

**ETHIRAJ COLLEGE FOR WOMEN  
AUTONOMOUS  
AIDED  
CHENNAI-8**

**DEPARTMENT OF  
NUTRITION, FOOD SERVICE MANAGEMENT AND DIETETICS**

**SYLLABUS FOR  
B.Sc NUTRITION, FOOD SERVICE MANAGEMENT AND DIETETICS  
2015 – 2016 batch onwards**

## **ETHIRAJ COLLEGE FOR WOMEN**

### **Department of Nutrition, Food Service Management and Dietetics Revised Syllabus from June 2015**

Department of Nutrition, Food Service Management and Dietetics is revising syllabi with effect from the academic year 2015-2016, by revising CBCS and Part IV and Part V components as specified by the Government of Tamil Nadu. Part IV and Part V components will seek to build the capacity of the students and provide inputs for his/her social service and social analysis capabilities.

Every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have five working hours. Teaching is organized into a modular pattern of credit courses. Credit is normally related to the number of hours a teacher teaches a particular subject. It is also related to the number of hours a student spends learning a subject or carrying out an activity.

## REGULATIONS

### **1. ELIGIBILITY FOR ADMISSION:**

Candidates for admission to the first year of the Degree of Nutrition, Food Service Management and Dietetics course shall be required to have passed the Higher Secondary Examinations conducted by the Government of Tamil Nadu or an Examination accepted as equivalent there to by the syndicate of the University of Madras.

### **2. ELIGIBILITY FOR THE AWARD OF THE DEGREE:**

A candidate shall be eligible for the award of the Degree only if she has undergone the prescribed course of study for a period of not less than three academic years, passed the examinations of all the six semesters prescribed.

### **3. COURSE OF STUDY:**

The main subject of study for Bachelor Degree shall consist of the following:

PART-I : Foundation Course exclusive for Languages.

PART-II : Core Courses

PART-III : Allied Subjects I and II – Job and Skill oriented entrepreneurship components.

PART-IV : Non major electives

PART-V : Extension Activities/ Sports/ NCC

### **4. PASSING MINIMUM:**

A candidate shall be declared to have passed in each paper/ practical of the main subject of study wherever prescribed, if she secured NOT LESS THAN 40% of the marks prescribed for the examination.

### **5. CLASSIFICATION OF SUCCESSFUL CANDIDATES:**

Part I, II, III & IV

Successful candidates passing the examination and securing the marks (i) 60 percent and above and (ii) 50 percent and above, but below 60 percent, in the aggregate shall be declared to have passed the examination in the FIRST and SECOND class respectively. All other successful candidates (above 40 and below 50 percent) shall be declared to have passed the examination in the THIRD class. Candidates who pass all the examinations (Part I, II, III & IV) prescribed for the course in the FIRST APPEARANCE ITSELF ALONE is eligible for ranking.

## COURSE PROFILE

### SEMESTER I

Semester	Course Code	Course Title	Hrs./Week	Credits	CA	End Semester	Total
I		<b>Part - I</b> Foundation Course Language	5	3	40	60	100
I		<b>Part - II</b> English	5	3	40	60	100
I	<b>ND15/1C/FSE</b>	<b>Part – III</b> <b>Core 1-</b> Food Science	7	5	40	60	100
I	<b>ND15/2C/PR1*</b>	<b>Core 3-</b> Food Science and Physiology Practical	3	-	40	60	100
I		<b>Part III</b> Allied 1- Allied Chemistry I	4	4	40	60	100
I		Allied Chemistry Practical	2	-	40	60	100
I	<b>ND15/1N/BTA</b> <b>ND15/1N/ATA</b> <b>ND15/1N/HEN**</b>	<b>Part IV</b> <b>1a/b/c</b> <b>1a- Basic Tamil</b> <b>1b- Advanced</b> <b>Tamil</b> <b>1c- Health and</b> <b>Nutrition (NME)</b>	2	2	-	50	50
I		Soft skill 1	2	3	-	50	50
<b>Total</b>			<b>30</b>	<b>20</b>			
<p><b>*practical examination (ND15/2C/PR1) – Food science and Physiology Practical will be conducted in the second semester.</b></p>							

## SEMESTER II

Semester	Course Code	Course Title	Hrs./ Week	Credits	CA	End Semester	Total
II		<b>Part – I</b> Foundation Course Language	5	3	40	60	100
II		<b>Part – II</b> English	5	3	40	60	100
II	ND15/2C/PHY	<b>Part – III</b> <b>Core 2-</b> Physiology	7	5	40	60	100
II	ND15/2C/PR1*	<b>Core 3-</b> Food Science and Physiology Practical	3	3	40	60	100
II		<b>Part III</b> <b>Allied 2-</b> Allied Chemistry II	4	4	40	60	100
II		Allied Chemistry Practical	2	2	40	60	100
II		<b>Part IV</b> <b>1A/B/C –</b> <b>1a- Basic Tamil</b> <b>1b- Advanced</b> <b>Tamil</b> <b>1c-Flower</b> <b>Arrangement</b>	2	2	-	50	50
II	ND15/2N/BTA ND15/2N/ATA ND15/2N/FLA**						
II		<b>Soft skill 2</b>	2	3			
<b>Total</b>			<b>30</b>	<b>25</b>			

\* Practical examination (ND15/2C/PR1) – Food science and Physiology practical will be conducted in the second semester

### SEMESTER III

Semester	Course Code	Course Title	Hrs./ Week	Credits	CA	End Semester	Total
III		<b>Part – I</b> Foundation Course Language	5	3	40	60	100
III		<b>Part – II</b> English	5	3	40	60	100
III	ND15/3C/HNU	<b>Part – III</b> <b>Core 4- Human Nutrition</b>	7	5	40	60	100
III	ND15/4C/PR2*	<b>Core 6-</b> <b>Human Nutrition and Nutrition Through Life Cycle Practical *</b>	3	-	40	60	100
III	ND15/3A/MIC	<b>Part III</b> <b>Allied 3- Microbiology</b>	4	4	40	60	100
III	ND15/4A/PR1**	Allied- Microbiology and Nutritional Biochemistry Practical	2	-	40	60	100
III		<b>Part IV</b> <b>Environmental studies</b>	2	2	-	50	50
III		<b>Soft skill 3</b>	2	3			
<b>Total</b>			<b>30</b>	<b>20</b>			

\*practical examination (ND15/4C/PR2) – Human Nutrition and Nutrition through Lifecycle Practical will be conducted in the fourth semester.

\*\*practical examination (ND15/4A/PR1) – Microbiology and Nutritional Biochemistry Practical will be conducted in the fourth semester.

## SEMESTER IV

Course Code	Course Title	Hrs./ Week	Credits	CA	End Semester	Total
	<b>Part – I</b> Foundation Course Language	5	3	40	60	100
	<b>Part – II</b> English	5	3	40	60	100
<b>ND15/4C/NLC</b>	<b>Part – III</b> <b>Core 5- Nutrition</b> <b>Through Lifecycle</b>	7	5	40	60	100
<b>ND15/4C/PR2*</b>	<b>Core 6-</b> <b>Human Nutrition</b> <b>and Nutrition</b> <b>Through Life</b> <b>Cycle Practical</b>	3	4	40	60	100
<b>ND15/4A/NBC</b>	<b>Part III</b> <b>Allied 4-</b> <b>Nutritional</b> <b>Biochemistry</b>	4	4	40	60	100
<b>ND15/4A/PR1**</b>	<b>Allied-</b> <b>Microbiology and</b> <b>Nutritional</b> <b>Biochemistry</b> <b>practical</b>	2	2	40	60	100
	<b>Part IV</b> <b>Value Education</b>	2	2	-	50	50
	<b>Soft skill 4</b>	2	3			
<b>Total</b>		<b>30</b>	<b>26</b>			

**\*practical examination (ND15/4C/PR2) – Human Nutrition and Nutrition through Lifecycle Practical will be conducted in the fourth semester.**

**\*\*practical examination (ND15/4A/PR1) – Microbiology and Nutritional Biochemistry Practical will be conducted in the fourth semester.**

## SEMESTER V

Course Code	Course Title	Hrs./ Week	Credits	CA	End Semester	Total
ND15/5C/FOM	Core 7- Food Service Management	4	4	40	60	100
ND15/5C/HFS	Core 8- Human Development and Family Studies	5	4	40	60	100
ND15/5C/BAK	Core 9- Baking and Confectionery	5	4	40	60	100
ND15/5C/TD1	Core 10- Therapeutic Dietetics I	5	4	40	60	100
ND15/5E/IDH	Elective 1 Interior Decoration & Housekeeping	5	5	40	60	100
ND15/6C/PR3*	Core 11- Food Service Management & Quantity Food Production Practical	3	-	-	-	100
ND15/6C/PR4*	Core 12- Therapeutic Dietetic Practicals	3	-	-	-	50
<b>Total</b>		<b>30</b>	<b>21</b>			

**\*practical examination (ND15/6C/PR3) – Food Service Management & Quantity Food Production Practical will be conducted in the sixth semester.**

**\*practical examination (ND15/6C/PR4) – Therapeutic Dietetic Practicals will be conducted in the sixth semester.**



## SEMESTER VI

Course Code	Course Title	Hrs./ Week	Credits	CA	End Semester	Total
ND15/6C/QPR	Core 13- Quantity Food Production	4	3	40	60	100
ND15/6C/TD2	Core 14- Therapeutic Dietetics II	5	4	40	60	100
ND15/6C/SPN	Core 15- Sports Nutrition	5	4	40	60	100
ND15/6E/CMN	Elective 2- Community Nutrition	5	5	40	60	100
ND15/6E/FPR	Elective 3- Food Preservation	5	5	40	60	100
ND15/6C/PR3*	Core 11- Food Service Management & Quantity Food Production Practical	3	3	40	60	100
ND15/6C/PR4*	Core 12- Therapeutic Dietetic Practicals	3	3	-	50	50
<b>Total</b>		<b>30</b>	<b>27</b>			
<b>Credits at the end of VI semesters</b>			<b>139</b>			
<b>Part V (Extension activities)</b>			<b>1</b>			
<b>Total credits</b>			<b>140</b>			

\*practical examination (ND15/6C/PR3) – Food Service Management & Quantity Food Production Practical will be conducted in the sixth semester.

\*practical examination (ND15/6C/PR4) – Therapeutic Dietetic Practicals will be conducted in the sixth semester.

**CREDIT ALLOTMENT FOR CORE, ALLIED AND PART IV  
SUBJECTS**

Semester	Part - I	Part - II	Part - III		Elective	Part - IV			
			CORE credits (Theory+ practical)	Allied Credits (Theory+ practical)		a/b/c	Soft skill	EVS	VE
<i>I</i>	3	3	5	4		2	3		
<b>II</b>	3	3	5+3	4+2		2	3		
<b>III</b>	3	3	5	4			3	2	
<b>IV</b>	3	3	5+4	4+2			3		2
<b>V</b>			16		5				
<b>VI</b>			11+6		10				
<b>Total</b>	<b>12</b>	<b>12</b>	<b>60</b>	<b>20</b>	<b>15</b>	<b>4</b>	<b>12</b>	<b>2</b>	<b>2</b>

**Total Credits: 139+1(extension activities) = 140 credits**

**EVS- Environmental Studies**

**VE - Value Education**

**1a/b/c -**

**1a- Basic Tamil, 1b- Advanced Tamil, 1c- Non-major elective**

## COURSE PROFILE

sem	Paper code	Paper	Hrs/wk	Credits	CA	End Sem	Total
I		Foundation Course Language	5	3	40	60	100
I		English	5	3	40	60	100
I	<b>ND15/1C/FSE</b>	Food Science	7	5	40	60	100
I	<b>ND15/2C/PR1*</b>	Food Science & Physiology practical	3	-	40	60	100
I		Allied Chemistry I	4	4	40	60	100
I		Allied Chemistry I Practical	2	-	40	60*	100
I	<b>ND15/1N/HEN</b>	Health and Nutrition	2	2	-	50	50
I		Soft skill 1	2	3	-	50	50
II		Foundation Course Language	5	3	40	60	100
II		English	5	3	40	60	100
II	<b>ND15/2C/PHY</b>	Physiology	7	5	40	60	100
II	<b>ND15/2C/PR1*</b>	Food Science & Physiology practical	3	3	40	60	100
II		Allied Chemistry II	4	4	40	60	100
II		Allied Chemistry II Practical	2	2	40	60*	100
II	<b>ND15/2N/FLA</b>	Flower Arrangement	2	2	-	50	50
II		Soft skill 2	2	3	-	50	50
III		Foundation Course Language	5	3	40	60	100
III		English	5	3	40	60	100
III	<b>ND15/3C/HNU</b>	Human Nutrition	7	5	40	60	100
III	<b>ND15/4C/PR2*</b>	Human Nutrition & Nutrition Through Lifecycle practical	3	-	40	60	100
III	<b>ND15/3A/MIC</b>	Microbiology	4	4	40	60	100
III	<b>ND15/4A/PR1**</b>	Microbiology & Nutritional Biochemistry Practical	2	-	40	60*	100
III		Environmental Studies	2	2	-	50	50
III		Soft Skill 3	2	3	-	50	50
IV		Foundation Course Language	5	3	40	60	100
IV		English	5	3	40	60	100

IV	ND15/4C/NLC	Nutrition Through Lifecycle	7	5	40	60	100
IV	ND15/4C/PR2*	Human Nutrition & Nutrition Through Lifecycle practical	3	4	40	60*	100
IV	ND15/4A/NBC	Nutritional Biochemistry	4	4	40	60	100
IV	ND15/4A/PR1**	Microbiology & Nutritional Biochemistry Practical	2	2	40	60*	100
IV		Value Education	2	2	-	50	50
IV		Soft Skill 4	2	3	-	50	50
V	ND15/5C/FOM	Food Service Management	4	4	40	60	100
V	ND15/5C/HFS	Human Development and Family Studies	5	4	40	60	100
V	ND15/5C/BAK	Baking and Confectionery	5	4	40	60	50
V	ND15/5C/TD1	Therapeutic Dietetics I	5	4	40	60	50
V	ND15/5E/IDH	Interior Decoration & Housekeeping	5	5	40	60	100
V	ND15/6C/PR3*	Food Service Management & Quantity Food Production Practical	3	-	40	60*	100
V	ND15/6C/PR4*	Therapeutic Dietetic Practicals	3	-	40	60*	100
V	ND15/6C/QPR	Quantity Food Production	4	3	40	60	100
V	ND15/6C/TD2	Therapeutic Dietetics II	5	4	40	60	100
V	ND15/6C/SPN	Sports Nutrition	5	4	40	60	100
S	ND15/6E/CMN	Community Nutrition	5	5	40	60	100
VI	ND15/6E/FPR	Food Preservation	5	5	40	60	100
VI	ND15/6C/PR3*	Food Service Management & Quantity Food Production Practical	3	3	40	60*	100
VI	ND15/6C/PR4*	Therapeutic Dietetic Practicals	3	3	40	60*	100
		Extension activity		1			
		<b>TOTAL</b>		<b>140</b>			

\*Practical examination is conducted internally in the even semester (II, IV, VI).

## EVALUATION PATTERN- THEORY

Sem	Course Code	Course Title	Continuous Assessment				
			Test I	Test II	Quiz/Assignment Seminar/ Field Visit	Participatory Learning	Total
I	ND15/1C/FSE	Food Science	10	10	10	10	40
II	ND15/2C/PHY	Physiology	10	10	10	10	40
III	ND15/3C/HNU	Human Nutrition	10	10	10	10	40
III	ND15/3A/MIC	Microbiology	10	10	10	10	40
IV	ND15/4C/NLC	Nutrition Through Lifecycle	10	10	10	10	40
IV	ND15/4A/NBC	Nutritional Biochemistry	10	10	10	10	40
V	ND15/5C/FOM	Food Service Management	10	10	10	10	40
V	ND15/5C/HFS	Human development and Family Studies	10	10	10	10	40
V	ND15/5C/BAK	Baking and Confectionery	10	10	10	10	40
V	ND15/5C/TD1	Therapeutic Dietetics I	10	10	10	10	40
V	ND15/5E/IDH	Interior Decoration & Housekeeping	10	10	10	10	40
V	ND15/6C/QPR	Quantity Food Production	10	10	10	10	40
V	ND15/6C/TD2	Therapeutic Dietetics II	10	10	10	10	40
V	ND15/6C/SPN	Sports Nutrition	10	10	10	10	40
VI	ND15/6E/CMN	Community Nutrition	10	10	10	10	40
VI	ND15/6E/FPR	Food Preservation	10	10	10	10	40

### STRUCTURE OF PART- IV PAPERS (NON-MAJOR ELECTIVE)

Semester	Code	Course Title	Maximum Marks
I	ND15/1N/HEN	Health and Nutrition	<b>50</b>
II	ND15/2N/FLA	Flower Arrangement	<b>50</b>

### EVALUATION PATTERN- PRACTICALS

Sem	Course Code	Course Title	Continuous Assessment				Total 40
			Odd semester (I/III/V)		Even semester (II/IV/VI)		
			Model	Participation	Model	Participation	
II	<b>ND15/2C/PR1</b>	Food Science and Physiology Practical	10	10	10	10	40
IV	<b>ND15/4C/PR2*</b>	Human Nutrition & Nutrition Through Lifecycle practical	10	10	10	10	40
IV	<b>ND15/4A/PR1*</b>	Microbiology & Nutritional Biochemistry Practical	10	10	10	10	40
VI	<b>ND15/6C/PR3*</b>	Food Service Management & Quantity Food Production Practical	10	10	10	10	40
VI	<b>ND15/6C/PR4*</b>	Therapeutic Dietetic Practicals	10	10	10	10	40

## PATTERN FOR CONTINUOUS ASSESSMENT

<b>Component</b>	<b>Time</b>	<b>Total marks</b>	<b>CA</b>
Test I	2 hrs	50 marks	10 marks
Test II	2 hrs	50 marks	10 marks
Quiz / Assignment / Seminar / Field visit			10 marks
Participatory Learning			10 marks
<b>Total</b>			<b>40 marks</b>

## RUBRICS FOR CONTINUOUS ASSESSMENT EVALUATION

Assignment	Appearance/ contents/ originality/ presentation/ schematic representation and diagram/ bibliography
Seminar	Organization/ subject knowledge/ visual aids/ confidence level/ presentation
Field trip	Participation / preparation/ respect/ attitude/ leadership
Project	Preliminary work/ design/ content/ presentation
Participatory learning	Answering questions/ clearing doubts/ participation in discussion/ attendance/ communication and language

**QUESTION PAPER PATTERN:**

Unless and otherwise specified in the syllabus for each paper, the pattern of question paper shall be as follows:

COMPONENT	NATURE OF THE QUESTION	MAXIMUM MARKS
Part A	Definition	20 Marks
Part B	Understanding Description / Problems	40 Marks
Part C	Application/ Analysis/ Synthesis/ Evaluation	40 Marks

Part A: Definition 10 questions, two from each unit.

Part B: Five out of eight questions to be answered carrying 8 marks each. One question from each unit and remaining from mentioned units.

Part C: Two out of four questions to be answered carrying 20 marks each.

\*Practical examination will be conducted internally. NO EXTERNAL EXAMINER.



## **SEMESTER – I**

### **FOOD SCIENCE**

#### **CORE-1**

**Course code: ND15/1C/FSE // CN15/1C/FSE**

**Credits: 5**

Teaching hrs: **7hrs/wk**

**LTP: 4 3 0**

#### **OBJECTIVES**

- ✓ To understand the importance of food groups based on the nutrient value to enable meal planning
- ✓ To learn the scientific basis of preliminary of food, and cooking methods to enhance conservation of nutrients and acceptability of food preparation.

#### **COURSE OUTLINE**

##### **UNIT I: BASICS OF FOOD AND COOKING METHODS –**

Food groups: Basic Five, Basic Seven. Food guide pyramid and food plate. Classification of food based on nutrients.

Introduction to food science- Preliminary preparation of food prior to cooking with special reference to conservation of nutrients and palatability.

Study of cooking methods: Dry heat method - broiling, grilling, frying and baking- its advantages and disadvantages. Moist method - boiling steaming, poaching, pressure cooking and stewing. Microwave cooking and solar cooking- merits and demerits.

Evaluation of food quality: Sensory characteristics of food, Food evaluation - Subjective method, Objective methods: chemical physical, physicochemical, and microscopic examination

(25 hours)

##### **UNIT II: CEREAL AND GRAINS:**

Rice and wheat- structure, composition, nutritive value and processing; Locally available millets- Ragi, Bajra, Foxtail, Kodo, Barnyard- composition and nutritive value. Fermented products, dough and batter. Cooking of starch – moist heat method (gelatinization) dry heat method (dextrinisation) Maillard's reaction.

Pulses and legumes - composition and nutritive value, processing – decortication, germination, parching & puffing, soya products, TVP. Toxic constituents in pulses, lathyrism and favism.

Nuts and oilseeds: Composition and nutritive value of some common nuts and oilseeds.

(20 hours)

##### **UNIT III: VEGETABLES AND FRUITS:**

Vegetables- Classification, composition, nutritive value, and storage of some common vegetables..

Pigments- classification, effect of cooking on pigments, factors affecting pigments.

Fruits- Classification, composition and nutritive value.

Milk - composition, nutritive value and types. Milk products-Types and processing of fermented and non-fermented. Milk cookery- Effect of heat, acid, enzymes, phenolic compounds, and salts. Role in cookery.

Beverages : Classification and uses in cookery. (20 hours)

#### **UNIT IV: FLESH FOODS & EGG:**

Meat - composition, nutritive value, postmortem changes in meat, ageing, tenderization of meat. Changes during cooking of meat.

Fish- Classification, composition, nutritive value, selection, changes during cooking and spoilage.

Egg- structure, composition, nutritive value, storage, deterioration during storage- Physical and Chemical changes. Egg cookery- effect of heat, sugar, salt, acid, starch on egg protein. Evaluation of egg quality. Role of egg in cookery. (20 hours)

#### **UNIT V: FATS AND SUGARS:**

Fat and oils- Sources, shortening, emulsification, flavour component, hydrogenation, rancidity, smoking point and factors affecting absorption of fat. Role of fat in cookery.

Sugar and jaggery- Types, stages of sugar cookery and crystallization of sugar.

Common condiments and spices - composition and uses in cookery. (20 hours)

#### **REFERENCE BOOKS**

1. Peckham G.C., Foundations of Food Preparation, The Macmillan Publishing Co., N.Y, 1979
2. Paul. C.C. and Palmer. R.H, Food Theory and Application John Wiley and Sons, N.Y, 1972
3. Griswold R.M., The Experimental study of Foods, Houghton Mifflin Co., Boston, 1979
4. Helen Charley Food Science, John Wiley and Sons, N.Y, 1970
5. Norman. M. Potter and Joseph. H. Hotchkiss, Food Science, C.B.S. Publishers. 1995
6. Srilakshmi B. Food Science, New Age International Ltd., Publishers. 2001
7. N. Shakunthala Manay and N. Shadakshara Swamy, Food Facts And Principle. New age International (P) Ltd., Publishers, 2001

#### **WEBSITES AND e-LEARNING SOURCES**

[www.fao.org](http://www.fao.org)

[www.wfp.org](http://www.wfp.org)

**QUESTION PAPER TEMPLATE**

**ETHIRAJ COLLEGE FOR WOMEN (AUTONOMOUS)  
CHENNAI-600008**

(for candidates admitted during the academic year 2015-2018)

**B.Sc DEGREE EXAMINATION  
I YEAR- II SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: FOOD SCIENCE**

**Paper Code: ND15/1C/FSE //  
CN15/1C/FSE**

**Max. Marks: 100**

**Time: 3 hrs**

**SECTION A**

**Definition (Answer all)**

Two questions from each unit

**(10x2=20 marks)**

**SECTION B**

**Answer any FIVE questions.**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**(5x8= 40 marks)**

**SECTION C**

**Answer any TWO questions.**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

**(2X20=40 marks)**

**SEMESTER –II**  
**PHYSIOLOGY**

**CORE-2**

Course code: ND15/2C/PHY // CN15/2C/PHY

Credits:5

Teaching hrs: 7hrs/wk

LTP:4 3 0

**OBJECTIVES:**

To enable the students to

1. Understand the structure and physiology of various organs in the body
2. Understand the principles of Nutrition & Dietetics through the study of Physiology.

**COURSE OUTLINE:**

**UNIT I:**

**Cell:** Structure and functions (Review). **Tissues** – classification, structure and functions of – epithelial, connective, muscular and nervous tissue (Review)

**Blood** – composition, RBC, WBC, Platelets; structure and function; Blood Groups –Blood coagulation – Body defense against diseases.

**Bones:** Classification, structure, function and chemical composition of bone. Bone mineral density. (20 hrs)

**Unit II:**

**Nervous system:** Physiology of nerve and muscle – Conduction of nerve impulses along nerve and muscle fibres, physiology of muscle contraction, Synapse.

**Central and Peripheral Nervous System** – General Anatomy – Functions of cerebrum, cerebellum, medulla oblongata, pons, Spinal cord.

**Autonomic nervous system** – Sympathetic, parasympathetic – functions. (20 hrs)

**UNIT III:**

**Heart and circulation** – Anatomy of Heart, Properties of cardiac muscle, Origin and conduction of heart beat – cardiac cycle, cardiac output and heart sounds; Blood pressure, Factors affecting blood pressure, ECG.

**Respiratory system** – Anatomy of respiratory organs, Gaseous exchange in lungs and tissues, Transport of oxygen and carbon dioxide, Muscles of inspiration and expiration. (25hrs)

**UNIT IV:**

**Digestive system** – Anatomy of Gastrointestinal Tract, digestion and absorption of Carbohydrates, fats and proteins.

**Excretory system** – Structure of kidney, Urine Formation, Acid – base balance.

Skin – structure and function. Body temperature regulation. (20 hours)

## **UNIT V:**

**Endocrine system** – Pituitary, Thyroid, Parathyroid, Adrenal Gland and pancreas – List of Hormones with its functions.

**Reproductive system** –Spermatogenesis and Oogenesis: menstrual cycle and ovarian cycle. Influence of hormones on fertilization, conception and lactation. (20 hrs)

## **REFERENCE BOOKS:**

1. Guyton, A.C. & Hall (2001). Textbook of Medical Physiology. 10<sup>th</sup> Edition Harcourt Asia P.Ltd Singapore.
2. Guyton, A.C. & Hall (2001). Functions of the Human Body. WB Saunders Co. Philadelphia, Latest Edition.
3. Chakrabarti et al., (1994). Human Physiology. The New Book Stall, Calcutta.
4. Joshi, V.D. (1995). Physiology – Preparation Manual for Undergraduates. Churchill Livingstone. New Delhi.
5. Ganong, W. F. (2003). Review of medical Physiology. 21<sup>st</sup> Edition Mc Graw Hill Publishers.
6. Tortora. G&Grabowski, S.R. (2003). Principles of Anatomy & Physiology. 10<sup>th</sup> Edition USA: John Wiley & Sons.
7. Elaine N. Marieb (2004). Human Anatomy and Physiology, VI edition, Pearson edition.
8. Walter F. Boron, Emile L. Boulpaep (2009). Medical Physiology, Ii edition, Saunders elsevier.

## **WEBSITES AND e-LEARNING SOURCES:**

1. <http://members.aol.com/Bio50> - Human physiology lecture notes.
2. <http://www.unomaha.edu/hpa> - Human Physiology and anatomy.

## QUESTION PAPER TEMPLATE

ETHIRAJ COLLEGE FOR WOMEN (AUTONOMOUS)  
CHENNAI-600008

(for candidates admitted during the academic year 2015-2018)

**B.Sc DEGREE EXAMINATION**  
**I YEAR- II SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND**  
**DIETETICS**

Title of the paper: **PHYSIOLOGY**

Max. Marks: 100

Paper Code: ND15/2C/PHY // CN15/2C/PHY

Time: 3

hrs

### SECTION A

**Definition (Answer all)**

(10x2=20 marks)

Two questions from each unit

### SECTION B

**Answer any FIVE questions.**

(5x8= 40 marks)

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

### SECTION C

**Answer any TWO questions.**

(2X20=40 marks)

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

## SEMESTER I & II

### FOOD SCIENCE AND PHYSIOLOGY PRACTICAL

#### CORE-3

Course code: ND15/2C/PR1 // CN15/2C/PR1

Credits:3

Teaching hrs: 3 hrs/wk

LTP: 0 0 3

#### FOOD SCIENCE PRACTICAL

1. Techniques in measurements of food stuffs, uses of standard measuring cups and spoons. Experimental foods and cookery practicals.
2. Cereals :
  - a. Microscopic study of different starches.
  - b. Method of combining starch and boiling water
  - c. Study of effects of moist heat on starch
  - d. Preparation of white sauces
  - e. Gluten formationDifferent methods of cooking rice - straining, absorption, pressure cooking.  
Preparation of phulka, lime rice, vegetable fried rice, ragi adai, , uppuma, string hoppers, puttu, idli and dosai,.
3. Pulses: Effect of hard, soft water, alkali, papaya, on the texture and the cooking time of grams and dhals.  
Preparation: sambhar, sundal, cereal and pulse combination - adai, dhokla, poli, sprouted gram salad.
4. Eggs: Coagulation of egg protein - egg white foam, effect of beating, addition of sugar, acid and effect of temperature on egg foam.  
Preparation – poached egg, omelette, scrambled egg, custard, steamed vanilla pudding.
5. Vegetables : Effect of shredding, dicing, addition of acid, alkali, covering, steaming and pressure cooking on different pigments and acceptability on vegetables.  
Preparation- Carrot cucumber, cauliflower manchurian, avial, vegetable kofta, stuffed capsicum, baked vegetables .
6. Fruits: Methods of preservation of colour, texture and flavour. Enzymatic browning and prevention. Preparation of banana fritters, fruit jelly, date pudding, fruit salad, pine apple payasam.
7. Milk: Coagulation of milk proteins, preparation of paneer, curd.  
Preparation- paneer masala, firni, rice payasam, sweet lassi, shrikand,.
8. Beverages :Preparation of stimulating and nourishing beverages - coffee, tea, cocoa, milk shake, lassi, fruit punch, panagam.
9. Fats and oils: Comparison of smoking temperature of some fats and oils.  
Preparation- shallow fry- vegetable cutlet and deep fry; banana chips, vadai, diamond cuts.

10. Sugar cookery: Different stages of crystallisation of sugar Preparation of recipes at different stages of sugar crystallisation - gulab jamun, , chocolate fudge, badhushah, coconut burfi, peanuts chikkis, caramel custard.

#### **REFERENCE BOOKS**

1. Peckham G.C., Foundations of Food Preparation, The Macmillan Publishing Co., N.Y, 1979
2. Paul. C.C. and Palmer. R.H, Food Theory and Application John Wiley and Sons, N.Y, 1972
3. Griswold R.M., The Experimental study of Foods, Houghton Mifflin Co., Boston, 1979
4. Helen Charley Food Science, John Wiley and Sons, N.Y, 1970
5. Norman. M. Potter and Joseph. H. Hotchkiss, Food Science, C.B.S. Publishers. 1995
6. Srilakshmi B. Food Science, New Age International Ltd., Publishers. 2014
7. N. Shakunthala Manay and N. Shadakshara Swamy, Food Facts And Principle. New age International (P) Ltd., Publishers, 2001

#### **PHYSIOLOGY PRACTICAL**

1. Microscopic study of different tissues – epithelial, Connective, Muscular and Nervous.
2. Anatomy of Sheep's Brain.
3. Hemoglobin Estimation, WBC Count, RBC Count, Coagulation time, bleeding time, blood grouping., Anatomy of Sheep's Heart, Estimation of Blood Pressure, effect of exercise on respiratory rate, arterial blood pressure and pulse rate.
4. Microscopic structure of lung and trachea.
5. Microscopic structure of pancreas, stomach, small intestine, liver.
6. Microscopic structure of nephron.
7. Microscopic structure of thyroid, pituitary, adrenal, ovary, uterus, mammary gland and testis.

#### **REFERENCES:**

1. Chaudhuri, A.R. (2000). Textbook of Practical Physiology. Paras Publishing, Hyderabad.
2. Jain, A.K. (2003). Textbook of Practical Physiology. Paras Publishing, Hyderabad.
3. Bloom W & Fawcett, D.W.A. "Text book of Histology". W.B.Souders & co. latest Edition.





## SEMESTER I

### PART IV NME- HEALTH AND NUTRITION

**NME- 1**

**COURSE CODE: ND15/1N/HEN**

**Teaching hours: 2 hrs/wk**

**CREDITS: 2 L T P: 1 1 0**

#### OBJECTIVES:

1. To inculcate the concept of good nutrition and health.
2. To improve the standard of health and nutritional status of college students.

#### COURSE OUTLINE:

**UNIT I:** Definition of health – components of healthy life style – Diet, physical fitness- benefits of fitness and stress management.

**UNIT II:** Definition of nutrition – The Nutrients, Diet planning principles, Food guide pyramid. Food safety- Processed foods, making wise choices, food safety in the kitchen, environmental contaminants in food.

**UNIT III:** Nutrition for teenagers and young adults- nutritional needs, food choices and health habits. Special situations- eating disorders, obesity, nutritional anemia, premenstrual syndrome. Recommended daily eating guide for adolescents, Adults - during pregnancy, lactation and peri menopause.

#### REFERENCE BOOKS

1. Wardlaw M Gordon 1999. Perspectives in nutrition 4<sup>th</sup> edition, McGraw Hill
2. Eleanor Noss Whitney and Sharon Rady Rolfes, 2002. Understanding Nutrition 9<sup>th</sup> edition, West Wordsworth.
3. Kathleen Mahan and Marian Arlin 2004 Krause's Food Nutrition & Diet therapy 8<sup>th</sup> edition, W.B.Saunders company.
4. Guthrie H. Andrews – Introductory Nutrition C.V.Mosby Co., St. Lours.
5. M.Swaminathan "Principles of Nutrition and Dietetics", 1993, Bappeo 88, Mysore Road, Bangalore – 560 018.
6. William, Sue Rodwell – Nutrition and Diet Therapy (1985) 5<sup>th</sup> edition, Mosby co., St. Louis.
7. Cataldo, DeBruyne and Whitney 1999. Nutrition and Diet therapy – Principles and Practice 5<sup>th</sup> edition, West/ Wadsworth, London.
8. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., 1989 – Nutritive value of Indian foods, NIN, Hyderabad.
9. Garrow JS, James WPT, Ralph A 2000. Human Nutrition and Dietetics 10<sup>th</sup> edition, Churchill Livingstone, NY.
10. Groff L James, Gropper S Sareen 2000. Advanced Nutrition and Human Metabolism 3<sup>rd</sup> edition, West / Wadsworth, UK.

#### Website

1. [www.nutrition.gov](http://www.nutrition.gov) - Service of National agricultural library, USDA
2. [www.nal.usda.gov/fnic](http://www.nal.usda.gov/fnic) - Food and Nutrition information centre.

## **SEMESTER II**

### **PART VI - FLOWER ARRANGEMENT**

**NME- 2**

**COURSE CODE: ND15/2N/FLA**

**Teaching hours: 2 hrs/wk**

**CREDITS: 2 L T P: 1 1 0**

#### **OBJECTIVES:**

- To enable students
- To gain understanding of the basic principles of flower arrangement
- To develop skills in arranging flowers for different occasions

#### **COURSE OUTLINE:**

**UNIT I:** Importance of flower arrangement- types of flowers, foliage and weeds used for flower arrangements. Choosing flowers for arrangement. Conditioning and keeping flowers fresh. Accessories and tools used for arranging flowers.

**UNIT II:** Basic types of flower arrangements- crescent, diagonal, circle, horizontal, open half circle, oval, hogarth, perpendicular, side triangle, spiral, swirl and triangle. Japanese style- Moribana and Ikebana. Dry and Floating arrangement.

**UNIT III:** Flower arrangements for different occasions- party-bouquet, festive occasion- floating arrangement, front office- triangular/ all around arrangement.

#### **REFERENCE BOOKS**

1. Dorothy S. and Darlene .M. Introduction to Interior Design Macmillan publishing company, New York, 1979.
2. Gold Stein.H. & Gold Stein.V. Art in every day life- Mac Millian and company , New York, 1966.

**SEMESTER III**  
**HUMAN NUTRITION**

**COURSE CODE – ND15/3C/HNU //CN15/3C/HNU**

**Credits: 4**

**Teaching Hours: 7hrs/wk**

**LTP: 4 3 0**

**OBJECTIVES**

1. To understand and learn the functions, deficiency symptoms, food sources, and requirements of nutrients
2. To understand and learn the functions, deficiency symptoms, food sources and requirements of nutrients

**COURSE OUTLINE**

UNIT I: Importance of nutrition, History of nutrition. Energy: Definition - Calories, Joule, Calorimetry, direct and indirect calorimetry, respiratory quotient, Energy value of foods, physiological fuel values.

Energy needs of the body – BMR, RMR, definition, factors influencing BMR, the energy cost of physical activities and method of determination, calculation of total caloric requirements, factorial method for determining total energy needs.

**Carbohydrates:** definition, classification, functions, utilization and storage, Unavailable carbohydrate or dietary fibre, food sources, requirements.

Role of fibre in human nutrition.

Glycemic index.

(25hours)

UNIT II: **Protein** : definition, classification, functions, essential and non essential amino acids, requirements, evaluation of protein quality- PER, BV, NPU, chemical score & PDCAAS; supplementary value; nitrogen balance; food sources & requirement.

**Lipids:** definition, classification, functions, essential fatty acids - sources and effects of deficiency; saturated fatty acids, cholesterol and its relation to CHD. Food sources & requirements.

(20 hours)

UNIT III: **Minerals** : (I) **Macro-minerals** – calcium and phosphorus : (a) Distribution in the body, functions, absorption and storage, excretion, blood level, role of parathyroid hormone, vitamin D and calcium (b) Ca : P ratio (c) food sources, RDA, effects of deficiency.

(II) **Micro minerals**- Iron - distribution in the body, function, absorption, transport, storage, excretion, food sources, nutritional anaemia, nutritional siderosis. Zinc, Copper, Iodine: distribution, function, RDA, food sources, deficiency and toxicity. Selenium-Vitamin E relationship, Chromium and glucose tolerance factor.

(20 hours)

**UNIT IV: Vitamins: Fat Soluble Vitamins:** Vitamin A & D –Measurements, function, absorption and transport, storage, RDA, food source, effects of deficiency, treatment of Vitamin A deficiency and prevention, hypervitaminosis, Vitamin E & K- functions, sources, effects of deficiency. (20 hours)

**UNIT V: Water:** Water balance, dehydration, water intoxication. Potassium, Sodium and Chloride: effects of imbalance (Deficiency and excess), distribution in the body, function, food sources, requirements.

**Water soluble vitamins:** Vitamin C, B1, B2, niacin, vitamin B6, B12, Folic acid, Biotin and pantothenic acid - function, RDA, food sources, loss during processing and preparation of food, effects of deficiency. (20 hours)

## REFERENCE BOOKS

1. Judith E. Brown, 1995 - Nutrition now, West Publishing Company.
2. Eleanor Noss Whitney and Sharon Rady Rolfes, 1997. Understanding Nutrition 8<sup>th</sup> edition, West Wordsworth.
3. Kathileen Mahan and Marian Arlin 1992 Krause's Food Nutrition & Diet therapy 8<sup>th</sup> edition, W.B.Sarenders company.
4. Guthrie H. Andrews - Introductory Nutrition C.V. Mosby Co., St. Lours.
5. M.Swaminathan "Principles of Nutrition and Dietetics", 1993, Bappeo 88, Mysore Road, Bangalore - 560 018.
6. William, Sue Rodwell - Nutrition and Diet Therapy (1985) 5<sup>th</sup> edition, Mosbey Co., St.Louis.
7. Davidson S., Passmore R., Brock . J.F., and Truswell A.S., Human Nutrition and Dietetics. The English Language Book Society and Chruchill, Livingstone 1986.
8. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., 1989 - Nutritive value of Indian Foods, NIN, Hyderabad.
9. Robinson C.H., Normal and Therapeutic Nutrition. The Macmillan Co., New York, 1972.
10. Sumathi R. Mudambi and M.V. Rajagopal 2001 - Foods and Nutrition 4<sup>th</sup> edition, New Age International Ltd. Publishers.
11. Wardlaw M Gordon 1999. Perspectives in nutrition 4<sup>th</sup> edition, McGraw Hill
12. Eleanor Noss Whitney and Sharon Rady Rolfes, 2002. Understanding Nutrition 9<sup>th</sup> edition, West Wordsworth
13. Cataldo, DeBruyne and Whitney 1999. Nutrition and Diet therapy- Principles and practice 5<sup>th</sup> edition, West/ Wadsworth, London.
14. Groff L James, Gropper S Sareen 2000. Advanced Nutrition and Human Metabolism 3<sup>rd</sup> edition, West/ Wadsworth, UK

### **WEBSITES AND e-LEARNING SOURCES**

1. [www.nutrition.gov](http://www.nutrition.gov)- Service of National agricultural library, USD
2. [www.nal.usda.gov/fnic](http://www.nal.usda.gov/fnic)- Food and Nutrition information centre.
3. [www.nutrition.gov](http://www.nutrition.gov)- Service of National agricultural library, USD

**QUESTION PAPER TEMPLATE**

**ETHIRAJ COLLEGE FOR WOMEN (AUTONOMOUS)  
CHENNAI-600008**

(for candidates admitted during the academic year 2015-2018)

**B.Sc DEGREE EXAMINATION  
II YEAR- III SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: HUMAN NUTRITION**  
**Paper Code: ND15/3C/HNU //CN15/3C/HNU**  
**hrs**

**Max. Marks: 100**  
**Time: 3**

**SECTION A**

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

**SECTION B**

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**SECTION C**

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

## SEMESTER III

### MICROBIOLOGY

#### ALLIED- 3

Course Code –ND15/3A/MIC// CN15/3A/MIC

Credits: 4

Teaching Hours: 4 hrs/wk

LTP: 3 1 0

#### OBJECTIVE:

- To enable the students to gain knowledge of general characteristics of micro-organisms and their role in food spoilage
- To gain knowledge of micro-organisms in health and diseases.

#### COURSE OUTLINE:

**UNIT I: Classification of microorganisms:** Morphology, Motility, Nutrition, Respiration and Reproduction of Bacteria, Viruses, Yeast & Moulds.  
(10 hours)

**UNIT II: Spoilage and contamination of common foods:**  
a) Factors affecting growth of microorganisms-temperature, water activity, pH, redox potential.  
b) Sources of contamination and spoilage of common foods -Cereal and cereal products, fruits and vegetables, egg, Meat and fish, milk and milk products (two each)  
(15 hours)

**UNIT III: Microorganisms in infection, resistance and immunity:**  
a) Infection-modes of spread of Infection; Body Defense- Chemical and cellular;  
b)Immunity: types- Active and Passive, Artificial and natural; Vaccines- live, dead and toxoids.  
(10 hours)

**UNITIV: Food poisoning and Food borne diseases:**  
a)Food poisoning or intoxication and food infection- definition. Bacterial food poisoning- Staphylococcus aureus, Clostridium botulinum, Clostridium perfringes, Bacillus cereus.  
b) Food Infection- Salmonellosis, Shigellosis, Cholera, Gastroenteritis; Measures to prevent food poisoning and food borne infection.  
(15 hours)

**UNIT V: Environmental Microbiology:**  
a) Micro organisms found in water, soil, air and sewage- List of microorganisms and Diseases caused; Test for sanitary quality of water: Total Bacterial count, Test for E-coli and Faecal Streptococci; Purification of water  
b) **Destruction of Microorganism:** Sterilization and Disinfection – Methods  
(10hours)



## REFERENCE BOOKS

1. Frazier W.C. Food Micro biology, Tata McGraw – Hill publishing 1995.
2. Pelzar, J. Microbiology , Tata McGraw – Hill publishing 1998.
3. Park's K, Preventive and Social medicine Banarsid as Bhanot Publishing 1995
4. Schlegel G.Hans, General Microbiology Cambridge University priers 1986
5. James M.Jay, Modern Food Micro biology CBS publishers 1996.
6. Joshua Anna K, Micro biology Popular publishing house
7. Purohit, S.S" Microbiology – Fundamentals & applications", 6<sup>th</sup> Ed, Agro bices. Indiana, 2002
8. Stanier, R.X" The Microbial World", 5<sup>th</sup> ed, Prentice Hall of India. New Delhi, 1986
9. Anandakrishnan, C.P, Singh, R.B and Padmanabhan, P.N "Dairy Microbiology", Srilakshmi publications. Chennai, 1994
10. Patel, A.H "Industrial Microbiology", Macmillan India Limited. New Delhi, 1996
11. Casida, L.E "Industrial Microbiology", New Age International Pvt Ltd. New Delhi, 1996
12. Garbutt J, Essentials of food microbiology, Arnold publication, New York.

## WEBSITES AND e-LEARNING SOURCES:

- <http://www.betterhealth.vic.an/bhcv2/bh.carticles.nsf> – genetically modified foods.
- [www.cfsan.fda.gov](http://www.cfsan.fda.gov) - Centre for food safety and applied nutrition
- <http://www.microbiol.org> - Microbiology network
- <http://mic.sgnjournals.org> - Microbiology journal



**QUESTION PAPER TEMPLATE**

**ETHIRAJ COLLEGE FOR WOMEN (AUTONOMOUS)  
CHENNAI-600008**

(for candidates admitted during the academic year 2015-2018)

**B.Sc DEGREE EXAMINATION  
II YEAR- III SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: MICROBIOLOGY**  
**Paper Code: ND15/3A/MIC// CN15/3A/MIC**  
**hrs**

**Max. Marks: 100**  
**Time: 3**

**SECTION A**

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

**SECTION B**

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**SECTION C**

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

## SEMESTER IV

### NUTRITION THROUGH LIFE CYCLE

CORE – 5

COURSE CODE: ND15/4C/NLC// CN15/4C/NLC

Credits:5

Teaching Hours: 7 hrs/wk

LTP: 4 3 0

#### OBJECTIVES:

To enable the students to

1. To gain knowledge on the nutritional needs of individuals at different age levels and stress conditions.
2. Develop the basic concepts and gain experience in planning, preparing and serving of meals for various age groups at different income levels and stress conditions based on nutritional status.

#### COURSE OUTLINE:

**UNIT I:** Introduction to meal planning: Balanced diet, RDA - Food Guide Pyramid; Food plate; Principles of meal planning – steps involved in planning a diet. Adult:- nutritional requirements, planning balanced diets for adult men and women, promoting healthy lifestyle through holistic approach - Diet, physical activity, stress management, yoga & mediation. (25 HOURS)

**UNIT II:** Pregnancy: Effect of nutrition on outcome of pregnancy, physiological demands of gestation, weight gain, nutrition needs, dietary plans and dietary problems, pregnancy induced complication. Lactation: Physiology of lactation, nutritional requirements during lactation, concerns of breast feeding mother. (20 HOURS)

**UNIT III:** Infancy: Breast feeding, complementary feeding, advantages and disadvantages, low cost complementary foods- Artificial feeding - Infant milk Substitutes. low birth weight infants Preschool: Growth and nutritional needs, problems in feeding patterns and food acceptance, PEM , Vitamin A. (20 HOURS)

**UNIT IV:** School Children: Physical development, factors affecting food needs, RDA, packed lunch. Adolescence: Growth and development, Food Habits, nutritional requirements, Eating disorders, Nutritional Anaemia. (20 HOURS)

**UNIT V:** Old Age: Biologic & Physiologic aspects of aging, nutritional disorders in the aged, factors affecting food selection, nutritional requirements. (20 HOURS)

## **REFERENCE BOOKS:**

1. Wardlaw M Gordon 1999. Perspectives in nutrition 4<sup>th</sup> edition, McGraw Hill
2. Eleanor Noss Whitney and Sharon Rady Rolfes, 2002. Understanding Nutrition 9<sup>th</sup> edition, West Wordsworth.
3. Kathleen mahan and Marian Arlin 2004 Krause's Food Ntrition & Diet therapy 8<sup>th</sup> edition, W.B.Saunders company.
4. Guthrie H. Andrews – Introductory Nutrition C.V.Mosby Co., St. Lours.
5. M.Swaminathan Principles of Nutrition and Dietetics, 1993, Bappeo 88, Mysore Road, Bangalore – 560 018.
6. William, Sue Rodwell – Nutrition and Diet Therapy (1985) 5<sup>th</sup> edition, Mosby co., St. Louis.
7. Cataldo, DeBruyne and Whitney 1999. Nutrition and Diet therapy – Principles and Practice 5<sup>th</sup> edition, West/ Wadsworth, London.
8. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., 1989 – Nutritive value of Indian foods, NIN, Hyderabad.
9. Garrow JS, James WPT, Ralph A 2000. Human Nutrition and Dietetics 10<sup>th</sup> edition, Churchill Livingstone, NY.
10. Groff L James, Gropper S Sareen 2000. Advanced Nutrition and Human Metabolism 3<sup>rd</sup> edition, West / Wadsworth, UK.

## **WEBSITES AND e-LEARNING SOURCES:**

[www.nutrition.gov](http://www.nutrition.gov) - Service of National agricultural library, USDA

[www.nal.usda.gov/fnic](http://www.nal.usda.gov/fnic) - Food and Nutrition information centre.

**QUESTION PAPER TEMPLATE**

**ETHIRAJ COLLEGE FOR WOMEN (AUTONOMOUS)  
CHENNAI-600008**

(For candidates admitted during the academic year 2015-2018)

**B.Sc DEGREE EXAMINATION  
II YEAR- IV SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: NUTRITION THROUGH LIFECYCLE**

**Max. Marks: 100**

**Paper Code: ND15/4C/NLC// CN15/4C/NLC**

**Time: 3 hrs**

**SECTION A**

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

**SECTION B**

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**SECTION C**

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

## SEMESTER IV

### NUTRITIONAL BIOCHEMISTRY

ALLIED – 4

COURSE CODE: ND15/4A/NBC// CN15/4A/NBC

Credits: 4

Teaching hours: 4hrs/wk

LTP: 3 1 0

#### OBJECTIVES:

To introduce the students to

1. The principles and viewpoints of biochemistry.
2. A basic understanding of the functions of biological systems in relation to nutritional biochemistry.

#### COURSE OUTLINE:

UNIT I: Introduction to biochemistry and its relation to nutrition.

**Carbohydrates** – Classification, glucose oxidation via glycolysis-aerobic, anaerobic (with structure), TCA (with structure), HMP( No Structure) Gluconeogenesis, glycogenolysis & biosynthesis of glycogen, blood glucose homeostasis, Cori Cycle. (15hours)

UNIT II: **Proteins and Amino acids.**

**Amino acids** – Classification, chemical properties, chromatography separation techniques. Peptides- structure & nomenclature.

**Protein**-Classification, structure-primary, secondary, tertiary and quaternary, transamination, deamination-oxidative and non-oxidative, decarboxylation, urea cycle, fate of ammonia, glutamine synthesis. (10 hours)

UNIT III: **Lipids**- Chemical composition of fat, beta-oxidation of fatty acids of oleic, linoleic and palmitic acid, desaturation of fatty acids, ketone bodies, ketogenesis. Dietary cholesterol- cholesterol bio-synthesis (No Structure), regulation of cholesterol synthesis.

Lipoproteins – Classification, their role and normal values. (15 hours)

Interrelationship between carbohydrates, fat and protein metabolism –hormonal regulation.

UNIT IV: **Enzymes** – Classification, factors affecting enzyme activity, role of B-vitamins as coenzymes - TPP, FAD, FMN, NAD, NADP, Tetrahydrofolic acid, Biotin, Coenzyme A, B12, Pyridoxine. Enzymes of clinical importance- LDH, SGPT, SGOT, creatine kinase etc. (10 hours)

Biological oxidation-electron transport chain.

UNIT V: **Inborn errors of metabolism**

**Carbohydrate**- fructose intolerance, galactosemia, glycogen-Type I Von Gierke's Disease.

**Disorders of aromatic amino acids** – Phenyl ketonuria, alkaptonuria, tyrosinosis. Disorders of **sulphur-containing amino acids**-Homocystinuria

**Nucleic acids**- Nucleoside, Nucleotide, DNA and RNA – Structure and Functions (10 hours)

## RECOMMENDED TEXT BOOK

Shanmugam, Ambika, Fundamentals of biochemistry to medical students. NAV Bharat Printers & traders 56, Peters Road, Chennai 86. 1985.

## REFERENCE BOOKS

1. R. Montgomery., Thomas.W. Conway, Arthur. A. Spector, 1990. Biochemistry-A care oriented Approach. Mosby Company.
2. G. P. Talwar., Srivastava, K. D.; Moudgil. 1989. Text book of biochemistry and Human biology. Prentice Hall of India (P)Ptd., New Delhi.
3. Robert. K. Murray, Darryl. K. Granner Peter. A Mays. Victor WRodwell 1993 Harpers Biochemistry Prentice Hall International Inc.
4. Conn. E. E. & Stump. P. K., Outlines of biochemistry, Wiley Eastern (P) Ltd., New Delhi 1981.
5. Canteron. A. & Schepertz. B. , Biochemistry W.B Saunders Co. Philadelphia London 1967.
6. Pairley. J. L.& Kilgous .G. L. Essentials of biological chemistry. Reinhold publishing corporations, New York 1968.
7. Gerald Litwack, A Laboratory manual. John Wiley sons Inc., New York 1960.
8. Mazur. A. & Harrow. B., Biochemistry – A Laboratory manual. John Wiley sons Inc., New York 1960
9. Mahier & Corder. E. H., Basic biological chemistry , Kapes & Row, New York, 1968
10. Varley, Practical clinical biochemistry , William Heinemam Medical books – London Ltd., 1969.
11. West. E. S. Todd. W. R., Moses. R.S. & Van Bruggon. J. S. ,Text book of Biochemistry , The MacMillan Co., New York 1968,
12. William. P. J. An introduction to biochemistry, Nostrsand Co., Inc. London 1972.

## Websites and e-learning resources:

1. <http://www.gwu.edu/~mpb-metabolic> pathways of biochemistry
2. <http://www.indstate.edu/thcme/mwking/inborn.html>-inborn errors of metabolism
3. <http://www.worthington-biochem/introBiochem/introEnzymes.html>-enzymes
4. <http://en.wikipedia.org/wiki/Biochemistry>-biochemistry encyclopedia



**QUESTION PAPER TEMPLATE**

**ETHIRAJ COLLEGE FOR WOMEN (AUTONOMOUS)  
CHENNAI-600008**

(for candidates admitted during the academic year 2015-2018)

**B.Sc DEGREE EXAMINATION  
II YEAR- IV SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: NUTRITIONAL BIOCHEMISTRY**

**Max. Marks: 100**

**Paper Code: ND15/4A/NBC// CN15/4A/NBC**

**Time: 3**

**hrs**

**SECTION A**

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

**SECTION B**

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**SECTION C**

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

## SEMESTER III & IV

### HUMAN NUTRITION AND NUTRITION THROUGH LIFE CYCLE PRACTICAL

#### CORE -6

COURSE CODE: ND15/4C/PR2// CN15/4C/PR2

Credits: 4

Teaching hours: 3 hrs/wk

LTP:0 0 3

#### HUMAN NUTRITION PRACTICAL:

1. Quantitative estimation of calcium.
2. Quantitative estimation of Vitamin C.
3. Quantitative estimation of phosphorous.
4. Quantitative estimation of iron.
5. Assessment of BMR and Calorie requirement by factorial approach
6. Determination of Chemical Score for protein rich recipes

#### REFERENCE BOOKS

1. Varley, Practical clinical biochemistry , William Heinemam Medical books – London Ltd., 1969.
2. West. E. S. Todd. W. R., Moses. R.S. & Van Bruggon. J. S. ,Text book of Biochemistry , The MacMillan Co., New York 1968,
3. William. P. J. An introduction to biochemistry, Nostrsand Co., Inc. London 1972.
4. Edusanjalbiochemist.blogspot.in

#### NUTRITION THROUGH LIFE CYCLE PRACTICAL:

1. Preparation of Complementary feed.
2. Planning and preparation of diets for different activity levels and income group.
  - a) pre-school child
  - b) school going children
  - c) adolescents
  - d) adult
  - e) expectant mother
  - f) Nursing mother.
  - g) old age
3. Planning and preparation of diets (low and medium cost) for deficiency diseases-
  - A) PEM
    - a) Vitamin A deficiency
    - b) Nutritional anemia

## **SEMESTER –III & IV**

### **MICROBIOLOGY & NUTRITIONAL BIOCHEMISTRY PRACTICAL**

**ALLIED PRACTICAL: 1**

**COURSE CODE: ND15/4A/PR1// CN15/4A/PR1**

**Credits: 2**

**TEACHING HOURS: 2hrs/wk**

**LTP: 0 0 2**

#### **MICROBIOLOGY PRACTICAL:**

1. Examination of yeast, moulds and bacteria.
2. Examination of organisms using Gram staining technique
3. Examination of organisms using simple staining technique
4. Motility of bacteria using hanging drop technique.
5. Demonstration of sterilization of glassware using hot air oven, auto clave

#### **NUTRITIONAL BIOCHEMISTRY PRACTICAL**

1. Qualitative test for carbohydrates - glucose, fructose, lactose, maltose
2. Qualitative test for proteins - albumin, globulin, casein and gelatin
3. Qualitative test for individual amino acids-Tyrosine, Cysteine, Methionine, Tryptophan.
4. Quantitative estimation of glucose
5. Qualitative test for minerals

#### **REFERENCE BOOKS**

1. Varley, Practical clinical biochemistry , William Heinemann Medical books – London Ltd., 1969.
2. West. E. S. Todd. W. R., Moses. R.S. & Van Bruggon. J. S. ,Text book of Biochemistry , The MacMillan Co., New York 1968,
3. William. P. J. An introduction to biochemistry, Nostrsand Co., Inc. London 1972.
4. Edusanjalbiochemist.blogspot.in

## SEMESTER V

### FOOD SERVICE MANAGEMENT

#### CORE -7

COURSECODE –ND15/5C/FOM// CN15/5C/FOM

Credits: 4

Teaching Hours: 4hrs/wk

LTP: 3 1 0

#### OBJECTIVE:

1. To understand the types of food service units
2. Become skilled in planning and design of food service units
3. Develop skills in quantity food purchase production, preparation and service.
4. Understand the concept and principles of resource management.

#### COURSE OUTLINE:

**UNIT I: Food service industry** - Definition of catering, Sectors of food service industry- Commercial-hotels, restaurants, Popular catering- fast food, take away, franchising, leisure attractions, Transport catering, Outdoor catering. Non-Commercial-Industrial catering, welfare catering-old age homes, prisons, religious institutions and Institutional catering.

(15 HOURS)

**UNIT II: Organization management** - Principles, Functions and Tools of management. Management of Resources – Man, Money and Material.

(10 HOURS)

**UNIT III: Human Resource Management** –Recruitment, Selection, Induction, Training, Supervision, Performance appraisal, Promotion, Demotion, Transfer, Retirement, Termination and Dismissal of employees. Laws Governing Food Service Establishment – Food laws, Labor laws and Welfare measures.

(10 HOURS)

**UNIT IV: Financial management** - Elements of cost, Food cost, Labor cost and overhead cost , advantages of cost accounting , Records for control. Sales, cost, profit relationship – Break even analysis.

Book Keeping – Transactions, Types- Single entry & Double entry system of book keeping, Rules and advantages. Book Of Accounts – Journal, Ledger, subsidiary books, Difference between Ledger and Journal, advantages of journal and ledger, trial balance, profit & loss account and balance sheet. Food cost pricing-Methods of pricing and factors affecting pricing.

(15 HOURS)

**UNIT V: Planning and design of physical plant** – Planning and Organizing of spaces – Kitchen area, storage area, service area and other areas-receiving, pre-preparation, dishwashing, garbage disposal. Concepts of work flow, principles of effective reach, material handling and charting techniques.

(10 HOURS)

## **REFERENCE:**

1. Mohini sethi and Sujeeth malhan ,”Catering management an integrated approach”, New age international publishers, III edition, 2015
2. Mohini sethi and Sujeeth malhan ,Institutional Food management”, New age international publishers, III edition, 2015
3. Casado,A.M, "House keeping Management", John Wiley and sons limited, 2000
4. R.Singaravelavan, ”Food and Beverage Service “,Oxford university press, I edition,2011
5. Kalsigsis, C and Thomas , C, "Design and equipment for food service -A management view", John Wiley and sons limited, 1999
6. Lillicrap, D, R and Cousins, J, A, "Food and beverage service", 1996
7. Jones, P, "Introduction to hospitality operations (An Indispensable guide to the industry.), Cassell publications, London, 1996
8. West,B,Wood, Food service in institutions, New York, 1995
9. Nathaniel, B.S, ", Catering management for hotels, restaurants, Institutions, sujeet publications, New Delhi, 1991
10. Jones,P, "Food service operations", Cassell publications, London, 1990

## **WEBSITES AND e-LEARNING SOURCES:**

<http://housekeeping.about.com/>

<http://www.ccohs.ca/oshanswers/hsprograms/house.html>

<https://en.wikipedia.org/wiki/Foodservice>

<http://www.nfsmi.org/documentlibraryfiles/PDF/20080228031334.pdf>



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CHENNAI-600008**

(for candidates admitted during the academic year 2015-2018)

**B.Sc DEGREE EXAMINATION  
IIIYEAR- V SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: FOOD SERVICE MANAGEMENT**

**Max. Marks: 100**

**Paper Code: ND15/5C/FOM//  
CN15/5C/FOM**

**Time: 3 hrs**

**SECTION A**

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

**SECTION B**

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**SECTION C**

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

## SEMESTER V

### HUMAN DEVELOPMENT AND FAMILY STUDIES

#### CORE- 8

COURSE CODE : ND15/5C/HFS// CN15/5C/HFS

Credits :4

Teaching Hours: 5 hrs/wk

LTP : 4 1 0

#### OBJECTIVES:

To enable students to

- understand the major concepts in human development
- Develop a scientific attitude towards behaviour pattern in individual, family and community life.

#### COURSE OUTLINE:

**UNIT I : Prenatal development-** Conception- test tube baby, signs of pregnancy, stages of prenatal development - Prenatal care, management of normal pregnancy, hygiene, diet and medical supervision, multiple pregnancy Labor-signs and stages of labor, types of birth, post-natal care of mother, adjustments of new born to temperature, breathing, feeding and elimination. (15 hours)

#### UNIT II:

**Infancy-[birth to 2yrs]** - development- physical, motor, social, emotional, cognitive and language, Effects of stimulation- care of infants - feeding, bathing, clothing, sleeping, toilet training and immunization. Maternal deprivation.

**Preschool stage- [2-6 yrs]** -development- physical, motor, social, emotional, cognitive and language. Importance of play and play activities, behaviour problems- causes and treatment. Paternal deprivation (15 hours)

#### UNIT III:

**School going [6-12 yrs]** - development- physical, motor, social, emotional, cognitive, moral and language, styles of parenting.

Adolescence [12-18 yrs] development - physical, motor, social, emotional, moral and cognitive; adjustment problems; delinquency- causes, prevention and rehabilitation, sex education. (15 hours)

#### UNIT IV:

**Adulthood- [18-60 yrs]**- characteristics and developmental tasks, marriage and family as basic institution, functions of marriage, adjustments in marriage —sex, finance, career, society and in-laws. family lifecycle-adjustment in different stages, critical family situations and its effect on children., (15 hours)

#### UNIT V:

**Old age [60 yrs and above]** physical and psychological changes, problems of the aged, family attitude towards the aged, place of the aged in Indian society. (15 hours)



### **Related experience**

- Visit to a nursery school.
- A survey on adjustment problems between husband and wife
- Survey on in-law relationships
- Survey on problems of old age

### **REFERENCE :**

1. Elizabeth Hurllock, Developmental Psychology.
2. Dixan, D.S., Stain, M.T (1992) Encounter with Children- Paediatric Behaviour and Development, 2nd Edition, St.Lus.
3. Berk, L.E. (2001) Child Development, 3rd Edition, Prentice Hall of India Pvt Ltd, New Delhi.
4. Menon, K.M.K., Palaniappan, (2000) Mudaliar and Menon's Clinical Obstetrics, 9th Edition, Orient Longman, Chennai.
5. Devadas, R.P., Jaya,N. (2003) A Textbook on Child Development, MacMillan India Ltd, NewDelhi.
6. Kaplan, P.S. (1986) A Child's Odyssey - Child and Adolescent Development, West Publishing Company, St. Paul.
7. Park, K. (1995) Textbook of Preventive and Social Medicine, 14th Edition, Banarasidas Bharat Publishers, Jabalpur.
8. Christersen, H.T. Johnson, K.P.(1971) Marriage and Family, Ronald Press Company, 3rd Edition.
9. Goode, W.J.(1985) The Family, Prentice Hall of India Pvt. Ltd, NewDelhi.
10. Kapadia, K.M. (1972) Marriage and Family in India, Oxford University Press, Bombay.
11. Ladir, J.T. Ladir, M.D. (1978) Marriage and Family, 6th Edition, Prentice Hall of India Pvt Ltd, New Delhi.

### **Websites and e-learning sources :**

1. [www.mhschool.com/benziger/online/family/parent/children.html](http://www.mhschool.com/benziger/online/family/parent/children.html)
2. [www.unt.edu/cpe/module/blk.2sty.html](http://www.unt.edu/cpe/module/blk.2sty.html)
3. [www.uky.edu/subject/family.html](http://www.uky.edu/subject/family.html)
4. [www.aifs.gov.au/institute/pubs/fm2003/fm64/booknotes.pdf](http://www.aifs.gov.au/institute/pubs/fm2003/fm64/booknotes.pdf)
5. [www.aifs.gov.au/institute/pubs/fm/fm53cj.pdf](http://www.aifs.gov.au/institute/pubs/fm/fm53cj.pdf)



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CHENNAI-600008**

(for candidates admitted during the academic year 2015-2018)

**B.Sc DEGREE EXAMINATION  
IIIYEAR- V SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: HUMAN DEVELOPMENT AND FAMILY STUDIES Max. Marks: 100**

**Paper Code: ND15/5C/HFS//  
CN15/5C/HFS**

**Time: 3 hrs**

**SECTION A**

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

**SECTION B**

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**SECTION C**

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

## SEMESTER V

### BAKING AND CONFECTIONERY

CORE 9

COURSE CODE – ND15/5C/BAK

Teaching Hours: 5hrs/wk

Credits: 4 LTP: 3 1 0

#### OBJECTIVE:

- To teach students the art of baking and chocolate making.
- To improve their entrepreneurship skills to start their own business in the field of baking

#### COURSE OUTLINE:

- UNIT-1**      **Introduction** to baking and bakery products-principle-baking process, terminologies, equipment and tools in baking. (10hrs)
- UNIT-2**      **Baking ingredients-** role of each ingredient in baking, Flour-composition and type of flour in baking, Sugar-types, Shortening, Egg, Leavening agents-yeast, baking soda, baking powder etc, Other ingredients- salt, milk and milk derivatives, malt, products, dough improver, oxidizing agents, spices (20hrs)
- UNIT-3**      **Bread making-** ingredients, types, and processing. Cakes – ingredients, types and decoration. (15hrs)
- UNIT-4**      **Pastries, Cookies & biscuits** – ingredients, types and processing. (15hrs)
- UNIT-5**      **Confectionery** – types, role of sugar in confectionery – crystalline, amorphous, process of chocolate making, types. (15hrs)

#### REFERENCES:

1. John kingslee, A Professional Text to Bakery and Confectionery, New Age International (P) Limited,Publishers. 2014
2. The Culinary Institute of America, Baking & Pastry: Mastering the Art and Craft, John Wiley & Sons,Inc New Jersy. 2009
3. Yogambal Ashokkumar, Textbook of Bakery and Confectionery, PHI Learning Private limted, New Delhi.2012
4. Paul. C.C. and Palmer. R.H. Food Theory and Application John Wiley and Sons, N.Y, 1972
5. Griswold R.M. The Experimental study of Foods, Houghton Mifflin Co., Boston, 1979
6. Helen Charley, Food Science, John Wiley and Sons, N.Y, 1970.
7. Srilakshmi B. Food Science, New Age International Ltd., Publishers. 2001
8. N. Shakunthala Manay and N. Shadakshara Swamy, Food Facts And Principle. New age International (P) Ltd., Publishers, 2001.

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(for candidates admitted during the academic year 2015-2018)

**B.Sc DEGREE EXAMINATION  
IIIYEAR- V SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: BAKING AND CONFECTIONERY  
Paper Code: ND15/5C/BAK**

**Max. Marks: 100  
Time: 3 hrs**

**SECTION A**

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

**SECTION B**

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**SECTION C**

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

**SEMESTER V**  
**THERAPEUTIC DIETETICS I**

**CORE 10**

**COURSECODE: ND15/5C/TD1**

**Teaching hours: 5 hrs/wk**

**Credits: 4**

**LTP: 3 1 0**

**OBJECTIVES:**

To enable students

- To obtain knowledge on role of diet in disease conditions
- To gain experience in planning, preparing and serving therapeutic diets.

**COURSE OUTLINE:**

UNIT I: Diet Therapy: Purposes & principles of therapeutic diets, modifications to be adopted.

- a. Modification of diet consistency, nutritive value, type of feed in
  - i. Clear Fluid Diet
  - ii. Full fluid diet
  - iii. Soft diet – Self study
- b. Special feeding methods – Parenteral & Enteral nutrition.

15 hours

UNIT II: Nutrition and diet counseling - nutritional assessment of patients, psychology of feeding the patient, dietary counseling, follow up and patient education.  
Role of Dietitian - In the hospital and community.

15 hours

UNIT III: Etiology, Prevalence, pathophysiology, principles of diet management & lifestyle modification, special foods/dietetic supplements of

- a. Obesity
- b. Diabetes mellitus – Type I & Type II.

15 hours

UNIT IV: Etiology, symptoms & dietary management of

- a. Persistent Diarrhoea & Constipation
- b. IBD, IBS, Celiac disease.

15 hours

UNIT V: Etiology, symptoms, pathophysiology and dietary management of

- a) Liver diseases – hepatitis, cirrhosis, hepatic encephalopathy.
- b) Peptic ulcer – gastric & duodenal ulcer.

15 hours

**RECOMMENDED TEXT BOOK**

Sue Rodwell Williams (2001). Nutrition & Diet Therapy. CV. Mosby St. Louis.

**REFERENCE BOOKS**

1. Mahan & Arlin. ( 2001). Krause's Food Nutrition & Diet Therapy. WB Saunder's Co. Philadelphia.
2. Robinson, C.H.; Lawless, M.R.; Chenowith, W.L.; & Garwick, A.E. ( 1990). Normal & Therapeutic Nutrition. McMillan Co. New York.

3. Garrow et al. (2000). Human Nutrition & Dietetics, 10<sup>th</sup> Edition, Churchill Livingstone.
4. Guthrie, Helen ( 2002). Introductory Nutrition. CV Mosby Co.St. Louis.
5. Gopalan, C. Balasubramaniam, SV Ramasastri & Visveswara Rao.(1999). Diet Atlas . ICMR, New Delhi. India
7. Wilson, EP.; Fisher, K.H. & Fuqua, ME (1975)., Principles of Nutrition. John Wiley & sons New York London.
8. Davidson & Passmore, (1976), Human Nutrition & Dietetics. Churchill Livingstone.

### **Websites and e-learning resources**

1. [www.nal.usda.gov](http://www.nal.usda.gov) – Food & Nutrition Information Centre.
2. [www.eatright.org](http://www.eatright.org) – American Dietetic Organisation.
3. [www.nin.org](http://www.nin.org)- National Institute of Nutrition, Hyderabad, India
4. [www.icmr.org](http://www.icmr.org) – Indian Council for medical Research.

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**B.Sc DEGREE EXAMINATION**  
**IIIYEAR- V SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND**  
**DIETETICS**

**Title of the paper: THERAPEUTIC DIETETICS I**  
**Paper Code: ND15/5C/TD1**

**Max. Marks: 100**  
**Time: 3 hrs**

### SECTION A

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

### SECTION B

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

### SECTION C

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)



## SEMESTER V

### INTERIOR DECORATION AND HOUSEKEEPING

#### ELECTIVE- 1

COURSE CODE: ND15/5E/IDH// CN15/5E/IDH

Credits: 5

Teaching Hours: 5hrs/wk

LTP: 4 1 0

#### OBJECTIVES:

To enable students to:

1. Gain understanding of the basic art principles and to develop aesthetic sense.
2. Learn to make good colour combinations in the interiors
3. To understand the basic principles in making effective flower arrangement.
4. To understand common housekeeping procedures and practices.

#### COURSE OUTLINE

- UNIT I:** **Art in daily living:** Importance of good taste, Objectives of Interior design,  
a) **Elements of design:** line, direction, shape, size, colour, texture, pattern and light; Types and characteristics of design  
b) **Principles of design:** harmony, balance, rhythm, proportion and emphasis  
(15hrs)
- UNIT II:** a) **Colour:** Qualities of colour-hue, value, intensity; colour harmony.  
b) **Flower arrangement:** Flowers for different arrangements, styles  
c) **Lighting:** principles, types of lighting, lighting needs for various activities.  
(15hrs)
- UNIT III:** a) **Furniture:** Selection and arrangement of furniture for different rooms  
b) **Furnishing materials:** types; factors considered in their selection.  
c) **Floor coverings:** Selection & types- hard and soft,  
d) **Window treatment:** curtains and draperies.  
e) **Accessories:** Selection, types, use and care. (15hrs)
- UNIT IV:** **Organization of the housekeeping department:** Importance of the housekeeping department, Layout and Organization of Housekeeping Department, qualification and personal qualities of a housekeeper; Recruitment and training of staff, interdepartmental co-operation  
(15hrs)
- UNIT V:** **Cleaning tools and equipment:** cleaning agents, cleaning methods, stain removal, types of cleaning, daily, weekly and annual, care of public, private and service areas in establishments; stain removal.  
**Linen room:** plan, layout, linen control, receiving, issuing, storage of clean linen, Selection, purchase and linen hire.  
Bed making Procedure (15hrs)

## REFERENCES

1. Dorothy S.and Darlene .M. Introduction to Interior Design Macmillan publishing company, New York,1979.
2. Dorothy S.and Darlene .M. Introduction to Interior Design Macmillan publishing company, New York,1979.
3. Gold Stein.H.& Gold Stein.V. Art in every day life- Mac Millian and company , New York,1966
4. Goldstein H. and Goldstein V. Art in Everyday Life, Oxford and IBH pub co., ND
5. New Decoration Book- Better Homes and Gardens, Marshall Cavendish Books Ltd, 1981
6. Enaksh Bhavani, Decorative Designs and Craftmanship of India, 1981
7. Premavathy Seetharaman, Interior design and decoration.
8. Joan Branson, Hotel, Hostel and Hospital Housekeeping.
9. Sudhir Andrews, Hotel Housekeeping.



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**B.Sc DEGREE EXAMINATION  
IIIYEAR- V SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: INTERIOR DECORATION AND HOUSEKEEPING Max. Marks: 100**  
**Paper Code: ND15/5E/IDH// Time: 3 hrs**  
**CN15/5E/IDH**

**SECTION A**

**Definition (Answer all) (10x2=20 marks)**  
Two questions from each unit

**SECTION B**

**Answer any FIVE questions. (5x8= 40 marks)**  
**Each answer should not exceed 300 words.**  
One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**SECTION C**

**Answer any TWO questions. (2X20=40 marks)**  
**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

## SEMESTER VI

### QUANTITY FOOD PRODUCTION

CORE -13

COURSE CODE – ND/6C/QPR//CN15/6C/QPR

Credits: 3

Teaching Hours: 4hrs/wk

LTP: 3 1 0

#### OBJECTIVE:

- To understand the basic principles of sanitation and safety.
- Understand the concept and principles of organization and financial management.
- To be knowledgeable about service areas and equipments used in food service areas

#### COURSE OUTLINE:

**UNIT I: Quantity food purchase-** Selection of foods – Standards for selection of perishable, non-perishable and convenience foods, Purchasing and delivery procedure- Buying methods and Receiving methods, storage of foods, types of storage, maintenance of stores and store records. Role of computers in catering industry- Purchasing, storage, menu planning and billing. (10 hours)

**UNIT II: Quantity food production-**Menu – definition, origin of menu, Functions of menu, Types of menu, French classic menu sequence, writing menu, menu display. Factors considered in menu planning, standardization of recipes- definition, advantages, enlargement of recipes, portion control and effective use of leftovers. Computer application in catering industry- Purchasing, Menu planning, Storing and billing. (15 hours)

**UNIT III: Equipments** - Definition, classification and factors considered in the selection of equipment, Pre-preparation Equipment – Dough making machine & bread slicer, vegetable cutting machine. Cooking Equipment – Gas ranges with ovens , fryer , Rotisserie. Holding Equipment – Bain marie and chafing dishes. Service equipment- Flatware, cutlery and hollow ware, Clearing & collection Equipment- Electric food trolleys & clearing trolleys. Washing Equipment – electric dishwasher and Glassware washing. (10 hours)

**UNIT V: Food service system and styles of service-**Food service system-Conventional, Cook chill/ Cook Freeze, Commissary and Assembly Service ,Styles of service- Table service- full silver service and French service. Waiter service– Silver/ English, family, plate /American, Self-service–cafeteria, counter, free flow, echelon, super market, Specialize service – tray & trolley, drive-in. Assisted service – buffet, carvary, Single point service – take away, vending bar, kiosks. Still room, Silver room, Rules for laying a table, waiting at table. Attributes of food and beverage personnel. Inter -personal skills. (15 hours)

**UNIT V: Hygiene and safety** - Definition of hygiene, Personal hygiene, food hygiene, and environmental hygiene, Pest control, garbage disposal. Accidents -Causes & Prevention (10 hours)

## REFERENCE

1. Mohini sethi and Sujeeth malhan ,”Catering management an integrated approach”, New age international publishers, III edition, 2015
2. Mohini sethi and Sujeeth malhan ,Institutional Food management”, New age international publishers, III edition, 2015
3. Sudir Andrews,” Food and Beverage Service” Tata Mc Graw hill publishing company limited.Ii edition, 2009
4. Bobby George ,”Food and Beverage Service “,Jaico Publishing House, I edition,2005
5. Casado,A.M, "House keeping Management", John Wiley and sons limited, 2000
6. R.singaravelavan, ”Food and Beverage Service “,Oxford university press, I edition,2011
7. Kalsigsis, C and Thomas , C, "Design and equipment for food service -A management view", John Wiley and sons limited, 1999
8. Lillicrap, D, R and Cousins, J, A, "Food and beverage service", 1996
9. Jones, P, "Introduction to hospitality operations (An Indispensable guide to the industry.), Cassell publications, London, 1996
10. West,B,Wood, Food service in institutions, New York, 1995
11. Nathaniel, B.S, ", Catering management for hotels, restaurants, Institutions, sujet publications, New Delhi, 1991
12. Jones,P, "Food service operations", Cassell publications, London, 1990
13. Powers, J.M, "Food service planning and control"US, 1989
14. Spears,C.M and vaden.G,a, "Food Service organizations- a Managerial and systems approach", Macmillan publishing company New York, 1985
15. Kotschewar,L and Tenal, M.e, "Food service planning layout and equipment.,John Wiley and sons limited, 1961

## WEBSITES AND e-LEARNING SOURCES:

- [http//.wikipedia.org/wiki/Interior\\_decoration.](http://.wikipedia.org/wiki/Interior_decoration)
- [http//www.infoplease.com/ce6/society/a0825323.html](http://www.infoplease.com/ce6/society/a0825323.html)
- [http//housekeeping.about.com/](http://housekeeping.about.com/)
- [http//www.ccohs.ca/oshanswers/hsprograms/house.html.](http://www.ccohs.ca/oshanswers/hsprograms/house.html)



**QUESTION PAPER TEMPLATE**

**ETHIRAJ COLLEGE FOR WOMEN (AUTONOMOUS)  
CHENNAI-600008**

(for candidates admitted during the academic year 2015-2018)

**B.Sc DEGREE EXAMINATION  
III YEAR- VI SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: QUANTITY FOOD PRODUCTION**

**Max. Marks: 100**

**Paper Code: ND15/6C/QPR //  
CN15/6C/QPR**

**Time: 3 hrs**

**SECTION A**

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

**SECTION B**

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**SECTION C**

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)



**SEMESTER VI**  
**THERAPEUTIC DIETETICS II**

**CORE 14** **COURSECODE ND15/6C/TD2**  
**Teaching hours: 5 hrs./wk** **Credits: 4** **LTP: 3 2 0**

**OBJECTIVES**

1. To obtain knowledge on the role of diet in disease conditions.
2. To gain experience in planning, preparing and serving therapeutic diets.

**COURSE OUTLINE**

UNIT I: Diets for lifestyle conditions – Prevalence, Etiology, Pathology, principles of diet management & lifestyle modification, special foods/dietetic supplements

- a) Cardiovascular diseases- atherosclerosis, hypertension, myocardial Infarction.
- b) Metabolic Syndrome. (15hrs)

UNIT II: a) Nutrition and cancer - Nutrition in the etiology of cancer, nutritional effect of cancer therapy, nutritional care and nutrients in prevention of cancer

- b) AIDS – Prevalence, Etiology, pathophysiology, complications, medical & nutritional management. (15hrs)

UNIT III:

- a) Diet in allergy & lactose intolerance- definition, classification, manifestation, common food allergens, tests and dietary treatment.
- b) Diet in fevers – acute – typhoid & chronic- TB (15hrs)

UNIT IV: Nutrition in stress:

- a) Diet in Sepsis and trauma
- b) Diet in burns – definition, types and dietary management in burns.
- c) Diet in surgery – pre operative and post operative diets. (15hrs)

UNIT V: Diseases of the excretory system – etiology, symptoms, diagnosis, nutritional therapy.

- a. Kidney – Acute Kidney disease, Chronic Kidney disease, Dialysis – types.
- b. Renal calculi – types, diet management. (15hrs)

**RECOMMENDED TEXT BOOK**

Sue Rodwell Williams (2001). Nutrition & Diet Therapy. CV. Mosby St. Louis

**REFERENCE BOOKS**

1. Mahan & Arlin. ( 2001). Krause's Food Nutrition & Diet Therapy. WB Saunder's Co. Philadelphia.
2. Robinson, C.H.; Lawless, M.R.; Chenowith, W.L.; & Garwick, A.E. ( 1990). Normal & Therapeutic Nutrition. McMillan Co. New York.

3. Garrow et al. (2000). Human Nutrition & Dietetics, 10<sup>th</sup> Edition, Churchill Livingstone.
4. Guthrie, Helen ( 2002). Introductory Nutrition. CV Mosby Co.St. Louis.
5. Gopalan, C. Balasubramaniam, SV Ramasastri & Visveswara Rao.(1999). Diet Atlas . ICMR, New Delhi. India
6. Wilson, EP.; Fisher, K.H. & Fuqua, ME (1975)., Principles of Nutrition. John Wiley & sons New York London.
7. Davidson & Passmore, (1976), Human Nutrition & Dietetics. Churchill Livingstone.

#### Websites and e-learning resources

5. [www.nal.usda.gov](http://www.nal.usda.gov) – Food & Nutrition Information Centre.
6. [www.eatright.org](http://www.eatright.org) – American Dietetic Organisation.
7. [www.nin.org](http://www.nin.org)- National Institute of Nutrition, Hyderabad, India
8. [www.icmr.org](http://www.icmr.org) – Indian Council for medical Research.

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(for candidates admitted during the academic year 2015-2018)

**B.Sc DEGREE EXAMINATION  
IIIYEAR- V SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: THERAPEUTIC DIETETICS II  
Paper Code: ND15/5C/TD2**

**Max. Marks: 100  
Time: 3 hrs**

**SECTION A**

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

**SECTION B**

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**SECTION C**

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

## SEMESTER VI

### SPORTS NUTRITION

#### CORE- 15

**COURSE CODE : ND15/6C/SPN// CN15/6C/SPN**

**Credits: 4**

**Teaching Hours: 5 hrs/wk**

**LTP: 3 2 0**

#### OBJECTIVES

To enable the students

1. To help students gain knowledge about the role of nutrients in athletic performance
2. To develop skills in planning diets for various performance events

#### COURSE OUTLINE

**UNIT 1:** Introduction and energy requirements - Fitness- definition, benefits, components, conditioning by training, aerobic & anaerobic activities. Energy and Performance - Energy definition, role of ATP and its inter conversion, storage of carbohydrate, protein and fat in the body, important fuels for exercise, human energy systems. Fatigue during aerobic and anaerobic activities and prevention .

(15 hours)

**UNIT II:** Role of Carbohydrates in sports- Relationship between muscle glycogen and performance, importance of glycemic index in athletes, high GI and low GI foods , pre and post exercise carbohydrate meals, glycogen replenishment, carbohydrate loading.

(10 hours)

**UNIT III:** Role of protein, fat, vitamins minerals and antioxidants in exercise.

- a. Protein requirements during endurance and strength training, meeting protein needs, bioavailability of proteins, protein requirement in vegetarian athletes, effect of excess protein intake on athlete's health.
- b. Body fat and performance, its advantages, assessment of body composition requirements, desirable body fat percentage for athletes. Role of dietary fat in performance, Fat loading.
- c. Effect of exercise on vitamins and mineral requirements, Recommendation for vitamins and minerals in athletes. Antioxidants and the role in exercise.

(20 hours)

**UNIT IV:** Fluid requirements & Ergogenic aids.-

- a Fluid requirements of exercise, dangers of dehydration and overhydration, hyponatremia, sports drinks -types , fluid concentration, weather and fluid intake, role of non alcoholic drinks, diet drinks, carbonated beverages in athletes.
- b Ergogenic aids: Classification , commonly used ergogenic aids- protein supplements, vitamin and mineral supplements, imbalances due to supplements, natural versus synthetic vitamin supplements.

(15 hours)

**UNIT V:** Nutrient needs of female athletes

- a. Performance in athletes with eating disorders-anorexia nervosa and continuance of training, amenorrhea in athletes, causes , risk factors, amenorrhea and bone loss , iron deficiency anemia and sports anemia, causes,

symptoms, latent iron deficiency, role of iron supplements, special recommendations for pregnancy, body fat level and fertility, weight gain during pregnancy, nutritional guidelines.

- b. Nutritional needs of athletes with special needs- Diabetic athlete (15 hours)

### **Activity**

- a. Preparation of sports drinks
- b. Planning diets for different performance events – foot ball, sprinting, swimming and weight lifting.

### **Visits**

Visit to YMCA

Visit to a National stadium to observe the performance of athletes.

### **REFERENCES**

1. Anita Bean, The Complete Guide To Sports Nutrition , A& C Black Publishers, 2000.
2. Melvin H Williams, Nutrition for health, fitness and sport, 5h ed Mc Graw Hill, Boston, 1999.
3. Asker Jeukendrup and Michael Gleeson, Sports Nutrition- An introduction to energy production and performance, Human Kinetics publishers, 2004.
4. William D, Mc Ardle, Frank I, Katch and Victor L. Katch, Sports and Exercise Nutrition. 4<sup>th</sup> ed, Lippincott Williams and Wilkins.1999.

### **WEBSITES AND e-LEARNING SOURCES:**

1. <http://www.hsc.wvu.edu/library/U-links/community-nutrition.htm>
2. [www.asns.rg/njnjun04a.pdf](http://www.asns.rg/njnjun04a.pdf).
3. [www.fns.usda.gov/fsec/FILES/fafetyNet.pdf](http://www.fns.usda.gov/fsec/FILES/fafetyNet.pdf).
4. [www.ext.vt.edu/action\\_for\\_healthykids/assistance/lesson\\_5background.pdf](http://www.ext.vt.edu/action_for_healthykids/assistance/lesson_5background.pdf).



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CHENNAI-600008**

(for candidates admitted during the academic year 2015-2018)

**B.Sc DEGREE EXAMINATION  
IIIYEAR- VI SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: SPORTS NUTRITION**

**Max. Marks: 100**

**Paper Code: ND15/6C/SPN//  
CN15/6C/SPN**

**Time: 3 hrs**

**SECTION A**

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

**SECTION B**

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**SECTION C**

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)





## SEMESTER VI

### COMMUNITY NUTRITION

**ELECTIVE 2**

**COURSE CODE: ND15/6E/CMN//**

**CN15/6E/CMN**

**TEACHING HOURS: 5hrs/wk**

**CREDITS: 5**

**LTP: 4 1 0**

#### OBJECTIVES:

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

#### COURSE OUTLINE:

UNIT I: **Nutrition and Health in National Development:** Nutritional problems confronting our country, Sustainable Development Goals, Causes of malnutrition in India, Food and Nutrition Security, Sustainable diets, Balance between food and population growth. (15 hours)

UNIT II: **Nutritional Assessment:** Sampling techniques, Identification of risk groups, Methods of Assessment of Nutritional Status: Direct assessment – Anthropometry, Biochemical estimations, Clinical and Dietary assessment; Indirect Assessment- Food balance sheets and Agricultural data, Ecological parameters and Vital Health Statistics (10 hours)

UNIT III: a) **National Nutrition Programmes to combat malnutrition:** Prophylactic programs – Vitamin A, Iron & Folic acid, Iodine; Pulse Polio, Revised National Tuberculosis Control Programme- DOTS, National AIDS control Programme; ICDS, School feeding Programmes, Intervention during Emergencies; Immunization and its importance (15 hours)  
b) **National and International agencies in Community Nutrition:** FAO, WHO, UNICEF, ICMR, ICAR, NIN, CFTRI, MSSRF, Food & Nutrition Board, Social Welfare Boards – Central & State. (15 hours)

UNIT IV: a) **Importance of Breast feeding:** Promotion of successful breastfeeding, Government policies, Exclusive Breastfeeding, Wet nursing, Breast milk banks, IMS Act; **Weaning foods:** Planning, formulating and preparation; Importance of correct and timely weaning, low cost complementary foods  
b) **Nutrition and Infection:** Relationship (10 hours)

UNIT V: a) **Nutrition Education Program:** Objectives, Planning, Implementation and Evaluation; Communication Strategies – Role of Audio visual aids  
b) Recent advances in community Nutrition; Fortification and enrichment of foods (10 hours)

**Related Experiences:** A) Assessment of Nutritional status of vulnerable groups  
B) Nutrition Education Programme for vulnerable groups

## References:

1. M.Swaminathan Principles of Nutrition and Dietetics, 1993, Bappeo 88, Mysore Road, Bangalore – 560 018.
2. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., 2010 – Nutritive value of Indian foods, NIN, Hyderabad.
3. Bamji, Textbook of Human nutrition, 2005
4. Park K, Park's Textbook of preventive medicine, 2005
5. Suraj Gupte, Textbook of Pediatric Nutrition, 2005
6. Jelliffe. D.B. (1996), "The assessment of Nutritional status on the community", - WHO monograph series – no. Geneva
7. Reh, Emma, (1976)", Manual On Household Food Consumption Surveys", FAO Nutritional studies, No.18, Rome.
8. Shanthi Gosh, (1977), "The feeding and care of infants and young children" Voluntary Health association of India – New Delhi.
9. Ebrahim. G.J. (1983), "Nutrition in mother and child health: London, macmillan Ritchey. S.J. and J. Taper. (1983), Maternal and child Nutrition, Harper and row publishers, New York.
10. McLarea, D.S. (Ed.). (1983), Nutrition in the community, John Wiley and sons.
11. Shukla P.K.(1982), Nutritional Problems of India- Prentice Hall of India Pvt. Ltd., New Delhi.

## Websites:

1. [www.nin.org](http://www.nin.org)- National Institute of Nutrition, Hyderabad, India
2. [www.icmr.org](http://www.icmr.org) – Indian Council for medical Research.

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**B.Sc DEGREE EXAMINATION  
III YEAR- VI SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: COMMUNITY NUTRITION**

**Paper Code: ND15/6C/CMN//  
CN15/6C/CMN**

**Max. Marks: 100**

**Time: 3 hrs**

**SECTION A**

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

**SECTION B**

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

### **SECTION C**

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

## SEMESTER –VI

### FOOD PRESERVATION

Elective 3

COURSE CODE: ND15/6E/FPR

Teaching Hours: 5 hrs/wk

Credits: 5

LTP: 4 1 0

#### OBJECTIVES

- Understand the need for food preservation
- Obtain knowledge of various types of preservation techniques
- Obtaining knowledge on packaging and food standards.

#### COURSE OUTLINE

**UNIT I: Introduction** -Importance and principles of preservation , food spoilage - causes of spoilage, spoilage of various foods and food products. (15 hrs)

**UNIT II: Methods of food preservation:** Traditional methods-salting, pickling and drying.  
**Preservation as sugar concentrates** - Jams, Jelly, Marmalades and Preserves.  
**Fruit Juice Beverages** - Preparation and preservation. Preparation of candied fruits. (15 hrs)

**UNIT III: Methods of food preservation:** Use of high temperatures- Drying and sterilization, canning, pasteurization, Blanching.

**Use of Low temperatures** - Refrigeration and freezing, Irradiation. (15 hrs)

**UNIT IV: Food additives** – definition, uses of additives, characteristics of chemical additives, intentional food additives, permitted amounts; Food standards –BIS,AGMARK, FSSAI 2006. (15 hrs)

**Food adulteration** – types of adulterants, intentional adulterants, incidental adulterants.

**UNIT V: : Convenience foods** – processing & preservation techniques - ready-to-cook, ready-to-use, ready-to serve and ready-to-eat .

**Packaging:** Functions of Packaging, packing materials and forms, special packaging - military and space foods and Intelligent packaging. (15 hrs)

#### REFERENCE BOOKS:

1. Subbulakshmi.G,Shoha A Udipi, Food Processing and Preservation, New Age International (P) Ltd, Publishers. 2001
2. Sivasankar.B, Food Processing and Preservation, Prentice Hall of India (P) Ltd, New Delhi.2008
3. Shakuntala Manay.N, M.Shadaksharaswamy, Food Facts and Principles, 3<sup>rd</sup> edition, New Age International (P) Ltd.2008
4. NIIR BOARD, Manual of Modern Technology on Food Preservation, Asia Pacific Business Press Inc, New Delhi.

5. Sudesh Jood and Neelam Khetarpaul, Food Preservation, Agro Tech Publishing Academy, Udaipur.2002
6. Neelam Khetarpaul, Food Processing and Preservation, Daya Publishing House, New Delhi.2005
7. Hausner.A, Preserved Foods and Sweetmeats, Biotech Books, New Delhi. 2005

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**B.Sc DEGREE EXAMINATION  
III YEAR- VI SEMESTER**

**DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND  
DIETETICS**

**Title of the paper: FOOD PRESERVATION**

**Max. Marks: 100**

**Paper Code: ND15/6E/FPR//  
CN15/6E/FPR**

**Time: 3 hrs**

**SECTION A**

**Definition (Answer all)**

**(10x2=20 marks)**

Two questions from each unit

**SECTION B**

**Answer any FIVE questions.**

**(5x8= 40 marks)**

**Each answer should not exceed 300 words.**

One question from each unit and the remaining three questions from Unit II, Unit III and Unit IV respectively (Understanding/Description / Problems). Each question carries eight marks

**SECTION C**

**Answer any TWO questions.**

**(2X20=40 marks)**

**Each answer should not exceed 1500 words.**

Four questions covering all five units. Sub divisions may be given. Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

## **SEMESTER V & VI**

### **FOOD SERVICE MANAGEMENT AND QUANTITY FOOD PRODUCTION PRACTICAL**

#### **CORE- 11**

**COURSE CODE – ND15/6C/PR3// CN15/6C/PR3**

**Credits: 3**

**Practical Hours: 3hrs/wk**

**LTP: 003**

#### **FOOD SERVICE MANAGEMENT PRACTICAL**

1. Visit to sectors of food industry – any 2 commercial and non-commercial sectors.

#### **QUANTITY FOOD PRODUCTION PRACTICAL**

1. Standardization of two portions of North Indian, South Indian and Chinese Cuisine.
2. Quantity production of North Indian, South Indian and Chinese Cuisine.

#### **REFERENCE**

1. Mohini sethi and Sujeeth malhan ,”Catering management an integrated approach”, New age international publishers, III edition, 2015
2. Mohini sethi and Sujeeth malhan, Institutional Food management”, New age international publishers, III edition, 2015
3. Sudir Andrews,” Food and Beverage Service” Tata Mc Graw hill publishing company limited.II edition, 2009
4. Bobby George ,”Food and Beverage Service “,Jaico Publishing House, I edition,2005
5. Casado,A.M, "House keeping Management", John Wiley and sons limited, 2000
6. R.singaravelavan, ”Food and Beverage Service “,Oxford university press, I edition,2011
7. Kalsigsis, C and Thomas , C, "Design and equipment for food service -A management view", John Wiley and sons limited, 1999
8. Lillicrap, D, R and Cousins, J, A, "Food and beverage service", 1996

#### **WEBSITES AND e-LEARNING SOURCES:**

- [http://.wikipedia.org/wiki/Interior\\_decoration](http://.wikipedia.org/wiki/Interior_decoration).
- <http://www.infoplease.com/ce6/society/a0825323.html>
- <http://housekeeping.about.com/>
- <http://www.ccohs.ca/oshanswers/hsprograms/house.html>.



**SEMESTER V & VI**  
**THERAPEUTIC DIETETIC PRACTICALS**

**CORE- 12**

**COURSE CODE: ND15/6C/PR4**

**Teaching hours: 3 hrs/wk**

**Credits: LTP: 0 0 3**

**THERAPEUTIC DIETETICS I**

1. Therapeutic diets for the following:
  - a. Parenteral feed, enteral feed – evaluation of case study.
  - b. Peptic ulcer
  - c. Planning and preparing diet in IBD, IBS, Coeliac disease
  - d. Liver disorders- Hepatitis & Cirrhosis
  - e. Obesity
  - f. Diabetes mellitus – Type 1 and Type 2.
2. Dietetic internship in a teaching hospital for 2 weeks to be conducted & completed before the completion of the degree at the end of second year.

**THERAPEUTIC DIETETICS II**

1. Cardiovascular diseases – Hypertension, Atherosclerosis, Myocardial Infarction
2. Planning and preparing diet in cancer.
3. Planning and preparing diet in AIDS.
4. Planning and preparing pre & postoperative diets.
5. Planning and preparing diet in trauma, burns.
6. Kidney – acute kidney disease, chronic kidney disease, urinary calculi

**RECOMMENDED TEXT BOOK**

Sue Rodwell Williams (2001). Nutrition & Diet Therapy. CV. Mosby St. Louis

**REFERENCE BOOKS**

1. Mahan & Arlin. ( 2001). Krause's Food Nutrition & Diet Therapy. WB Saunder's Co. Philadelphia.
2. Robinson, C.H.; Lawless, M.R.; Chenowith, W.L.; & Garwick, A.E. ( 1990). Normal & Therapeutic Nutrition. McMillan Co. New York.
3. Garrow et al. (2000). Human Nutrition & Dietetics, 10<sup>th</sup> Edition, Churchill Livingstone.
4. Guthrie, Helen ( 2002). Introductory Nutrition. CV Mosby Co. St. Louis.
5. Gopalan, C. Balasubramaniam, SV Ramasastry & Visveswara Rao. (1999). Diet Atlas. ICMR, New Delhi. India
6. Wilson, EP.; Fisher, K.H. & Fuqua, ME (1975)., Principles of Nutrition. John Wiley & sons New York London.
7. Davidson & Passmore, (1976), Human Nutrition & Dietetics. Churchill Livingstone.

