

**SHRIMATHI DEVKUNVAR NANALAL BHATT  
VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)**

**CHROMEPET, CHENNAI -44.**

**SYLLABUS AND REGULATIONS**

**DEPARTMENT  
OF  
HOME SCIENCE  
CLINICAL NUTRITION AND DIETETICS**

## DEPARTMENT OF CLINICAL NUTRITION & DIETETICS

### Regulations, Curriculum and Syllabus (Autonomous) Bachelor of Science in Home Science- clinical nutrition & dietetics

#### 1. ELIGIBILITY FOR ADMISSION TO THE COURSE

- A pass in the higher secondary examination of the Government of Tamilnadu or any other qualification equivalent to this as approved by the University of Madras.
- Subject Requirement: Any science group in the qualifying exam

#### 2. EXAMINATIONS

All odd semester examinations will be held in November and all even Semesters in April

#### 3. EVALUATION

##### 3.1- CORE MAJOR, ALLIED PAPER & ELECTIVE-THEORY-

<b>INTERNAL</b>	-	<b>25</b>
<u>BREAK UP INTERNAL - THEORY</u>		
Test Mark	-	15
Seminar	-	5
Assignment	-	5
<b>EXTERNAL</b>	-	<b>75</b>

##### 3.2- PRACTICAL CORE

<b>INTERNAL</b>	-	<b>25</b>
<u>BREAK UP INTERNAL – PRACTICAL</u>		
Test Mark	-	15
Record	-	10
<b>EXTERNAL</b>	-	<b>75</b>

#### 4. WORKING DAYS: 114 per semester. (total hours per semester-456)

**DEPARTMENT OF CLINICAL NUTRITION & DIETETICS**

**SEMESTER VICE - SUBJECT BREAKUP**

<b>Semester</b>	<b>Subject</b>	<b>Credits</b>
Semester I	Core Major-Paper I - Food Science	4
	Food Science practical	-
	Core Major-Paper II – Microbiology	4
	Allied I- Paper I - Chemistry I	4
	Allied I- Practical - Chemistry I	-
Semester II	Core Major-Paper III - Human Physiology	4
	Core Major-Paper IV - Microbiology & Physiology Practical	4
	Allied I- Paper II - Chemistry II	4
	Allied I- Practical - Chemistry II	2
Semester III	Core Major-Paper V -Family Meal Management	4
	Core Major-Paper VI - Nutrition I	4
	Practical Core -Family Meal Management	-
	Allied II- Paper III – Biochemistry	5
	Allied II- Paper III - Biochemistry Practical	-
Semester IV	Core Major-Paper VII - Advanced Dietetics	4
	Core Major-Paper VIII - Nut. & Advanced Dietetics Practical	4
	Allied III- Paper IV - Community Nutrition	5
	Allied III- Paper IV- Community Nutrition Practical	-
	Skill based elective – fundamental of textiles	-
	Internship (one month)	-
Semester V	Core Major-Paper IX - Human Development I	4
	Core Major-Paper X -Food Service Management I	4
	Core Major-Paper XI - Nutrition II	4
	Core Major-Paper XII - Sports Nutrition	4
	Practical Core - Sports Nutrition	-
	Elective I- Entrepreneurial Development	5
Semester VI	Core Major-Paper XIII - Clinical Nutrition	4
	Core Major-Paper XIV - Food Service Management II	4
	Core Major-Paper XV - Clinical Nutrition Practical	4
	Elective II-Health Psychology	5
	Elective III- Human Development II	5

## Course Framework- BSc. Clinical Nutrition & Dietetics

(For candidates admitted during the academic year 2013 onwards)

S.No	Year / Semester	Part	Subject	Teaching Hours		Credits	CIA	ESE	Total
				Theory	Practical				
1	I Year I Semester	I	Language (Tamil/Hindi/Sanskrit)	6	-	3	25	75	100
2		II	English	6	-	3	25	75	100
3		III	Core Major-Paper I - Food Science	6	-	4	25	75	100
4		III	Core Major-Paper II - Microbiology	6	-	4	25	75	100
6		III	Allied I- Paper I - Chemistry I	4	-	4	15	60	75
7		IV	NME	-	-	2	40	60	100
8		IV	Soft Skills	-	-	3	40	60	100
9		I Year II Semester	I	Language (Tamil/Hindi/Sanskrit)	6	-	3	25	75
10	II		English	6	-	3	25	75	100
11	III		Core Major-Paper III - Human Physiology	6	-	4	25	75	100
12	III		Core Major-Paper IV - Microbiology & Physiology Practical	-	6	4	40	60	100
13	III		Allied I- Paper II - Chemistry II	4	-	4	15	60	75
14	III		Allied I- Practical - Chemistry II	-	2	2	20	30	50
15	IV		NME	-	-	2	40	60	100
16	IV		Soft Skills	-	-	3	40	60	100
17	II Year III Semester	I	Language (Tamil/Hindi/Sanskrit)	6	-	3	25	75	100
18		II	English	6	-	3	25	75	100
19		III	Core Major-Paper V - Family Meal Management	4	-	4	25	75	100
20		III	Core Major-Paper VI - Nutrition I	4	-	4	25	75	100
21		III	Practical Core -Family Meal Management	-	2	-	-	-	-
22		III	Allied II- Paper III - Biochemistry	4	-	5	25	75	100
23		III	Allied II- Paper III - Biochemistry Practical	-	2	-	-	-	-
24		IV	EVS	2	-	2	25	75	100

25	II Year IV Semester	I	Language (Tamil/Hindi/Sanskrit)	6	-	3	25	75	100
26		II	English	6	-	3	25	75	100
27		III	Core Major-Paper VII - Advanced Dietetics	6	-	4	25	75	100
28		III	Core Major-Paper VIII - Nut. & Advanced Dietetics Practical	-	6	4	40	60	100
29		III	Allied III- Paper IV - Community Nutrition	6	-	5	25	75	100
30		III	Allied III- Paper IV- Community Nutrition Practical	-	2	-	-	-	-
31		IV	Soft Skills – personality Enrichment	-	-	3	40	60	100
32		IV	EVS	-	-	2	25	75	100
33				Internship (one month)	-	-	2	-	-
34	III Year V Semester	III	Core Major-Paper IX - Human Development I	6	-	4	25	75	100
35		III	Core Major-Paper X - Food Service Management I	6	-	4	25	75	100
36		III	Core Major-Paper XI - Nutrition II	6	-	4	25	75	100
37		III	Core Major-Paper XII - Sports Nutrition	4	-	4	25	75	100
38		III	Practical Core - Sports Nutrition	-	2	-	-	-	-
39		III	Elective I- Entrepreneurial Development	6	-	5	25	75	100
40		IV	Soft skills- computing skills	2	-	2	-	-	-
41		III Year VI Semester	III	Core Major-Paper XIII - Clinical Nutrition	6	-	4	25	75
42	III		Core Major-Paper XIV - Food Service Management II	6	-	4	25	75	100
43	III		Core Major-Paper XV - Clinical Nutrition Practical	-	6	4	40	60	100
44	III		Elective II-Health Psychology	6	-	5	25	75	100

45		III	Elective III- Human Development II	6	-	5	25	75	100
46		V	Value Education	-	-	2	40	60	100

	Credits	Marks
Language	12	400
English	12	400
Major / Elective	75	1800
Allied	20	400
Soft Skills / NME / Value Education	20	800
Internship	-	-
<b>Total</b>	139	3800

	Count
Total Theory Paper	19
Total Practical	8

# CHOICE BASED CREDIT SYSTEM

## BSc. H.Sc.-Clinical Nutrition & Dietetics

Study Components	No. of Papers	Credit Per Paper	Total Credit
<b>Part I</b> (Tamil/Hindi/Sanskrit)	4	3	12
<b>Part II</b> (English)	4	3	12
<b>Part III :</b>			
Core Major :	15	4	60
Core Elective:	3	5	15
Allied - Paper I:	2	5	10
Allied - Paper II:	2	5	10
<b>Sub Total for Part III</b>			<b>95</b>
<b>Part IV :</b>			
1. Basic Tamil/Advanced Tamil/Non-Major (I and II Semester)	2	2	4
2. Soft Skills	4	3	12
3. EVS (III Semester)	1	2	2
4. Value Education (VI Semester)	1	2	2
<b>Sub Total for Part IV</b>			<b>20</b>
<b>Part V :</b>			
1. Sports	—	—	1
2. N.C.C.	—	—	
3. N.S.S.	—	—	
4. Roctract	—	—	
5. E.D.P.	—	—	
6. Fine Arts	—	—	
<b>Subtotal for Part V</b>			<b>1</b>
<b>Total</b>			<b>139</b>

**SEMESTER EXAMS**  
**Question Paper Pattern-Theory**

**For 75 Marks-**

Section A (10x2=20) (Q. No. 1-12)

Answer any 10 questions out of 12. Each Question carries 2 marks

Section B (5x5=25) (Q. No. 13-17)

Answer all questions. Each Question carries 5 marks

Section C (3x10=30) (Q. No. 18-22)

Answer any 3 questions out of 5. Each Question carries 10 marks

**For 60 Marks-**

Section A (10x1=10) (Q. No. 1-12)

Answer any 10 questions out of 12. Each Question carries 1 mark

Section B (4x5=20) (Q. No. 13-18)

Answer any 4 questions out of 6. Each Question carries 5 marks

Section C (3x10=30) (Q. No. 19-23)

Answer any 3 questions out of 5. Each Question carries 10 marks

## SEMESTER - I

### CORE PAPER I - FOOD SCIENCE

#### OBJECTIVES:

- a) To enable students to obtain knowledge of different food groups and their contribution to nutrition.
- b) To help them study the different methods of cooking and their advantages and disadvantages.
- c) To enable them gain them to experience in the preparation of foods with attention to the preservation of their nutritive value - oriented to Indian cooking.
- d) To help them understand the scientific principles governing the acceptability of food preparations.

#### UNIT -1

**NUTRIENT CONTENT OF FOODS** - Classification of foods according to nutrient content. Food groups for balance diets - Food in relation to health. **COOKING METHODS** -Study of the different cooking methods, merits and demerits - solar cooking – Microwave cooking. **CEREALS AND MILLETS** -Source of manufacture, structure, composition, storage, processing, milling, parboiling, scientific methods of preparation and cooking, acceptability and palatability of rice, wheat, maize and millets, factors affecting gelatinization.

#### UNIT-2

**PULSES**- Source of manufacture, nutritive value, judicious combination of cereals and pulses, storage high-lighting soya beans, lathyrism - removal of toxins. **VEGETABLES**- Classification, colour, nutritive value, effect of cooking on colour, texture, flavour, appearance and nutritive value, Purchase - storage and preservation. **FRUITS** -Classification, nutritive value, uses, preservation.

#### UNIT-3

**FLESH FOODS**-Meats - nutritive value, methods of cooking, purchase, storage. Fish - classification, nutritive value, purchase, storage, cooking and preservation. **EGGS**- Structure and composition, nutritive value, palatability, methods of storage, preservation and uses in cookery. **MILK AND MILK PRODUCTS**-Nutritive value, cow's milk as compared with human milk, coagulation of milk, digestion of milk, milk products - whole and skimmed milk, milk powders and yogurt, ghee, butter, cheese. Storage and preservation.

#### UNIT-4

**BEVERAGES**-Classification, nutritive value and uses, coffee, tea and cocoa, malted beverages. Sources, manufacture, processing, methods of preparation, serving. **a) NUTS AND OIL SEEDS** : Nutritive value, toxins.**b) Fats and Oils**: Source and manufacture, usage, hydrogenation, rancidity, smoking point, emulsification. **SUGAR COOKERY**-Stages in sugar cookery, types of sugars available, crystallisation in sugar cookery, jaggery.

#### UNIT-5

**SPICES AND CONDIMENTS**-Origin, use in food preparation, excess consumption.**FOOD ADDITIVES** -Leavening agents, shortenings, stabilizers, flavouring agents and food substitutes. **Food adulteration** - types of adulteration - methods of detection, food laws and standards.

#### REFERENCES

1. Hughes, O and Bennion, M. 1970 **Introductory Foods**, 5th ed., The macmillan Co., New York.
2. Griswold, R.M. 1962. **Experimental Study of Foods**, Houghton mifflin company, Boston.
3. Ghose, R.L.M., Ghate, M.B. and Subramaniam, V. 1960. **Rice in India**. ICMR, New Delhi.

4. Eckles, G.H., Combs, W.S. and Macy, H. 1951. **Milk and Milk Products**, RMB Publishing Co., Ltd., New Delhi.
5. Fisher, P. and Bender, A. 1971. **The Value of Foods**. Oxford University Press, London.
6. Birch, G.C. and Cameron, A.G, and Spencer, M. **Food Science**, 3rd ed., Perganon Press, Oxford.
7. Sweetnah, M.D. and Mackellar, I, 1954. **Food Science and Preparation**. 4th ed., John Wiley & Sons Inc., New York.
8. Fitch, J.J. and Francis, C.A. 1953. **Foods and Principles of Cookery**, 1st ed., Prentice-Hall Inc., New York.
9. Pechkham, G.C. 1969. **Foundations of Food Preparation**, The Macmillan Company, London.

## **Core Major-Paper I - Food Science Practical**

1. Measurement techniques and relation between edible and non edible portions of food
2. Starch cookery
  - a. microscopic structure of starch
  - b. Gelatinization and gluten formation
  - c. preparation of white sauce
  - d. Methods of cooking rice
  - e. cereal recipes
3. Pulse cookery
  - a. cooking quality of pulse
  - b . pulse recipes
4. Egg cookery
  - a. Ferrous sulphide formation in boiled egg
  - b. Quality of poached egg.
  - c. whipping quality of egg white
  - d. Best quality of stirred custard.
  - e. Egg recipes
5. Vegetable and fruit cookery.
  - a. Effect of cooking factors on different pigments.
  - b. Effect of cooking factors on sulphur containing vegetables.
  - c. Enzymatic browning.
  - d. Vegetable and fruit recipe
6. Sugar cookery
  - a. Stages of sugar cookery
  - b. Sugar recipes.
7. Fats and oils
  - a. smoking point of fats and oils.
  - b. fats and oil recipe.
8. Milk cookery.
  - a. coagulation of milk.
  - b. milk recipes.

## CORE PAPER II - MICROBIOLOGY

### OBJECTIVES:

To enable the students to

1. Gain knowledge of the role of micro-organisms in health and disease
2. To understand the role of micro-organisms in spoilage of various foods.
3. To gain knowledge of micro-organisms in relation to food and food preservation

### UNIT -1

Introduction to microbiology and its relevance to everyday life-general characteristics of microorganisms-bacteria, virus, yeasts, moulds, algae, protozoa. Morphology, classification, motility, nutrition, respiration and reproduction. **PROTOZOA**-Morphology, reproduction, motility and classification. Entamoeba histolitica - Plasmodium Vivax - Balantidium Coli. **DISTRIBUTION AND ROLE OF MICRO ORGANISM IN a) Soil**

- i) Micro-organisms in the soil.
- ii) Nitrogen Cycle.

#### **b. Water**

- i) Micro-organisms in water
- ii) Total bacterial count in water.
- iii) Sanitary tests done on water.
- iv) Listing of water borne infections.

#### **c) Air**

- i) Micro-organisms present in air.
- ii) Total bacterial count of air.
- iii) Listing of air borne infections

#### **d) Sewage**

- i) Composition of sewage
- ii) Effect of treatment of sewage by micro-organisms, septic tanks. Activated sludge process.

### UNIT -2

#### **DESTRUCTION OF BACTERIA**

##### **a) Sterilization**

- i) Application of dry heat, burning, flaming and hot air oven.
- ii) Application of moist heat, boiling, pasteurization, steam steriliser and autoclave.
- iii) Sterilization with the use of filters

##### **b) Pasteurization**

Advantages involved in pasteurization / methods - holder, flash.

##### **c) Disinfection**

Methods of disinfection, natural, physical and chemical.

#### **PURIFICATION OF WATER INDUSTRIAL AND DOMESTIC METHODS**

- i) Industrial method of purification of water, sedimentation, filtration - slow sand filters rapid sand filters. Differences between slow and rapid sand filters - disinfection of water with the use of chemicals. ii) Domestic method of water purification - involving simple techniques like straining water through a muslin cloth, filtration of water by 'Three pitchers system and use of domestic

filters like Pasteurs, Chamberland filters and Berkfield filters. Use of Certain Common Chemicals like alum, quick lime and potassium permanganate in filtration.

### UNIT -3

#### **MICRO-ORGANISM IN INFECTION, RESISTANCE AND IMMUNITY**

- i) Different modes of spread of infection.
- ii) Reaction of the body to infection cellular and chemical defenses - phagocytoses -antigens - antibody. 2 examples of antigen antibody reactions.
- iii) Immunity - active and passive - artificial and natural

#### **ALLERGY AND HYPER SENSITIVITY**

- i) Different types of allergies like idiosyncrasies, allergy of infection, contact dermatitis and drug allergy.
- ii) Hypersensitivity - definition - anaphylaxis and serum sickness.

#### **CHEMOTHERAPY AND ANTIBIOTICS**

- i) Chemotherapy - use of sulphonamides, sulphones and PAS. Antibiotics - use of antibiotics, spectrum of activity, mode of administration, complication arising due to constant use of antibiotics, sensitivity tests done on antibiotics. Brief knowledge of any four common antibiotics

### UNIT -4

#### **GENERAL PRINCIPLES UNDERLYING SPOILAGE**

Chemical changes caused by Micro-organisms, fit or unfit food for consumption -causes of spoilage - classification of food by the case of spoilage - factors affecting -kinds and numbers of micro-organisms in food - growth and chemical changes - caused by microorganisms.

#### **PRINCIPLES OF FOOD PRESERVATION**

Use of high and low temperatures. Canning of fruits and vegetables.

Preservation by drying, use of chemicals in food preservation. Part played by antibiotics in the preservation of fleshy food.

#### **FOOD MICRO-BIOLOGY CONTAMINATION AND SPOILAGE OF FOODS**

Principles of food spoilage by micro-biological, physical and biological factors.

- a) Cereal and Cereal products and baked products.
  - i) Contamination, preservation and spoilage of cereals.
  - ii) Spoilage of bread, ropiness in bread, Red bread and chalky bread.
- b) Fruits and vegetables and their products: Contamination. Preservation and spoilage of fruits and vegetables.
- c) Fleshy food 1. Meat, 2. Poultry 3. Fish
  - i) Contamination of Meat, fish and poultry.
  - ii) Preservation of Meat, fish and poultry.
  - iii) General principles underlying the spoilage of meat, fish and poultry.
- d) Eggs : Contamination, preservation and spoilage occurring in eggs.
- e) Milk and Milk Products:
  - i) Contamination, preservation and spoilage of milk.
  - ii) Brief knowledge of butter, cheese and fermented milk.
- f) Fats and Oils : Contamination, preservation, storage and spoilage of fats and oils.

### UNIT -5

**FERMENTATION, PUTREFACTION AND DECAY:**

- i) Fermentation - aerobic respiration, anaerobic respiration, products of fermentation.
- ii) Part played by micro-organisms in putrefaction and decay.

**MICRO-BIOLOGY OF FOOD POISONING, FOOD INFECTIONS AND FOOD BORNE DISEASES, PRINCIPLES OF FOOD PRESERVATION**

- i) Microbial food poisoning by Staphylococci, Salmonella food poisoning group and clostridium botulinum (Botulism). Measures to prevent microbial food poisoning.
- ii) Food infections -food borne diseases - Dysentries, diarrhoea, Typhoid, Cholera.

**REFERENCES**

- 1 Joshua A.K. : Micro-biology - India Printing works, Madras - 1971
- 2 Carpenter : Micro-biology - W.B. Saunders Co., London
- 3 Salie, A.J. : Fundamental principles of Bacteriology - McGraw Hill Book Co
- 4 R.C. Rubey & D.K.Maheshwari : A Textbook of Micro - biology
- 5 Pelczar J.Michael : Micro-biology concepts and Application
- 6 Ananthanarayan.R & Paniker C.K.J. : Textbook of Microbiology
- 7 Frazier.W.C. : Food Micro-biology - McGraw HillBook and Co; New York
- 8 Smith and Water : Introductory food services - McGraw Hill Book and Co. New York 1975

## **ALLIED CHEMISTRY –I (60 HOURS)-4 CREDITS**

### **UNIT-I: ELECTROCHEMISTRY**

1.1 Electrochemistry : Strong and Weak electrolyte, common ion effect, pH, buffer solutions.  
Henderson equation and buffer action in biological systems

### **UNIT-II: INDUSTRIAL CHEMISTRY**

2.1 Fuels-gaseous –water gas, natural gas, semi-water gas

2.2 Fertilizers-Preparation and uses of urea, ammonium sulphate, superphosphate, triple super phosphate, NPK.

2.3 Hardness of water: Temporary and permanent hardness, disadvantage of hard water-softening of hard water-reverse osmosis-purification of water for domestic use: uses of chlorine, ozone and uv light.

### **UNIT-III : FUNDAMENTALS OF ORGANIC CHEMISTRY**

3.1 Classification of organic compounds-hybridisation in methane, ethane, acetylene, benzene

3.2 Classification of reagents-electrophiles, nucleophiles and free radicals definition examples-classification of reactions-addition, substitution, elimination, condensation and polymerization

3.3 Electrophilic substitution reaction mechanism in benzene (Nitration and Sulphonation only)

### **UNIT-IV : HETEROCYCLIC COMPOUNDS**

4.1 Introduction to heterocyclic compounds preparation and properties of furan, thiophene, pyrrole, pyridine. Comparative study of heterocyclic compounds

### **UNIT-V : PHOTOCHEMISTRY**

5.1 Introduction to photochemistry-statement of Grothus-Draper Law, Stark-Einstein's law, quantum yield, Hydrogen –chlorine reaction (Elementary idea only).

Photosynthesis, Photosensitization, phosphorescence, fluorescence and chemiluminescence-Definition with examples

**SEMESTER - II**  
**CORE PAPER III - HUMAN PHYSIOLOGY**

**OBJECTIVES:**

- a. To enable students to understand the structure and physiology of various organs in the body.
- b. To help students to obtain a better understanding of the principles of nutrition and dietetics through the study of physiology.

UNIT -1

**CELL**

Introduction - cell under e/m. Recent concepts.

**TISSUES**

Classification, structure and function.

UNIT -2

**PHYSIOLOGY OF NERVE AND MUSCLE**

Conduction of nerve impulses - Physiology of muscle contraction.

**NERVOUS SYSTEM**

General anatomy of nervous system, functions of the different parts, reflexes, autonomic nervous system.

**SENSE ORGANS**

Physiology of vision, hearing, taste, smell and cutaneous sensations.

UNIT -3

**BLOOD**

Composition, constituents, functions, wounds, hemorrhage, reticulo- endothelial system, body defence against diseases.

**HEART AND CIRCULATION**

Anatomy of the heart-structure of the heart and blood vessels, properties of cardiac muscle, origin and conduction of heart beat, cardiac cycle, cardiac output, heart sounds, blood pressure - definition and factors affecting blood pressure and ECG.

UNIT -4

**RESPIRATORY SYSTEM**

Anatomy and physiology of respiratory organs. Gaseous exchange in the lungs, mechanism of respiration.

**DIGESTIVE SYSTEM**

Anatomy of gastro-intestinal tract. Digestion and absorption of carbohydrates, proteins and fats.

UNIT -5

**EXCRETORY SYSTEM**

Structure of kidney, formation of urine, acid-base balance, skin-temperature regulation,

water balance.

### **ENDOCRINOLOGY**

Pituitary, thyroid, parathyroid, adrenal and pancreas - functions of the hormones and their relationships.

### **REPRODUCTIVE SYSTEM**

Anatomy of male and female reproductive organs, hormonal regulation of female reproductive function, menstruation, fertilization, pregnancy, lactation - hormone influence.

### **REFERENCES**

1. Guyton, A.C. Functions of the Human Body, W.B. Saunders Co., Philadelphia.
2. Vander, A.J , Sherman, J.H. and Luciano, D.S. Human Physiology - the Mechanisms of Body Functions, 2<sup>nd</sup> ed., TMH Publishing Co., Ltd.,
3. Subramaniam, S. and Madhavan Kutty, K. 1971. The Text Book of Physiology, 1<sup>st</sup> ed., Orient Longman Ltd.
4. Best, CH and NB Taylor, The living body, latest edition, Asia publishing house, Bombay.
5. Ham, A.W., Histology, Latest edition. Pitman Medical Publishing Ltd., London,

## **CORE PAPER IV - MICROBIOLOGY AND PHYSIOLOGY PRACTICAL**

### **OBJECTIVES:**

- a. To enable students to estimate the various blood constituents
  - b. Gain knowledge of the role of micro-organisms in health and disease
  - c. To understand the role of micro-organisms in spoilage of various foods
1. Identification of prepared slides - mould - mucor, rhizopus, aspergillus, penicillium, yeast and bacteria – bacilli.
  2. Simple staining, identification of organism in contaminated water and food.
  3. Examination of the motility of micro-organisms-hanging drop preparation.
  4. Demonstration of sterilization methods - Hot air oven and autoclave
  5. Field trip to dairy and food industries.
  6. Microscopic studies of different tissues. Epithelial, connective, muscular and nervous tissues.
  7. Microscopic study of blood, WBC, RBC estimation, Hemoglobin estimation.
  8. Blood of different groups of people. Blood pressure.
  9. Respiratory rate and pulse rate.

### **REFERENCES**

- 1 Joshua A.K. : Micro-biology - India Printing works, Madras - 1971
- 2 Carpenter : Micro-biology - W.B. Saunders Co., London
- 3 Salie, A.J. : Fundamental principles of Bacteriology - McGraw Hill Book Co
- 4 R.C. Rubey & D.K. Maheshwari : A Textbook of Micro - biology
- 5 Pelczar J. Michael : Micro-biology concepts and Application
- 6 Ananthanarayan. R & Paniker C.K.J. : Textbook of Microbiology
- 7 Frazier. W.C. : Food Micro-biology - McGraw Hill Book and Co; New York
- 8 Smith and Water : Introductory food services - McGraw Hill Book and Co. New York 1975
9. Guyton, A.C. Functions of the Human Body, W.B. Saunders Co., Philadelphia.
10. Vander, A.J , Sherman, J.H. and Luciano, D.S. Human Physiology - the Mechanisms of

Body Functions, 2<sup>nd</sup> ed., TMH Publishing Co., Ltd.,

11. Subramaniam, S. and Madhavan Kutty, K. 1971. The Text Book of Physiology, 1<sup>st</sup> ed.,  
Orient Longman Ltd.

12. Best, CH and NB Taylor, The living body, latest edition, Asia publishing house, Bombay.

13. Ham, A.W., Histology, Latest edition. Pitman Medical Publishing Ltd., London

## **ALLIED CHEMISTRY –II (60 HOURS)-4 CREDITS**

### **UNIT-I : CARBOHYDRATES**

- 1.1 Classification , Preparation and reactions of glucose and fructose. Discussion of open and ring structure of glucose, mutarotation
- 1.2 Inter conversion of glucose to fructose and vice versa-properties of sucrose
- 1.3 Properties of Starch, cellulose and derivatives of cellulose

### **UNIT-II : PROTEINS**

- 2.1 Aminoacids-classification, preparation and properties of alpha amino acids- preparation of dipeptide using Bergman method
- 2.2 Proteins-classification according to composition-biological functions and shape- Nucleic acids- Elementary idea of DNA and RNA

### **UNIT-III: PHARMACEUTICAL CHEMISTRY**

- 3.1 Definition and one example each- analgesics, antipyretics, tranquilisers, sedatives, hypnotics, local anesthetics and general anesthetics.
- 3.2 Cause and treatment of – Diabetes, cancer and AIDS

### **UNIT-IV: SEPERATION AND PURIFICATION TECHNIQUES**

- 4.1 Seperation techniques-Extraction-distillation vaccum,fractional and steam-crystallization,sublimation.

### **UNIT-V: CHROMATOGRAPHY**

- 5.1 Principles and application of column, paper and thin layer chromatography

# **ALLIED CHEMISTRY PRACTICALS**

## **VOLUMETRIC ANALYSIS**

1. Estimation of Sodium hydroxide using standard Sodium Carbonate and link Hydrochloric acid
2. Estimation of Borax using standard Sodium Carbonate and link Hydrochloric acid
3. Estimation of Ferrous Sulphate using standard Mohr salt solution and link Potassium permanganate
4. Estimation of Oxalic acid. Standard Ferrous Sulphate solution and link Potassium Permanganate.
5. Estimation of Hydrochloric acid. Standard Oxalic acid solution and link Sodium hydroxide.

## **ORGANIC ANALYSIS**

Detection of Elements (N,S, Halogens)

To distinguish between aliphatic and aromatic Saturated and unsaturated compounds. Functional group tests for phenol, acids (mono, di) aromatic primary amine, aliphatic amide & Carbohydrate Glucose. Systematic analysis of organic compounds containing one functional group and characterization by confirmatory test.

## **REFERENCE**

Basic Principles of practical Chemistry Venkateswaran, Veerasamy & Kulandaivel,  
S.Chand & co

## **SEMESTER III**

### **CORE PAPER V- FAMILY MEAL MANAGEMENT**

#### UNIT -1

Introduction to meal management. Balanced diet - food guide, food pyramid. Basic principles of meal planning - objectives - steps in meal planning - food cost

#### UNIT -2

Nutrition in pregnancy - physiological stages, food selection - complications of pregnancy. Nutrition during lactation - Physiology of lactation – nutrition requirements, special foods given during lactations.

#### UNIT -3

Nutrition during infancy - Growth and development – nutrition requirements - Breast feeding - Infant formula – Introduction of supplementary foods. Nutrition during early childhood (Toddler/ Pre school) Growth and Nutritional needs - nutrition related problems. Feeding patterns - acceptance

#### UNIT -4

Nutrition of school children - Nutritional requirement - Importance of snacks - school lunch. Nutrition during Adolescence Growth development and nutrient needs - food choices, eating habits – factors influencing them.

#### UNIT -5

Nutrition during adulthood , Geriatric nutrition - Factors affecting food intake and nutrient use - nutrient needs -nutrition related problems

### **PRACTICAL**

**Objectives:** To enable the students to:

1. Learn the principles of meal planning.
2. Plan & prepare meals for the family members at different income levels.
3. Plan meals for special groups - infants, preschoolers, adolescents, pregnant & nursing mothers and the aged.

#### **Course Content No. of Lectures**

1. Basic principles of meal and menu planning
2. Daily food guide - The 5 food groups, the use of the food groups. Food Costing.
3. Planning for adult man and woman during different physical activities - sedentary, moderate, heavy worker. Preparation of above diet.
4. Planning and Preparation of a balanced diet for a pregnant woman - Nutrient requirements, modifications of dietary pattern.
5. Planning and preparation of a balanced diet for a nursing mother - modification of normal meal pattern – nutritional requirements.
6. Nutrition during infancy - nutritional requirements during infancy-advantages of breast feeding - disadvantages of bottle feeding
7. Supplementary feeding-preparation of weaning foods
8. Planning and preparation of diet for a toddler, pre-school child-nutritional requirements - food pattern.
9. Nutrition during school age - nutritional considerations - planning and preparation of meals / packed lunch.
10. Nutrition during adolescence - nutritional requirements. Factors influencing food habits - preparation of meal.

11. Planning a diet for a senior citizen - factors affecting food intake and nutrient use - special needs – nutritional requirements - Preparation of meals.

#### **REFERENCES**

1. Guthrie H.A. & Others, "Introductory Nutrition", 1986, 6th ed. Times Mirror/Mosby College Pub Louis.
2. Anderson L. et al, "Nutrition in Health and Disease", 1982, 17th ed, J.B Lippincott Co Philadelphia.
3. Whitney E.N., Hamilton E.N. & Raffles S.R., "Understanding Nutrition", 5th ed. West Pub. Co. New York.
4. Recommended Dietary Intakes for Indians, I.C.M.R. 1989.
5. Mudambi, S.R. & M.N. Rajagopal - "Fundamentals of Food and Nutrition", 3rd ed. Wiley Eastern Ltc New Delhi-19.
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7. Worthington Roberts, Bonnie S & others - "Nutrition in Pregnancy & Lactation", 3rd ed. Times Mirror Mosby College, St. Louis, 1985.

## CORE PAPER VI – NUTRITION- I

### OBJECTIVES

1. To introduce the students to the principle of Human Nutrition.
2. Understand the importance of various macronutrients in relation to health.

### THEORY

#### UNIT 1.

History of Nutrition – Development of Nutrition as a Science – Definition of Nutrition – Under nutrition, over nutrition and malnutrition.

Introduction to nutrition – food as a source of nutrients, function of foods, definition of nutrients, adequate, optimum and good nutrition, malnutrition. Inter relationship between nutrition and health, visible symptoms of good health. Uses of food in the body, digestion, absorption, transport and utilization of the nutrients in the body.

#### UNIT 2.

ENERGY-Energy units – Kilocalories, Megajoules, determination of energy value of foods, using Bomb calorimeter, diagram of Bomb Calorimeter – gross calorific values. Physiological energy, value of foods, relation between oxygen used and calorific value.

Determination of energy requirements, direct calorimetry. Relation between Respiratory quotient and energy output – Specific dynamic action of food (Thermogenic food in REE) indirect calorimetry – Basal metabolism – definition, determination – Benedict Roth basal Metabolism Apparatus – factors affecting BMR – determination of energy metabolism, during work – energy requirements for various types of activities, factorial methods for calculation of the daily energy requirements of an adult for varying degrees of physical activity – recommended allowances for calories, energy requirements of adults expressed in terms of Reference man and Reference woman – FAO committee and ICMR committee percent calories supplied by carbohydrates, fats and proteins in average Indian diets – Energy requirements for different age groups.

#### UNIT 3.

CARBOHYDRATES-Definition and composition, classification, Review of digestion, absorption and metabolism – word diagram – Regulation of blood sugar, Hormonal controls, functions of carbohydrates in the body. Dietary fibre – Definition, soluble and insoluble fibres, sources of fibre, components, physiological effects of dietary fibre; Role of fibre in human nutrition, sources and requirements.

#### UNIT 4.

LIPIDS-Classification, Composition function – essential fatty acids, deficiency, food sources of EFA, Function of TGL, Characteristics of animal and vegetable fats, sterols – cholesterol – function, food sources, phospholipids – function, ketone bodies – fat requirements – food sources, dietary lipids and their relation to the causation of Atherosclerosis and Ischaemic heart disease.

#### UNIT-5.

PROTEINS-Composition – structure and classification, function of protein, Amino acids – Indispensable and dispensable amino acids – special function of amino acids – protein deficiency – Protein Energy Malnutrition – KWASHIORKOR and MARASUMS – etiology, clinical features, treatment and prevention – Evaluation of protein quality – PER, BV, NPU and NPR, chemical score, mutual and amino acid supplementation of proteins.

### REFERENCES

1. Guthrie H.A. – Introductory Nutrition C.V. Mosby Co. St. Louis.
2. Bogert, J.G.V. Briggs, D.H. Calloway Nutrition and physical fitness (1985), 11<sup>th</sup> edition

- W.B. Saunders Co., Philadelphia, London, Toronto.
3. Wardlaw, G.M. Insel, P.H. – Perspectives in Nutrition (1990) Times Mirror / Mosby College Publishing Co. St. Louis, Toronto, Boston.
  4. William, S.R. – Nutrition and Diet Therapy (1985) 5<sup>th</sup> edition, Mosbey Co. St. Louis.
  5. M. Swaminathan “Principles of Nutrition and Dietetics”, 1993, Bappco 88, Mysore Road, Bangalore-560 018.
  6. Maurice E. Shils, James A. Olson, Moshe Shike “Modern Nutrition in health and disease” (1994) eighth edition, Vol. I & II Lea & febiger Philadelphia, A waverly Company.

## **ALLIED PAPER III- BIO-CHEMISTRY**

### **OBJECTIVES**

To introduce the students to

1. The principles of Biochemistry
2. A basic understanding of the functions of biological systems in relation to Nutritional biochemistry
3. The skills in qualitative tests and quantitative estimation of nutrients.

### **UNIT I**

INTRODUCTION TO BOCHEMISTRY Definition

and relation to nutrition, Enzyme classification, Nomenclature, Factors affecting enzymatic activity, Mechanism of action. Co- enzyme and prosthetic group of B vitamins.

### **UNIT II**

CARBOHYDRATE – structure, general reaction of mono, di, tri and oligo saccharides, interconversion of sugars – metabolism of carbohydrate – glucose oxidation through glycolysis – Krebs – TCA cycle, pentose phosphate cycle – gluconeogenesis.

### **UNIT III**

AMINO ACIDS – classification, chemical properties due to amino and carboxyl groups. Chromatographic separation. Proteins – primary, secondary, tertiary structure of proteins – Hydrolysis of proteins – Denaturation, precipitation, coagulation, metabolism of proteins, general pathways of metabolism of amino acids. Deamination, transamination, decarboxylation – urea cycle fate of carbon skeleton of amino acids. Peptides – structure and nomenclature, determination of amino acids sequence.

### **UNIT IV**

LIPIDS AND LIPID METABOLISM – chemical composition of fats, b oxidation of fatty acids, metabolism of unsaturated fatty acids. Bio synthesis of fatty acids – formation of aceto acetate, ketogenesis. Cholestrol – Biosynthesis and metabolism.

### **UNIT V**

Nucleic acids and protein biosynthesis bases, nucleotides, purines and pyrimidines structure and function. Inter relationship between carbohydrate, fat and protein metabolism – Hormonal regulation of metabolism. Inborn errors of metabolism with reference to carbohydrate – Fructosuria and galactosemia. Protein – Phenyl ketonuria, Alcaptonuria, amino aciduria.

## **PRACTICALS**

1. Qualitative tests for sugars – glucose, fructose, lactose, maltose and glucose.
2. Quantitative estimation of reducing sugar.
3. Qualitative tests for proteins

#### 4. Demonstration Experiments.

- a. Estimation of total nitrogen in foods (Micro or Macrokjeldahl methods)
- b. Lipid extraction
- c. Determination of Iodine value

#### **REFERENCES**

1. Conn E E and Stump P.K. – Outlines of Biochemistry – Wiley Eastern (P) Ltd. New Delhi, 1981.
2. Canteron A and Schepertz B – Biochemistry – W.B. Saunders Co., Philadelphia London, 1967.
3. Pairely J.L. and Kilgous G.L. – Essentials of biological chemistry Reinhold publishing corporations, New York 1968.
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6. Mahier and Corder E H – Basic biological chemistry, Kapes and Row, New York, 1968.
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11. Karison and Peterson 1971 – Introduction to Modern bio-chemistry. Academic press, New York, London.
12. Karison and Peterson 1975 – Introduction to Modern bio-chemistry. Academic press, New York, London.
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14. Rama Rao A.V.S.S. 1990 – Text book of biochemistry. 5<sup>th</sup> edition, L K and Publishers, Visakhapatnam.

**SEMESTER – IV**  
**CORE PAPER VII – ADVANCED DIETETICS**

**OBJECTIVES:**

To enable the students to

1. Understand the modifications in nutrient requirements for various diseases.
2. Develop skills in planning and preparation of therapeutic diets for various diseases.

**Unit I Gastrointestinal Diseases**

Etiology, clinical findings and dietary modifications for peptic ulcer, ulcerative colitis, sprue, celiac disease, hepatitis, cirrhosis of liver, cholecystitis, cholelithiasis and pancreatitis. **Principles of diet therapy, Routine hospital diet, diet in diarrhea and constipation, diet in fever**

**Unit II Metabolic Disorders**

Diabetes mellitus - Predisposing factors, clinical findings, types, metabolic changes, complications and dietary management, Gout -Nature and occurrence of uric acid crystals, causes, symptoms and dietary management. **Diet in obesity and underweight**

**Unit III Renal diseases**

Predisposing factors, symptoms and dietary management of acute glomerulonephritis, nephrosis, renal failure and urinary calculi; Types of dialysis and modification of diet in dialysis.

**Unit IV Cardiovascular diseases**

Predisposing factors, clinical findings and dietary management of acute and chronic diseases of the heart - Hyperlipidemia, hypertension, atherosclerosis and congestive cardiac failure

**Unit V Diet in Cancer**

Causes, types, clinical symptoms and dietary modification. **Special feeding methods.**

**REFERENCES**

1. Antia. F.P.. 1989. Clinical Dietetics and Nutrition. Bombay, Oxford University Press.
2. Passmore. P.and Eastwood. M.A. 1986. Human Nutrition and dietetics. London,ELBS.
3. Robinson. C.H. et al. 1994. Normal and Therapeutic Nutrition. New York, Macmillan and Co.
4. Williams. S.R. 1994. Nutrition and Diet Therapy. New York., Mosby Mirror Publishing Co.
5. Sri Lakshmi. B. 2002. Dietetics. New Delhi ,New Age International Pub. Ltd.
6. MALhan,K.N.and Arlim(2002) Krauses Food Nutrition and Diet Therapy. W.B Saunders Company, Philadelphia.
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## **CORE PAPER VIII – NUTRITION AND ADVANCED DIETETICS PRACTICAL**

### **OBJECTIVES:**

To enable the students to

1. To gain skill in qualitative tests and quantitative estimation of nutrients.
2. Plan therapeutic diets.
3. Learn skills in the preparation of therapeutic diets.
  1. Qualitative tests for minerals
  2. Quantitative estimation of calcium
  3. Quantitative estimation of phosphorus
  4. Quantitative estimation of vitamin C
  5. Demonstration Experiments.
    - a) Estimation of Iron
    - b) Qualitative tests for vitamin A
    - c) Quantitative estimation of carotene

### **PLANNING AND PREPARATION OF DIETS FOR**

1. Peptic Ulcer
2. Ulcerative Colitis
3. Hepatitis
4. Cirrhosis of Liver
5. Diabetes Mellitus
6. Gout
7. Nephritis
8. Nephrosis
9. Atherosclerosis & Hypertension

### **REFERENCES**

1. Antia. F.P.. 1989. Clinical Dietetics and Nutrition. Bombay, Oxford University Press.
2. Passmore. P.and Eastwood. M.A. 1986. Human Nutrition and dietetics. London,ELBS.
3. Robinson. C.H. et al. 1994. Normal and Therapeutic Nutrition. New York, Macmillan and Co.
4. Williams. S.R. 1994. Nutrition and Diet Therapy. New York., Mosby Mirror Publishing Co.
5. Sri Lakshmi. B. 2002. Dietetics. New Delhi ,New Age International Pub. L

## **ALLIED PAPER IV - COMMUNITY NUTRITION**

### **OBJECTIVES:**

1. To enable students to understand the importance of nutrition in national progress and the significance of assessment of nutritional statuses.
2. To recognize the solutions to overcome problems of malnutrition in the country and the role of national and international agencies in this area.

### **Course Content**

UNIT 1. (a) Nutrition and health in National development

(b) Nutritional problems confronting our country – The causes of malnutrition in India- Balances food production and population growth.

UNIT 2. Methods of assessment of nutritional status

- Sampling techniques.
- Identification of risks groups.
- Direct assessment – Diet surveys, Anthropometry, Clinical and Biochemical estimations.
- Indirect assessment – food balance sheets and Agricultural data, Ecological parameters and vital statistics.
- Use of growth charts.

UNIT 3. a- Nutrition intervention schemes in the country lecture and demonstration, nutrition exhibitions and visual aids.

b- Recent advances in community nutrition research-Fortification & enrichment of foods.

National and International agencies in community nutrition

ICDS, SNP, ANP, Midday meal programme, FAO, WHO, UNICEF, CARE, AID, ICMR, CSIR, NIN, CFTRI

UNIT 4 Breast feeding and its implications, Hazards of bottle feeding – Review.

Weaning foods-planning, formulating and preparing importance of correct and timely weaning – Review

UNIT 5 Nutrition and infection-relationship, immunization and its importance.

### **REFERENCES**

1. McLaren.D.S., ED-1983. Nutrition in the Community. John Weley and sons.
2. Jelliffe. D.B.-1996. The Assessment of Nutritional status on the community-WHO Monograph series No. 53-geneva.
3. Reh, Emma-1976. Manual on Household Food consumption surveys, FAO. Nutritional studies No.18 Rome
4. Shukla, P.K.- 1982. Nutritional problem of India-prentice Hall of India Pvt. Ltd., New Delhi.
5. Shanti ghosh-1977. The feeding and care of infants and young children, voluntary Health Association of India-New Delhi.
6. Ibrahim. G.J-1983. Nutrition in mother and children Health. London, Macmillan.
7. Ritchey, S.J. and J. Taper-1983. Maternal and child Nutrition. Harper and Row publishers, New Delhi.

### **PRACTICALS**

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.

### **Course outline:**

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

## **SKILL BASED ELECTIVE- FUNDAMENTAL OF TEXTILES**

### **OBJECTIVES:**

To help the students

1. Study the science of Textiles and use this knowledge in wise buying.
2. Select clothing appropriate for various family members.
3. Learn the techniques involved in Garment Construction.

### **PRACTICALS**

1. Textile fibers - Classification, identification, properties
2. Basic weaves
3. Principles and elements of design in relation to apparel design
4. Types of labeling
5. Sewing machine and sewing tools.
6. Hand stitches – temporary and permanent.
7. Seam and seam finishes
8. Preparation and application of true bias, bias facing, shaped facing & bias binding
9. Plackets and opening – continuous placket, bound & faced placket.
10. Garment construction-Basic principles

## **SEMESTER V**

### **CORE PAPER IX - HUMAN DEVELOPMENT - I**

(Development from infancy to adolescence)

#### **OBJECTIVES:**

To enable the students to

1. Know the development of an individual from infancy to adolescence.
2. Develop an awareness of the problems of children, adolescent and exceptional children.

#### **UNIT I Growth and development**

- Meaning and importance of growth and development, principles of governing growth and development – developmental task of different stages.
- Methods of study of human development.

#### **UNIT II Infancy and Babyhood (0-2 years)**

- Characteristics, physical, social and emotional development, cognitive and language development
- Effect of stimulation – care of the infant, feeding, toilet training, bathing, clothing, sleeping and immunization, importance of mothering, importance of psychological needs.
- Common ailments and safety measures.

#### **UNIT III Early childhood period (2-6 years)**

- a. Characteristics, physical, social, emotional, intellectual, language development.

#### **UNIT IV Late childhood period (6-12 years)**

- a. Characteristics, physical, social, emotional, intellectual, language and moral development.
- b. Nursery School – Aims and objective, building equipments curriculum program and personnel.

#### **UNIT V Adolescence**

- a. Adolescence –physical and psychological changes, emotional, moral and social, development, Problems of adolescence.
- b. Delinquency – causes, prevention and rehabilitation.
- c. Educational and vocational guidance, role of family and schools and colleges in guiding adolescence.

#### REFERENCES

1. Hurlock, E.B., (1986). Child Development. Prentice Hall – Inc.
2. Craig, J., (2009). Human Development, Prentice hall penn state university.
3. Rajammal .P. Devadas. (1980). Introduction to child Development printed in India.
4. Suriakanthi, A., (2009). Child Development. Kavitha publications, Tamil

### CORE PAPER X FOOD SERVICE MANAGEMENT – I

#### OBJECTIVES:

- a) To enable the students to develop skills in organizing and managing Food Service institution and to gain knowledge about the food service and responsibilities of each.

#### UNIT I

Definition and scope of Food Industries – classification of Commercial and Non-commercial food service and welfare food service institutions.

#### UNIT II

Management Definition, principles and functions of management Organization – Types and theories of organisation. Tools of management

#### UNIT III

Staffing Manpower Planning Labour sources, Selection, Recruitment and training wages, salaries, incentives, promotion demotion, transfer, dismissal. Managerial Problems of Food Service Unit. Directing and direction, leadership, delegation and controlling decentralization, centralization, supervision, human relation industry, authority and responsibility, motivation, communication evaluation techniques. Leadership styles and qualities.

## UNIT IV

Food cost and review of maintenance of accounts Accountability Daily, Weekly, Monthly accounts for food, labour equipment and furnishing, rent, water, fuel, light, licences, cleaning supplies, maintenance, miscellaneous. Double entry book keeping, ledger accounts journal and balance sheet, budgetary control. Cost control, fixed, variable, average marginal and unit cost, break even analysis – production planning control.

## UNIT V

Application of Computers in catering.

## REFERENCES:

1. West. B.B. Wood L., Harger, V.F. (1977) Food Service Institutions, JohnWiley and sons, Inc., NewYork, V Ed.
2. Shukla. M.C. (1982) Business Organization and Management S. Chand and Co., Ltd., Ramnagar, New Delhi.
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15. Rutherford, D.G. Hotel Management and operation, van Nostrant Reinhold. 115, fifth Avenue, New York, 10003, 1990.

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1. Journal of vacation marketing. Henry Steward Publications 28/30 Little Russel Street, London, W.C.IA.2HN
2. Indian Management-Journal of All India Management Association. All India Management Association Pub. Management House, New Delhi – 3
3. Journal of the American Dietetic Association 'The American Dietetic Association, 430North Michigan Avenue, Chicago, Illincise.

## **CORE PAPER XI- NUTRITION II**

### **OBJECTIVES**

- ❖ To learn the role of various micronutrients in body functions.
- ❖ To gain skill in qualitative tests and quantitative estimation of nutrients.

### **UNIT I**

#### **FAT SOLUBLE VITAMINS**

Metabolism, Functions, effects of deficiency, food sources, requirements, unit of measurements and hypervitaminosis of vitamins A, D, E and K.

### **UNIT II**

#### **WATER SOLUBLE VITAMINS**

Ascorbic acid and B Complex vitamins- Thiamine, Riboflavin and Niacin- Functions, effects of deficiency, food sources and requirements for different age groups.  
Importance of folic acid, Pyridoxine, Vitamin B12, Biotin and Pantothenic acid to the body.

### **UNIT III**

#### **MACRO MINERALS- Calcium, Phosphorous, Magnesium, Potassium, Sodium and Chloride-**

Distribution in the body; functions, effects of deficiency, food sources and RDA.

#### **MICRO / TRACE MINERALS in human nutrition - Iron, Zinc, Fluoride and Copper**

Distribution in the body; functions, effects of deficiency, food sources and requirements for different age groups.

### **UNIT IV**

#### **ULTRATRACE MINERALS- Iodine, Selenium, Manganese, Chromium, Molybdenum and Cobalt.**

Distribution in the body; functions, effects of deficiency, food sources and requirements.

Selenium and Vitamin E relationship.

Chromium and glucose tolerance factor.

## UNIT V

**WATER** – as a nutrient, functions, sources, requirements. Distribution of water in the body, exchange of water in the body, composition of body fluids, water exchange between plasma and interstitial fluid. Water imbalance – dehydration- water intoxication, water and electrolyte mechanism - ADH , vasopressin.

### REFERENCES

1. Guthrie H.A. – Introductory Nutrition C.V. Mosby Co. St. Louis.
2. Bogert, J.G.V. Briggs, D.H. Calloway Nutrition and physical fitness (1985), 11<sup>th</sup> edition – W.B. Saunders Co., Philadelphia, London, Toronto.
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6. Maurice E. Shils, James A. Olson, Moshe Shike “Modern Nutrition in health and disease” (1994) eighth edition, Vol. I & II Lea & febiger Philadelphia, A waverly Company.

## CORE PAPER XII - SPORTS NUTRITION

### OBJECTIVES:

- 1.To learn about the importance of Nutrition in sports personnel
- 2.To find out the sources of generation of energy for muscle and force generation
- 3.To know about the ergogenic aids and supplements available in the market.

### UNIT I – Fuel Sources for Muscle and Exercise Metabolism

Sources of energy for muscle force generation – fuel stores on skeletal muscle – energy pathways – regulation of energy metabolism – metabolic response to exercise – metabolic adaptation to exercise training – factors influencing choice of fuels – Components of energy expenditure – energy balance

### UNIT II – Macro and Micro Nutrients in Sports Nutrition

Role of carbohydrates before, during and after exercise – carbohydrates loading – protein requirements for exercise – techniques to study protein and amino acid metabolism – effect of protein intake on protein synthesis – amino acids as ergogenic aids – health risks with excessive protein intake – Fat as a fuel during exercise – fat supplementation and exercise supplements that increase aft oxidation.

Micronutrients – role of antioxidants – essential function of vitamins and minerals for athletes, ergogenic effect

Water – thermoregulation and exercise in the heat – effect of dehydration in exercise performance – heat illness – fluid guidelines before, during and after exercise.

### UNIT III – Weight Management and Body Composition

Weight management- Ideal body weight and composition – weight loss – making weight and rapid weight loss strategies

Eating disorders – types, prevalence, risk factors, effect on sports performance, treatment and prevention

Body composition analysis-importance of body composition, different techniques-normative values for comparison.

### UNIT IV-Practical Sports Nutrition

Pre event and post event meal- preparing for competition, dealing with cramps, stitch GI distress-electrolyte balance-sports drinks

Eating for anaerobic power-aerobic power timing of meals and snacks-guidelines for the travelling athlete-recovery food

Food for power sports, endurance sports, combined power

Nutrition for special population: child athlete, ageing athlete, athletic diabetes, vegetarian and disabled athlete.

## UNIT V – Ergogenic aids and supplements

Overview of supplements and sports foods – use of performance enhancing substances among athletes – finding proof of efficacy of supplements and sports foods-anabolic steroids-sports foods (cereal bar, sports drinks, carbohydrate gels, liquid meal replacements, vitamins)-different types of protein supplements, creatine, glutamine, BCAA, HMB, caffeine, glycerol, bicarbonate, citrate – WADA-Anti doping rules and regulations.

## PRACTICALS

1. Body fat analysis-learn to use skin fold calipers, bio electrical impedance analysis technique. Observe DEXA analysis.
2. Measurement of Blood pressure, heart rate, calculate METs, VO2 max
3. Learn to take whole body measurements from a certified fitness trainer using a measuring tape
4. Observe fitness testing methods by a sports physiotherapist or certified fitness trainer- to measure cardio vascular fitness, core strength, muscular endurance, explosive power, flexibility, agility, stability, strength, speed
5. Planning diets for strength sports, endurance sports, racquet sports, team games
6. Planning diets for competition, recovery (case studies)
7. Assignment on sports foods and supplements available in the market
8. Guest lecture by a sports nutritionist, fitness trainer, sports physician or physiotherapist on career opportunities
9. Attend a sports tournament-swimming or tennis or hockey or cricket or track and field sports etc.

## REFERENCES:

1. Deakin, Burke (2006), 3<sup>rd</sup> Ed, Clinical Sports Nutrition, McGraw-Hill Australia.
2. Bean, Anita (2006), 5<sup>th</sup> Ed, Sports Nutrition
3. Bourns, Fred (2002), Essentials of Sports Nutrition, 2<sup>nd</sup> Ed. John and Wiley.
4. Suzanne Girard Eberle (2000), Endurance Sports Nutrition, Human Kinetics.
5. Benardot, Dan (2000), Advanced Sports Nutrition, Human Kinetics
6. Burke, Louise (2007), Practical Sports Nutrition, Human Kinetics
7. Gleeson, Jeukendrup (2004), Sports Nutrition: An Introduction to Energy Production and Performance, Human Kinetics

## **ELECTIVE I - ENTREPRENEURIAL DEVELOPMENT**

### **OBJECTIVES:**

- a) Creating an awareness about entrepreneurship as an effective to a “White collar job”.
- b) Students can be taken to trade fairs to collect information on industrial products of their interest.
- c) Students visits to financial institutions industrial associations, research institutions and banks would help them in collecting information on availability of finance, technology, raw material and export potential.

Alumni Association-Ex-students of the institution who has set up their own enterprises can be invited to talk to the students to take up an entrepreneurial career.

### **UNIT I**

Importance of entrepreneurship and its relevance in career growth.

Entrepreneur, entrepreneurship and enterprise.

Concept and development

Characteristics of entrepreneurs

Developing entrepreneurial competencies

### **UNIT II**

Types of Enterprises and Ownership

Manufacturing, Service and Franchise.

Large, medium, SSIM tiny and cottage industries.

Limited, public limited, Private limited.

Partnership, Sole Proprietorship.

Advantages and disadvantages of types of ownership.

Employment, Self employment and Entrepreneurship.

### **UNIT III**

Financial management – Importance and Techniques

Management of working capital, reinforcement of the concept of working capital.

Factors to be controlled in managing working capital-Tools and Techniques.

Books of Account- Importance of accounting assessment. Different books and its relevance. Support. Stationery and its use. Operating mechanism

#### **UNIT IV**

Marketing management –Marketing for small business

Strategies for sales promotion-tools and techniques for sale promotion, pricing policy and its implications on sales.

Export marketing- Understand the International Business Environment-Procedures and formalities-Do's and Don't's for export

Inventory Control and Quality Management-Defining quality and its concept-Aspects of quality management-ISO 9000 certification-Total Quality Management (TQM)

Financial support from financial institutions

#### **UNIT V**

Legal complications

Income tax

Sales tax

Excise

Labour laws, factory act, pollution control etc.

#### **REFERENCES**

- 1) Jain P.C, (1998). Handbook of New Entrepreneurs, Oxford University Press.
- 2) Jan Narayan Vyas, (1947). Small Scale Industry Handbook, Grantjistran.
- 3) Shiv Khera, (1998). You Can Win, MacMillan, India.
- 4) Charles Hozgrew, (1997). Cost Accountancy, A Managerial Emphasis, PHI.
- 5) Mitch McGremmon, (1995). Unleash the Entrepreneur Within, FT-Pitman.

- 6) Holt, (1997). Entrepreneurship, New Venture creation, PHI.
- 7) Philip Kotter, (1997). Marketing Management, Prentice Hall, India, (PHI).
- 8) Pandey, I.M, (1998). Management Accounting, Vikas.
- 9) Everette Adam, (1997). Production and Operational Management, PHI.
- 10) Azhav Kazmi, (1997). Business Policy, Tata McGraw Hill (TMH).

## **PRACTICALS**

- 1) Visit to the Trade fair
- 2) Ex. Students enterprise-Visit
- 3) Visit to a Small Scale Industry, Financial Institution Association, Research Institution and bank

## **SEMESTER VI**

### **CORE PAPER XIII - CLINICAL NUTRITION**

#### **OBJECTIVES**

To enable the students to

1. Learn the basic principles of clinical nutrition.
2. Understand the clinical significance of biochemical findings.

#### **THEORY**

##### **Unit I Metabolism**

Review of digestion and absorption of proximate principles

Carbohydrate - Glucose transport, glycolysis, metabolism of lactate and pyruvate, citric acid cycle, gluconeogenesis, pentose phosphate pathway.

Amino acid - Intermediary metabolism and urea cycle

Lipid - Intestinal resynthesis of TG, transport, oxidation of fatty acids, biosynthesis of cholesterol.

##### **Unit II Genetic control of metabolism**

Nucleic acids, DNA replication, RNA – Synthesis, types and functions, Genetic code, protein biosynthesis, Recombinant DNA Technology

##### **Unit III Biochemical changes due to disorders of metabolism**

Diabetes mellitus, Inborn errors of metabolism with respect to lactose, galactose, phenyl alanine and uric acid (Gout)

##### **Unit IV Digestive System**

a. Diarrhoea, constipation. Gastritis, ulcers, colitis, malabsorption syndrome -Nutritional implications.

b. Metabolic and nutritional implications of Hepatitis. Cirrhosis of liver. Hepatic coma. Pancreatitis. Cholecystitis and Cholelithiasis.

### **Unit V Renal System**

a. Metabolic and nutritional implications of Nephritis. Nephrotic syndrome. Renal failure. Renal calculi and Dialysis.

b. Water and electrolyte losses and replenishment. effect of dehydration and water intoxication.

### **REFERENCES**

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.
5. Ramakrishnan. S. and Venkat Rao.. 1995. Nutritional Biochemistry. Chennai, T.R. Publications.
6. Shils et al. 1994. Modern Nutrition in Health and Disease. Vol. I and II. New York, Lea and Febiger.
7. Williams S.R.. 1993. Nutrition and Diet Therapy. New York, Mosby Publishers.

## **CORE PAPER- XIV FOOD SERVICE MANAGEMENT – II**

### **OBJECTIVES:**

1. To understand the applications of basic principles to bulk production of the food
2. To gain knowledge regarding selection and purchase of food
3. To develop skills in menu planning for quality preparation
4. To understand the different styles of food service in volume feeding
5. To gain knowledge of food service layout
6. To gain knowledge to develop skills in handling equipment and maintenance

### **UNIT I**      Equipment in food service

Classification of equipment, factors affecting selection of equipments-electrical and nonelectrical equipment for food storage, preparation, service and dishwashing

Base materials and insulating materials

### **UNIT II**

Planning of Food Service unit

Layout of food plants, different work area, planning of storage, production and service areas. Lighting and ventilation.

### **UNIT III**

Menu planning – Definition, types, menu planning for various sectors and institutions, health safety in menu planning, standardization of recipes, portion control.

Types of food and beverage services.

## **UNIT IV**

Sanitation and safety in food service institutions, garbage disposal, pest control.

## **UNIT V**

FSSAI (Food safety standard authority of India ), HACCP , Entrepreneurial ship in catering.

## **REFERENCES**

- 1) Food service system and Lewis J. Minor, Ronald. Cichy, Avi Publishing Co.
- 2) Food Service operations: Mahmood A. Khan, Avi Publishing Co 1987
- 3) Conol A. King (1988). Professional Dining Room Management, VNR, New York.
- 4) John Fuller and Hutchinson, (1983). Modern Restaurant Services.
- 5) Dorothy Tompikins (1969). Table Layout and Decoration, Wardlock & co Ltd
- 6) Lillicarp, D.R, (1989). Food and Beverage Services, 2<sup>nd</sup> Ed. BLBS Reprinted.
- 7) Besbe, B., West, Le Velle, (1986) Revised by HArger V. Shugant M.S. June Payne Palacio, MacMillan Publishing Co.
- 8) Mass Catering WHO Publishing.
- 9) Avery-A.A, (1980). Modern Guide to Food Service Equipment, C.B.I Publishing Inc.
- 10) Anderson F, (1976). Home Appliances Servicing Taraporewala Sons & Co.
- 11) Johnston J.B, (1965). Equipment for Modern Linings, MacMillan Co.
- 12) Kotschevir, L and Terrll, M. E, (1971). Food Service Planning Layout and Equipment, John Wiley Eastern Ltd.
- 13) Mohini Sethi and Surjet Malhan, (1987). Catering Management, “An Integrated Approach. Wiley Eastern Ltd.

## **REFERENCES**

- 1) [www.codexalimentarius.org](http://www.codexalimentarius.org)
- 2) [www.fssai.gov.in](http://www.fssai.gov.in)

## **PRACTICALS**

### **OBJECTIVES:**

1. Develop skills in food production and service

## **Course content**

1. Standardization of four selected recipes from each of the following cuisines-South Indian North Indian, East Indian and West Indian.
2. Organizing, preparing and serving food for three different meals for 50 members or more (list attached)
3. Setting up the restaurant-laying of table cloth changing, setting up the silver and other table arrangements.  
Folding of serviettes correct use of waiter's cloth.  
Preparation for customers.
4. Serving and clearing practice, French and English Service.
5. Service of beverage tea, coffee, juices and alcoholic beverages.
6. Laying for breakfast.
7. Tray service.
8. Order taking, making out checks bills presentation of bills.
9. Up keep and cleaning of cutlery, crockery, other equipments.

## **CORE PAPER XV- CLINICAL NUTRITION PRACTICAL**

### **OBJECTIVES:**

To enable the students to

1. Develop skills in analysis of urine and estimation in serum.

### **PRACTICAL**

1. Analysis of urine
2. Collection of blood and separation of plasma and serum
3. Estimation of blood glucose
4. Estimation of total protein
5. Determination of A/G ratio
6. Estimation of serum urea
7. Estimation of serum creatinine
8. Estimation of cholesterol
9. Estimation of Bilirubin

### **REFERENCES**

1. ICMR. 1978. Laboratory techniques in Nutrition. Hyderabad, NIN.
2. Oser. B.L. 1965. Hawk's Physiological Chemistry. New Delhi, Tata McGraw Hill Publishing Co.

3. Chawla. R. 1995. Practical Clinical Biochemistry. Methods and Interpretations. New Delhi, Jaypee Brothers. Medical Publishers (P) Ltd.
4. Pattabiraman. T.N. 1998. Laboratory Manual in Biochemistry. New Delhi, All India Publishers and distributors..

## **ELECTIVE - PAPER II - HEALTH PSYCHOLOGY**

### **OBJECTIVES:**

- 1) To understand the basic concepts of Human behavior and Health Psychology
- 2) To study the psychological and other psycho social factors that affect health
- 3) Understand the interrelationship between Nutrition and Psycho social disorders.
- 4) To understand the special needs and health challenges of the human life cycle.
- 5) To familiarize with the health promoting treatment and inventions in health psychology.

### **UNIT I** Foundation of Health Psychology

Health and health psychology-health and illness-trends that shape health psychology-perspectives in health psychology

### **UNIT II** Stress and Health

Stress-measurement-physiology of stress-sources-psychological factors in stress-stress response-factors affecting the ability to cope stress management.

### **UNIT III** Health psychology through life span

Childhood and adolescence-childhood nutrition, childhood obesity, adolescents and risk taking interventions, adulthood and ageing theories of ageing life style and aging.

### **UNIT IV** Nutrition and Illness

Nutrition-obesity-treatment-eating disorders-substance abuse-alcoholism and tobacco abuse, chronic and life threatening illness-Psychological factors in cardio vascular disease, managing stress following CVD, Health psychology and diabetes, coping with cancer, Intervention strategy for AIDS, Coping with AIDS or HIV

### **UNIT V** Intervention Strategies

Applications of principle of counseling and psychotherapy in disease management and health care. Relaxation technique, somatic oriented cognitive and behavioral skills in the management of diseases. Support group-family counseling, alternative healing systems.

### **REFERENCES**

- 1) Taylor.S.E. (1995), "Health Psychology", McGraw Hill Inc, New York.
- 2) Richard. O. Straub (2002) "Health Psychology", Worth Publishers, New York.
- 3) Ogden. J. (2000). "Health Psychology", 2<sup>nd</sup> Ed., open University Press, U.K.
- 4) Tones. K and Tillofrd. S (2001), "Health Promotopn Effectiveness-Efficiency and Equity", 3<sup>rd</sup> Ed., Nelson theories Ltd., U.K.

## **ELECTIVE PAPER III - HUMAN DEVELOPMENT-II**

(Development from Adulthood through Old age)

### **OBJECTIVES:**

To enable the students to:

1. Understand the developmental tasks during adulthood till old age.
2. Impart knowledge on pregnancy and prenatal Development
3. Create an awareness on special children.

### **UNIT I Adulthood**

Characteristics and developmental tasks, all aspects of development and vocational adjustments.

### **UNIT II Marriage and family**

- a) Characteristics and developmental tasks-types of family-Indian, traditional and modern.
- b) Functions of family and marriage, motives of marriage, marriage and family as a basic social institution.
- c) Adjustment in marriage-adjustment towards mate, sex, finance, society and in-laws
- d) Family life cycle-stages-beginning family, expanding family, contracting family, adjustment in different stages.
- e) Crisis in the family-critical family situation and impact on children.
- f) Maternal and Paternal deprivation and their effect on child growth and development
- g) Paternal attitudes and their influence on their children, styles of parenting.
- h) Small family norms-concepts, advantages and limitations.

### **UNIT III Pregnancy and Prenatal Development**

- a) Conception-test tube baby, periods of prenatal development, factors affecting prenatal development, prenatal care.
- b) Management of normal pregnancy, hygiene, diet and medical supervision. Common discomfort and hazards during pregnancy, birth process-signs of labour, stages of labour, types of birth, birth injuries.

- c) Post natal care, normal puerperium, prevention of gynecological complications, adjustment of new born, temperature, breathing, feeding and elimination.

#### **UNIT IV Introduction to Children with Special Needs**

- |                         |                              |
|-------------------------|------------------------------|
| a) Gifted children      | d) Orthopedically challenged |
| b) Mentally retarded    | e) Hearing impaired          |
| c) Visually handicapped | f) Learning disability       |

#### **UNIT V Old age**

Characteristics of old age, physical changes, Psychological changes. Place of the aged in Indian Society.

#### **PRACTICALS**

1. Preparation of case study, observing various development-physical and motor, social emotional and intellectual-of a particular child.
2. Socio-metric study of adolescents.
3. A survey on preferences of adolescents in choosing a life partner.
4. Visit to an institution for exceptional children.
5. Survey on problems of old age.

#### **REFERENCES**

- 1) Hurlock, E.B.(1986). Child Development, Prentice Hall Inc.
- 2) Rajammal.P.Devadas. (1980). Introduction to Child Development, Printed in India.
- 3) Suriakanthi. A. (2009). Human Development, Kavitha Publications, Tamil Nadu.
- 4) Craig. J(2009). Human Development, Prentice Hall Penn State University.
- 5) K. M Kapadia. (1985). Family, Oxford University Press, India.
- 6) C.B. Mammoria. (2005). Family-Social Organization.

## **INTERNSHIP**

### **CATERING/DIETETICS/FOOD PROCESSING/MICROBIOLOGY**

ONE MONTH INTERNSHIP IN THE SUMMER HOLIDAYS WHEN STUDENTS PASSES  
HER SECOND B.Sc COURSE AND GOES TO THE THIRD YEAR.

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**DEPARTMENT OF HOME SCIENCE – CLINICAL NUTRITION & DIETETICS**  
**CERTIFICATE COURSE IN INTERIOR DECORATION & FLOWER ARRANGEMENT**

Duration- 6 months

Classes- 3 hrs/week (total 40 hrs)

Total seats -100 (2 batches = 50 + 50)

Eligibility – II & III yr UG students

Fees – 500 /-

Timings –12:30 – 1:30 for batch -1 (evening college student)

1:30 – 2:30 for batch -2 (day college student)

**SYLLABUS (2014-15)**

**UNIT- I**

Introduction to design. Elements & principles of design.

**UNIT- II**

Interior Décor –

- Colour – uses & applications
- Light and lighting
- Walls, wall finishes and ceilings

**UNIT- III**

Interior furnishing-

- Floor and floor covering
- House plan
- Soft furnishings
- Furnitures

**UNIT- IV**

Interior decoration-

- Accessories
- Allocation of furniture
- Floor decoration

**UNIT- V**

Flower arrangement - style and methods

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