

**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
2018 – 2021 batch onwards**

ETHIRAJ COLLEGE FOR WOMEN

Department of Nutrition, Food Service Management and Dietetics Revised Syllabus from June 2018

Department of Nutrition, Food Service Management and Dietetics is revising syllabi with effect from the academic year 2018-2019, 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 : Foundation Course- English.

PART-III : Core & Elective, Allied Subjects.

PART-IV : Non major electives/ Soft skill/ skill based

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		Part - I Foundation Course Language	5	3	40	60	100
I		Part - II English	5	3	40	60	100
I	ND18/1C/FSE	Part – III Core 1- Food Science	7	5	40	60	100
I	ND18/2C/PR1*	Core 3- Food Science and Physiology Practical	3	-	-	-	100
I		Part III Allied 1- Allied Chemistry I	4	4	40	60	100
I		Allied Chemistry Practical	2	-	40	60	100
I	UG18/1N/BTA UG18/1N/ATA ND18/1N/HEN**	Part IV 1a/b/c 1a- Basic Tamil 1b- Advanced Tamil 1c- Health and Nutrition (NME)	2	2	-	50	50
I		Soft skill 1	2	3	-	50	50
Total			30	20			
<p>*practical examination (ND18/2C/PR1) – Food science and Physiology Practical will be conducted in the second semester.</p>							

SEMESTER II

Semester	Course Code	Course Title	Hrs./ Week	Credits	CA	End Semester	Total
II		Part – I Foundation Course Language	5	3	40	60	100
II		Part – II English	5	3	40	60	100
II	ND18/2C/PHY	Part – III Core 2- Physiology	7	5	40	60	100
II	ND18/2C/PR1*	Core 3- Food Science and Physiology Practical	3	3	40	60	100
II		Part III Allied 2- Allied Chemistry II	4	4	40	60	100
II		Allied Chemistry Practical	2	2	40	60	100
II	UG18/2N/BTA UG18/2N/ATA ND18/2N/FLA**	Part IV 1A/B/C – 1a- Basic Tamil 1b- Advanced Tamil 1c-Flower Arrangement	2	2	-	50	50
II		Soft skill 2	2	3			
Total			30	25			

*** Practical examination (ND18/2C/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		Part – I Foundation Course Language	5	3	40	60	100
III		Part – II English	5	3	40	60	100
III	ND18/3C/HNU	Part – III Core 4- Human Nutrition	7	5	40	60	100
III	ND18/4C/PR2*	Core 6- Human Nutrition and Nutrition Through Life Cycle Practical *	3	-	-	-	-
III	ND18/3A/MIC	Part III Allied 3- Microbiology	4	4	40	60	100
III	ND18/4A/PR1**	Allied- Microbiology and Nutritional Biochemistry Practical	2	-	-	-	-
III		Part IV Environmental studies	2	2	-	50	50
III		Soft skill 3	2	3			
Total			30	20			

***practical examination (ND18/4C/PR2) – Human Nutrition and Nutrition through Lifecycle Practical will be conducted in the fourth semester.**

****practical examination (ND18/4A/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
	Part – I Foundation Course Language	5	3	40	60	100
	Part – II English	5	3	40	60	100
ND18/4C/NLC	Part – III Core 5- Nutrition Through Lifecycle	7	5	40	60	100
ND18/4C/PR2*	Core 6- Human Nutrition and Nutrition Through Life Cycle Practical	3	4	40	60	100
ND18/4A/NBC	Part III Allied 4- Nutritional Biochemistry	4	4	40	60	100
ND18/4A/PR1**	Allied- Microbiology and Nutritional Biochemistry practical	2	2	40	60	100
	Part IV Value Education	2	2	-	50	50
	Soft skill 4	2	3			
Total		30	26			

***practical examination (ND18/4C/PR2) – Human Nutrition and Nutrition through Lifecycle Practical will be conducted in the fourth semester.**

****practical examination (ND18/4A/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
ND18/5C/FM1	Core 7- Food Service Management I	4	4	40	60	100
ND18/5C/HFS	Core 8- Human Development and Family Studies	5	4	40	60	100
ND18/5C/BAK	Core 9- Baking and Confectionery	5	4	40	60	100
ND18/5C/TD1	Core 10- Therapeutic Dietetics I	5	4	40	60	100
ND18/5E/IDH	Elective 1 Interior Decoration & Housekeeping	5	5	40	60	100
ND18/6C/PR3*	Core 14- Food Service Management Practical	3	-	-	-	-
ND18/6C/PR4*	Core 15- Therapeutic Dietetic Practical	3	-	-	-	-
Total		30	21			

***practical examination (ND18/6C/PR3) – Food Service Management Practical will be conducted in the sixth semester.**

***practical examination (ND18/6C/PR4) – Therapeutic Dietetic Practical will be conducted in the sixth semester.**

SEMESTER VI

Course Code	Course Title	Hrs./ Week	Credits	CA	End Semester	Total
ND18/6C/FM2	Core 11- Food Service Management II	4	3	40	60	100
ND18/6C/TD2	Core 12- Therapeutic Dietetics II	5	4	40	60	100
ND18/6C/SPN	Core 13- Sports Nutrition	5	4	40	60	100
ND18/6E/PHN	Elective 2- Public Health Nutrition	5	5	40	60	100
ND18/6E/FPR	Elective 3- Food Preservation	5	5	40	60	100
ND18/6C/PR3*	Core 14- Food Service Management Practical	3	3	40	60	100
ND18/6C/PR4*	Core 15- Therapeutic Dietetic Practical	3	3	40	60	100
Total		30	27			
Credits at the end of VI semesters			139			
Part V (Extension activities)			1			
Total credits			140			

*practical examination (ND18/6C/PR3) – Food Service Management Practical will be conducted in the sixth semester.

*practical examination (ND18/6C/PR4) – Therapeutic Dietetic Practical 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	3	3	5	4		2	3		
II	3	3	5+3	4+2		2	3		
III	3	3	5	4			3	2	
IV	3	3	5+4	4+2			3		2
V			16		5				
VI			11+6		10				
Total	12	12	60	20	15	4	12	2	2

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	ND18/1C/FSE	Food Science	7	5	40	60	100
I	ND18/2C/PR1*	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	ND18/1N/HEN	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	ND18/2C/PHY	Physiology	7	5	40	60	100
II	ND18/2C/PR1*	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	ND18/2N/FLA	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	ND18/3C/HNU	Human Nutrition	7	5	40	60	100
III	ND18/4C/PR2*	Human Nutrition & Nutrition Through Lifecycle practical	3	-	40	60	100
III	ND18/3A/MIC	Microbiology	4	4	40	60	100
III	ND18/4A/PR1*	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	ND18/4C/NLC	Nutrition Through Lifecycle	7	5	40	60	100
IV	ND18/4C/PR2*	Human Nutrition & Nutrition Through Lifecycle practical	3	4	40	60*	100
IV	ND18/4A/NBC	Nutritional Biochemistry	4	4	40	60	100
IV	ND18/4A/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	ND18/5C/FM1	Food Service Management I	4	4	40	60	100
V	ND18/5C/HFS	Human Development and Family Studies	5	4	40	60	100
V	ND18/5C/BAK	Baking and Confectionery	5	4	40	60	50
V	ND18/5C/TD1	Therapeutic Dietetics I	5	4	40	60	50
V	ND18/5E/IDH	Interior Decoration & Housekeeping	5	5	40	60	100
V	ND18/6C/PR3*	Food Service Management Practical	3	-	40	60*	100
V	ND18/6C/PR4*	Therapeutic Dietetic Practical	3	-	40	60*	100
V	ND18/6C/FM2	Food Service Management II	4	3	40	60	100
V	ND18/6C/TD2	Therapeutic Dietetics II	5	4	40	60	100
V	ND18/6C/SPN	Sports Nutrition	5	4	40	60	100
VI	ND18/6E/PHN	Public Health Nutrition	5	5	40	60	100
VI	ND18/6E/FPR	Food Preservation	5	5	40	60	100
VI	ND18/6C/PR3*	Food Service Management Practical	3	3	40	60*	100
VI	ND18/6C/PR4*	Therapeutic Dietetic Practical	3	3	40	60*	100
		Extension activity		1			
		TOTAL		140			

*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	ND18/1C/FSE	Food Science	10	10	10	10	40
II	ND18/2C/PHY	Physiology	10	10	10	10	40
III	ND18/3C/HNU	Human Nutrition	10	10	10	10	40
III	ND18/3A/MIC	Microbiology	10	10	10	10	40
IV	ND18/4C/NLC	Nutrition Through Lifecycle	10	10	10	10	40
IV	ND18/4A/NBC	Nutritional Biochemistry	10	10	10	10	40
V	ND18/5C/FM1	Food Service Management I	10	10	10	10	40
V	ND18/5C/HFS	Human development and Family Studies	10	10	10	10	40
V	ND18/5C/BAK	Baking and Confectionery	10	10	10	10	40
V	ND18/5C/TD1	Therapeutic Dietetics I	10	10	10	10	40
V	ND18/5E/IDH	Interior Decoration & Housekeeping	10	10	10	10	40
V	ND18/6C/FM2	Food Service Management II	10	10	10	10	40
V	ND18/6C/TD2	Therapeutic Dietetics II	10	10	10	10	40
V	ND18/6C/SPN	Sports Nutrition	10	10	10	10	40
VI	ND18/6E/PHN	Public Health Nutrition	10	10	10	10	40
VI	ND18/6E/FPR	Food Preservation	10	10	10	10	40

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

Semester	Code	Course Title	Maximum Marks
I	ND18/1N/HEN	Health and Nutrition	50
II	ND18/2N/FLA	Flower Arrangement	50

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	ND18/2C/PR1	Food Science and Physiology Practical	10	10	10	10	40
IV	ND18/4C/PR2*	Human Nutrition & Nutrition Through Lifecycle practical	10	10	10	10	40
IV	ND18/4A/PR1*	Microbiology & Nutritional Biochemistry Practical	10	10	10	10	40
VI	ND18/6C/PR3*	Food Service Management Practical	10	10	10	10	40
VI	ND18/6C/PR4*	Therapeutic Dietetic Practical	10	10	10	10	40

PATTERN FOR CONTINUOUS ASSESSMENT

Component	Time	Total marks	CA
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
Total			40 marks

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.

FOOD SCIENCE

CORE-1

Teaching hours: 7hours/week

Paper Code: ND18/1C/FSE // CN18/1C/FSE

Credits: 5 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, Food guide pyramid (ICMR) and Food plate (USDA). 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.

Role of cereals and pulses in cookery.

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.

Role of vegetables in cookery.

Fruits: Classification, composition and nutritive value. Browning of fruits

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 of fish.

Egg- structure, composition, nutritive value, storage, deterioration during storage-Physical and Chemical changes. Egg cookery- effect of heat, sugar, salt, acid, and 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

- Reddy SM, *Basic Food science and Technology*, New Age Publishers, New Delhi, 2015.
- Lowe B, *Experimental cookery from chemical and physical stand point*, Forgotten books, UK, 2015
- Srilakshmi B, *Food Science*, Sixth Edition, New Age International Ltd Publishers, New Delhi, 2015
- Roday S, *Food science and Nutrition*, Oxford university press, New Delhi, 2007
- McCance and Widdowson, *Composition of food*, 6th Edition, Food Standards Agency, 2004
- Manay S and Swamy S, *Food Facts and Principles*, New Age International (P) Ltd Publishers, New Delhi, 2001
- Subramani A, *Concise Food Science*, Soundarya Publications, 1998.
- Potter NM and Hotchkiss JH, *Food Science*, C.B.S. Publishers, New Delhi, 1995.
- Peckham G.C., Foundations of Food Preparation, The Macmillan Publishing Co., N.Y, 1979

- Paul. C.C. and Palmer. R.H, Food Theory and Application John Wiley and Sons, N.Y, 1972
- Griswold R.M., The Experimental study of Foods, Houghton Mifflin Co., Boston, 1979
- Helen Charley Food Science, John Wiley and Sons, N.Y, 1970.

WEBSITES AND e-LEARNING SOURCES

www.fao.org

www.wfp.org

QUESTION PAPER TEMPLATE

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

(for candidates admitted during the academic year 2018-2021)

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

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

Title of the paper: FOOD SCIENCE

Max. Marks: 100

Paper Code: ND18/1C/FSE //

Time: 3 hrs

CN18/1C/FSE

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 –II PHYSIOLOGY

CORE-2

Course code: **ND18/2C/PHY // CN18/2C/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 – Anatomy of Reproductive Organs (Review). Spermatogenesis and Oogenesis: menstrual cycle and ovarian cycle. Influence of hormones on fertilization, conception and lactation. (20 hrs)

REFERENCE BOOKS

1. Chatterjee CC, *Human Physiology*, Volume I, 11th Edition, CBS Publishers, New Delhi, 2016
2. Chatterjee CC, *Human Physiology*, Volume II, 11th Edition, CBS Publishers, New Delhi, 2016
3. Waugh A & Grant A, [*Ross & Wilson Anatomy and Physiology in Health and Illness*](#), 12th Edition, Churchill Livingstone Elsevier evolve, 2014
4. Sathya P and Devanand V, *Textbook of Physiology*, First edition, CBS Publishers and Distributors Pvt Ltd, New Delhi, 2013
5. Sembulingam K, *Essentials of Medical Physiology*, 6th edition, Jaypee Medical Publishers, New Delhi, 2013
6. Boron WF and Boulpaep EL, *Medical Physiology*, II edition, Saunders Elsevier, 2009
7. Marieb EN, *Human Anatomy and Physiology*, VI edition, Pearson edition, 2004
8. Tortora. G & Grabowski, S.R. *Principles of Anatomy & Physiology*, 10th Edition, John Wiley & Sons, USA, 2003
9. Ganong, WF, *Review of Medical Physiology*, 21st Edition, McGraw Hill Publishers, 2003
10. Guyton AC & Hall JE, *Textbook of Medical Physiology*, 10th Edition, Harcourt Asia P.Ltd Singapore, 2001
11. Joshi, VD, *Physiology – Preparation Manual for Undergraduates*, Churchill Livingstone. New Delhi, 1995
12. Chakrabarti et al., *Human Physiology*, The New Book Stall, Calcutta, 1994

WEBSITES AND e-LEARNING SOURCES:

1. <http://ib.bioninja.com.au/standard-level/topic-6-human-physiology/>
2. <https://www.drnajeeblectures.com/cardiac-cycle/>
3. www.cvphysiology.com/Heart%20Disease/HD002
4. <https://study.com/academy/lesson/what-is-respiration-definition-process-equation.html>
5. <https://www.bbc.com/education/guides/zq349j6/revision>
6. https://books.google.co.in/books/about/Guyton_and_Hall_Textbook_of_Medical_Phys.html?id=Po0zyO0BFzWC
7. <http://jpkc.hactem.edu.cn/2012yxslx/file/Textbook%20of%20Medical%20Physiology.pdf>
8. <https://books.google.co.in/books?isbn=070205321X>
9. <https://www.us.elsevierhealth.com/medicine/physiology>
10. www.ebooks-for-all.com/bookmarks/detail/Human-Physiology/onecat/0.html

QUESTION PAPER TEMPLATE

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

(for candidates admitted during the academic year 2018-2021)

**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: ND18/2C/PHY // CN18/2C/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: **ND18/2C/PR1 // CN18/2C/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 and dry 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: 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. Lowe B, *Experimental cookery from chemical and physical stand point*, Forgotten books, UK, 2015
2. Srilakshmi B, *Food Science*, Sixth Edition, New Age International Ltd Publishers, New Delhi, 2015.
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.
4. Gunasegaran JP, *Textbook of Histology and A Practical guide*, 3rd edition, Elsevier, 2016
5. Kote N, *Practical Manual of Histology for Medical Students*, Jaypee brothers, 2014
6. Chaudhuri, A.R, *Textbook of Practical Physiology*, Paras Publishing, Hyderabad, 2000

SEMESTER I

PART IV NME- HEALTH AND NUTRITION

NME- 1

COURSE CODE: ND18/1N/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 and Food Plate. 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. Nutrition for Elderly.

REFERENCE BOOKS

1. Wardlaw M Gordon 1999. Perspectives in nutrition 4th edition, McGraw Hill
2. Eleanor Noss Whitney and Sharon Rady Rolfes, 2002. Understanding Nutrition 9th edition, West Wordsworth.
3. Kathleen Mahan and Marian Arlin 2004 Krause's Food Nutrition & Diet therapy 8th 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. Cataldo, DeBruyne and Whitney 1999. Nutrition and Diet therapy – Principles and Practice 5th edition, West/ Wadsworth, London.
7. Garrow JS, James WPT, Ralph A 2000. Human Nutrition and Dietetics 10th edition, Churchill Livingstone, NY.
8. Groff L James, Gropper S Sareen 2000. Advanced Nutrition and Human Metabolism 3rd edition, West / Wadsworth, UK.

Website

1. www.nutrition.gov - Service of National agricultural library, USDA
2. www.nal.usda.gov/fnic - Food and Nutrition information centre.

SEMESTER II

PART VI - FLOWER ARRANGEMENT

NME- 2

COURSE CODE: ND18/2N/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. Seetharaman P, Pannu P, *Interior Design and Decoration*, 1st Edition, CBS Publishers and Distributors Pvt Ltd, New Delhi, 2015.
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.

**SEMESTER III
HUMAN NUTRITION**

COURSE CODE – ND18/3C/HNU //CN18/3C/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 and Glycemic load. (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. Protein energy malnutrition.

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, functions, 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. Longvah T, Ananthan R, Bhaskar K, Venkaiah K, *Indian Food Composition Tables*, National Institute of Nutrition, 2017
2. Mahan LK, Stump SE and Raymond JL, *Krause's Food and Nutrition Care Process*, 13th Edition, Elsevier Saunders, Missouri, 2012
3. Mann and Truswell, *Essential of Human Nutrition*, 3rd edition, Oxford University Press, 2007
4. Whitney EN and Rolfes SR, *Understanding Nutrition*, 10th edition, Thomson/Wordsworth, 2005
5. Insel P, Turner E & Ross D, *Nutrition*, ADA, Jones & Bartlett, Canada, 2nd edition, 2004
6. Sumathi R. Mudambi and Rajagopal MV, *Foods and Nutrition*, 4th edition, New Age International Ltd. Publishers, New Delhi, 2001
7. Groff JL, Gropper SS, *Advanced Nutrition and Human Metabolism*, 3rd edition, West/Wadsworth, UK, 2000
8. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., *Nutritive value of Indian Foods*, NIN, Hyderabad, 2001
9. Cataldo, DeBruyne and Whitney EN, *Nutrition and Diet therapy, Principle and Practice*, 5th edition, West Wordsworth, London, , 1999
10. Gordon WM, 4th edition, *Perspectives in Nutrition*, McGraw Hill, 1999
11. Brown JE, *Nutrition now*, West Publishing Company, 1995
12. Swaminathan .M, *Principles of Nutrition and Dietetics*, Bappco, Bangalore, 1993

WEBSITES AND e-LEARNING SOURCES

1. www.nutrition.gov- Service of National agricultural library, USD
2. www.nal.usda.gov/fnic- Food and Nutrition information centre.
3. 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 2018-2021)

B.Sc DEGREE EXAMINATION II YEAR- III SEMESTER

DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND DIETETICS

Title of the paper: HUMAN NUTRITION
Paper Code: ND18/3C/HNU //CN18/3C/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 –ND18/3A/MIC// CN18/3A/MIC

Teaching Hours: 4 hrs/wk

Credits: 4

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/ 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 infections.
(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- MPN and Faecal Streptococci; Purification of water
b) **Destruction of Microorganism:** Sterilization and Disinfection – Methods
(10hours)

REFERENCE BOOKS

1. Arora DR, *Textbook of Microbiology*, 4th edition, CBS Publishers and distribution Pvt Ltd, New Delhi, 2012
2. Parija SC, *Textbook of Microbiology & Immunology*, 2nd Edition, Elsevier India, 2012
3. Anandanarayanan,R and Panicker CK, *Textbook of Microbiology*, Seventh edition, University Press, Hyderabad, 2009
4. Ramesh VK, *Food Microbiology*, MJP Publishers, 2007
5. Dubey RC, Maheswar DK, *A Textbook of Microbiology*, 1st edition, S. Chand & Co Ltd Publications, 2005
6. Jay JM, Loessner MJ, Golden DA, *Modern Food Microbiology*, 7th Edition, Springer, New york, 2005
7. Adam MR, Moses MO, *Food Microbiology*, 2nd edition, Panima publishing corporation, 2003
8. Purohit, S.S *Microbiology – Fundamentals & applications*, 6th Edition, Agrobices Indiana, 2002
9. Heritage J, Evans EGV, Killington RA, *Introductory Microbiology*, Cambridge University press, 2002
10. Pelczar, J. *Microbiology*, 7th edition, Tata McGraw Hill publishing, 1998
11. Garbutt J, *Essentials of Food microbiology*, 2nd edition, Arnold publication, New York, 1997
12. Patel A.H, *Industrial Microbiology*, Macmillan India Limited. New Delhi, 1996

WEBSITES AND e-LEARNING SOURCES:

- <https://www.us.elsevierhealth.com/medicine/microbiology>
- <https://www.journals.elsevier.com/international-journal-of-food-microbiology>
- <https://www.journals.elsevier.com/food-microbiology>
- www.cfsan.fda.gov/
- <http://www.microbiol.org/>
- <http://mic.sgnjournals.org/>
- <http://media.axon.es/pdf/86637.pdf>
- http://www.grsmu.by/files/file/university/cafedry/microbiologii-virysologii-immynologii/files/essential_microbiology.pdf
- <http://www.fim.edu.my/FSC110.pdf>
- https://booksite.elsevier.com/samplechapters/9780123705198/Sample_Chapters/02~Chapter_1.pdf
- <http://microbiologyonline.org/file/7926d7789d8a2f7b2075109f68c3175e.pdf>
- <http://themodern.farm/studies/Microbiology-Laboratory-Manual.pdf/>

QUESTION PAPER TEMPLATE

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

(for candidates admitted during the academic year 2018-2021)

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

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

Title of the paper: MICROBIOLOGY
Paper Code: ND18/3A/MIC// CN18/3A/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: ND18/4C/NLC// CN18/4C/NLC

Teaching Hours: 7 hrs/wk

Credits:5

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 (ICMR); Food plate (USDA); 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 & meditation. (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, complication of pregnancy . Lactation: Physiology of lactation, nutritional requirements during lactation, concerns of breast feeding mother. Lactogogues. (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. Childhood obesity. 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. Edelstein S, *Lifecycle Nutrition- An evidence based approach*, 2nd edition, Jones & Bartlett learning publications, 2015,
2. Mahan LK, Stump SE and Raymond JL, *Krause's Food and Nutrition Care Process*, 13th Edition, Elsevier Saunders, Missouri, 2012
3. Stump SE, *Nutrition and diagnosis related care*, 7th edition, Lippincott, 2012
4. Srilakshmi B, *Dietetics*, sixth edition, New age Publishing Press, New Delhi, 2011
5. Stacy N, *William's Basic Nutrition and Diet Therapy*, 12th edition, Elsevier publications, UK, 2005
6. Whitney EN and Rolfes SR, *Understanding Nutrition*, 9th edition, West/Wordsworth, 2002
7. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., *Nutritive value of Indian foods*, NIN, Hyderabad, 2001
8. Garrow JS, James WPT, Ralph A, *Human Nutrition and Dietetics* 10th edition, Churchill Livingstone, NY, 2000
9. Groff JL, Gropper SS, *Advanced Nutrition and Human Metabolism* 3rd edition, West / Wadsworth, UK. 2000
10. Cataldo, DeBruyne and Whitney, *Nutrition and Diet therapy– Principles and Practice* 5th edition, West/ Wadsworth, London. 1999
11. Gordon WM, *Perspectives in Nutrition*, 4th edition, McGraw Hill, 1999
12. Swaminathan M, *Principles of Nutrition and Dietetics*, Bappeo, Bangalore, 1995

WEBSITES AND e-LEARNING SOURCES:

1. <https://2012books.lardbucket.org/pdfs/an-introduction-to-nutrition/s17-nutrition-through-the-life-cyc.pdf>
2. <http://scitechconnect.elsevier.com/wp-content/uploads/2014/08/main-47.pdf>
3. <http://gerlings.faculty.mjc.edu/Lifecycle%20Nutrition%20Part%201.pdf>
4. http://fod.infobase.com/HTTP/40400/40445_worksheet.pdf
5. https://www.health.gov.bc.ca/library/publications/year/2008/Meals_and_More_M anual.pdf
6. <https://dpi.wi.gov/sites/default/files/imce/community-nutrition/pdf/menu-planning-guide-web.pdf/>

QUESTION PAPER TEMPLATE

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

(For candidates admitted during the academic year 2018-2021)

**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: ND18/4C/NLC// CN18/4C/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: ND18/4A/NBC// CN18/4A/NBC

Teaching hours: 4hrs/wk

Credits: 4

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**- Classification, Chemical composition and properties 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, AST, ALT, creatine kinase etc.

Biological oxidation-electron transport chain. (10 hours)

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. Ramadevi K, Ed: *Ambika Shanmugam's Fundamentals of biochemistry for medical students*, 8th edition, Wolters Kluwer Health, India, 2016
2. Rodwell V, Bender D, Botham KM, Kennelly PJ, Weil PA, *Harper's Illustrated Biochemistry*, 30th Edition, McGraw hill Education, 2015
3. Sulochana H, *Principles of Biochemistry*, PBS enterprises, Chennai, 2010
4. Cox MM and Nelson DL, *Lehninger Principles of biochemistry*, 5th edition, EH Freeman & Company, New York, 2008
5. Vasudevan DM, Sreekumari S, *Textbook of Biochemistry*, 5th edition, Jaypee Publishers, New Delhi, 2007
6. Veerakumari L, *Biochemistry*, 1st edition, MJP Publishers, 2005
7. Murray RK, Granner DK, Mayes PA, Rodwell VW, *Harper's Illustrated Biochemistry*, 26th edition, McGraw hill publishing house, 2003
8. Montgomery R, Conway TW, Spector AA, *Biochemistry-A care oriented Approach*. Mosby Company, 1990

Websites and e-learning resources:

1. <https://ia801208.us.archive.org/0/items/HARPERSILLUSTRATEDBIOCHEMISTRY30th/HARPER%27S%20ILLUSTRATED%20BIOCHEMISTRY%2030th.pdf>
2. <https://www.journals.elsevier.com/clinical-biochemistry>
3. <https://www.journals.elsevier.com/the-international-journal-of-biochemistry-and-cell-biology>
4. <http://www.ijmb.in>
5. <http://jpkc.gmu.cn/swhx/book/Biochemistry.pdf>
6. <http://www.jaypeedigital.com/Book/BookDetail?isbn=9788180615382&AspxAutoDetectCookieSupport=1>
7. https://www.saddleback.edu/faculty/jzoval/mypptlectures/ch15_metabolism/lecture_notes_ch15_metabolism_current-v2.0.pdf
8. http://www.inf.ed.ac.uk/teaching/courses/csb/CSB_lecture_metabolic_pathways.pdf
9. [http://www.gwu.edu/~mpb-metabolic pathways of biochemistry](http://www.gwu.edu/~mpb-metabolic%20pathways%20of%20biochemistry)
10. <http://www.indstate.edu/thcme/mwking/inborn.html>-inborn errors of metabolism
11. <http://www.worthington-biochem/introBiochem/introEnzymes.html>-enzymes
12. <http://en.wikipedia.org/wiki/Biochemistry-biochemistryencyclopedia>

QUESTION PAPER TEMPLATE

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

(for candidates admitted during the academic year 2018-2021)

**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: ND18/4A/NBC// CN18/4A/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: ND18/4C/PR2// CN18/4C/PR2

Teaching hours: 3 hrs/wk

Credits: 4

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. Quantitative estimation of reducing sugar.
6. Assessment of BMR and Calorie requirement by factorial approach.
7. Determination of Chemical Score for protein rich recipes.

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-
 1. PEM
 2. Vitamin A deficiency
 3. Nutritional anemia

REFERENCE BOOKS

1. Nielson S, *Food Analysis Laboratory Manual*, 3rd edition, Springer International Publishing, 2017
2. Longvah T, Ananthan R, Bhaskar K, Venkaiah K, *Indian Food Composition Tables*, National Institute of Nutrition, 2017
3. Abraham S, *Nutrition Through Lifecycle*, 1st edition, New age international publishers, New Delhi, 2016
4. Cheung PCK and Mehta BM (Eds), *Handbook of Food chemistry*, 1st edition, Springer-Verlag Berlin Heidelberg, 2015
5. James CS, *Analytical chemistry of Foods*, 1st edition Springer US, 1995.

SEMESTER III & IV

MICROBIOLOGY & NUTRITIONAL BIOCHEMISTRY PRACTICAL

ALLIED PRACTICAL: 1

COURSE CODE: ND18/4A/PR1// CN18/4A/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, casein and gelatin.
3. Qualitative test for individual amino acids-Tyrosine, Cysteine, Methionine, Tryptophan.
4. Qualitative test for minerals.

REFERENCE BOOKS

1. Nielson S, *Food Analysis Laboratory Manual*, 3rd edition, Springer International Publishing, 2017
2. Cheung PCK and Mehta BM (Eds), *Handbook of Food chemistry*, 1st edition, Springer-Verlag Berlin Heidelberg, 2015
3. Cappuccino J, Sherman, N, *Microbiology: A Laboratory Manual*, 10th edition, Pearson, 2013
4. Garg N and Garg KL, *Laboratory Manual of Food Microbiology*, 1st edition, KG Mukerji Publishers, 2010
5. James CS, *Analytical chemistry of Foods*, 1st edition Springer US, 1995.

SEMESTER V
FOOD SERVICE MANAGEMENT I

CORE -7

COURSECODE –ND18/5C/FM1// CN18/5C/FM1

Teaching Hours: 4hrs/wk

Credits: 4

LTP: 3 1 0

OBJECTIVES:

To help students to

1. Understand the various sectors of food service industry.
2. Become skilled in planning and design of food service units.
3. Develop skills in quantity food purchase production and service.
4. Understand the concept and principles of organization management.

COURSE OUTLINE:

UNIT I: Food Service Industry:

- a) **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.
- b) **Food service systems:** Conventional, Cook chill/ Cook Freeze, Commissary and Assembly Service.

(15 HOURS)

UNIT II: Organization management: Types of organization, Principles, Functions and Tools of management – Organization chart, Job description, Job specification, Job analysis, Work schedule, Budget and Leadership styles. (10 HOURS)

UNIT III: Planning and Layout of physical plant: Planning and organizing of spaces: Kitchen area, storage area, service area, receiving, pre-preparation, dishwashing and garbage disposal area. Concepts of work flow and work simplification techniques (10 HOURS)

UNIT IV: Menu Planning and Standardization:

- a) Menu: Definition, Functions of menu, Types of menu, French classic menu sequence, writing menu, and menu display; Factors considered in menu planning.
- b) Standardization of recipes: definition, advantages, enlargement of recipes, portion control and effective use of leftovers.

(15 HOURS)

UNIT V: Food Purchase and Storage:

- a) Food Purchase: Buying and Receiving methods.
- b) Food Storage: Types of storage; Maintenance of store records- Requisition slips, Order form, Stock book, Invoice, Goods received book, Inventories.
- c) Computer Applications in Food Service Establishments.

(10 HOURS)

REFERENCE

1. Sethi M and Malhan S, *Catering Management An integrated approach*, 3rd edition, New age international publishers, New Delhi, 2015
2. Sethi M, *Institutional Food Management*, 3rd edition, New age international publishers, New Delhi, 2015
3. Singaravelavan R, *Food and Beverage Service*, 1st edition, Oxford university press, 2011
4. Fospett D and Paskins P, *The theory of Hospitality and Catering*, Hodder Education, UK, 2011
5. Jaiswal P, *Food Quality and safety*, CBS Publishers and Distributers Pvt Ltd, New Delhi, 2011
6. Bali PS, *Quantity food Production operations & Indian Cuisine*, Oxford University Press, New Delhi, 2011
7. George B and Chatterjee S, *Food and beverage Service and Management*, JAICO, 2010
8. Kalsigsis C and Thomas C, *Design and equipment for food service -A management view*, John Wiley and sons limited, 1999
9. Lillicrap DR and Cousins JA, *Food and beverage service*, 4th edition, ELBS, 1996
10. Jones, P, *Introduction to hospitality operations (An Indispensable guide to the industry)*, Cassell publications, London, 1996
11. West B, and Wood, *Food service in institutions*, New York, 1995
12. Nathaniel BS, *Catering management for hotels, restaurants, Institutions*, Sujeet publications, New Delhi, 1991
13. Jones P, *Food service operations*, Cassell publications, London, 1990

WEBSITES AND e-LEARNING SOURCES:

1. <http://www.ccohs.ca/oshanswers/hsprograms/house.html>
2. <https://en.wikipedia.org/wiki/Foodservice>
3. <http://www.nfsmi.org/documentlibraryfiles/PDF/20080228031334.pdf>

QUESTION PAPER TEMPLATE

ETHIRAJ COLLEGE FOR WOMEN (AUTONOMOUS)
CHENNAI-600008

(for candidates admitted during the academic year 2018-2021)

B.Sc DEGREE EXAMINATION IIIYEAR- V SEMESTER

DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND DIETETICS

Title of the paper: FOOD SERVICE MANAGEMENT I

Max. Marks: 100

Paper Code: ND18/5C/FM1//

Time: 3 hrs

CN18/5C/FM1

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 : ND18/5C/HFS// CN18/5C/HFS

Teaching Hours: 5 hrs/wk

Credits :4

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.

Early Childhood - [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:

Late Childhood [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; 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. Walsh BA, Weiser DA, DeFlorio L, and Burnham MM, 1st edition, *Introduction to Human Development and Family Studies*, Psychology Press, 2017
2. Beckett C, Taylor H, *Human Growth and Development*, 3rd edition, SAGE, 2016
3. Peterson GW, Bush KR, *Handbook of Marriage and the Family*, 3rd edition, Springer US, 2016
4. Sigelman CK and Rider EA, *Life-span Human development*, 8th edition, Cengage Learning, USA, 2015
5. McCarthy JR, Edwards R, *Key Concepts in family studies*, 1st edition reprint, SAGE publications, 2010
6. Santrock WJ, *Adolescence*, 11th edition, Tata Mcgraw hill education, New Delhi, 2007
7. Berk LE, *Child Development*, 6th Edition, Prentice Hall of India Pvt Ltd, New Delhi, 2003
8. Berk LE, *Child Development*, 3rd Edition, Prentice Hall of India Pvt Ltd, New Delhi, 2001
9. Menon KMK, Palaniappan, *Mudaliar and Menon's Clinical Obstetrics*, 9th Edition, Orient Longman, Chennai, 2000
10. Devadas RP, Jaya N, *A Textbook on Child Development*, MacMillan India Ltd, New Delhi, 2003
11. Hurrlock EB, *Child development*, 6th edition, Tat Mcgraw hill education, New york, 1997
12. Park K, *Textbook of Preventive and Social Medicine*, 14th Edition, Banarasidas Bharat Publishers, Jabalpur, 1995
13. Boss P, Doherty WJ, LaRossa R, Schumm WR, Steinmet SK, *Source book of Family Theories and Methods: A Contextual Approach*, Springer Science & Business Media, 1993

WEBSITES AND E-LEARNING SOURCES:

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

QUESTION PAPER TEMPLATE

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

(for candidates admitted during the academic year 2018-2021)

**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: ND18/5C/HFS//
CN18/5C/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 – ND18/5C/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- History -principles of baking -baking process, terminologies.
Equipment and tools in baking- Hand tools, measuring & portioning devices, cookware & bakeware, processing equipment, heavy equipment. (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.(20 hrs)
Baking for special dietary needs – use of alternative ingredients & substitutes.
- UNIT-3** **Bread making**- ingredients, types of processing, types of breads – leavened and unleavened.
Cakes – ingredients, types of cakes – shortened & unshortened.
Related experience
Preparation of shortened & unshortened cakes – angel food cake, butter cake, sponge cake, chocolate cake, pound cake, muffins. (15hrs)
- UNIT-4** **Pastries**- history, types of pastries- puff pastry, short crust, Phyllo pastry, flaky pastry, choux pastry- Pies and tarts- quiches, pastry fillings.
Cookies & biscuits – ingredients, types and processing. (15hrs)
Related experience
Preparation of pastries- Short crust pastry, flaky pastry, puff pastry, choux pastry, sweet dough pastry.
- UNIT-5** **Confectionery** – chocolate and sugar based confectionery.
Chocolates- production, types, chocolate decorations
Sugar based confectionery – fudge, fondant, sugar candies, marzipan, pastillage, nougatine.
Decoration - preparation of icing- butter cream, foam, fudge, fondant, glaze, royal icing & ganache.
Piping – steps involved in piping, piping patterns. (15hrs)

REFERENCES:

1. John kingslee, A Professional Text to Bakery and Confectionery, New Age International (P) Limited,Publishers. 2014
2. Uttam, KS . Theory of Bakery and Confectionery – An Operational Approach, Kanishka Publishers, New Delhi, 2011.
3. Sarah R.Lebensky, Pricilla et al., Textbook of Baking and Pastry Fundamentals, third edition, Pearson Education Ltd, 2004.
4. The Culinary Institute of America, Baking & Pastry: Mastering the Art and Craft, John Wiley & Sons,Inc New Jersy. 2009
5. Yogambal Ashokkumar, Textbook of Bakery and Confectionery, PHI Learning Private limited, New Delhi.2012
6. Paul. C.C. and Palmer. R.H. Food Theory and Application John Wiley and Sons, N.Y, 1972
7. Griswold R.M. The Experimental study of Foods, Houghton Mifflin Co., Boston, 1979
8. Helen Charley, Food Science, John Wiley and Sons, N.Y, 1970.
9. Srilakshmi B. Food Science, New Age International Ltd., Publishers. 2001
10. N. Shakunthala Manay and N. Shadakshara Swamy, Food Facts And Principle. New age International (P) Ltd., Publishers, 2001.

QUESTION PAPER TEMPLATE

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

(for candidates admitted during the academic year 2018-2021)

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

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

Title of the paper: BAKING AND CONFECTIONERY

Max. Marks: 100

Paper Code: ND18/5C/BAK

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

Teaching hours: 5 hrs/wk

COURSECODE: ND18/5C/TD1

Credits: 4

LTP: 3 2 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

- a. Obesity
- b. Diabetes mellitus – Prediabetes, GDM, Type I & Type II.
- c. Cardiovascular diseases- atherosclerosis, hypertension, myocardial Infarction, Metabolic Syndrome.

(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, GERD.

(15 hours)

REFERENCE BOOKS

1. Width, M & Reinhardt, T. The Essential Pocket Guide for Clinical Nutrition, 2nd Ed. Wolters Kluwer, 2018.
2. Elia M, Ljungqvist O, Stratton RJ, Lanham SA, Clinical Nutrition (The Nutrition Society Textbook), 2nd edition, Wiley Blackwell Publishers, 2013
3. Mitch, W. and Ikizler, Alp. Handbook of Nutrition and the Kidney, 6th Ed. Lippincott Williams and Wilkins, New Delhi, 2010.
4. Mahan LK, Stump SE and Raymond JL, *Krause's Food and Nutrition Care Process*, 13th Edition, Elsevier Saunders, Missouri, 2012
5. Stump SE, *Nutrition and diagnosis related care*, 7th edition, Lippincott Williams and Wilkins, Canada, 2012
6. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., Nutritive value of Indian foods, NIN, Hyderabad, 2010
7. Srilakshmi B, *Dietetics*, sixth edition, New age Publishing Press, New Delhi, 2011.
8. Vimla, V. Advances in Diet Therapy, New Age International Publishers, 2009.
9. Marian M et al., Clinical Nutrition for surgical patients, Jones and Bartlett Publishers, Canada, 2008
10. Joshi Y.K, Basics of Clinical Nutrition, 2nd edition, JP Medical Publishers Pvt Ltd, New Delhi, 2008
11. Stacy N, *William's Basic Nutrition and Diet Therapy*, 12th edition, Elsevier publications, UK, 2005
12. Gibney MJ, Elia M, Ljungqvist O, Clinical Nutrition (The Nutrition Society Textbook) Wiley Blackwell Publishers, 2005
13. Whitney EN and Rolfes SR, *Understanding Nutrition*, 9th edition, West/Wordsworth, 2002
14. Guthrie H, Introductory Nutrition, CV Mosby Co.St. Louis, 2002
15. Williams SR, Nutrition & Diet Therapy, CV. Mosby St. Louis, 2001
16. Garrow et al, Human Nutrition & Dietetics, 10th Edition, Churchill Livingstone, 2001

WEBSITES AND E-LEARNING RESOURCES:

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

QUESTION PAPER TEMPLATE

ETHIRAJ COLLEGE FOR WOMEN (AUTONOMOUS)
CHENNAI-600008

(for candidates admitted during the academic year 2018-2021)

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

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

Title of the paper: THERAPEUTIC DIETETICS I
Paper Code: ND18/5C/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: ND18/5E/IDH// CN18/5E/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, 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, types of flower arrangement.
c) **Lighting:** principles, types of lighting.
(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; interdepartmental co-operation.
(15hrs)
- UNIT V:** **Cleaning tools and equipment:** cleaning agents, cleaning methods, stain removal, types of cleaning- daily, weekly and annual. Bed making Procedure. Care of public and private areas in the establishment.
Linen room: plan, layout, linen control, receiving, issuing, storage of clean linen, Selection, purchase and linen hire.
(15hrs)

REFERENCES

1. Seetharaman P, Pannu P, *Interior Design and Decoration*, 1st Edition, CBS Publishers and Distributors Pvt Ltd, New Delhi, 2015
2. Raghubalan G, Raghubalan S, *Hotel Housekeeping: Operations and Management*, 3rd edition, Oxford University Press India, 2015
3. Wildhide E, *The Interior Design Directory*, 1st Edition, Quardrille Publishing Ltd, 2009
4. Andrews S, *Textbook of Hotel Housekeeping Management & Operations*, First edition Reprint, Tata McGraw Hill Education, New Delhi, 2007
5. Khanna G, *Art of Interior Design*, 1st Edition, Indica Publishers, 2005
6. Murphy B, *Flawless Interior Decorating*, 1st Edition, McGraw Hill Publications NY, 2005.
7. Dorothy S. and Darlene .M. *Introduction to Interior Design* Macmillan publishing company, New York, 1979.
8. Goldstein H. and Goldstein V. *Art in Everyday Life*, Oxford and IBH pub co., ND

WEBSITES:

1. www.mydesignagenda.com
2. www.bestinteriordesigners.eu
3. www.interiordezine.com
4. www.bestdesignbooks.eu
5. www.homedesignideas.eu
6. <http://housekeeping.about.com>

QUESTION PAPER TEMPLATE

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

(for candidates admitted during the academic year 2018-2021)

**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: ND18/5E/IDH// Time: 3 hrs
CN18/5E/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

FOOD SERVICE MANAGEMENT II

CORE -11

COURSE CODE – ND18/6C/FM2//CN18/6C/FM2

Credits: 3

Teaching Hours: 4hrs/wk

LTP: 3 1 0

OBJECTIVE:

- To understand the concept and principles of financial management and human resource management.
- To gain knowledge on the styles of service and equipments used in food service areas.
- To understand the basic principles of sanitation and safety.

COURSE OUTLINE:

UNIT I: Financial Management:

- a) Elements of cost, Food cost, Labor cost and overhead cost and Break even analysis.
- b) Basic concept of Book Keeping: Transactions, Types- Single entry and Double entry system of book keeping, Book of Accounts – Journal, Ledger, subsidiary books, difference between Journal and Ledger; trial balance and balance sheet
- c) Food cost pricing: Methods of pricing and factors affecting pricing.(10 HOURS)

UNIT II: Human Resource Management:

- a) Recruitment, Selection, Induction, Training, Supervision, Performance appraisal, Promotion, Demotion, Transfer, Retirement, Termination and Dismissal of employees.
- b) Laws Governing Food Service Establishment pertaining to employees –Labor laws. (15 HOURS)

UNIT III: Food and Beverage Service:

- a) **Styles of Service:** Table service/ waiter service, self-service, specialized service, assisted service and single point service.
- b) Rules for laying a table, waiting at table, Attributes of food and beverage personnel, Inter-personal skills of food and beverage personnel. (10 HOURS)

UNIT IV: Equipments:

- a) Definition, classification- based on weight or size, order of use and mode of operation and factors considered in the selection of equipment
- b) Pre-preparation Equipment- Dough making machine & bread slicer, vegetable cutting machine. Cooking Equipment – Gas ranges with ovens, fryer, Rotisserie.
- c) Holding Equipment – Bain-marie and chafing dishes. Service equipment- Flatware, cutlery and hollow ware.
- d) Clearing & collection Equipment- Electric food trolleys & clearing trolleys. Washing Equipment – electric dishwasher and Glassware washing. (15 HOURS)

UNIT V: Hygiene and safety:

- a) Definition of hygiene, Personal hygiene, food hygiene, and environmental hygiene; Types of Pests and Pest control - Methods; Garbage disposal – Methods, HACCP.
- b) Accidents -Causes and Prevention (10 HOURS)

REFERENCES

1. Sethi M and Malhan S, *Catering Management An integrated approach*, 3rd edition, New age international publishers, New Delhi, 2015
2. Sethi M, *Institutional Food Management*, 3rd edition, New age international publishers, New Delhi, 2015
3. Singaravelavan R, *Food and Beverage Service*, 1st edition, Oxford university press, 2011
4. Fossett D and Paskins P, *The theory of Hospitality and Catering*, Hodder Education, UK, 2011
5. Jaiswal P, *Food Quality and safety*, CBS Publishers and Distributors Pvt Ltd, New Delhi, 2011
6. Bali PS, *Quantity food Production operations & Indian Cuisine*, Oxford University Press, New Delhi, 2011
7. George B and Chatterjee S, *Food and beverage Service and Management*, JAICO, 2010
8. Kalsigsis C and Thomas C, *Design and equipment for food service -A management view*, John Wiley and sons limited, 1999
9. Lillicrap DR and Cousins JA, *Food and beverage service*, 4th edition, ELBS, 1996
10. Jones, P, *Introduction to hospitality operations (An Indispensable guide to the industry)*, Cassell publications, London, 1996
11. West B, and Wood, *Food service in institutions*, New York, 1995
12. Nathaniel BS, *Catering management for hotels, restaurants, Institutions*, Sujeet publications, New Delhi, 1991
13. Jones P, *Food service operations*, Cassell publications, London, 1990

WEBSITES AND e-LEARNING SOURCES:

- <http://www.infoplease.com/ce6/society/a0825323.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 2018-2021)

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

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

Title of the paper: FOOD SERVICE MANAGEMENT II **Max. Marks: 100**

Paper Code: ND18/6C/FM2//CN18/6C/FM2 **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 12

Teaching hours: 5 hrs./wk

COURSE CODE: ND18/6C/TD2

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: a) Nutrition and cancer - Nutrition in the etiology of cancer, Effect of cancer therapy on nutritional status and nutrients in prevention of cancer. Nutritional assessment of cancer patients. (10 HOURS)

UNIT II

- a. AIDS – Prevalence, Etiology, pathophysiology, complications, medical & nutritional management.
- b. Diet in fevers – acute – typhoid & chronic- TB , intermittent fevers - malaria . (15 hours)

UNIT III:

- a) Diet in allergy & lactose intolerance- definition, classification, manifestation, common food allergens, tests and dietary treatment. (10hours)

UNIT IV: Nutrition in stress:

- a) Diet in Sepsis and trauma
- b) Diet in burns – definition, types and dietary management in burns.
- a) Diet in surgery – pre operative and post operative diets. (20hrs)

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. (20 hrs)

REFERENCE BOOKS

1. Width, M & Reinhardt, T. The Essential Pocket Guide for Clinical Nutrition, 2nd Ed. Wolters Kluwer, 2018.
2. Elia M, Ljungqvist O, Stratton RJ, Lanham SA, Clinical Nutrition (The Nutrition Society Textbook), 2nd edition, Wiley Blackwell Publishers, 2013
3. Mitch, W. and Ikizler, Alp. Handbook of Nutrition and the Kidney, 6th Ed. Lippincott Williams and Wilkins, New Delhi, 2010.
4. Mahan LK, Stump SE and Raymond JL, *Krause's Food and Nutrition Care Process*, 13th Edition, Elsevier Saunders, Missouri, 2012
5. Stump SE, *Nutrition and diagnosis related care*, 7th edition, Lippincott Williams and Wilkins, Canada, 2012
6. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., Nutritive value of Indian foods, NIN, Hyderabad, 2010
7. Srilakshmi B, *Dietetics*, sixth edition, New age Publishing Press, New Delhi, 2011.
8. Vimla, V. Advances in Diet Therapy, New Age International Publishers, 2009.
9. Marian M et al., Clinical Nutrition for surgical patients, Jones and Bartlett Publishers, Canada, 2008
10. Joshi Y.K, Basics of Clinical Nutrition, 2nd edition, JP Medical Publishers Pvt Ltd, New Delhi, 2008
11. Stacy N, *William's Basic Nutrition and Diet Therapy*, 12th edition, Elsevier publications, UK, 2005
12. Gibney MJ, Elia M, Ljungqvist O, Clinical Nutrition (The Nutrition Society Textbook) Wiley Blackwell Publishers, 2005
13. Whitney EN and Rolfes SR, *Understanding Nutrition*, 9th edition, West/Wordsworth, 2002
14. Guthrie H, Introductory Nutrition, CV Mosby Co. St. Louis, 2002
15. Williams SR, Nutrition & Diet Therapy, CV. Mosby St. Louis, 2001
16. Garrow et al, Human Nutrition & Dietetics, 10th Edition, Churchill Livingstone, 2001

WEBSITES AND E-LEARNING RESOURCES:

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

QUESTION PAPER TEMPLATE

ETHIRAJ COLLEGE FOR WOMEN (AUTONOMOUS)
CHENNAI-600008

(for candidates admitted during the academic year 2018-2021)

B.Sc DEGREE EXAMINATION IIIYEAR- V SEMESTER

DEPARTMENT OF NUTRITION, FOOD SERVICE MANAGEMENT AND DIETETICS

Title of the paper: THERAPEUTIC DIETETICS II
Paper Code: ND18/6C/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 unit. Sub divisions may be given.Each question carries twenty marks (Application/ Analysis/Synthesis/ Evaluation)

SEMESTER VI
SPORTS NUTRITION

CORE- 13

COURSE CODE : ND18/6C/SPN// CN18/6C/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 I: Introduction and energy requirements - Fitness- definition, benefits, components, conditioning by training, aerobic & anaerobic activities. Energy and Performance - Energy definition, role of ATP and it's 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, 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: Nutritional issues and recommendations for athletes

- a. Female athlete triad - 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, young and elderly, travelling 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. Bean A, *The Complete Guide To Sports Nutrition*, 7th edition, Bloomsbury, London, 2013.
2. Dunford M, *Fundamentals Of Sports And Exercise Nutrition*, Human Kinetics, Illinois, 2010
3. Jeukendrup A and Gleeson M, *Sports Nutrition: An introduction to energy production and performance*, Human Kinetics publishers, 2004
4. Maughan RJ, Burke LM, *Handbook of Sports Medicine & Science- Sports Nutrition*, Blackwell Science publications, 2002
5. Williams MH, *Nutrition For Health, Fitness And Sport*, 5th edition, McGraw Hill, Boston, 1999
6. William D, McArdle, Frank I, Katch and Katch VL, *Sports and Exercise Nutrition*, 4th edition, Lippincott Williams and Wilkins, 1999

WEBSITES AND e-LEARNING SOURCES:

1. www.acsm.org
2. www.ausport.govt.au
3. www.sportsci.org
4. www.gssiweb.com
5. www.acefitness.org
6. <https://www.ucd.ie/t4cms/Sports%20Nutrition%20Talk%20UCD%20seminar.pdf>
7. <https://www.dcms.uscg.mil/Portals/10/CG-1/cg111/docs/HPM/Nutrition-for-Sports-Performance.pdf?ver=2017-04-04-152011-810>
8. http://samples.jbpub.com/9781284036695/9781449690045_CH01_pass03.pdf
9. <https://www.albertahealthservices.ca/assets/info/nutrition/if-nfs-sports-nutrition-for-youth.pdf>
10. <http://ommolketab.ir/aaf-lib/5g2s72u8j4qfbi9p4x56zhsjxru8rf.pdf>
11. https://www.researchgate.net/profile/Lisa_Mcanulty/publication/229071049_Eating_Before_During_and_After_the_Event/links/56d4899c08aefd177b0f5a9c/Eating-Before-During-and-After-the-Event.pdf
12. <http://www.aco.org.nz/pdf/nutrition-for-sports.pdf>

QUESTION PAPER TEMPLATE

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

(for candidates admitted during the academic year 2018-2021)

**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: ND18/6C/SPN//

Time: 3 hrs

CN18/6C/SPN

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

PUBLIC HEALTH NUTRITION

ELECTIVE 2

**COURSE CODE: ND18/6 E/PHN//
CN18/6E/PHN**

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, Nutrition 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. Chander Vir S, Public Health Nutrition in developing countries, Part I, 1st edition, Woodhead Publishing, New Delhi, 2011
2. Chander Vir S, Public Health Nutrition in developing countries, Part II, 1st edition, Woodhead Publishing, New Delhi, 2011
3. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., Nutritive value of Indian foods, NIN, Hyderabad, 2010
4. Bamji, M. Textbook of Human Nutrition, Oxford publishers, New Delhi, 2010
5. Bhatt, VB, *Protein Energy Malnutrition*, PeePee Publishers, New Delhi, 2008
6. Sharma N, *Child Nutrition*, 1st edition, Murarilal & sons, New Delhi, 2006
7. Gupte S, Textbook of Pediatric Nutrition, Pawaninder P Vij Publishers, New Delhi, 2006
8. Park K, Park's Textbook of Preventive Medicine, 2005
9. [Gibney MJ](#), [Margetts BM](#), [Kearney JM](#), [Arab L](#) (Ed), *Public Health Nutrition (The Nutrition Society Textbook)*, 1st edition, Wiley black well, 2004
10. WHO, The Management of Nutrition in Major Emergencies, AITBS Publishers, New Delhi, 2000
11. Sachdev HPS, Choudhary P, *Nutrition In Children – Developing Country Concerns*, BI publications, New Delhi, 1994
12. Swaminathan M, Principles of Nutrition and Dietetics, Bappeo, Bangalore, 1993
13. Young H, Nutrition in Emergencies (Practical Health Guides), 1st edition, Oxfam, 1991

WEBSITES AND e LEARNING RESOURCES:

1. www.nin.org- National Institute of Nutrition, Hyderabad, India
2. www.icmr.org – Indian Council for medical Research.
3. <https://motherchildnutrition.org/resources/pdf/mcn-iasc-toolkit-nutrition-in-emergency-situations.pdf>
4. http://fscluster.org/sites/default/files/documents/chapter_9_food_and_nutrition.pdf
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3148629/>

QUESTION PAPER TEMPLATE

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

(for candidates admitted during the academic year 2018-2021)

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

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

Title of the paper: PUBLIC HEALTH NUTRITION

Max. Marks: 100

**Paper Code: ND18/6E/PHN//
CN18/6E/PHN**

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: ND18/6E/FPR//
CN18/6E/FPR
Credits: 5 LTP: 4 1 0

Teaching Hours: 5 hrs/wk

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. Sivasankar B, *Food Processing and Preservation*, Prentice Hall of India (P) Ltd, New Delhi, 2008
2. Manay SN, Swamy MS, *Food Facts and Principles*, 3rd edition, New Age International (P) Ltd, New Delhi, 2008
3. Khetarpaul N, *Food Processing and Preservation*, Daya Publishing House, New Delhi, 2005
4. Hausner A, *Preserved Foods and Sweetmeats*, Biotech Books, New Delhi, 2005
5. Jood S and Khetarpaul N, *Food Preservation*, Agro Tech Publishing Academy, Udaipur, 2002
6. Subbulakshmi G, Udipi SA, *Food Processing and Preservation*, New Age International (P) Ltd, Publishers, New Delhi, 2001
7. NIIR BOARD, *Manual of Modern Technology on Food Preservation*, Asia Pacific Business Press Inc, New Delhi.

QUESTION PAPER TEMPLATE

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

(for candidates admitted during the academic year 2018-2021)

**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: ND18/6E/FPR//
CN18/6E/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 PRACTICAL

CORE- 14

COURSE CODE – ND18/6C/PR3// CN18/6C/PR3

Practical Hours: 3hrs/wk

Credits: 3

LTP: 003

FOOD SERVICE MANAGEMENT I

1. Visit to sectors of food industry – any 2 commercial and non-commercial sectors.
2. Standardization of two portions of North Indian, South Indian and Chinese Cuisine.

FOOD SERVICE MANAGEMENT II

1. Quantity production of standardized 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://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).

**SEMESTER V & VI
THERAPEUTIC DIETETIC PRACTICAL**

CORE- 15

Teaching hours: 3 hrs/wk

COURSE CODE: ND18/6C/PR4

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, Celiac disease
 - d. Liver disorders- Hepatitis & Cirrhosis
 - e. Obesity
 - f. Diabetes mellitus – Type 1 and Type 2, GDM.
 - g. Cardiovascular diseases – Hypertension, Atherosclerosis, Myocardial Infarction.

2. Dietetic internship in a teaching hospital for 2 weeks to be conducted & completed before the completion of the degree at the end of fifth semester.

THERAPEUTIC DIETETICS II

1. Planning and preparing diet in cancer.
2. Planning and preparing diet in AIDS.
3. Planning and preparing pre & postoperative diets.
4. Planning and preparing diet in trauma, burns.
5. Kidney – acute kidney disease, chronic kidney disease, urinary calculi.
6. Survey on oral nutritional supplements.

REFERENCE BOOKS

1. Width, M & Reinhardt, T. The Essential Pocket Guide for Clinical Nutrition, 2nd Ed. Wolters Kluwer, 2018.
2. Elia M, Ljungqvist O, Stratton RJ, Lanham SA, Clinical Nutrition (The Nutrition Society Textbook), 2nd edition, Wiley Blackwell Publishers, 2013
3. Mitch, W. and Ikizler, Alp. Handbook of Nutrition and the Kidney, 6th Ed. Lippincott Williams and Wilkins, New Delhi, 2010.
4. Mahan LK, Stump SE and Raymond JL, *Krause's Food and Nutrition Care Process*, 13th Edition, Elsevier Saunders, Missouri, 2012
5. Stump SE, *Nutrition and diagnosis related care*, 7th edition, Lippincott Williams and Wilkins, Canada, 2012
6. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., Nutritive value of Indian foods, NIN, Hyderabad, 2010
7. Vimla, V. Advances in Diet Therapy, New Age International Publishers, 2009.
8. Marian M et al., Clinical Nutrition for surgical patients, Jones and Bartlett Publishers, Canada, 2008
9. Joshi Y.K, Basics of Clinical Nutrition, 2nd edition, JP Medical Publishers Pvt Ltd, New Delhi, 2008