhishek Gupta Japee,6th edition,2010
5. Nutrition and Therapeutic Diets Darshan Sohi Japee,1st edition,2013

REFERENCE BOOKS:

1. Nutritive Value of Indian Foods C.Gopalan,B.V.Rama Sastri and S.C.Balasubramanian Japee,1st edition,1971
2. Food and Nutrition Dr.Shrinandan Bansal AITB,2nd edition,2012

ENGLISH (IE)

GENERAL OBJECTIVES:

At the end of the semester the students should be able to

- To improve comprehensive and writing skills in English
- To discuss about effective communication skills
- To prevent barriers in communication.

Unit I: Grammar

- Components of a sentence
- Positive and Negative statements
- Interrogative Statement
- Parts of speech in brief
- Transformation and synthesis of sentences
- Verb and Tense forms
- Voice
- Reported Speech
- Common errors and how to avoid them

Unit II: Vocabulary

- Medical Terminology
- Words often confused or misused
- Words and expression in British and American English
- Idioms and Phrases

Unit III: Oral communication

- Importance of speaking efficiently
- Voice culture
- Preparation of Speech
- Secrets of good delivery
- Audience Psychology
- Presentation Skills
- Using non-verbal communication
- Interview technique
- Skill in arguing

Unit IV: Spoken English

- The phonetic symbols
- Stress
- Intonation
- Rhythm
- Transcription
- Using dictionaries for learning to pronounce

Unit V: Written communication

(a) Art of writing

- Rules for effective writing
- Expansion of proverbs & Ideas
- Précis writing

(b) Letter writing

- Private letters & Social letters
- Business letters
- Letter to a Bank
- Letter to a Newspaper
- Letter to Application
- Curriculum Vitae (Different models)
- Placing an order

(c) Report writing

- Guidelines to prepare a good report
- Usage of impersonal language
- Preparing lab reports

(d) Note making and Note taking

- Note making and note taking strategies
- Organizing notes
- Exercise and note making / taking

(e) Comprehension

- Listening and reading comprehension
(Exercise of prescribed short answers)

Unit VI: Reading

- What is efficient and fast reading?

- Awareness of existing reading habits
- Tested techniques for improving speed
- Improving concentration and comprehension through systematic study.

Reference Books:

1. English for Competitive Examinations by R.P.Bhatnagar, Rajiel Bhargava
2. English for college and competitive exams by Dyvadatham
3. Written Communication in English by Sarah Freeman
4. Writing with a purpose by Tickoo & Sasikumar
5. English phonetics for Beginners by P.Iyadurai
7. Empowerment through verbs & idioms by Padmini devkumar
8. High School English Grammer and Composition by Wren & Martin
9. Communication techniques for your success everywhere by Muralidharan.

SEMESTER II

S.No	Subject
1.	Diet Therapy (UE)
2.	Physiology –II (UE)
3.	Biochemistry II (UE)
4	Food Microbiology – II(UE)
5.	Family Meal Management-II(UE)
6.	Quantity Food Production (UE)
7.	Advanced Nutrition(IE)
8.	Computer science (IE)

SEMESTER – II

DIET THERAPY (UE)

OBJECTIVES

To enable the students to:

- Study the aetiology, symptoms and medical nutrition therapy in various diseases
- Learn how to plan and prepare diet for various diseases.
- To acquire knowledge regarding effect of various diseases on nutritional status and nutrient requirements.

UNIT- I

INTRODUCTION TO DIET THERAPY

- Glycemic Index
- Dietary Supplements
- Diet and Inflammation
- Prebiotics & Probiotics
- Artificial Sweeteners
- Food, Nutrition and Drug Interaction
- Personalized Nutrition.

UNIT II

THE DIETITIAN

- Classification,
- Ethics & Responsibilities
- Responsibilities of Specific Dietitians
- Indian Dietetic Association

UNIT III

THERAPEUTIC DIETS

- Immuno Nutrition
- Routine Hospital Diets
- Nutrition Support Service
- Malnutrition In Hospitalized Patients
- Nutrition And Wound Healing.

- Pre & Post Operative Nutrition
- Nutrition support in Burn patients
- Summary of Therapeutic Diet.

PRACTICALS

1. GI foods
2. Anti-Inflammatory food pyramid
3. Prebiotics and probiotics
4. Artificial sweeteners
5. Routine Hospital Diets
6. Nutrition support service
7. Therapeutic diet
8. Spotters
9. Charts

Recommended books

1. Bamji et al. 1996. Text Book of Human Nutrition. New Delhi, Oxford and IBH Publishing Co. Pvt. Ltd.
2. Devlin. T.M. 1997. Text book of Clinical Biochemistry. New York, John Wiley and Sons.
3. Harper. H.A. 1997. Review of Physiological Chemistry. 21st edition. Los Angeles, Lange Medical Publications.
4. Leninger. A. L. 1992. The molecular basic of cell structure and functions. New Delhi, Kalyani Publishers.

PHYSIOLOGY-II (UE)

OBJECTIVES:

- To develop vocabulary for appropriate terminologies to effectively communicate terms related to physiology of various body systems

- To identify and describe physiological functions of various structures involved in smooth functioning of the body.

Unit I Cardiovascular System

- Cardiac muscle, action potential and conducting system of the heart.
- Cardiac cycle.
- ECG, heart sounds, Heart Rate.
- Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output.
- Blood pressure-Definition, measurement, factors maintaining BP.
- Regional circulation-Coronary and cerebral.

Unit -II Nervous system

- Structure & Properties of Neuron.
- Nerve- Classification, injury.
- Types and properties of Receptors
- Synapse and synaptic transmission.
- Reflex and its properties.
- Spinal cord-Ascending & Descending tracts.
- Thalamus, Basal ganglia, Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid.
- Autonomic nervous system.
- Ascending and descending tracts.

Unit –III Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.
- Lung volumes and capacities-definition, normal values, intrapulmonary and intra pleural pressures, surfactant.
- Oxygen transport, carbon-dioxide transport.
- Neural and chemical regulation of respiration.
- Hypoxia, cyanosis, Artificial Respiration.

Unit – IV Special sense and skin

- Vision,
- Audition,

- Olfaction,
- Gustation.

Unit – V Reproductive system

- Male reproductive organs-Spermatogenesis and testosterone actions.
- Female reproductive organs.
- Contraception Methods.

Unit – VI Endocrine system

- Hypothalamus hypophyseal inter relationship.
- Anterior pituitary hormones and their functions.
- Posterior pituitary hormones and their actions.
- Thyroid hormones, biosynthesis and functions.
- Parathyroid hormones ,functions.
- Insulin, glucagons, actions and Diabetes mellitus.
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions

PRACTICAL & VIVA VOCE SYLLABUS

1. WBC.
2. Blood pressure.
3. Bleeding time
4. Clotting time.
5. Charts and spotters.

Recommended book

- Basics of Medical Physiology (Third edition) by D. Venkatesh/ H.H. Sudhakar

Reference books

- Medical physiology for under graduates by Indhu Khurana,
- Text Book of Physiology by A.K. Jain for BDS.

BIOCHEMISTRY – II(UE)

OBJECTIVES:

At the end of the semester the students should be able

- To have a knowledge about the chemistry and metabolism of proteins
- To learn about nutrition-balanced diet and malnutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

UNIT I - PROTEINS

- Classification of amino acids,
 - Structure of proteins,
 - Plasma proteins,
 - Immunoglobulins.
- Metabolism of Proteins :**
- Digestion and absorption of proteins,
 - Transamination,
 - Deamination,
 - Steps of urea cycle,
 - Phenylketonuria,

- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

UNIT II - NUCLEIC ACIDS

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA
- Nucleic Acid Metabolism

UNIT III - HAEMOGLOBIN

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

UNIT IV-- MINERALS

- Macro & Minor Minerals & Metabolism

UNIT V -- NUTRITION

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

UNIT VI -- ORGAN FUNCTION TEST

- RFT

UNIT XI - ACID BASE BALANCE

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOCE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine

- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles' Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout

Text books Recommended :

- Textbook of Biochemistry for Paramedical Students By Dr.P.Ramamoorthy
- Essentials of Biochemistry by U. Sathyanarayana

Reference books :

- Text book of Biochemistry for Medical students by DM vasudevan, Sreekumari S, Kannan Vaidyanathan. 7th Edition
- Harper's Illustrated Biochemistry – 30th Edition.

FOOD MICROBIOLOGY II (UE)

OBJECTIVES:

At the end of the semester the students should be able to

- Explain general and specific spoilage of foods
- Explain in detail about soil borne, water borne and air borne infections.

UNIT I – Microbiology of Deficient food

Spoilage, contamination sources, types, effect on the following:

- Cereal & cereal products
- Sugar & sugar products
- Vegetables & fruits
- Meat & meat products
- Fish, egg and poultry
- Milk & milk products
- Canned foods.

UNIT II – Environmental Microbiology

- Water & water borne diseases, Air & air borne diseases, Soil & soil borne diseases, Sewage and diseases.
- Beneficial effect of micro organisms.

UNIT III – Microbial intoxication and infections

- Sources of contamination of food, toxin production and physiological action, sources of infection of food by pathogenic organisms, symptoms and method of control. Relevance of microbiology standards for food safety.

PRACTICALS

I. SPOTTERS

II. Clinical case discussion with charts

1. Food poisoning
2. Gastroenteritis

3. Water borne disease
4. Air borne disease
5. Milk borne disease

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).
2. Food Microbiology, 1st Edition, M. R. Adams 1995
3. Food Microbiology, 5th Edition Frazier, Westhoff, Vanitha N M 2014

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Subhash Chandra Parija – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,Satish Patwardhan – Handbook of Practical examination in Microbiology

FAMILY MEAL MANAGEMENT II (UE)

OBJECTIVES

To enable students to:

- Learn the principles of meal planning
- Acquire knowledge on planning meals for different age groups

UNIT I

- **Nutrition during early childhood (Toddler/Preschool):** Growth and nutrient needs, Food requirements, Dietary guidelines, Feeding problems, Nutrition related problems, Growth monitoring, Importance of growth charts, GOBIFFF.

UNIT II

- **Nutrition during school children:** Nutritional and food requirements, Dietary guidelines, Importance of breakfast, Feeding problems, Packed lunch, School lunch programmes

UNIT III

- **Nutrition during adolescence:** Growth and nutrient needs, Food requirements, Food habits and dietary guidelines, Nutritional problems, Nutritional programmers' for adolescence.

UNIT IV

- **Nutrition during adulthood** – Reference man, Reference woman, Nutritional requirements, feeding pattern. Geriatric nutrition: Process of ageing, Factors affecting food intake and nutrient use, Change in organ function with ageing, Nutrient needs, Nutrition related problems

PRACTICALS

Plan and prepare a diet for

1. A pre-school child (1-3 years)
2. A school going child (boy and girl of 7- 9 years)
3. An adolescent (boy and girl 17 – 19 years)

Plan and prepare a diet for

1. Sedentary, moderate and heavy worker (male and female)

2. A senior citizen
3. A middle income family

RECOMMENDED BOOK:

1. Nutrition and Diet Therapy Corroll Iutz & Karen Przytulski Japee, 14Th edition
2. Therapeutic Paediatric Nutrition Madhu Sharma Japee, 1st edition, 2011
3. Diet Management Rekha Sharma Elsevier, 4th edition, 2011
4. Food and Nutrition L.C.Gupta, Kusum Gupta, Abhishek Gupta Japee, 6th edition, 2010
5. Nutrition and Therapeutic Diets Darshan Sohi Japee, 1st edition, 2013

REFERENCE BOOKS:

1. Nutritive Value of Indian Foods C.Gopalan, B.V.Rama Sastri and S.C.Balasubramanian Japee, 1st edition, 1971
2. Food and Nutrition Dr.Shrinandan Bansal AITB, 2nd edition, 2012

QUANTITY FOOD PRODUCTION (UE)

OBJECTIVES:

- To understand the application of basic principles of bulk production of the food.
- To gain knowledge regarding selection and purchase of food.
- To develop skills in menu planning for quantity food preparation.
- To understand the different styles of food services.
- To gain knowledge of food service layout.

COURSE CONTENT:

Unit I: Aims and objectives of different service outlets

- Industrial
- Institutional
- Hospital

Unit II: Different food and beverage outlets

- 5 types of services of food and beverage outlets.
- Staff organization of different outlets (A la carte and Table d hote)

Unit III: Menu planning

- Sequence of course- Indian- techniques of writing menus.
- Types of meals and styles of service
- Breakfast, lunch, dinner, afternoon, tea & snacks (table d hote and a la carte).

Unit IV: Plant and equipment management

- Maintenance, sanitation of plant, safety, security, garbage disposal & pest control.

Unit V: Beverages

- Alcoholic and non-alcoholic- Hot & cold- Classification of beverages, use & importance in meals and snacks, suitable glassware for beverage service.

Unit VI: Use of bills and checks in control system outlets

Recommended books:

1. Food service system and Lewis J. Minor, Ronald F. Cichy, Avi Publishing Co.
2. Food service Operations; Mahmood A.Khan, Avi Publishing Co.

Reference books:

1. Modern Restaurant service, John Fuller, Hutchinson, 1983.
2. Food and Beverage Service, D.R. Lillicarp 2nd edn. BLBS, Reprinted 1989.
3. Mass Catering WHO publication.

PRACTICAL & VIVA VOCE

OBJECTIVES:

- Develop skills in food production and service.

CONTENT:

1. Organizing, preparing and serving food for three different meals for 10 members.
2. Setting up the restaurant- laying of table cloth changing, setting up the silver and other table arrangements.
3. Serving and clearing practice, French and English service.
4. Service of beverages tea, coffee, juices and alcoholic beverages.
5. Laying for breakfast
6. Tray service
7. Order taking, making out check bills, presentation of bills.
8. Up keep and cleaning of cutlery, crockery, other equipment.

WESTERN COOKERY

- Soups: Mixed veg, tomato cream soup, carrot cream soup, mulligatawny soup, minestone soup, chicken soup and corn soup.
- Sauces: white sauce, cheese sauce, mayonnaise sauce, pizza sauce, curry sauce, tomato sauce and hollandaise sauce.
- Entrees: Vegetable pie, veg and meat loaf, chicken casserole, hamburgers, vegetable burgers.
- Vegetables: vegetables au gratin, Baked cauliflower, savoury vegetables, baked stuffed capsicum
- Sweets: Bread pudding, soufflés, trifle, coffee mousse, gateaux.

BAKERY PRODUCTS

- Short crust pastries: different types of tarts, pies and turn overs. Vegetable and mutton pattis.
- Cakes and Cookies: plain cake, fruit cake, banana bread, date and walnut cake and varieties of cookies.
- Breads, different kinds of rolls, doughnuts.
- Different types of Icings.

Text books suggested for reading:

1. Modern Restaurant service, John Fuller, Hutchinson, 1983.
2. Food and Beverage Service, D.R. Lillicarp 2nd edn. BLBS, Reprinted 1989.
3. Mass Catering WHO publication.

ADVANCED NUTRITION (IE)

Objectives

To enable the students

- To understand the relation between nutrition and health.
- To acquire knowledge about the main nutrients and its functions in the body.

Unit-I

Macro minerals

- Calcium, Phosphorus, Magnesium - Functions, sources, requirements, factors affecting absorption and utilization, Deficiency and Toxicity. Calcium – Phosphorus ratio.

Unit II

Micro minerals

- Iron, Zinc, Copper, Selenium, Chromium, Iodine and Fluorine- Functions, sources, requirements, factors affecting absorption and utilization, deficiency and toxicity.

Unit III

Fat Soluble Vitamins

- Functions, sources, requirements, factors affecting absorption and utilization, deficiency, toxicity of vitamin A, D, E, K , conversion factor of vitamin A and Vitamin D.

Unit IV

Water Soluble Vitamins

- Functions, sources, requirements, factors affecting absorption and utilization, deficiency and toxicity of Thiamin, Riboflavin, Niacin, vitamin B6, Vitamin B12, Biotin, Pantothenic acid, Folic acid and Vitamin C.

RECOMMENDED BOOKS:

1. Robert's Nutrition Work with Children, Martin S.R., 1963, The University of - Chicago Press, Chicago.
2. Assessment of Nutrition Status of the Community, Jelliffe D.B. 1966, WHO, Geneva.
3. Nutrition in the Sub-Tropics and Tropics, Jelliffe D.B. 1968.

Computer Science (IE)

Unit-I. History of computers

- Definition of computers, Input devices, Output devices, Storage devices, Types of memory and units of measurement, Range of computers, Generations of computers, Characteristics of computers

Unit-II. System

- Hardware, Software, system definition, Fundamentals of Networking, Internet, Performing searches and working with search engines, types of software and its applications

Unit-III. Office application suite

- Word processor, spreadsheet, presentations, other utility tools, Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

Unit-IV. Language

- Comparison chart of conventional language, Programming Languages, Generations Of Programming Languages, Compilers and Interpreters, Universal programming constructs based on SDLC, Variable, constant, identifiers, functions, procedures, if while, do – while, for and other Structures. Programming in C language, Data types, identifiers, functions and its types, arrays, union, structures and pointers

Unit-V. Introduction to object oriented programming with C++

- Classes, Objects, Inheritance Polymorphism and Encapsulation. Introduction to databases, and query languages, Introduction to Bioinformatics.

Practicals:

1. Various browsers, search engines, email
2. Text document with mages with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions

7. C program- functions
8. C program – file handling
9. C program demonstrating the usage of user defined variables
10. Databases
11. Applications in allied health sciences

Text Books:

1. Peter Norton., Introduction to Computers. 7th Edition, Tata McGraw Hill Education Private Limited 2010.
2. Gary B. Shelly, Thomas J. Cashman, Misty E. Vermaat., Microsoft Office 2007. 1st Edition, Delmar Cengage Learning 2010

Reference Books:

1. C programming tutorial (K&R version 4) Author(s) Mark Burgess
2. Red hat Linux 9 bible by Christopher Negus May 2003

SEMESTER -III

S.No	SUBJECT
1	Basic Dietetics –Theory(UE)
2	Basic Dietetics -Practical(UE)
3	Food Science -Theory(UE)
4	Food Science - Practical(UE)
5	Medical Ethics and Biosafety(IE)
6	Psychology(IE)

SEMESTER-III

BASIC DIETETICS – THEORY (UE)

OBJECTIVES:

The students will be able to

1. Gain basic knowledge of the diet therapies and nutritional care in disease conditions.
2. Develop skills in planning a diet for disease condition.

UNIT I – Diet Therapy & Nutritional care in disease

- The nutritional care process
- Nutritional care plan

UNIT II – Diet in Infections and Fevers

- General Dietary considerations
- Typhoid, Influenza, Malaria, Tuberculosis & AIDS

UNIT III – Diet in Obesity

- Aetiology, Theories & Role of hormones
- Assessment, Grades, Types
- Treatment, Principles of Dietetic Management, Complications

UNIT IV – Diet in underweight

- Aetiology
- Nutritional & Food requirement

UNIT V – Diet in Cardiovascular Diseases

- Clinical effects, risk factors
- Role of Fat in the development of Atherosclerosis
- Treatment

UNIT VI – Diet in Hypertension

- Causes, pathogenesis
- Types, symptoms
- Principles of diet.

UNIT VII – Diet in Diabetes mellitus

- Types, Aetiology
- Insulin Resistance, symptoms, diagnosis
- Treatment, complications

REFERENCE BOOKS:

1. Srilakshmi B., Dietetics, New Age International (P) Ltd, Publishers, Eighth multi colour edition, 2016.
2. Mangala Kango, Normal Nutrition, Curing diseases through diet, CBS Publications, First edition, 2005.
3. Sue Rodwell Williams, Nutrition and Diet Therapy, C.V. Melskey Co., 6th edition, 2000.
4. Mahtab. S. Bamji, Kamala Krishnaswamy and G.N.V. Brahmam, Text Book of Human Nutrition, Oxford and IBH Publishing Company, Third Edition, 2009.

BASIC DIETETICS – PRACTICAL (UE)

PRACTICALS

1. Planning, preparation and displaying of diet for Under weight patient
2. Planning, preparation and displaying of diet for Obesity patient
3. Planning, preparation and displaying of diet for Typhoid
4. Planning, preparation and displaying of diet for Influenza
5. Planning, preparation and displaying of diet for Malaria.
6. Planning, preparation and displaying of diet for Tuberculosis.
7. Planning, preparation and displaying of diet for AIDS.
8. Planning, preparation and displaying of diet for Hypertension.
9. Planning, preparation and displaying of diet for Diabetes mellitus.
10. Planning snacks, desserts and beverages for diabetes.

REFERENCE BOOKS:

1. Srilakshmi B., Dietetics, New Age International (P) Ltd, Publishers, Eighth multi colour edition, 2016.
2. Mangala Kango, Normal Nutrition, Curing diseases through diet, CBS Publications, First edition, 2005.
3. Sue Rodwell Williams, Nutrition and Diet Therapy, C.V. Melskey Co., 6th edition, 2000.

4. Mahtab. S.Bamji, Kamala Krishnaswamy and G.N.V Brahman, Text Book of Human Nutrition, Oxford and IBH Publishing Company, Third Edition.2009.

FOOD SCIENCE - THEORY (UE)

OBJECTIVE:

The students will be able to

1. Learn about the functions of food
2. Study in detail about food groups

UNIT I: INTRODUCTION TO FOODS

- Definition, functions, food groups, classification of foods. Study of different cooking methods, merits and demerits, Solar cooking, Microwave cooking. Cereals - Cereals and millets- breakfast cereals, cereal products, fast foods- structure, processing, use in variety of preparation, selection, variety, storage, nutritional aspects and cost.

UNIT II: PULSES

- Pulses and legumes- Production (in brief), Selection and variety, storage, processing, use in variety of preparation, nutritional aspects and cost. Highlighting soya beans, lathyrism-removal of toxins.

UNIT III: MILK AND MILK PRODUCTS

- Composition, classification, quality, processing, coagulation of milk, digestion of milk, storage, uses and cost. Nutritional aspects of milk, curd, butter, paneer, khoa, cheese, ice cream, kulfi and various kinds of processed milk.

UNIT IV: EGG, FISH, POULTRY AND MEAT

- Selection, quality, purchase, storage, uses and nutritional aspects. Spoilage of egg, fish, poultry and meat.

UNIT V: VEGETABLES AND FRUITS

- Variety, selection, purchase, storage, availability, cost, use and nutritional aspects of raw and processed vegetables and fruits. Effects of cooking on colour, texture, flavour, appearance and nutritive value.

TEXT BOOKS

1. Swaminathan (1995): “Food & Nutrition”, The Bangalore Printing & publishing co ltd., Vol I, Second Edition, Bangalore.
2. Srilakshmi (1997): “Food Science”, New Age International (P) Ltd, Publishers, Pune.

REFERENCE BOOKS

1. Mudambi .R. Sumathi & Rajagpal M.V (1983), “Foods & Nutrition”, Willey Eastern Ltd, Second Edition, New Delhi.
2. Thangam.E.Philip(1965): Modern Cookery, Orient Longman, II edition. Vol II, Bombay.

FOOD SCIENCE- PRACTICAL (UE)

OBJECTIVES

- To understand the techniques of estimating nutrients

EXERCISE

1. Familiarization with different stoves, ovens and simple kitchen equipment.
2. Methods of measuring and weighing dry ingredients and liquids.
3. Cereal cookery
 - Methods of combining flour with liquid eg. Powdered cereal coarse(eg. Phirnee, broken wheat uppuma) and fine (eg. Ragi porridge, wheat halwa).
 - Cereal Grains – different methods of cooking rice – straining, absorption – cooking over low heat, pressure cooking, addition of fat, microwave and rice cooker.
 - Rice preparations – lime rice, tamarind rice, coconut rice, curd rice, egg fried rice, peas fried rice, iddli and dosai.
 - Wheat and ragi preparations – Kesari, poori, paratha, bhathura, naan, ragi puttlu, ragi leaf cake, ragi adai.
4. Pulse Cookery
 - Different methods of cooking pulses – hard water, soft water, soaking, addition of soda bicarbonate, addition of raw papaya, pressure cooking eg. Any whole gram and any dhal.
 - Pulse Preparations – brinjal sambar, sprouted green gram patchadi, cow peas sundal, adai, tomato dhal maseel, ven pongal, ompodi, sugian, green gram payasam, masala vadai and chole.
5. Vegetable Cookery
 - Different methods of cooking vegetables – effect of shredding, dicing, acid and alkali, pressure cooking, steaming with and without lid. Eg. Potato, beetroot, carrot and greens.
 - Vegetable preparations – potato methi curry, mashed potatoes, aloo tikke, vegetable kurma, avial, keera maseel, cabbage pugath, carrot cucumber, ridge gourd and green gram dhal kootu, tomato chutney and carrot halwa.
6. Fruits
 - Different ways of serving oranges, stuffed dates, banana fritters, fruit salad, stewed apricots, banana with custard, fruit jelly, grape jam, fruit punch, baked apple and pineapple upside down cake.

MEDICAL ETHICS AND BIO SAFETY (IE)

UNIT-I

Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.

UNIT-V

Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

TEXT BOOKS:

1. Medical Ethics - CM Francis 2e, Jaypee publishers, India (2004)
2. Medical Law, ethics, and bioethics - M Lewis and C Tamparo, 4e. FA Davis publishers (1998)
3. Biomedical ethics - Terry O' Neill, Greenhaven Press (1999)

REFERENCE BOOKS:

1. Human factor, a bridge between care and cure, eds. R Tartaglia, S Bagnaro et al. Taylor and Francis(2005)
2. Medical Ethics - Robert Snedden, Steck-Vaughn Publishers, Texas, USA (2000)

PSYCHOLOGY (UE)

UNIT 1: Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning. Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression –Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 5: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality. Social Factors Influencing Personality.

UNIT 6: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter-personal attraction – Love and Companionship. Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 7: Health Psychology

Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, **“Introduction to Psychology” – 7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), **“Social psychology”**, New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, **“Social psychology” 9th edition** published by Pearson education, Inc., 2006
4. Shelley E. Taylor. **“Health Psychology” Third Edition**. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, Latha Sathish, **“Psychology for Effective Living”**, Department of Psychology, University of Madras.
6. Coleman, James. 1980. **“Abnormal Psychology and modern life”**. New Delhi: Tata McGraw Hill Ltd.

SEMESTER IV

S.No	SUBJECT
1	Advance Dietetics–Theory(UE)
2	Advance Dietetics -Practical(UE)
3	Personnel Management - Theory(UE)
4	Personnel Management - Practical(UE)
5	Basics And Advanced Life Support(IE)
6	Sociology(IE)

SEMESTER IV

ADVANCE DIETETICS –THEORY (UE)

OBJECTIVES:

The students will be able to

1. Gain basic knowledge of the major deficiencies.
2. Develop skills in planning special diets for disease condition.

UNIT I – Diet in GI diseases

1) Upper Gastrointestinal Diseases

- GERD
- Peptic Ulcer

2) Intestinal Diseases

- Constipation
- Diarrhea

3) Inflammatory Bowel Disease

UNIT II – Diet in Diseases of Liver and Pancreas

- Functions of liver, causes
- Damage caused to Liver
- Infective Hepatitis
- Cirrhosis of Liver
- Hepatic Encephalopathy
- Liver Transplantation
- Cholecystitis & cholelithiasis
- Pancreatitis

UNIT III – Diet in Diseases of Kidneys

- Functions of kidneys
- Glomerulonephritis
- Nephrotic syndrome
- Renal Failure
- Dialysis
- Renal transplant
- Urolithiasis

UNIT IV – Diet in Cancer

- Classification, Risk factors, Symptoms
- Nutritional problems of Cancer Therapy
- Nutritional Requirements
- Dietary Management

UNIT V: An overview of Special Diets

- Purine-Restricted Diet
- Ketogenic Diet
- Paleo diet
- Diet in Cleft Lip and /or Palate.

TEXT BOOKS

1. Antia, F.P (1973): Clinical dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
2. Joshi, S.A (1992): Nutrition and Dietetics, TATA McGraw Hill publications, New Delhi

REFERENCE BOOKS

1. Mahan,L.K.Arlin.M.T(1992) Krause's Food, Nutrition and Diet Therapy, 8th Ed.W.B.Saunders Company, London
2. Williams S.R. (1989): Nutrition and Diet Therapy, 6th Ed. Times Mirror / Mosby College Publishing, St. Louis.
3. Raheena Begum(1989) A Test Book of Foods, Nutrition and Dietetics, Sterling Publishers, New Delhi.
4. Robinson, C.H., Lawler, M.R,Chenoweth, W,L, and Garwick A,E(1986) Normal and Therapeutic Nutrition, 17th Ed., Macmillan Publishing Co.
5. Dacie and Lewis Practical Haematology, Bain, 11th Edition, Elsevier Health Sciences, 2012.

ADVANCE DIETETICS –PRACTICAL (UE)

PRACTICALS

1. Planning, preparation and displaying of diet for Ulcer
2. Planning, preparation and displaying of diet for Constipation
3. Planning, preparation and displaying of diet for GI
4. Planning, preparation and displaying of diet for Cirrhosis of Liver
5. Planning, preparation and displaying of diet for Pancreatitis
6. Planning, preparation and displaying of diet for Nephrotic syndrome
7. Planning, preparation and displaying of diet for Renal Failure
8. Planning, preparation and displaying of diet for Dialysis
9. Planning, preparation and displaying of diet for Cancer Diet
10. Planning, preparation and displaying of diet for Purine-Restricted Diet
11. Planning, preparation and displaying of diet for Ketogenic Diet
12. Planning, preparation and displaying of diet for Paleo Diet

TEXT BOOKS

1. Antia, F.P (1973): Clinical dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
2. Joshi, S.A (1992): Nutrition and Dietetics, TATA McGraw Hill publications, New Delhi

PERSONNEL MANAGEMENT–THEORY (UE)

OBJECTIVES:

The students will be able to

1. Gain basic knowledge about the organization and management.
2. To learn about labour laws and legislations

UNIT I- Organization & Management

- Definition
- Types of organization
- Functions and
- Tools of management.

UNIT II- Food Material Management

- Food selection
- Purchasing
- Receiving
- Storeroom management and
- Controls of management.

UNIT III- Personnel Management

- Recruitment
- Selection and training of personalities
- Work standards
- Productivity
- Supervision
- Performance appraisal and
- Motivation incentives for effective performances.

UNIT IV- Labour Policies & Legislation

- Personal policies,
- Laws affecting food service institution.

Text book:

1. Mohini sethi: Institutional food management, 2nd edition, New age international publisher.
2. Mohini sethi: Catering management ,3rd edition ,New age international publisher.

PERSONNEL MANAGEMENT–PRACTICAL (UE)

PRACTICALS

VISIT & APPRAISAL OF ANY ONE MEDICAL ORGANISATION

1. Work simplifications: food preparation, calculating work unit, time norms etc.
2. Costing, accounting, budgeting and purchase.
3. Store keeping: listing and management of food items in the store.
4. Personnel recruitment: preparations of a project and report making.
5. Maintenance of the clothing for persons and staff involved in kitchen area.
6. Prepare an inventory for evaluating staffs personal hygiene.

Text book:

1. Mohini sethi: Institutional food management, 2nd edition, New age international publisher.
2. Mohini sethi: Catering management ,3rd edition ,New age international publisher.

BASIC AND ADVANCED LIFE SUPPORT(IE)

Unit-I: TRAUMA LIFE-Part 1

- BLS,TRIAGE-Primary Survey,Secondary Survey,Airway & Ventilatory management ,Shock,Central & peripheral venous access,Thoracic trauma – Tension pneumothorax,Other thoracic injuries Abdominal trauma – Blunt injuries Abdominal trauma – Penetrating injuries.

Unit-II: TRAUMA LIFE-Part 2

- Spine and spinal cord trauma,Head trauma,Musculoskeletal trauma,Electrical injuries,Thermal burns,Cold injury.

Unit-II: TRAUMA LIFE-Part 3

- Pediatric trauma, Trauma in pregnant women, Workshop BLS, Workshop cervical spine immobilization, Imaging studies in trauma.

Unit-III: BASIC CARDIAC LIFE SUPPORT

- BLS, The universal algorithm for adult ECC, Ventricular fibrillation/Pulseless ventricular tachycardia algorithm, Pulseless electrical activity (PEA) / asystole algorithm, Bradycardia treatment algorithm, Tachycardia Treatment algorithm.

Unit-IV: ADVANCED CARDIAC LIFE SUPPORT

- Hypotension/Shock, Acute myocardial infarction, Pediatrics Advanced life support,Defibrillation,Drugs used in ACLS,Emergency cardiac pacing,AED,Techniques for oxygenation and ventilation.

Text Books:

1. Handbook of Emergency Medicine, Suresh S. David, 8th edition, Elsevier, 2012

Reference Books:

1. Emergency Medicine, S. N. Chugh, 4th edition, CBS publishers, 2014

SOCIOLOGY(IE)

Unit 1: NATURE AND SCOPE OF SOCIOLOGY

- Definition, Historical background, subject matter of sociology, Nature and scope, Importance, Sociology of India, Relationship of sociology with other social sciences

Unit 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

- Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social change,

Unit 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

- Auguste comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

Unit 4: SOCIOLOGY OF INDIA

- Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization,

Unit 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

- Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist
- Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications
3. Neil J.Smelser,Handbook of sociology,1988.sage publication
4. Johnson R.M,Systematic Introduction to Sociology,1960,Allied Publishers
5. Cultural Anthropology,Barbara D.Miller,2006 Pearson/Allyn and Bacon Co
6. C.N.ShankarRao., Introduction to Sociology, 2008, S.CHAND & Company Publications.
- 7.C.N.ShankarRao., Sociology of India, S.CHAND & Company Publications.

SEMESTER V

S.No	SUBJECT
1.	Clinical Nutrition I - Theory(UE)
2.	Clinical Nutrition I - Practical(UE)
3.	Community Nutrition -Theory(UE)
4.	Community Nutrition - Practical(UE)
5.	Environmental Science And Community Medicine(IE)
6.	Bio-Statistics and Research Methodology(IE)
7.	Basic Nutrition (Elective) / Advanced Diagnostic technique (Elective) (IE)

SEMESTER V

CLINICAL NUTRITION I – THEORY (UE)

OBJECTIVES:

- To enable the students to understand the principles of diet and nutrient modifications for different diseases
- Develop skills in planning and evaluating nutrition for different disease condition.

UNIT -1 MEDICAL NUTRITION THERAPY AND NUTRITIONAL CARE IN DISEASE

- 1.1. Definitions and Role of Dietitian in Health care
- 1.2. The Nutritional Care Process:

- 1.2. 1.Nutritional Assessment
- 1.2. 2. Nutritional diagnosis
- 1.2. 3 .Nutritional Intervention
- 1.2. 4 Monitoring & Evaluation
- 1.2. 5. Documentation

UNIT -2 ADAPTATION OF THERAPEUTIC DIETS

- 2.1. Therapeutic diets
- 2.2. Diet Prescription
- 2.3. Constructing Therapeutic Diets
- 2.4. Routine Hospital Diets
- 2.5. Mode of Feeding

UNIT -3 NUTRITIONAL MANAGEMENT OF INFECTIONS AND FEVERS

- 3.1. Defense Mechanism in the body
- 3.2. Nutrition and Infection
- 3.3. Metabolic changes during Infections
- 3.4. Classification and Etiology of Fever/Infection
- 3.5. Typhoid
- 3.6. Tuberculosis
- 3.7. HIV & AIDS

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

- 4.1. Nutrient and Drug Interaction: Basic Concept
- 4.2. Effect of Nutrition on Drugs

- 4.3. Drug effect on Nutritional Status
- 4.4. Drug and Drug interaction

UNIT -5 NUTRITION MANAGEMENT IN CRITICAL CARE

- 5.1. Nutritional management of the critically ill.
- 5.2. Nutritional support systems
 - 5.2.1 Enteral Nutrition
 - 5.2.2 Parenteral nutrition

TEXTBOOKS

1. Shubangini A Joshi, (1998): Nutrition and Dietetics, Tata Mc Graw Hill Pub. Co. Ltd., New Delhi.
2. National Institute of Nutrition, (2005): Dietary Guidelines for Indians – A Manual, Hyderabad.
3. Srilakshmi. B, (2005): Dietetics, V Edition, New Age International (P) Ltd, Publishers, Chennai.

REFERENCES BOOKS

1. Mahan, L.K. and Escott-Stump, S. (2000) Krause's Food, Nutrition and Diet Therapy, 10th Ed. W.B. Saunders Company, London.
2. Williams S.R. (1993): Nutrition and Diet Therapy, 7th Ed. Times Mirror / Mosby College Publishing, St. Louis.
3. Antia F.P, Clinical Dietetics and Nutrition, Oxford University Press.
4. Shills, M.E, Olson, J.A, Shike, M and Ross, A.C. (1999): Modern Nutrition in Health and Disease, 9th Edition.

CLINICAL NUTRITION I – PRACTICAL (UE)

CONTENTS

- 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
- Using different Malnutrition assessment tools-SGA,MUST etc
- Standardization common staple-rice,chapathi,idli,dosa, porridge
- Plan and prepare weaning foods
- Plan and prepare nutrient rich recipe -High protein Iron rich recipe
- Planning and preparation of liquid diet
- Preparation of formulas for enteral feeding-Home based, combination feeds, supplement feeds.
- Planning, preparation, calculate and displaying of diet for Typhoid
- Planning, preparation, calculate and displaying of diet for Influenza
- Planning, preparation, calculate and displaying of diet for Malaria.
- Planning, preparation, calculate and displaying of diet for Tuberculosis.
- Planning, preparation, calculate and displaying of diet for AIDS

TEXTBOOKS

1. Shubangini A Joshi, (1998): Nutrition and Dietetics, Tata Mc Graw Hill Pub. Co. Ltd., New Delhi.
2. National Institute of Nutrition, (2005): Dietary Guidelines for Indians – A Manual, Hyderabad.
3. Srilakshmi. B, (2005): Dietetics, V Edition, New Age International (P) Ltd, Publishers, Chennai.

COMMUNITY NUTRITION -THEORY (UE)

OBJECTIVES:

To enable the students

1. Gain insight into the national nutritional problems and their implications
2. Appreciate the national and international contribution towards nutrition improvement in India.
3. Understand the importance of nutrition education
4. Develop skills in organizing and evaluating nutrition projects in the community

UNIT I Concept and scope of community nutrition, Assessment of Nutritional Status.

UNIT II Nutrition related policies and programmes

- Millennium Development Goals
- NNP
- Health, Nutrition and Family Welfare Through the XIIth five year plan
- Programmes to control malnutrition
- National Food Security Act, 2013.

UNIT III - Role of International and National agencies in combating Malnutrition.

- International Agencies- WHO, FAO, UNCF, CARE
- National Agencies- ICAR, ICMR, NIN, CFTRI.

UNIT IV - Nutrition Education

- Methods, Teaching Aids, Mass communication media & Computer applications.

UNIT V - Nutrition and Infection

- Immunity, Infections and Infestations, Effect of Malnutrition on Infection, Effect of Infection on Nutritional status & nutrients, AIDS.

TEXT BOOK

1. Swaminathan, M., Essentials of Food and Nutrition. An Advanced Textbook Vol.I, The Bangalore Printing and Publishing Co. Ltd, Bangalore, 2007.
2. Srilakshmi, B., Nutrition Science, New Age International Publication, New Delhi, 2010.

REFERENCE BOOKS

1. Park, A. Park's Textbook of Preventive and Social Medicine, XIX Edition M/S Banarasidas, Bharat Publishers, 1167, Prem Nagar, Jabalpur, 428 001(India), 2007.
2. Bamji M.S, Prahlad Rao N, Reddy V., Textbook of Human Nutrition, II Edition, Oxford and PBH Publishing Co. Pvt. Ltd , New Delhi, 2004.
3. Bhatt D.P, Health Education, Khel Sahitya Kendra, New Delhi, 2008.
4. Gibney, M.J., Margetts, B.M., Kearney, J.M., Arab, L., Public Health Nutrition, Blackwell Publishing Co. UK, 2004.

COMMUNITY NUTRITION -PRACTICAL (UE)

OBJECTIVES:

The objectives of this practical course are to enable the students

- To learn and prepare different types of visual aid for the community
- To gain practical experience in giving demonstration and conducting survey and other methods of assessments.

PRACTICALS

1. Diet and Nutrition surveys
 - a) Identifying vulnerable and at risk groups.
 - b) Diet survey and breast feeding and weaning practices of specific groups.
 - c) Use of anthropometric measurements in children.
2. Methods of Extension used in community
 - a) Preparation of visual aids-charts, posters models, etc. for exhibition.
 - b) Lecture and Method Demonstrations to target groups.
3. Field visits
 - a) Observe the working of nutrition programmes.
 - b) Hospitals to observe nutritional deficiencies.

TEXTBOOK:

1. Bhatt D.P, Health Education, Khel Sahitya Kendra, New Delhi, 2008.
2. Srilakshmi, B., Nutrition Science, New Age International Publication, New Delhi, 2010.
3. Gibney, M.J., Margetts, B.M., Kearney, J.M., Arab, L., Public Health Nutrition, Blackwell Publishing Co. UK, 2004.

ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE(IE)

UNIT-I

- **Natural Resources:** Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/pesticide problems, Water logging, and salinity, Energy Resources.

UNIT-II

- **Ecosystems:** Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem

UNIT-III

- **Biodiversity:** Introduction, Definition: Genetic, Species, Ecosystem Diversity, India as a Mega Diversity Nation, Hotspots of Biodiversity Threats to Biodiversity. Poaching of Wildlife, Man-Wildlife Conflicts, Endangered and Endemic

UNIT-IV

- **Pollution:** Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.

UNIT-V

- **Social Issues Human, Population and Environment:** From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.

UNIT-VI

- **Concept of health & disease:** Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Modes of Intervention, Changing pattern of disease.

UNIT-VII

- **Epidemiology:** Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT- Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.

UNIT-VIII

- **Environmental & health:** Definition & Components (environment sanitation environmental sanitation) Water : Safe & Whole some water Requirements Uses source of water supply (sanitary well) – Purification (1).Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room

INTRODUCTION

What is statistics – Importance of statistics in behavioral sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioral sciences. Measurements – Scales of measurements – Nominal, Ordinal, Interval and Ratio scales. Cumulative frequency curve – Drawing inference from graph. Measures of central tendency – Need – types: Mean, Median, Mode – Working out these measures with illustrations. Measures of variability – Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation. Normal distribution – General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.

Variants from the normal distribution – skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.

RESEARCH METHODS:

Research Meaning- Scope and Objectives –.Research methods vs. Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical, concept of applied and basic research process, criteria of good research. Defining and formulating the research problem, selecting the problem, necessity of defining the problem, importance of literature review in defining a problem, literature review-primary and secondary sources, reviews, monograph, patents, research databases, web as a source, searching the web, critical literature review, identifying gap areas from literature and research database, development of working hypothesis

DATA COLLECTION AND SAMPLING:

Data collection – Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram. Accepts of method validation, observation and collection of data, methods of data collection, sampling methods, data processing and analysis strategies and tools, data analysis with statically package (Sigma STAT, SPSS for student t-test, ANOVA, etc.), hypothesis testing. Correlation – historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.

Tests of significance- need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

BASIC NUTRITION (ELECTIVE) (IE)

UNIT 1 - NUTRITIONAL ASSESSMENT

- Nutritional anthropometric measurements
- Nutritional biochemical assessment
- Clinical signs & symptoms
- Dietary assessment

UNIT 2 - NUTRITION THROUGH LIFE CYCLE

- Diet during infancy
- Diet during preschool
- Diet during school
- Diet during adolescence
- Diet during adulthood
- Diet during geriatrics
- Diet during special needs- Pregnancy and lactation

UNIT 3 - THERAPEUTIC NUTRITION 1

- Dietary management in underweight,
- Dietary management in obesity,
- Dietary management in diabetes,
- Dietary management in hypertension.

UNIT 4 - THERAPEUTIC NUTRITION 2

- Dietary management in cardiovascular diseases
- Dietary management in renal diseases
- Dietary management in cancer

ADVANCED DIAGNOSTIC TECHNIQUES (ELECTIVE) (IE)

Unit I

Volumetric analysis, Balancing & Weighing, Concept of solute & solvent, Units of measurement. Specimen Collection & Processing: Specimen collection (Blood, urine, spinal fluid, saliva synovial fluid, Amniotic fluid), Preservation, transportation

Unit II

Clinical Enzymology: Principle of diagnostic enzymology, Digestive enzyme, miscellaneous enzyme. General Function Tests: Liver function test, Cardiac Function Test, Renal Function Test, Thyroid Function test, Reproductive endocrine function test

Unit III

Immunodiagnosics: Introduction, Antigen-Antibody Reactions, Conjugation Techniques, Antibody Production, Enzymes and Signal Amplification Systems, Separation and Solid-Phase Systems, Studies related to bacterial, viral and parasitic infections.

Unit IV

Product Development: Immunoassay Classification and Commercial Technologies, Assay Development, Evaluation, and Validation, Reagent Formulations and Shelf Life Evaluation, Data Analysis, Documentation, Registration, and Diagnostics Start-Ups.

Unit V

DNA based diagnostics: PCR, RFLP, SSCP, Microarrays, FISH, In-situ hybridization, Studies related to bacterial, viral and parasitic infections, Cell based diagnostics: Antibody markers, CD Markers, FACS, HLA typing, Bioassays.

SEMESTER VI

S.No	SUBJECT
1	Clinical Nutrition II - Theory (UE)
2	Clinical Nutrition II - Practical (UE)
3	Dietetics And Counseling - Theory(UE)
4	Dietetics And Counseling - Practical(UE)
5	Healthcare And Basic Principles(IE)
6	Hospital Management / Applied Research (Elective) (IE)

SEMESTER VI

CLINICAL NUTRITION II – THEORY (UE)

OBJECTIVES:

To enable the students to understand the principles of diet and nutrient modifications for different diseases.

UNIT 1. NUTRITIONAL MANAGEMENT OF EATING DISORDERS

- 1.1. Eating disorders
- 1.2. Anorexia Nervosa
- 1.3. Bulimia Nervosa
- 1.4. Binge Eating disorder
- 1.5. Starvation syndrome
- 1.6. Management of Eating Disorders

UNIT 2. NUTRITIONAL MANAGEMENT IN PHYSIOLOGICAL STRESS

- 2.1. Introduction and the Stress Response
- 2.
 - 2.2. Surgery: Pre and post-surgical dietary management
 - 2.3. Burns
 - 2.3.1. Classification
 - 2.3.2. Complication
 - 2.3.3. Dietary management
 - 2.4. Trauma: Dietary management
 - 2.5. Sepsis: Dietary management with or without MODS

UNIT 3: Nutritional Anaemia

- 3.1. Prevalence
- 3.2. Causes
- 3.3. Types
- 3.4. Iron Deficiency Anaemia
- 3.5. Megaloblastic Anaemia
- 3.6. Haemolytic Anaemia
- 3.7. Differentiating Anaemias
- 3.8. Prevention.

UNIT 4: PEM

- 4.1. Prevalence
- 4.2. Aetiology
- 4.3. Clinical features
- 4.4. Changes in the organs and system
- 4.5. Biochemical & Metabolic changes
- 4.6. Nutritional Requirement
- 4.7. Treatment
- 4.8. Prevention

UNIT V: Food Sensitivity

- Types of reactions, foods involved in Sensitivity, Symptoms, Diagnosis, Treatment, food Intolerance.

TEXTBOOKS

1. Shubangini A Joshi, (1998): Nutrition and Dietetics, Tata Mc Graw Hill Pub. Co. Ltd., New Delhi.
2. National Institute of Nutrition, (2005): Dietary Guidelines for Indians – A Manual, Hyderabad.
3. Srilakshmi. B, (2005): Dietetics, V Edition, New Age International (P) Ltd, Publishers, Chennai.

REFERENCES BOOKS

4. Mahan, L.K. and Escott-Stump, S. (2000) Krause's Food, Nutrition and Diet Therapy, 10th Ed. W.B. Saunders Company, London.
5. Williams S.R. (1993): Nutrition and Diet Therapy, 7th Ed. Times Mirror / Mosby College Publishing, St. Louis.
6. Antia F.P, Clinical Dietetics and Nutrition, Oxford University Press.
7. Shills, M.E, Olson, J.A, Shike, M and Ross, A.C. (1999): Modern Nutrition in Health and Disease, 9th Edition.

CLINICAL NUTRITION II – PRACTICAL (UE)

CONTENTS

1. Prepare High carbohydrate and nil fat recipe
2. Prepare Protein free/nil protein recipe/drink
3. Prepare Low residue diet
4. Prepare Low fat diet
5. Prepare Nutrient dense -high calorie and high protein recipes
6. Prepare high fiber low calorie recipes
7. Prepare sweets using artificial sweeteners
8. Prepare Low Calcium diet
9. Prepare Low Oxalate diet
10. Prepare Low Purine diet
11. Prepare Iron rich diet
12. Planning, preparation and calculation of diets for Post Operative patient
13. Planning, preparation and calculation of diets for Burns patient

TEXTBOOKS

1. National Institute of Nutrition, (2005): Dietary Guidelines for Indians – A Manual, Hyderabad.
2. Srilakshmi. B, (2005): Dietetics, V Edition, New Age International (P) Ltd, Publishers, Chennai.

DIETETICS AND COUNSELLING - THEORY (UE)

OBJECTIVES:

To enable students to:

- Obtain knowledge on the role of diet in disease conditions
- Gain experience in planning, preparing and serving therapeutic diets
- Understand the role of dietitian in the hospital and community

UNIT-1

- Practical consideration in giving dietary advice and counseling
 - a) Factors affecting and individual food choice.
 - b) Communication of dietary advice
 - c) Consideration of behaviour modification
 - d) Motivation.

UNIT-II

- Counseling and educating patient
 - a) Introduction to nutrition counseling
 - b) Determining the role of nutrition counselor
 - c) Responsibilities of the nutrition counselor
 - d) Practitioner v/s client managed care
 - e) Conceptualizing entrepreneur skills and behavior
 - f) Communication and negotiation skills.

UNIT-III

- Teaching aids used by dietitians
 - a) Charts, leaflets, posters etc.,
 - b) Preparation of teaching material for patients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis and cirrhosis.

UNIT-IV

- Computer application
 - a) Use of computers by dietitian
 - b) Dietary computations
 - c) Dietetic management
 - d) Education/ training
 - e) Information storage
 - f) Administrations
 - g) Research

UNIT-V

- Computer application
 - a) Execution of software packages
 - b) Straight line, frequency table, bar diagram, pie chart, Preparation of dietary charts for patients
 - c) Statistical computation- mean, median, standard deviation, conclusion and regression test.

TEXT BOOK

1. Shills and Young. Modern Nutrition In Health And Disease 15. Willims, S. R.: Nutrition and Diet Therapy, 4th ed., The C. V. Mosby Co., S1. Louis, 1981.
2. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
3. Antia, F.P (1973): Clinical dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
4. Joshi, S.A (1992): Nutrition and Dietetics, TATA McGraw Hill publications, New Delhi Mahan,L.K.Arlin.M.T(1992) Krause"s Food, Nutrition and Diet Therapy, 8 th Ed.W.B.Saunders Company, London

DIETETICS AND COUNSELLING- PRACTICAL (UE)

OBJECTIVES

- a) To enable the students to understand the modifications in nutrients and dietary requirements for the therapeutic condition and dietary management of different diseases.

PRACTICALS

- 1) Project planning for any one disease.
- 2) Computer application for different diseases.
- 3) Submitting computed data.
- 4) Preparations of teaching aids in the field of nutrition.
- 5) Preparation of case history of a patient and feeding of information in the hard disc.

TEXT BOOK

1. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
2. Antia, F.P (1973): Clinical dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.

HEALTH CARE AND BASIC PRINCIPLES (IE)

UNIT-I Concept of Health Care and Health Policy

4. Health in Medical Care
5. Indigenous systems of Health Care & their relevance
6. Framework for Health Policy Development

UNIT-II Health Organization

7. Historical development of Health Care System in the third world & India
8. Organization & Structure of Health Administration in India
9. Type of Health Organization including International Organizations
10. Private & Voluntary Health care provider
11. Distribution of Health Care Services
12. Health Care System in Public Sector Organization
13. Health systems of Various Countries

UNIT-III Health Policy and National Health Programme

14. National Health Policy
15. Drug Policy
16. National Health Programs (Malaria, T.B., Blindness, AIDS etc.)
17. Evaluation of Health Programs (Developing indicators for evaluation)
18. Medical Education & Health Manpower Development

UNIT-IV Health Economics

Fundamentals of Economics

19. Scope & Coverage
20. Demand for Health Services
21. Health as an Investment
22. Population, health of Economic Development

UNIT-V Methods & Techniques of Economic Evaluation of Health Program

23. Cost Benefit & Cost Effective Methods

UNIT-VI Household & Health

Health Expenditure & Outcome

24. Rationale for Government action
25. Household capacity, income and schooling

UNIT-VII Economics of Health

26. Population based health services
27. Economics of Communicable and Non Communicable diseases

UNIT-VIII Health Insurance

REFERENCE BOOKS:

1. Principles of Hospital Administration and Planning, BM Sakharkar, 2nd edition, Jaypee Brothers, Medical Publishers Pvt. Limited, 2008
2. Hospital Administration And Management : Theory And Practice, R. Kumar S.L. Goel, Deep and Deep Publications, 2007
3. Principles of Management, Mason Andrew Carpenter, Talya Bauer, 3rd edition, Flat World Knowledge, L.L.C., 2010

APPLIED CLINICAL RESEARCH (ELECTIVE) (IE)

UNIT I: INTRODUCTION TO CLINICAL RESEARCH

Basic pharmacology and drug development process, clinical research definition, Basic terminology used in clinical research, preclinical studies, Introduction to pharmacoeconomics, Types of clinical trials, Good Clinical Practices, and Scope of Clinical Research.

UNIT II: CLINICAL TRIALS

New drug discovery process- purpose, main steps involved in new drug discovery process, timelines of each steps, advantages and purposes of each steps, Pre clinical toxicology: General principles, Systemic toxicology, animal toxicity requirements, Phase-I, II, III, IV trials: Introduction and designing, Various phases of clinical trials, Termination of trial, Safety monitoring in clinical trials.

UNIT III : ETHICS & REGULATIONS IN CLINICAL RESEARCH

Ethical Theories and Foundations, Ethics Review Committee and Informed Consent Process, Integrity & Misconduct in Clinical Research Clinical Trial Application in India Import & Export of Drug in India, Investigational New Drug application (IND), New Drug Application (NDA), Abbreviated New Drug Application (ANDA), Post Drug Approval Activities, PMS, FDA Audits and Inspections EU Regulatory Affairs.

UNIT IV: PRINCIPLES OF CLINICAL TRIALS

Clinical trial design (observational and interventional) protocol, consent in clinical trials, placebo, bias and methods to prevent bias, ethics in clinical trials, monitoring, problems and solutions of controlled clinical trials.

UNIT V: BIOSTATISTICS AND DATA MANAGEMENT

Preparation of a successful clinical study, Study management, Project management Documentation, Monitoring, Audits and Inspections Pharmacovigilance Training in clinical research Budgeting in clinical research, Supplies and vendor management.

HOSPITAL MANAGEMENT(ELECTIVE) (IE)

Objectives:

To promote awareness of health care among all sections of the Indian people

To promote awareness among functionaries involved in Health and Hospital Management.

To promote research in the field of Health and Hospital Management.in order to improve the efficiency of Health Care delivery Systems.

To promote the development of high quality hospital services and community health care.

To promote a forum for the exchange of ideas and information among health and hospital planners, academicians, administrators, various statutory bodies and the general public for the improvement of Hospital and Health Care delivery Systems

To develop norms and standards for accreditation of the Health Care Organization and adopt means of evaluation of such institutions, so as to improve the quality of health care in the community

To provide opportunities for training and research in all aspects of Hospital Services Health Care Delivery System and Health Care Administration.

To update the knowledge and skill of the Health & Hospital Administrators and other personnel involved in the management of health care organization through continuous education and research.

UNIT – I

Introduction to Management: Introduction, concept, Characteristics and nature, scope, Principles of Management, Functions and techniques.

UNIT II

Planning: Principles, Characteristics, Essential of good planning, advantages and limitations, Classifications.

UNIT – III

Staffing: Importance, Norms and activities, PCS, Types of PCS, Duty Roaster.

Human resource management: HR planning, Recruitment, selection process, Placement, Orientation of new staff and training, Staff development , staff promotion.

UNIT – IV

Budgetting and material management: Purpose, Types, Principles, Function, cost benefit analysis, Auditing.

Principles of MM, process, supply and equipment, Inventory control, Procurement.

UNIT- V

Controlling-Quality management: Essential of effective control system, Importance of controlling, TQM. Hospital and patient care, ward management. Legal Issues.

UNIT - VI

Staff development and welfare:

Importance of staff development, Training Vs Education, Function. Staff welfare. Inservice education, Continuing education and career Opportunities-Component, manager role.

SEMESTER-VII

S.NO	SUBJECT
1	Project/ Dissertation

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/ Dissertation

SEMESTER – VIII (FOR ALL SPECIALITIES)

Internship -12 months



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