

# **Sri Meenakshi Government Arts College for Women**

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

Re-Accredited with 'A' Grade by NAAC (3rd Cycle)

Madurai - 625 002.



## **M.Sc. Home Science**

**CHOICE-BASED CREDIT SYSTEM**

**OUTCOME-BASED EDUCATION**

### **SYLLABUS**

**(For those who joined in 2021 - 2022)**

**SRI MEENAKSHI GOVERNMENT ARTS COLLEGE FOR WOMEN (A),  
MADURAI**

**SYLLABUS FOR M.Sc. HOME SCIENCE**

**INDEX**

<b>S.No.</b>	<b>Particulars</b>		<b>Page No.</b>
<b>1</b>	<b>PROFILE OF THE DEPARTMENT</b>		<b>i</b>
<b>2</b>	<b>PROGRAMME OUTCOMES</b>		<b>ii</b>
<b>3</b>	<b>SCHEME FOR INTERNAL &amp; EXTERNAL ASSESSMENT</b>		<b>iii</b>
<b>4</b>	<b>QUESTION PAPER PATTERN &amp; BLUEPRINT</b>		<b>iv</b>
<b>5</b>	<b>PROGRAMME STRUCTURE</b>		<b>v</b>
<b>6</b>	<b>SYLLABUS, LESSON PLAN</b>		
	<b>SEMESTER I</b>	<b>CORE PAPERS</b>	<b>1 - 11</b>
		<b>ELECTIVE PAPERS</b>	<b>12 - 16</b>
	<b>SEMESTER II</b>	<b>CORE PAPERS</b>	<b>17 - 28</b>
		<b>ELECTIVE PAPERS</b>	<b>29 - 33</b>
	<b>SEMESTER III</b>	<b>CORE PAPERS</b>	<b>34 - 44</b>
		<b>ELECTIVE PAPERS</b>	<b>45 - 49</b>
		<b>NON MAJOR ELECTIVE</b>	<b>50 - 52</b>
	<b>SEMESTER IV</b>	<b>CORE PAPERS</b>	<b>53 - 59</b>
		<b>ELECTIVE PAPERS</b>	<b>60 - 63</b>
		<b>PROJECT</b>	<b>64</b>

**SRI MEENAKSHI GOVERNMENT ARTS COLLEGE FOR WOMEN (A), MADURAI****DEPARTMENT OF HOME SCIENCE****SCOPE OF HOME SCIENCE:**

The study of Home Science helps the pupil to lead a more satisfying personal, family and community life because of the knowledge, understanding, skills and appreciation of cultural and spiritual values a pupil acquires through Home Science education. Unlike other subjects, Home Science is a practical science that applies to everyday life. As a skill-oriented subject, it offers maximum opportunity to express one's ability to achieve one's potential in diverse fields, as an individual and a team player and develop leadership qualities.

Home Science education develops qualities needed for responsible citizenship. Home Science helps pupils to recognize the importance of food in healthy living, teaches how to prepare food by retaining its nutrients and the importance of a balanced diet. It also enables one to achieve healthy family relationships and manage household resources. Home Science education lays the foundation for entrepreneurship, a sustainable path towards today's youth empowerment. The student becomes efficient to nurture and take care of the young, to foster their healthy growth and development. Moreover one gains technical knowledge and information from various branches of Home Science for both personal and professional capabilities.

YEAR OF ESTABLISHMENT OF THE DEPARTMENT: 1979-1980

COURSES OFFERED: CBCS Course Structure; Outcome-Based Education (OBE)

- UG COURSE offered since 2000-2001:  
**B.Sc. Home Science (Nutrition, Food Service Management & Dietetics)**
- PG COURSE offered since 2018-2019: **M.Sc. Home Science**

**VISION:** *To uplift the socially backward and economically poor young women of the society through value-based education in health & nutrition*

**MISSION**

- **Equip students to become messengers of nutrition to the community at large**
- **Impart skills and techniques to find placement in the food & health sector**
- **Revise syllabus constantly for social relevance & employability**
- **Provide flexibility & academic freedom through Choice Based Credit System**
- **Identify strengths & eliminate weaknesses**
- **Provide accountability & accreditation**

**PROGRAMME: M.Sc. HOME SCIENCE****ELIGIBILITY FOR ADMISSION: As per DCE norms (Pass in B.Sc. Home Science or equivalent)****PROGRAMME OUTCOMES**

1. Exhibit advanced comprehensive knowledge in the core and elective subjects with relevant practical experience
2. Develop professional competency as a team player in diverse interdisciplinary settings
3. Gain real-time experience through demonstrations, internships and projects for further career prospects
4. Demonstrate problem-solving, decision making and communication skills to interact with all stakeholders
5. Identify research problems with creativity and sensitivity to attain sustainable solutions
6. Translate the acquired knowledge and skills to evolve as a sensible global citizen.

**PROGRAMME SPECIFIC OUTCOMES**

1. Appreciate nuances of value-based life-skill oriented learning
2. Devise strategies for promoting healthy living in the community
3. Develop comprehensive and analytical skills in food industries and health sectors
4. Demonstrate higher-order skill set in all the specializations of Home Science
5. Appraise and distinguish exceptional situations in human development to make early detection of special needs
6. Achieve desirable change in the development and empowerment of people

**Mapping of COs with POs and PSOs**

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Mean Score of COs = $\frac{\text{Total of Value}}{\text{Total No. of POS \& PSOs}}$			Mean Overall Score of COs = $\frac{\text{Total of Mean Score}}{\text{Total No. of COs}}$		

CO: COURSE OUTCOME

PO: PROGRAMME OUTCOME

PSO: PROGRAMME SPECIFIC OUTCOME

**SCHEME FOR INTERNAL ASSESSMENT****Theory:** Internal: 25 marks**Practical:** Internal: 40 marks

The pattern of internal assessment will be as follows:

Test average of two tests	10 marks
Model Exam	10 marks
Assignments	5 marks
<b>Total</b>	<b>25 marks</b>

**SCHEME FOR EXTERNAL ASSESSMENT****Theory:** External Exam: Maximum 75 marks**Practical:** External Exam: Maximum 60 marks**PASSING MINIMUM**

Assessment	Internal	External	Aggregate
Theory	No minimum	45% of 75 (34/75)	50/100
Practical	No minimum	45% of 60 (27/60)	50/100

**QUESTION PAPER PATTERN**

<b>Title of the paper</b>		
<b>Subcode:</b>	<b>Time : 3 Hours</b>	<b>Max Marks: 75</b>
<b>Section - A</b>		<b>(5x6=30)</b>
Question No. 1 to 5 (Two questions from each unit)		
Answer ALL Questions ( <b>Internal Choice</b> )		
Answers not exceeding two pages		
<b>Section – B</b>		<b>(3 x 15 = 45)</b>
Question No. 6 to 10 (One question from each unit)		
Answer any 3 questions out of 5		
Answers not exceeding four pages		

**BLUEPRINT**

UNIT	SECTION		TOTAL Questions & Marks
	A 6 MARKS EACH 5 questions INTERNAL CHOICE	B 15 MARKS EACH 3 out of 5 OPEN CHOICE	
I	2	1	3
II	2	1	3
III	2	1	3
IV	2	1	3
V	2	1	3
Total Marks	30	45	75

**PATTERN OF EVALUATION**

Scale of assessment (BLOOM'S TAXONOMY)	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

## M.Sc. HOME SCIENCE- PROGRAMME STRUCTURE

The Department of Home Science has structured the PG Course with the aim of enabling our students to clear the UGC-NET/ SET/ RD examination. The syllabi of core courses have been designed keeping in line with the curriculum of the above-mentioned examinations.

SEM	CODE	COURSE TITLE	Hrs/Wk	Cr	Int	Ext	Total
I	NA1	Core I - Applied Physiology	6	5	25	75	100
	NA2	Core II -Advanced Food Science	6	5	25	75	100
	NA3	Core III -Food Safety and Quality Control	6	5	25	75	100
	NL1	Core IV -Food and Nutrient Analysis Practical	3+3	3	40	60	100
	ENA1	Elective I (a)-Family Resource Management	6	5	25	75	100
	ENA2	Elective I (b)-Food Processing and Packaging					
		<b>TOTAL</b>	<b>30</b>	<b>23</b>	<b>-</b>	<b>-</b>	<b>500</b>
II	NB1	Core V- Principles of Nutrition	6	5	25	75	100
	NB2	Core VI – Applied Human Nutrition	6	5	25	75	100
	NB3	Core VII - Biochemical changes in Diseases	6	5	25	75	100
	NL2	Core VIII - Clinical Investigation Practical	3+3	3	40	60	100
	ENB3	Elective II (a)-Trends and Issues in Human Development	6	4	25	75	100
	ENB4	Elective II (b)-Diabetes Care and Education					
		<b>TOTAL</b>	<b>30</b>	<b>22</b>	<b>-</b>	<b>-</b>	<b>500</b>
III	NC1	Core IX – Diet in Metabolic Diseases	5	5	25	75	100
	NC2	Core X – Clinical Nutrition and Dietetics	6	5	25	75	100
	NC3	Core XI - Research Methodology and Statistics	6	5	25	75	100
	NL3	Core XII –Clinical Nutrition and Dietetics Practical	3+3	3	40	60	100
	ENC5	Elective III (a)-Current Trends in Extension Education and Communication	5	4	25	75	100
	ENC6	Elective III (b)-Public Health & Epidemiology					
	NMPN	NME-Nutrition for Health and Fitness	2	2	25	75	100
		<b>TOTAL</b>	<b>30</b>	<b>24</b>	<b>-</b>	<b>-</b>	<b>600</b>
IV	ND1	Core XIII -Institutional Food Administration	6	5	25	75	100
	ND2	Core XIV-Food Product Development and Marketing	6	5	25	75	100
	NL4	Core XV-Dietetic Internship	6	3	40	60	100
	END7	Elective IV (a)-Textiles and Clothing	6	4	25	75	100
	END8	Elective IV (b)-Gender Studies					
	NPW	Project	6	4	-	100	100
		<b>TOTAL</b>	<b>30</b>	<b>21</b>	<b>-</b>		<b>500</b>
	<b>GRAND TOTAL</b>	<b>120</b>	<b>90</b>			<b>2100</b>	

Programme : M.Sc. HOME SCIENCE

Semester : I

Core Paper- I

Hours per week: 6

90 hrs/Semester

Sub. Code : NA1

Credits : 5

**TITLE OF THE COURSE: APPLIED PHYSIOLOGY**

Pedagogy	Hours	Lecture	Peer Group Teaching	Demo/OER/Tutorial	GD/Seminar	ICT/Blended Learning	IV/DI
	90	53	-	9	-	28	-

**PREAMBLE**

This course is designed to:

- Familiarize the structure and functions of systems in human body
- Understand the integrated functions of all systems and disease conditions

<b>COURSE OUTCOME</b>		Unit	Hrs P/S
At the end of the Semester, the Students will be able to			
<b>CO1:</b> Connect the functions of blood components with disorders of blood and immune system.		I	18
<b>CO2:</b> Differentiate the phases of cardiac cycle and demonstrate measurement of blood pressure.		II	18
<b>CO3:</b> Explain mechanism of respiration, lung capacities, digestive and absorption of food.		III	18
<b>CO4:</b> Illustrate structure and functions of nervous and excretory systems.		IV	18
<b>CO5:</b> Integrate mechanism of hormonal secretion, action and regulation.		V	18
<b>CO6:</b> Describe role of hormones in fertilization.		V	

**SYLLABUS**

**UNIT 1**

**Blood**-Composition, functions of WBC, RBC, Platelets, Plasma protein, Leucocytes; Erythropoiesis. Disorders of blood – Anaemia - types, White blood cell, Platelets, Clotting of blood. Lymphatic system; Tissue fluid: Intracellular & Extracellular. Immune system-antigen, antibodies; Auto-immune disorders - Gravis, Sjogren's syndrome, rheumatoid arthritis, haemolytic anaemia, thyroiditis.

**UNIT II**

**Circulatory system** – Classification (Systemic, pulmonary, coronary, portal, cerebral and foetal circulation) cardiac cycle, cardiac output, Blood pressure- measurement of blood pressure, peripheral resistance, Hypotension, Hypertension- types. Thrombophlebitis.

**UNIT III**

**Respiratory System** -Anatomical Structures, Mechanism of respiration. Disturbances of respiration – apnea, hypo and hyperventilation, hypoxia, asphyxia, Oxygen toxicity. Lung volumes, Lung capacities. Composition of alveolar air, inspired air and expired air.

**Digestive system:** Composition, functions and secretory mechanism of digestive juices (Saliva, Gastric juice, Pancreatic juice, Bile juice). Digestion of food – carbohydrate, protein, fat; Process of absorption- carbohydrate, protein, fat and water.

**UNIT IV**

**Nervous System:** Anatomical classification of nervous system, structure and functions of neurons, sensation, reflexes. Disorders of spinal cord - multiple sclerosis. Disorders of basal ganglia - Parkinson's disease, Huntington chorea. Sleep disorder. Epilepsy.

**Excretory system:** Formation of urine, characteristics of urine, normal and abnormal constituents of urine; osmotic diuresis. Abnormalities of micturition - atonic bladder, nocturnal micturition. Sense organs - Abnormalities of taste sensation - ageusia, hypogeusia, dysgeusia, taste blindness. Abnormalities of olfactory sensation - anosmia, hyposmia, hyperosmia. Skin- structure, functions.

**UNIT V**

**Endocrine system**—Classification of hormones – steroids, proteins and derivatives of tyrosine. Mechanism of hormonal action. Structure and functions of Pituitary, adrenal, thyroid, pancreas, parathyroid, pineal and thymus glands. Conditions of Hypo and Hyperactivity. Regulation of hormone secretion.

**Reproductive System**- Female reproductive system, Primary female sex organs and hormones (Ovaries, graafian follicle, ovum, uterus, vagina, oestrogen, progesterone) secondary female sex organs (Mammary glands); Menstruation cycle, fertilization. Abnormal menstruation - oligomenorrhea, dysmenorrhea, amenorrhea. Male reproductive system - Hypo and hypergonadism in males.

**TEXTBOOK**

1. Ratan, V. (2004) Handbook of Human Physiology (Seventh Edition), Jaypee Brothers Medical Publishers, New Delhi.
2. Chatterjee, C.C. (2016) 11<sup>th</sup> Edition, Human Physiology Volume I, CBS Publishers and Distributors Pvt. Ltd., Mumbai.

**REFERENCES**

1. Sembulingam, K. & Sembulingam, P. (2012) 6<sup>th</sup> Edition, Essentials of Medical Physiology, Jaypee Brothers Medical Publishers Pvt. Ltd., New Delhi.
2. Joshi, D.V. (1995) Preparatory Manual for Undergraduate Physiology, B.I. Churchill LivingStone, New Delhi.
3. Subramaniam & Kutty, S.M. (2001) TextBook of Human Physiology, S. Chand & Company Ltd., New Delhi.
4. Umamaheshwari, B & Sampath, K. (2007) A Textbook of Human Anatomy & Physiology, Birla Publications Pvt. Ltd.

**Open Educational Resources**

Blood <http://www.ignouhelp.in/ignou-mfn-01-study-material/>-

Skin - <http://ecoursesonline.iasri.res.in/course/view.php?id=633>

Endocrine system - [https://epgp.inflibnet.ac.in/view\\_f.php?category=554](https://epgp.inflibnet.ac.in/view_f.php?category=554)

**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	<b>Blood</b> -Composition, Functions - WBC, RBC, Platelets, Plasma Protein, Leucocytes	3	Lecture
	Erythropoiesis, Disorders of blood – Anaemia - types, White blood cell, Platelets, Clotting of blood.	6	Lecture
	<b>Lymphatic system</b> ; Tissue fluid - intracellular and extracellular	3	OER
	Immune system-antigen, antibodies; Autoimmune disorder: Gravis, Sjogren's syndrome, Rheumatoid arthritis, Hemolytic anaemia, Thyroiditis.	6	ICT
UNIT II	<b>Circulatory system</b> – Classification- Systemic	2	Lecture
	Pulmonary, coronary, Portal, cerebral and foetal circulation	6	Lecture
	Cardiac cycle, Cardiac output	4	ICT
	Blood pressure- measurement of blood pressure, Peripheral resistance, Hypotension, Hypertension- types. Thrombophlebitis.	6	ICT
UNIT III	<b>Respiratory System</b> - Anatomical Structures, Mechanism of respiration.	3	Lecture

	Disturbances of respiration – apnea, Hypo and hyperventilation, Hypoxia, Asphyxia, Oxygen toxicity, Lung volumes, Lung capacities, Composition of alveolar air, inspired air and expired air.	5	Lecture
	<b>Digestive system:</b> Composition, functions, Secretary mechanism of digestive juices- Saliva , Gastric juice, Pancreatic juice, Bile juice	4	Lecture
	Digestion of food – carbohydrate, protein, fat	3	Lecture
	Process of absorption- carbohydrate, protein, fat and water.	3	ICT
UNIT IV	<b>Nervous System:</b> Anatomical classification of nervous system	2	Lecture
	Structure and Functions of neurons , Sensation, Reflexes. Disorders of spinal cord - multiple sclerosis. Disorders of basal ganglia - Parkinson’s disease, Huntington chorea. Sleep disorder. Epilepsy.	7	Lecture
	<b>Excretory system:</b> Formation of urine, Characteristics of urine, Normal and abnormal constituents of urine. osmotic diuresis. Abnormalities of micturition - atonic bladder, nocturnal micturition.	3	Lecture
	<b>Sense organs</b> - Abnormalities of taste sensation - ageusia, hypogeusia, dysgeusia, taste blindness. Abnormalities of olfactory sensation - anosmia, hyposmia, hyperosmia.	3	OER
	Skin- structure, functions.	3	ICT
UNIT V	<b>Endocrine system</b> –Classification of hormones – steroids, Proteins and derivatives of tyrosine.	3	OER
	Mechanism of hormonal action, Structure and functions of Pituitary, Adrenal, thyroid	4	Lecture
	Pancreas, parathyroid, pineal and thymus glands, Conditions of Hypo and Hyperactivity, Regulation of hormone secretion.	3	Lecture
	<b>Reproductive System</b> -Review on Female and male reproductive system, Primary female sex organs and hormones (Ovaries, graafian follicle, ovum, uterus, vagina, oestrogen, progesterone)	2	Lecture
	Secondary female sex organs (Mammary glands); Menstruation cycle, fertilization, Abnormal menstruation - oligomenorrhea, dysmenorrhea, amenorrhea. Male reproductive system -Hypo and hypergonadism in males.	6	ICT

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO6	
CO1	5	3	4	2	3	2	4	5	3	3	3	2	3.3
CO2	5	3	4	2	3	2	4	5	3	3	3	2	3.3
CO3	5	3	4	2	3	2	4	5	3	3	3	2	3.3
CO4	5	3	4	2	3	2	4	5	3	3	3	2	3.3
CO5	5	3	4	2	3	2	4	5	3	3	3	2	3.3
CO6	5	3	4	2	3	2	4	5	3	3	3	2	3.3
MEAN OVERALL SCORE													3.3

Result: The score for this course is 3.3 (High Relationship)

Programme : M.Sc. HOME SCIENCE

Semester : I

Core Paper - II

Hours per week: 6

90 hrs/Semester

Sub. Code : NA2

Credits : 5

**TITLE OF THE COURSE: ADVANCED FOOD SCIENCE**

Pedagogy	Hours	Lecture	Peer Teaching	Demo/OER/ Tutorial	GD/Seminar/Flipped Classroom	ICT/ Blended Learning	IV/DI
	90	38	8	11	20	13	--

**PREAMBLE**

This course is designed to:

- Provide an understanding of composition of various foodstuffs.
- Familiarize students with changes occurring in various foodstuffs as a result of processing and cooking.
- Enable students to use theoretical knowledge in various applications and food preparations.

<b>COURSE OUTCOME</b>	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
<b>CO1:</b> Analyze the constituents of foods and their physical properties.	I	18
<b>CO2:</b> Apply the classification and properties of carbohydrates in food products.	II	18
<b>CO3:</b> Familiarize with need, types and scope of novel proteins and protein substitutes.	III	18
<b>CO4:</b> Discuss the role of enzymes in food fermentation.	IV	18
<b>CO5:</b> Examine the quality of food fat based on functional properties.	V	18
<b>CO6:</b> Compare food colours and flavours and their safety limits.		

**SYLLABUS**

**UNIT I**

**Water and Food Dispersions:** Physical properties of water, chemical nature, Free and bound water, solutions and colligative properties. Water activity and Food spoilage.

**Food Colloids and Emulsions:** Classification, stabilization of colloidal systems.

- Gels: Structure, formation, strength, types.
- Emulsions: Formation, stability, surfactants and emulsifiers
- Foams: Structure, formation and stabilization.

**UNIT II**

**Polysaccharides, Sugars and Sweeteners:**

- Starch: Structure and Composition, Gelatinization and dextrinization, Effects of ingredients and conditions on gelatinization. Modified food starches. Non-starch Polysaccharides: Cellulose, hemicellulose, pectins, gums, animal / plant polysaccharides.
- Sugars: Kinds of sugar, sugar syrups, sugar products. Properties –solubility, hydrolytic reactions, crystallization, hygroscopicity, colligative properties, textural contributions, fermentation, non-enzymatic browning.
- Sweeteners: Types, properties, applications in food products

**UNIT III**

**Proteins in foods:**

- Structure, Composition, coagulation, denaturation, non-enzymatic browning, putrefaction, and other chemical changes.
- Protein Concentrates, Hydrolysates and textured vegetable proteins.
- Milk substitutes-Soya, Groundnut and Coconut milk.

**Enzymes:**

- Classification and Nature, stability and action.
- Proteolytic enzymes, oxidases, lipases, enzymes decomposing carbohydrates and applications.
- Enzymes in food fermentations. Immobilized enzymes.

**UNIT IV****Fats and Oils:**

- Sources, Composition, Oil extraction, refining, hydrogenation, winterizing.
- Fats and Oils: Composition, Functional properties of fat and uses in food preparations. Animal fats and Plant oils. Smoking point of different edible oils.
- Changes in fat on cooking and processing. Trans-fats.
- Fat deterioration: types of rancidity and antioxidants. Fat substitutes.

**UNIT V****Food Colours and Flavours:**

- Pigments classification, structure and properties; Effects of processing on stability of pigments in foods and the factors influencing stability of colours in foods; Role of colours in food products. Safety limits.
- Flavors: Taste and nonspecific saporous sensations, Flavour compounds in vegetables, fruits and spices; Flavours produced from fermentation and volatiles on foods; Effect of processing on food flavours; Role of flavours in food products. Flavour encapsulation.

**TEXT BOOKS**

1. Manay, S. and ShadaksharaSwamy, Food: Facts and Principles, New Age International (P) Publishers, New Delhi.

2. Srilakshmi, B. (2018) Food Science, 7<sup>th</sup> Edition, New Age International Ltd., New Delhi.

**REFERENCES**

1. Potter, N. and Hotch Kiss, J.H. (1996): Food Science, Fifth edition, CBS Publishers and Distributors, New Delhi

2. Charley, H. (1982). Food Science, 2nd edition, John Wiley & Sons, New York.

3. Meyer, L.H. 1974. Food Chemistry, AVI Publishing Co. Inc,

4. Chandrasekhar, U. (2002) Food Science and Applications in Indian Cookery, Phoenix Publishing House Pvt. Ltd., New Delhi

**JOURNALS**

- Journal of Food Science.
- Advances in Food Research.
- Journal of Food Science and Technology.

**Open Educational Resources**

Emulsion and colloids - [https://epgp.inflibnet.ac.in/view\\_f.php?category=546](https://epgp.inflibnet.ac.in/view_f.php?category=546)

Gelatinization - [https://epgp.inflibnet.ac.in/view\\_f.php?category=546](https://epgp.inflibnet.ac.in/view_f.php?category=546)

Fats and oils - [https://epgp.inflibnet.ac.in/view\\_f.php?category=546](https://epgp.inflibnet.ac.in/view_f.php?category=546)

**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	<b>Water and Food Dispersions:</b> Physical properties of water, chemical nature, Free and bound water	2	Lecture
	Solutions and colligative properties.	3	Group Discussion
	Water activity and Food spoilage.	3	Blended Learning
	<b>Food Colloids and Emulsions:</b> Classification, stabilization of colloidal systems.	3	OER
	Gels: Structure, formation, strength, types.	2	Lecture
	Emulsions: Formation, stability, surfactants and emulsifiers	2	Lecture
	Foams: Structure, formation and stabilization	3	Demo

UNIT II	<b>Polysaccharides, Sugars and Sweeteners</b> Starch: Structure and Composition, Gelatinization and dextrinization	2	Lecture
	Effects of ingredients and conditions on gelatinization.	3	OER
	Modified food starches.	2	Lecture
	Non-starch Polysaccharides: Cellulose, hemicellulose, pectins, gums, animal / plant polysaccharides.	2	Lecture
	Sugars: Kinds of sugar, sugar syrups, sugar products.	2	Group Discussion
	Properties – solubility, crystallization, hygroscopicity, colligative properties, textural contributions	3	Lecture
	Fermentation, non-enzymatic browning	2	Flipped Classroom
	Sweeteners: Types, properties, applications in food products	2	Peer Teaching
UNIT III	<b>Proteins in foods:</b> Structure, Composition, coagulation, denaturation	3	Lecture
	Non-enzymatic browning, putrefaction, and other chemical changes.	3	Lecture
	Protein Concentrates, Hydrolysates and textured vegetable proteins.	2	Blended Learning
	Milk substitutes–Soya, Groundnut and Coconut milk.	2	Group Discussion
	<b>Enzymes</b> – Classification and Nature, stability and action.	2	Peer Teaching
	Proteolytic enzymes, oxidases, lipases, enzymes decomposing carbohydrates and applications.	3	Flipped Classroom
	Enzymes in food fermentations. Immobilized enzymes.	3	Seminar
UNIT IV	<b>Fats and Oils</b> Sources, Composition	2	Lecture
	Oil extraction, refining	2	Blended Learning
	Hydrogenation, winterizing	2	Blended Learning
	Fats & Oils: Composition, Functional properties of fat, uses in food preparations.	2	OER
	Animal fats and Plant oils. Smoking point of different edible oils.	2	Lecture
	Changes in fat on cooking and processing.	2	Group Discussion
	Trans-fats	2	Lecture
	Fat deterioration: types of rancidity and antioxidants.	2	Peer Teaching
	Fat substitutes.	2	Lecture
UNIT V	<b>Food Colours</b> Pigments classification, structure, properties	3	Lecture
	Effects of processing on stability of pigments in foods and the factors influencing stability of colours in foods	2	Blended Learning
	Role of colours in food products. Safety limits.	3	Lecture
	<b>Flavors:</b> Taste and nonspecific saporous sensations.	3	Lecture
	Flavour compounds in vegetables, fruits and spices	2	Blended Learning
	Flavours produced from fermentation and volatiles on foods	2	Peer Teaching
	Effect of processing on food flavours; Role of flavours in food products. Flavour encapsulation	3	Flipped Classroom

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)							MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	
CO1	5	3	4	3	3	3	4	4	4	3	3	2	3.4
CO2	5	3	4	3	3	3	4	4	4	3	3	2	3.4
CO3	5	3	4	3	3	3	4	4	4	3	3	2	3.4
CO4	5	3	4	3	3	3	4	4	4	3	3	2	3.4
CO5	5	3	4	3	3	3	4	4	4	3	3	2	3.4
MEAN OVERALL SCORE													3.4

Result: The score for this course is 3.3 (High Relationship)

**Programme: M.Sc. HOME SCIENCE****Semester: I****Core Paper - III****Hours per week: 6****90hrs/Semester****Sub. Code: NA3****Credits : 5****TITLE OF THE COURSE: FOOD SAFETY AND QUALITY CONTROL**

Pedagogy	Hours	Lecture	Peer Group Teaching	Demo/ OER/ Tutorial	GD/Seminar	ICT/Blended Learning	IV/DI
	90	38	4	12	24	12	-

**PREAMBLE**

To enable students

1. To know the importance of quality assurance in food industry
2. To know the tests and standards for quality assessment and food safety
3. To know the laws and standards ensuring food quality and safety

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to

	Unit	Hrs P/S
<b>CO1:</b> Identify types of food spoilage and the need for hygiene in food handling.	I	18
<b>CO2:</b> Discuss the implications of food adulterants and additives on consumers' health.	II	18
<b>CO3:</b> Demonstrate skill in food quality testing career for further career prospects in food industry.	III	18
<b>CO4:</b> Describe the process of food quality assurance.	IV	18
<b>CO5:</b> Apply the guidelines of food laws and standards to ensure food quality in the food industry.	V	18
<b>CO6:</b> Interpret the principles of food safety and quality to contribute to the best practices in food		

**SYLLABUS****UNIT I**

**Food Spoilage:** Food spoilage definition; Factors influencing food spoilage; Types of food spoilage such as microbes, enzymes and insects; Changes in food quality due to spoilage; Methods for detection of food spoilage; Concept of food preservation and the principles.

**Food Safety:** Need and importance of food safety in food industries; Factors affecting food safety; Role of kitchen-hygiene, employee health and food plant hygiene in prevention of food spoilage and contamination; Regulatory authorities at local, district and national levels ensuring food safety in food industries.

**UNIT II**

**Food Additives and Adulterants:** Food additives definition; Common food additives and its function and usage; Permissible limits of additives in foods; Implications of additives on consumers health; Food adulteration: Meaning and definition; Types of food adulterants; Methods used for detection of food adulterants.

**UNIT III**

**Testing of Food Quality:** Quality - meaning and need for food quality testing; Types of evaluation – subjective and objective; Subjective evaluation methods based on difference, rate, sensitivity etc.; Difference tests: paired comparison test, duo-trio, triangle test; Rating tests: ranking, two-sample difference test, multiple sample difference, hedonic rating, numerical scoring, composite scoring; Sensitivity test- threshold, dilution. Descriptive test - flavour profile. Objective evaluation methods – tools and instruments used.

**UNIT IV**

**Food Quality Control and Assurance:** Current concepts of quality control and assurance; Need and importance of quality control programmes such as quality plan, documentation of records, product standards, Product and purchase specifications and process control; Principles of HACCP and its role in total quality process; Duties and responsibilities of food quality controller.

#### UNIT V

**Food Laws and Standards:** Need and importance; National food legislation such as FSSAI, Essential Commodities Act, ISI or BIS, AGMARK, FPO and PFA; International Organization such as FAO, WHO, Codex Alimentarius, and APEDA.

#### TEXT BOOKS

1. Jaiswal P.K., (2011) Food Quality and Safety, CBS Publishers and Distributors, New Delhi
2. Manay, S.M. & Shadakshara Swamy, M. (2010) Food Facts & Principles, New Age International (P)Limited

Publishers, Chennai

#### REFERENCES

1. Early, R. (1995). Guide to Quality Management Systems for the Food Industry, Blackie, Academic and Professional, London
2. Gould, W.A. and Gould, R.W. 1988. Total Quality Assurance for the Food Industries, CTI Publications Inc, Baltimore
3. Pomeranz, Y. and Meloan, C.E. 1996. Food Analysis : Theory and Practice, CBS Publishers and Distributor, New Delhi
4. Ranganna, S. 1986. Handbook of Analysis and Quality Control for Fruit and Vegetable Products, 2nd Edition, Tata McGraw hill Publishing Co Ltd., New Delhi
5. Hagstad, H.V. and Hubbert, W.T. (1986). Food Quality Control, Foods of Animal Origin, Iowa State University Press, AMES
6. Srilakshmi, B. 2005. Food Science, New Age International (P) Ltd., Publishers, New Delhi.

#### Open Educational Resources

Employee Hygiene - [https://epgp.inflibnet.ac.in/view\\_f.php?category=547](https://epgp.inflibnet.ac.in/view_f.php?category=547)

Food spoilage - [https://epgp.inflibnet.ac.in/view\\_f.php?category=548](https://epgp.inflibnet.ac.in/view_f.php?category=548)

Evaluation - [https://epgp.inflibnet.ac.in/view\\_f.php?category=547](https://epgp.inflibnet.ac.in/view_f.php?category=547)

#### LESSON PLAN

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	<b>Food Spoilage:</b> Review of Food spoilage: definition, factors influencing food spoilage, Types of food spoilage such as microbes, Enzymes and insects	3	OER
	Changes in food quality due to spoilage, Methods for detection of food spoilage, Concept of food preservation and the principles.	4	Blended Learning
	<b>Food Safety:</b> Need and importance of food safety in food industries, Factors affecting food safety, Role of kitchen-hygiene	3	Group Discussion
	Employee health and food plant hygiene in prevention of food spoilage and contamination	4	Lecture
	Regulatory authorities at local, district and national levels ensuring food safety in food industries	4	Lecture
UNIT II	<b>Food Additives and Adulterants:</b> Food additives definition, Common food additives and its function and usage	4	Lecture
	Permissible limits of additives in foods, Implications of additives on consumers health	4	Lecture
	Food adulteration: Meaning and definition; Types of food adulterants	4	Group Discussion

	Methods used for detection of food adulterants.	6	Seminar
UNIT III	<b>Testing of Food Quality:</b> Food Quality - meaning and need for food quality testing; Types of evaluation – subjective and objective;	2	Group Discussion
	Subjective evaluation methods: based on difference, rate, sensitivity etc.;	3	Lecture
	Difference tests: paired comparison test, duo-trio, triangle test;	4	Seminar
	Rating tests - ranking tests- single sample, two sample, multiple sample difference, hedonic rating, numerical scoring, composite scoring;	4	Lecture
	Sensitivity tests - threshold test and dilution. Descriptive test - flavour profile.	3	Lecture
	Objective evaluation methods – - Descriptive tests, tools and instruments used.	2	ICT
UNIT IV	<b>Food Quality Control and Assurance:</b> Current concepts of quality control and assurance, Need and importance of quality control programmes such as quality plan	4	Lecture
	Documentation of records, Product standards	4	OER
	Product and purchase specifications, Process control	4	Peer Group Teaching
	Principles of HACCP, Its role in total quality process, Duties and responsibilities of food quality controller.	6	ICT
UNIT V	<b>Food Laws and Standards:</b> Need and importance; National food legislation such as FSSAI	4	Lecture
	Essential Commodities Act, ISI or BIS, AGMARK, FPO, PFA	4	Lecture
	International Organization such as FAO, WHO	5	OER
	Codex Alimentarius, APEDA.	5	Seminar

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	4	4	3	3	4	4	4	4	3	3	4	3.8
CO2	5	4	4	3	3	4	4	4	4	3	3	4	3.8
CO3	5	4	4	3	3	4	4	4	4	3	3	4	3.8
CO4	5	4	4	3	3	4	4	4	4	3	3	4	3.8
CO5	5	4	4	3	3	4	4	4	4	3	3	4	3.8
CO6	5	4	4	3	3	4	4	4	4	3	3	4	3.8
MEAN OVERALL SCORE													3.8

Result: The score for this course is 3.3 (High Relationship)

Programme : M.Sc. HOME SCIENCE  
 Semester : I Core Paper -IV Hours per week: 3+3 90 hrs/Semester  
 Sub. Code : NL1 Credits: 3

**TITLE OF THE COURSE: FOOD AND NUTRIENT ANALYSIS PRACTICAL**

Pedagogy	Hours	Lecture	Practical Experience	Demo/ OER/ Tutorial	GD/ Seminar/ Flipped Classroom	ICT/ Blended Learning	IV/DI
	90	16	56	18	--	--	--
<b>COURSE OUTCOME</b>						Unit	Hrs P/S
At the end of the Semester, the Students will be able to							
<b>CO1:</b> Determine the moisture and ash content of cereal products						I	18
<b>CO2:</b> Integrate the study of egg white stability in preparations of food emulsions						II	18
<b>CO3:</b> Evaluate quality of milk, fats and oils based on its physical components						III	18
<b>CO4:</b> Demonstrate the sensory attributes of different foods						IV	18
<b>CO5:</b> Estimate the calorie, protein and mineral content of foods using various laboratory equipment						V	18
<b>CO6:</b> Apply the acquired analytical skills in handling instruments for career as food analysts						I-V	
<b>SYLLABUS</b>							
<b>UNIT I</b>							
<b>Chemistry of cereals-</b> Determination of the moisture content, total ash content of maida, rice flour and ragi flour, gluten content of whole and refined wheat flour.							
<b>UNIT II</b>							
<b>Chemistry of colloidal particles-</b> Study the effect of various additives on the stability of egg white foam. Determination of the best method of preparing a stable emulsion in mayonnaise.							
<b>UNIT III</b>							
<b>Evaluation of milk samples-</b> Determination of the physical characteristics and presence of any additives, fat content, percentage of total solids, Solid Non- Fat (SNF) Percentage and protein content.							
<b>UNIT IV</b>							
<b>Fats and oils-</b> Determination of the moisture content, impurities, Acid Value and Free Fatty Acids, Peroxide Value. <b>Sensory Evaluation of Foods-</b> Determination of the taste threshold for the different sensations- Sweet, salty, Sour. Descriptive analysis of a given sample of white bread, multigrain bread on the basis of its sensory attributes.							
<b>UNIT V</b>							
Determination of calorific value of foods- Bomb Calorimeter, Quantitative analysis of protein- Kjeldahl Method, Quantitative analysis of minerals- Sodium, Calcium, Lithium, Potassium- Flame Photometer.							
<b>TEXT BOOK</b>							
1. Srilakshmi (2010) Food Science Laboratory Manual New Age Publications, New Delhi.							
<b>REFERENCES</b>							
1. Charley. H (1982): Food Science (2nd Edition), John Wiley & Sons, New York.							
2. Potter, N. and Hotchkiss, J.H. (1996); Food Science, Fifth Edition, CBS Publishers and Distributors, New Delhi.							
3. Belitz, H.D. and Grosch, W. (1999); Food Chemistry (2nd Edition), Springer, New York.							
4. Bowers, J. (1992); Food Theory and Applications, (2nd Edition), MacMillan.							
5. Peckham, G and Freeland — Graves, G.H. (1979); Foundations of Food Preparation.							
6. UshaChandrasekaran (2002). Food Science and its Application to Indian Cookery, New Delhi Phoenix Publishing.							
7. Raghuramulu, N. Nair, K.M. & Kalyanasundaram, S.A. (1983) Manual of Laboratory Techniques, National Institute of Nutrition, ICMR, Hyderabad							

## LESSON PLAN

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	Introduction to chemistry of cereals	3	Lecture
	Determination of the moisture content of maida, rice flour and ragi flour	5	Practical Experience
	Determination of the total ash content of maida, rice flour and ragi flour	5	Practical Experience
	Determination of the gluten content of whole and refined wheat flour	5	Practical Experience
UNIT II	Introduction to chemistry of colloidal particles	4	Lecture
	Study the effect of various additives on the stability of egg white foam	7	Practical Experience
	Determination of the best method of preparing a stable emulsion in mayonnaise	7	Practical Experience
UNIT III	Introduction to evaluation of milk samples	3	Lecture
	Evaluation of milk samples-Determination of the physical characteristics and presence of any additives	5	Practical Experience
	Evaluation of milk samples-Determination of fat content, and percentage of total solids	5	Practical Experience
	Evaluation of milk samples-Determination of Solid Non- Fat (SNF) Percentage and protein content.	5	Practical Experience
UNIT IV	Introduction to Fats and oils	3	Lecture
	Fats and oils- Determination of the moisture content, impurities	3	Practical Experience
	Determination of Acid Value, Free Fatty Acids and Peroxide Value	3	Practical Experience
	Introduction to Sensory Evaluation of Foods	3	Lecture
	Determination of the taste threshold for the different sensations- sweet, salty and sour	3	Practical Experience
	Descriptive analysis of a given sample of white bread, multigrain bread on the basis of its sensory attributes	3	Practical Experience
	UNIT V	Determination of calorific value of foods using Bomb Calorimeter	6
Quantitative analysis of protein in foods - Kjeldahl Method		6	Demonstration
Quantitative analysis of Sodium, Calcium, Lithium, and Potassium in a given food sample using Flame Photometer		6	Demonstration

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	4	5	4	4	3	4	3	4	3	2	3	3.7
CO2	5	4	5	4	4	3	4	3	4	3	2	3	3.7
CO3	5	4	5	4	4	3	4	3	4	3	2	3	3.7
CO4	5	4	5	4	4	3	4	3	4	3	2	3	3.7
CO5	5	4	5	4	4	3	4	3	4	3	2	3	3.7
CO6	5	4	5	4	4	3	4	3	4	3	2	3	3.7
MEAN OVERALL SCORE													3.7

Result: The score for this course is 3.7 (High Relationship)

**Programme :** M.Sc. HOME SCIENCE

**Semester :** I **Elective Paper I**

**Hours per week: 6**

**90 hrs/Semester**

**Sub. Code :** ENA1

**Credits: 5**

**TITLE OF THE COURSE: FAMILY RESOURCE MANAGEMENT**

Pedagogy	Hours	Lecture	Peer Group Teaching	Demo/Tutorial	GD/Seminar	ICT/Blended Teaching	IV/DI
	90	41		18	13	18	

**PREAMBLE**

To enable the students to

- Understand the factors motivating management
- Acquire ability to use human resources
- Gain knowledge about management of family resources
- Know the importance of decisions in management
- Understand the functions of market, consumer problems and protection

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to	Unit	Hrs P/S
<b>CO1:</b> Associate human values in achieving family goals.	I	18
<b>CO2:</b> Demonstrate abilities in home management.	II	18
<b>CO3:</b> Analyze effective usage of family resources.	III	18
<b>CO4:</b> Develop skills in personal time and money management.	IV	18
<b>CO5:</b> Integrate ergonomics in home and work environment	V	18

**SYLLABUS**

**UNIT I**

**Introduction to Management:** concept and definition of management, Management in family living - importance, managerial function of families. Factors motivating management: Human Values- meaning, sources, characteristics, factors influencing values, changes in values and their causes. Goal-types, characteristics, factors influencing goals, Standards-conventional and modern, flexible and rigid.

**UNIT II**

**Resources and their management in the family. Resources** - definition, characteristics, usefulness of resources, classification of resources, factors affecting the use of resources, guidelines for the use of resources, Decision making- steps in decision making, types. Management Process-Planning, controlling and evaluating.

**UNIT III**

**Management of Time and Money** -Management of time -Characteristics and nature of time, Tools in time management- time cost, time norms, peak loads, work units, work curves, rest periods. Process of managing time-Planning, Controlling and evaluating. Management of money-Definition, types of income and their sources- Money income, Real income. Psychic income, Family budget and Savings

**UNIT IV**

**Management of Energy and Ergonomics:** Management of energy –Planning, Controlling – body mechanics, fatigue- meaning, causes, types, avoidance of fatigue and evaluating. Work Simplification- meaning, importance, Mundel's classes of changes in household activities.

Ergonomics and work environment -Ergonomics- definition, scope and importance. Principles of workplace design, Workstation design for computer users. Functional designs of Kitchen and other storage areas.

**UNIT V**

**Human wants and consumer choice** - nature, classification, concept of marginal utility-law of diminishing marginal utility, principles of equi-marginal utility. Consumer market- functions, types of market, Consumerism- meaning of consumer and consumerism, Status of consumer in India-consumer rights and responsibilities, problems faced by consumer and the role of Government and NGO towards consumer protection.

**TEXTBOOK**

1. Varghese, M.A., Ogale, N.N. and Srinivasan, K. (2017) Home Management 2<sup>nd</sup> Edition New Age International (P) Ltd., Publishers, New Delhi.

**REFERENCES**

1. Nickell and Dorsey, 1991, Management of Family living, Wiley Eastern Limited.
2. Deacon R & Firebaugh F. 1981. Family Resource Management – Principles and Applications, Allyn & Bacon, Boston.
3. Kapur, S.K. (1996): Professional Management, S.K. Publishers, New Delhi.
4. Sherman A.W. et al (1988): Managing Human Resources, South-Western Publication Co Cincinnati.
5. Veena, G.O., Krishana and S. Promila. (2010). Essential of Ergonomics, Dominant publishers and distributors.

**Open Educational Resources**

Values, Goals - <http://ecoursesonline.iasri.res.in/course/view.php?id=218-->

Resource management

[-http://vidyamitra.inflibnet.ac.in/index.php/home/subjects?domain=Social+Sciences&subdomain=Home+Science](http://vidyamitra.inflibnet.ac.in/index.php/home/subjects?domain=Social+Sciences&subdomain=Home+Science)

**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	Introduction to Management, concept and definition of management,	3	Lecture
	Management in family living-importance, Managerial function of families.	3	Lecture
	Factors motivating management: Human Values- Meaning, sources, origin, Characteristics, Factors influencing values,	5	Lecture
	Changes in values and their causes. Goal-types, characteristics, Factors influencing goals,	5	Group Discussion
	Standards-conventional and modern, flexible and rigid.	2	Lecture
UNIT II	Resources and their management in the family. Resources - definition, characteristics, Usefulness of resources,	4	OER
	Classification of resources, Factors affecting the use of resources,	4	OER
	Guidelines for the use of resources, Decision making- steps in decision making types	5	OER
	Management Process-Planning, controlling and evaluating	5	Lecture
UNIT III	Management of time , Characteristics and nature of time,	4	Blended Learning
	Tools in time management, Time cost, Time norms, Peak loads, Work units, Work curves	5	Lecture
	Process of managing time-Planning, Controlling and evaluating	3	Blended Learning
	Management of money-Definition, types of income and their sources	3	Blended Learning
	Money income, Real income. Psychic income, Family budget and Savings	3	Lecture
UNIT IV	Management of energy: Planning, Controlling, Body mechanics, fatigue- meaning, causes	4	Lecture
	Fatigue- Types, avoidance of fatigue and evaluating, Work Simplification- meaning, importance, Mundel's Classes of changes in household activities	4	Lecture
	Ergonomics and work environment -Ergonomics- definition, scope and importance. Principles of workplace designs	5	ICT
	Workstation design for computer users. Functional designs of Kitchen and other storage areas.	5	OER

UNIT V	Human wants and consumer choice-nature, classification , Concept of marginal	3	Lecture
	Utility-law of diminishing marginal utility, Principles of equi-marginal utility	3	ICT
	Consumer market- functions, Types of market	4	Lecture
	Consumerism- meaning of consumer and consumerism	4	GD
	Status of consumer in India-consumer rights and responsibilities, Problems faced by consumer and The role of Government and NGO towards consumer protection.	4	GD

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO6	
CO1	5	4	3	4	3	4	5	4	2	3	2	3	3.5
CO2	5	4	3	4	3	4	5	4	2	3	2	3	3.5
CO3	5	4	3	4	3	4	5	4	2	3	2	3	3.5
CO4	5	4	3	4	3	4	5	4	2	3	2	3	3.5
CO5	5	4	3	4	3	4	5	4	2	3	2	3	3.5
MEAN OVERALL SCORE													3.5

**The score for this course is 3.5 (High Relationship)**

Programme : M.Sc. HOME SCIENCE  
 Semester : I Elective Paper II Hours per week: 6 90 hrs/Semester  
 Sub. Code : ENA2 Credits: 5

**TITLE OF THE COURSE: FOOD PROCESSING AND PACKAGING**

Pedagogy	Hours	Lecture	Peer Teaching	Demo/OER/ Tutorial	GD/Seminar/Flipped Classroom	ICT/ Blended Learning	IV/DI
	90	28	--	16	28	16	2

**PREAMBLE**

- To know the principles of different techniques used in processing and preservation of foods.
- To understand the packaging methods, packaging materials, packaging machineries, modern packaging techniques etc.

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to

	Unit	Hrs P/S
<b>CO1:</b> Summarize the scope of food processing, preservation and packaging in India	I	18
<b>CO2:</b> Combine methods of processing and preservation for different food products	II	18
<b>CO3:</b> Apply principles of food packaging to selection of packaging materials for different foods	III	18
<b>CO4:</b> Differentiate packaging materials and their finishes	IV	18
<b>CO5:</b> Discuss the recent trends in food packaging systems applied to perishable foods	V	18
<b>CO6:</b> Interpret the contribution of food preservation sector towards nation's economy	I-V	

**SYLLABUS**

**UNIT I**

Scope of food processing, principles of food processing and preservation. Processing and preservation by heat blanching, pasteurization, sterilization and UHT processing, canning, extrusion cooking, dielectric heating, microwave heating, baking, roasting and frying, etc.

**UNIT II**

Processing and preservation by low temperature, refrigeration, freezing, dehydro-freezing. cold storage methods. Processing and preservation by dehydration, drying, concentration and evaporation- types of dryers and their suitability for different food products, ultra-filtration, reverse osmosis.

**UNIT III**

Definitions and functions of packaging, MAP, CAP, Vacuum packing, Packaging requirements and selection of packaging materials; Types of packaging materials: Paper: Pulping, fibrillation and beating, types of papers and their testing methods.

**UNIT IV**

**Glass:** composition, properties, types of closures, methods of bottle making; **Metals:** Tinplate containers, tinning process, components of tinplate, tin free steel (TFS), types of cans, aluminum containers, lacquers; **Plastics:** types of plastic films, laminated plastic materials, co-extrusion, edible films, biodegradable plastics.

**UNIT V**

Food packaging system: Different forms of packaging such as rigid, semi-rigid, flexible forms and different packaging systems for (a) dehydrated foods (b) frozen foods (c) dairy products (d) fresh fruits and vegetables (e) meat, poultry and sea foods.

**TEXT BOOKS**

- Subbulakshmi, G. and Udipi, A.S. (2006) Food Processing and Preservation, New Age International Publishers, New Delhi.

**REFERENCES**

- Richard Coles, Mark J. Kirwan. (2011). Food and Beverage Packaging Technology, 2<sup>nd</sup> Edition. Wiley Blackwell.
- James G. Brennan, Alistair S. Grandison. (2011) Food Processing Handbook, 2<sup>nd</sup> Edition, 2 Vol Set.
- James G. Brennan. (2006) Food Processing Handbook.
- Ramaswamy H and Marcotte M. (2006) Food Processing: Principles and Applications. Taylor & Francis.
- Fellows PJ. (2005) Food Processing Technology: Principle and Practice. 2<sup>nd</sup> Ed. CRC.
- Potter NN & Hotchkiss. (1997) Food Science. 5<sup>th</sup> Ed. CBC.
- Mahadeviah M & Gowramma RV. (1996) Food Packaging Materials. Tata McGraw Hill.

**JOURNAL**

1. Journal of Packaging Technology and Research
2. Food Packaging and Shelf Life
3. Journal of Advanced Research in Food Science and Nutrition

**Open Educational Resources**

Modified atmosphere packaging – [https://epgp.inflibnet.ac.in/view\\_f.php?category=1416](https://epgp.inflibnet.ac.in/view_f.php?category=1416)

Principles of Food Processing - [https://epgp.inflibnet.ac.in/view\\_f.php?category=549](https://epgp.inflibnet.ac.in/view_f.php?category=549)

Frozen packaging - [https://epgp.inflibnet.ac.in/view\\_f.php?category=1416](https://epgp.inflibnet.ac.in/view_f.php?category=1416)

Food Preservation-[https://epgp.inflibnet.ac.in/view\\_f.php?category=548](https://epgp.inflibnet.ac.in/view_f.php?category=548)

Food Preservation-<http://ecoursesonline.iasri.res.in/course/view.php?id=639>

Packaging Technology- <http://eagri.org/eagri50/HORT381/lec10.html>

**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	Scope of food processing, principles of food processing and preservation	6	OER
	Processing and preservation by heat blanching, pasteurization, sterilization and UHT processing	6	Lecture
	Canning, extrusion cooking, dielectric heating, microwave heating, baking, roasting and frying	6	Seminar
UNIT II	Processing and preservation by low temperature, refrigeration, freezing, dehydro-freezing, cold storage methods	6	OER
	Processing and preservation by dehydration, drying, concentration and evaporation	6	ICT
	Types of dryers and their suitability for different food products, ultra-filtration, reverse osmosis	6	Lecture
UNIT III	Definitions and functions of packaging, MAP, CAP, Vacuum packing	6	Lecture
	Packaging requirements and selection of packaging materials	6	Seminar
	Types of packaging materials: Paper: Pulping, fibrillation and beating, types of papers and their testing methods	6	Flipped Classroom
UNIT IV	Glass: composition, properties, types of closures, methods of bottle making	6	Seminar
	Metals: Tinplate containers, tinning process, components of tinplate, tin free steel (TFS), types of cans, aluminum containers, lacquers	6	OER
	Plastics: types of plastic films, laminated plastic materials, co-extrusion, edible films, biodegradable plastics	6	Lecture
UNIT V	Food packaging system: Different forms of packaging such as rigid, semi-rigid, flexible forms	4	OER
		2	IV
	Different packaging system for dehydrated foods and frozen foods	4	Seminar
	Different packaging system for dairy products and fresh fruits and vegetables	4	Lecture
	Different packaging system for meat, poultry and sea foods	4	ICT

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	4	3	3	2	3	4	3	5	3	2	4	3.4
CO2	5	4	3	3	2	3	4	3	5	3	2	4	3.4
CO3	5	4	3	3	2	3	4	3	5	3	2	4	3.4
CO4	5	4	3	3	2	3	4	3	5	3	2	4	3.4
CO5	5	4	3	3	2	3	4	3	5	3	2	4	3.4
CO6	5	4	3	3	2	3	4	3	5	3	2	4	3.4
MEAN OVERALL SCORE													3.4

Result: The score for this course is 3.5 (High Relationship)

Programme : M.Sc. HOME SCIENCE  
 Semester : II Core Paper - V Hours per week: 6 90 hrs/Semester  
 Sub. Code : NB1 Credits : 5

**TITLE OF THE PAPER: PRINCIPLES OF NUTRITION**

Pedagogy	Hours	Lecture	Peer Teaching	Demo/OER/Tutorial	GD/Seminar/Flipped Classroom	ICT/ Blended Learning	IV/DI
	90	28	3	23	28	8	--

**PREAMBLE**

Learning outcomes

This course will enable the students to:

- Gain in-depth knowledge of the physiological and metabolic role of macronutrients, fat soluble vitamins and electrolytes and their importance in human nutrition.
- Enable the understanding of the basis of human nutritional requirements and Recommendations through the life cycle and translate the knowledge into practical guidelines for dietary needs.
- Familiarize with the recent advances in nutrition and apply this knowledge in planning for public health programmes.

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to

	Unit	Hrs P/S
CO1: Interpret RDA to meet nutritional requirements for Indians and determine energy requirements for all age groups based on BMR and activity levels	I	18
CO2: Distinguish carbohydrates and dietary fibre; identify their role in promoting health	II	18
CO3: Evaluate protein quality and protein deficiency	III	18
CO4: Compare dietary fatty acids based on composition transport and absorption		
CO5: Analyze factors affecting bioavailability of minerals and vitamins in foods	IV	18
CO6: Assess the role of nutrition policies and programmes	V	18

**SYLLABUS**

**UNIT I**

**Human Nutritional Requirements** – Basic concepts of human nutrition – health, nutrition, balanced diet; Nutrition states – optimum nutrition, malnutrition, undernutrition, over nutrition. Nutrient Guidelines – Recommended Dietary Allowances. Food Guides and Recommendations – Food Pyramid, Food Groups, ICMR Guidelines for Dietary Requirements of all nutrients.

Energy-Measurement of Food energy – Units of food energy. Physiological fuel value. Energy balance. Components of energy requirements – BMR/REE. Calculating BMR – Harris Benedict, Mifflin – St.Jeor Equations for men & women, Physical activity levels. Factors influencing BMR. Total Energy Requirement – BMR, Physical activity, Thermic effect of food. Determination of energy requirements. ICMR Guidelines for energy intake.

**UNIT II**

**Carbohydrates:** Composition, classification, food sources, functions, digestion – mechanical and chemical – mouth, stomach, small intestine; intestinal absorption, metabolic utilization – energy for fuel and storage. ICMR Recommendations for Dietary Carbohydrate.

**Dietary fibre:** Types, food sources, mechanism of action and physiological significance. Resistant starch, fructo-oligosaccharides. Glycemic Index and Glycemic load. Factors affecting GI of foods; Role of GI in chronic diseases.

**UNIT III**

**Proteins:** Composition, classification, food sources, functions, digestion, absorption, amino acid pool, metabolic utilization, ICMR Guidelines for dietary protein requirements. Nitrogen Balance - Dietary protein deficiency or excess. Evaluation of protein quality – Digestibility Coefficient, Net Protein Utilization, Protein Efficiency Ratio, Biological Value, Amino acid score, PDCAAS.

**Lipids:** Composition, classification, food sources. Dietary fatty acids – SFA, MUFA, n-3, n-6, PUFA, EFA, Trans fats; Triglycerides, Phospholipids- lecithin, eicosanoids; Sterols- Cholesterol. Food fats – Visible and invisible, animal and plant fats. Digestion and Absorption – Composition of chylomicron, Transport – Lipoprotein types – LDL, VLDL, HDL. Requirements and ICMR Dietary guidelines.

**UNIT IV**

**Minerals:** Macro minerals: Calcium, Phosphorous, Sodium, Potassium; Micro minerals: Iron, Zinc, Selenium, Iodine and Fluorine. Trace elements – Selenium, Cobalt, Chromium, Vanadium, Silicon, Boron and Nickel. Review of Food sources, Metabolism (digestion, absorption, transport, storage and elimination); Bioavailability and factors affecting bioavailability; Biochemical and Physiological functions; Interaction with other nutrients;

**Vitamins:** Fat soluble vitamins: A, D, E and K; Water soluble vitamins: B1, B2, B5, B6, B12 and Vitamin C. Review of food sources, metabolism (digestion, absorption, transport, storage and elimination), factors affecting bioavailability, Biochemical and physiological functions, deficiency conditions and treatment. Inter-relationship between vitamin and mineral metabolism.

**UNIT V**

**National Nutrition Policies and Programmes.** National Nutrition Policy. Health, Nutrition and Family Welfare. AYUSH. National Rural Health Mission. National Health Outcome Goals. Intervention programmes to combat malnutrition - ICDS, PDS, Mid day meal scheme;

Role of National and International Organisations – Objectives and functions– ICMR, NIN, ICDS, FNB, CFTRI, NNMB, WHO, FAO, UNICEF.

**Food and Nutrition Security:** causes of food and nutrition insecurity – availability, accessibility and affordability of food; Policies to control food costs and intervention to food production to meet nutrient needs.

**TEXTBOOK**

1. Shubhangini Joshi (2010) Nutrition and Dietetics with Indian Case Studies, 3<sup>rd</sup> edition, McGrawHill Higher Education, New Delhi.
2. Sheila John & Jennifer DJ (2008) Essentials of Nutrition and Dietetics for Nursing, B.I. Publishing Pvt Ltd., Chennai.

**REFERENCES**

1. Michael J. Gibney, Hester V Vorster and Frans J Kok (2003) Introduction to Human Nutrition Blackwell publishing Oxford, U.K.
2. Kathleen Mahan and Sylvia Escort- Stump (2000): Food, Nutrition and Diet Therapy 11<sup>th</sup> Edition, W.B. Saunders Company London.
3. Susan G. Dudek (2007) Nutrition Essentials for Nursing Practice, Lippincot Williams & Wilkins, Philadelphia.
4. Staci Nix Williams (2009) Basic Nutrition and Diet Therapy, 13<sup>th</sup> edition, CV Mosby Inc., New Delhi.
5. Z.S.C. Okoye: Biochemical Aspects of Nutrition, Prentice-Hall of India Pvt. Ltd., New Delhi.

**JOURNALS**

1. American Journal of Clinical Nutrition
2. Indian Journal of Nutrition and Dietetics
3. Journal of American Nutrition and Dietetics
4. Malaysian Journal of Nutrition

**Open Educational Resources**

Macronutrients- <https://epgp.inflibnet.ac.in/ahl.php?csrno=444> Micronutrients-

<https://epgp.inflibnet.ac.in/ahl.php?csrno=444>

Nutrition policies -<http://ecoursesonline.iasri.res.in/course/view.php?id=476>

**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	Human Nutritional Requirements - Basic concepts of human nutrition – health, nutrition, balanced diet. Nutrition states – optimum nutrition, malnutrition, undernutrition, over nutrition.	2	Seminar
	Nutrient Guidelines – Recommended Dietary Allowances. Food Guides and Recommendations Food Pyramid, Food Groups, ICMR Guidelines for Dietary Requirements of all nutrients	6	Group Discussion

	Energy - Measurement of Food energy. Units of food energy. Physiological fuel value. Energy balance.	2	OER
	Components of energy requirements – BMR/REE. Calculating BMR – Harris Benedict, Mifflin - St.Jeor equations for men & women, Physical activity levels. Factors influencing BMR	6	Lecture
	Total Energy Requirement – BMR, Physical activity, Thermic effect of food. Determination of energy requirements. ICMR Guidelines for energy intake	2	ICT
UNIT II	Carbohydrates: Composition, classification, food sources, functions	4	OER
	Digestion – mechanical & chemical – mouth, stomach, small intestine; intestinal absorption, metabolic utilization – energy for fuel and storage. ICMR Recommendations for Dietary Carbohydrate	5	Seminar
	Dietary fibre: Types, food sources, mechanism of action and physiological significance. Resistant starch, fructo-oligosaccharides	5	Lecture
	Glycemic Index and Glycemic load. Factors affecting GI of foods; Role of GI in chronic diseases	4	OER
UNIT III	Proteins: Composition, classification, food sources, functions, digestion, absorption.	3	Flipped Classroom
	Amino acid pool, metabolic utilization, ICMR guidelines for Dietary Protein Requirements. Nitrogen Balance - Dietary protein deficiency or excess.	3	Seminar
	Evaluation of protein quality – Digestibility Coefficient, Net Protein Utilization, Protein Efficiency Ratio, Biological Value, Amino acid score, PDCAAS	3	Lecture
	Lipids: Composition, classification, food sources. Food fats – Visible and invisible, animal and plant fats. Dietary fatty acids – SFA, MUFA, n-3, n-6, PUFA, EFA, Trans fats; Triglycerides,	3	Seminar
	Phospholipids - lecithin, eicosanoids; Sterol- Cholesterol. Food fats – Visible and invisible, animal and plant fats.	3	Peer Teaching
	Digestion and Absorption, Composition of chylomicron, Transport – Lipoprotein types – LDL, VLDL, HDL. Requirements & ICMR Dietary guidelines	3	ICT
UNIT IV	Minerals: Macro minerals: Calcium, Phosphorous, Sodium, Potassium; Micro minerals: Iron, Zinc, Selenium, Iodine and Fluorine. Trace elements – Selenium, Cobalt, Chromium, Vanadium, Silicon, Boron and Nickel. Review of food sources, metabolism - digestion, absorption, transport, storage and elimination.	4	OER
	Bioavailability and factors affecting bioavailability; Biochemical and Physiological functions;	6	Lecture
	Vitamins: Fat soluble vitamins: A, D, E and K; Water soluble vitamins: B1, B2, B5, B6, B12 and Vitamin C. Review of food sources, metabolism (digestion, absorption, transport, storage and elimination).	4	OER
	Factors affecting bioavailability, Biochemical and physiological functions, deficiency conditions and treatment.	2	OER
	Inter-relationship between vitamin and mineral metabolism	2	Lecture
UNIT V	National Nutrition Policies and Programmes. National Nutrition Policy. Health, Nutrition and Family Welfare. AYUSH. National Rural Health Mission. National Health Outcome Goals.	3	OER
	Intervention programmes to combat malnutrition - ICDS, PDS, Mid day meal scheme.	3	ICT

	Role of National and International Organisations: Objectives and functions – ICMR, NIN, ICDS, FNB, CFTRI, NNMB, WHO, FAO, UNICEF.	6	Lecture
	Food and Nutrition Security: causes of food and nutrition insecurity – availability, accessibility and affordability of food; Policies to control food costs and intervention to food production to meet nutrient needs.	6	Seminar

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO 2	PSO3	PSO4	PSO5	PSO6	
CO1	5	4	4	4	4	4	4	5	5	3	4	4	4.2
CO2	5	4	4	4	4	4	4	5	5	3	4	4	4.2
CO3	5	4	4	4	4	4	4	5	5	3	4	4	4.2
CO4	5	4	4	4	4	4	4	5	5	3	4	4	4.2
CO5	5	4	4	4	4	4	4	5	5	3	4	4	4.2
CO6	5	4	4	4	4	4	4	5	5	3	4	4	4.2
MEAN OVERALL SCORE													4.2

The score for this course is 4.2 (High Relationship)

Programme : M.Sc. HOME SCIENCE  
Semester : II Core Paper - VI  
Sub. Code : NB2

Hours per week: 6

90 hrs/Semester

Credits: 5

**TITLE OF THE COURSE: APPLIED HUMAN NUTRITION**

Pedagogy	Hours	Lecture	Peer Teaching	Demo/OER/ Tutorial	GD/Seminar/Flipped Classroom	ICT/ Blended Learning	IV/DI
	90	34	2	17	22	15	-

**PREAMBLE**

1. To familiarize students with changes occurring in the physiology and metabolism of the human body as a result of change in altitude, gravity and exercise.
2. To provide in-depth knowledge of nutritional requirements for various physiological and metabolic conditions.

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to

	Unit	Hrs P/S
<b>CO1:</b> Associate the nutritional needs during exercise and physical activity of different sports activities.	I	18
<b>CO2:</b> Connect performance with nutritional needs before, during and after different sports activities.	II	18
<b>CO3:</b> Indicate physiological changes and nutrient requirements during space activities.	III	18
<b>CO4:</b> Relate physiological and psychological changes to nutritional needs during sea travel.	IV	18
<b>CO5:</b> Integrate nutrition support system with relief and rehabilitation in disaster management.	V	18
<b>CO6:</b> Apply nutritional skills in real life situations.	I-V	

**SYLLABUS****UNIT I**

**Nutrition for Exercise and Physical Fitness:** Exercise Physiology – Types of physical activity – activities of daily living, aerobic exercise, resistance exercise. Energy metabolism during exercise – aerobic and anaerobic. Dietary need during exercise – fuel sources – macronutrients, oxygen, fluid and micronutrient needs. Health benefits of exercise.

**UNIT II**

**Sports Nutrition:** Need and scope of sports nutrition; Nutrition for competition - pregame meal, meal during game and post-game meal; Concept of carbohydrate loading and the methods of carbohydrate loading; Hydration. Nutrition management during sports/game; Ergogenic aids in sports. Significance of nutritional supplements.

**UNIT III**

**High Altitude and Space Nutrition:** Physiological changes due to high altitude; Acclimatization process; Altitude sickness and related health problems; Nutrient requirements and dietary management of mountaineers. Space Nutrition: Need and scope for space travel; History of space travel; Physiological changes in astronauts; Nutrient requirement and dietary management during space travel.

**Sea Travel Nutrition:** Physiological changes in the human body during sea travel. Psychological preparedness for sea travel. Health and nutritional problems encountered during sea travel; Nutrient requirements and dietary management during sea travel.

**UNIT IV**

**Nutrition in Emergencies:** Need and importance of nutrition support systems in relief and rehabilitation. Types of emergency situations such as natural – flood, earthquake, drought, cyclone, novel contagion; and manmade - war; Nutritional and health problems in emergencies; Control of communicable diseases through sanitation and immunization; Assessment of food needs and food distribution strategies. Nutrient requirement and dietary management during emergencies.

**UNIT V**

**Nutrigenomics:** Basic concepts of nutrigenetics and nutrigenomics; The Human Genome Project. Tools of nutrigenomics; Nutrition-gene interaction. Chronic disease and nutrigenomics; Nutritional genomic influences on gene expression. Role of nutrigenomics in obesity, type-2 diabetes, cardiovascular diseases, hypertension, cancer, immune health. Application of nutrigenomics: Genotype and nutrition assessment, nutrition diagnosis and genetic counselling. Gene guided 'Personalised nutrition'. Advantages and disadvantages of nutrigenomics.

**TEXT BOOKS**

1. Srilakshmi B, Suganthi V, Ashok CK (2018) Exercise Physiology, Fitness and Sports Nutrition, New Age International Pvt Ltd., New Delhi.

**REFERENCES**

1. Michael J. Gibney, Hester V Vorster and Frans J Kok (2003) Introduction to Human Nutrition Blackwell publishing Oxford, U.K.

2. Kathleen Mahan and Sylvia Escort- Stump (2000): Krause's Food, Nutrition and Diet Therapy 11<sup>th</sup> Edition, W.B. Saunders Company London.

3. Susan G. Dudek (2007) Nutrition Essentials for Nursing Practice, Lippincott Williams D Wilkins, Philadelphia.

4. Staci Nix Williams(2009) Basic Nutrition and Diet Therapy, 13<sup>th</sup> edition, CV Mosby Inc., New Delhi.

5. Z.S.C.Okoye: Biochemical Aspects of Nutrition, Prentice-Hall of India Pvt. Ltd., New Delhi.

**JOURNALS**

1. American Journal of Clinical Nutrition

2. Indian Journal of Nutrition and Dietetics

**Open Educational Resources**

Carbohydrates for Exercise-<https://epgp.inflibnet.ac.in/ahl.php?csrno=444>

Hydration and Physical Fitness-<https://epgp.inflibnet.ac.in/ahl.php?csrno=444>

Diet in exercise -[https://epgp.inflibnet.ac.in/view\\_f.php?category=558](https://epgp.inflibnet.ac.in/view_f.php?category=558)

Ergogenic Aids - [https://epgp.inflibnet.ac.in/view\\_f.php?category=558](https://epgp.inflibnet.ac.in/view_f.php?category=558)

Physical fitness -[https://epgp.inflibnet.ac.in/view\\_f.php?category=558](https://epgp.inflibnet.ac.in/view_f.php?category=558)

**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	Nutrition for Exercise and Physical Fitness: Exercise Physiology	3	OER
	Types of physical activity – activities of daily living, aerobic exercise, resistance exercise	5	Lecture
	Energy metabolism during exercise – aerobic and anaerobic	4	Lecture
	Dietary need during exercise – fuel sources – macronutrients, oxygen, fluid and micronutrient needs	3	OER
	Health benefits of exercise	3	OER
UNIT II	Sports Nutrition: Need and scope of sports nutrition	4	Lecture
	Nutrition for competition - pregame meal, meal during game and post-game meal	4	OER
	Concept of carbohydrate loading and the methods of carbohydrate loading; hydration	5	Lecture
	Nutrition management during sports/game; Ergogenic aids in sports. Significance of nutritional supplements	5	ICT
UNIT III	High Altitude and Space Nutrition: Physiological changes due to high altitude	2	Seminar
	Acclimatization process; Altitude sickness and related health problems	2	ICT
	Nutrient requirements and dietary management of mountaineers	2	GD
	Space Nutrition: Need and scope for space travel; History of space travel	2	Peer Teaching
	Physiological changes in astronauts	2	Lecture
	Nutrient requirement and dietary management during space travel	2	GD
	Sea Travel Nutrition: Physiological changes in human body during sea travel; Psychological preparedness for sea travel	2	ICT
	Health and nutritional problems encountered during sea travel	2	Flipped Classroom

	Nutrient requirements and dietary management during sea travel	2	GD
UNIT IV	Nutrition in Emergencies: Need and importance of nutrition support systems in relief and rehabilitation	3	ICT
	Types of emergency situations such as natural – flood, earthquake, drought, cyclone; novel contagion; manmade - war; Nutritional and health problems in emergencies	4	GD
	Control of communicable diseases through sanitation and immunization	3	ICT
	Assessment of food needs and food distribution strategies	4	Lecture
	Nutrient requirement and dietary management during emergencies	4	GD
UNIT V	<b>Nutrigenomics</b> - Basic concepts of Nutrigenetics, Nutrigenomics; The Human Genome Project.	5	Lecture
	Tools of nutrigenomics. Nutrition gene interaction. Chronic disease and nutrigenomics; Nutritional genomic influences on gene expression.	5	Lecture
	Role of nutrigenomics in obesity, type-2 diabetes, cardiovascular diseases, hypertension, cancer, immune health. Application of nutrigenomics:	4	GD
	: Genotype and nutritional assessment, nutrition diagnosis and genetic counselling. Gene guided 'Personalised Nutrition'. Advantages and disadvantages of nutrigenomics.	4	OER

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	5	4	3	3	4	5	5	5	3	3	4	4.1
CO2	5	5	4	3	3	4	5	5	5	3	3	4	4.1
CO3	5	5	4	3	3	4	5	5	5	3	3	4	4.1
CO4	5	5	4	3	3	4	5	5	5	3	3	4	4.1
CO5	5	5	4	3	3	4	5	5	5	3	3	4	4.1
CO6	5	5	4	3	3	4	5	5	5	3	3	4	4.1
MEAN OVERALL SCORE													4.1

Result: The score of this course is 4.1 (Very high relationship)

Programme : M.Sc. HOME SCIENCE  
Semester : II Core Paper VII  
Sub. Code : NB3

Hours per week: 6 90hrs/Semester  
Credits : 5 Max Marks: 100

**TITLE OF THE COURSE: BIOCHEMICAL CHANGES IN DISEASES**

Pedagogy	Hours	Lecture	Peer Teaching	Demo/OER/Tutorial	GD/Seminar/Flipped Classroom	ICT/Blended Learning	IV/DI
	90	33	14	8	12	18	-
<b>PREAMBLE</b>							
This course will enable the students to:							
1. Understand the pathophysiological changes in different organs, tissues and systems indifferent disease conditions across the lifespan							
2. Comprehend the implications of functional interrelationships in a diseased body							
3. Know and interpret the various diagnostic indicators/parameters							
4. Apply this knowledge for planning nutritional care of individuals.							
<b>COURSE OUTCOME</b>						Unit	Hrs P/S
At the end of the Semester, the Students will be able to							
<b>CO1:</b> Examine the immunological and haematological functions, alterations and metabolic adaptations.						I	18
<b>CO2:</b> Describe the implications of alterations in blood components and circulatory systems.						II	18
<b>CO3:</b> Identify the manifestations of gastrointestinal dysfunction and suggest diet therapy.						III	18
<b>CO4:</b> Relate disorders of nutrient metabolism to general well-being.						IV	18
<b>CO5:</b> Suggest dietary management of various metabolic disorders.						V	18
<b>CO6:</b> Interpret the metabolic interrelationships in normal and diseased conditions.						I - V	
<b>SYLLABUS</b>							
<b>UNIT I</b>							
<b>Basic concepts of pathophysiology and metabolism of adaptation</b> - Fluid and electrolyte, acids and bases, Immunity, Inflammation, Hypersensitivity, Infection and Immunodeficiency. Cellular Proliferation and Cancer: Biology of Cancer, Tumor spread and treatment, Clinical manifestations of cancer. Alterations of Haematologic functions: Nutritional Anemias. Erythropoiesis and haemoglobin synthesis Nutrients involved in erythropoiesis. Classifications of Anemias and Nutritional Care i) Normocytic anemia – aplastic anemia, ii) Megaloblastic anemia, iii) Microcytic anemia, iv) Sickle cell anemia and Thalassemia v) Hemolytic anemia.							
<b>UNIT II</b>							
<b>Pathophysiology of Cardiovascular, lymphatic and pulmonary system:</b> Alteration of cardiovascular functions, atherosclerosis, arteriosclerosis, Thrombus, embolus, dysrhythmias. Myocardial ischemia, Myocardial infarction, Heart failure, Stroke, Hypertension, Dyslipidemias. Intestinal transport of lipids, Cellular uptake and metabolism of lipids, (beta-oxidation, de novo synthesis of fatty acids, synthesis and breakdown of unsaturated fatty acids, cholesterol, phospholipids and triacylglycerol). Lipoprotein metabolism, VLDL and LDL and HDL. Regulation of lipid metabolism at substrate level, enzyme level, hormonal level and organ level, Disorders of lipid metabolism, Dyslipidemias, Lipid storage diseases.							
<b>UNIT III</b>							
<b>Manifestations of gastrointestinal dysfunction:</b> Hepatic dysfunction: Liver function tests; Pathophysiology of Liver disorders - Hepatitis, Cirrhosis, Hepatic encephalopathy; Etiology of Gallbladder disorders - Cholelithiasis, Gout. Acute and chronic gastritis, Ulcers, Malabsorption syndrome. Pancreatic insufficiency and Pancreatitis. Ulcerative colitis, Crohn's disease. Liver dysfunction, Hepatitis, Cirrhosis, Cholelithiasis. Alteration of hormonal regulation: Hypo and Hyper functions of Pituitary, Adrenal cortex and medulla, Hypo and Hyperthyroidism. Hypocalcaemia.							

Functions of the adrenal cortex, thyroid and parathyroid gland, their insufficiencies, clinical symptoms and metabolic implications. Dietary treatment as supportive to other forms of therapy.

#### UNIT IV

**Renal dysfunction:** Assessment of Renal function, Glomerular Filtration Rate (GFR), proteinuria, uremia, microalbuminuria; Creatine and Creatinine levels; Pathophysiology of Nephritis, Nephrotic Syndrome - Acute and Chronic Renal Disease, Uremic Renal Failure; Dialysis and its types; Nephrolithiasis - etiology and types.

#### UNIT V

**Disorders of Carbohydrate and Amino Acid metabolism:** Blood glucose monitoring, Glycosylated hemoglobin, Urine testing. Blood sugar lowering agents - Oral hypoglycemic agents, Insulin, Exercise. Acute complications – pathophysiology, diagnosis, types, treatment - Hypoglycemia, Ketoacidosis, Somogyi effect, Dawn phenomenon. Long term complications- pathophysiology, diagnosis, types, and treatment - Macrovascular and Microvascular.

Glycogen Storage disorders; Lipid Storage disorders.

#### TEXT BOOKS

1. Ramadevi. K. (2016) AmbikaShanmugam's Fundamentals of Biochemistry for Medical Students 8<sup>th</sup> edition, Wolters Kluwer Health (India) Pvt. Ltd., New Delhi. ISBN 9789351296829.

#### REFERENCES

1. Mohan, V, Rema, M, Unnikrishnan, R. (2009) Dr. Mohan's Handbook of Diabetes Mellitus, Elsevier India Ltd
2. Staci Nix Williams, (2009) Basic Nutrition and Diet Therapy, Mosby Inc Elsevier.
3. Mahan K & Sylvia Escott-Stump (2008) Krause's Food, Nutrition and Diet Therapy, 12th edition, Saunders Elsevier Inc. Canada, ISBN 978-0-8089-2378-7.
4. Mosby's Manual of Diagnostics and Laboratory Tests (2006) Elsevier.
5. Maurice E. Shils, James A. Olson, Moshe Shike, A. Catharine Ross, (1994), Modern Nutrition in Health and Disease" Lippincott Williams and Wilkins publication, London.
6. Satyanarayana U and Chakrapani U (2009) Biochemistry, 3<sup>rd</sup> edition, Books & Allied Pvt. Ltd., Vijayawada.
7. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2000): 25th Ed. Harpers Biochemistry. Macmillan Worth Publishers.

#### Journals

1. Journal of American Dietetic Association.
2. British Journal of Dietetics.
3. Asia-Pacific Journal of Clinical Nutrition.
4. Journal of Academy of Nutrition and Dietetics
5. Indian Journal of Nutrition and Dietetics.

#### Open Educational Resources

Lipoprotein metabolism - [https://epgp.inflibnet.ac.in/view\\_f.php?category=559](https://epgp.inflibnet.ac.in/view_f.php?category=559)

#### LESSON PLAN

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	<b>Basic concepts of pathophysiology and metabolism of adaptation -</b> Fluid and electrolyte, acids and bases	3	Lecture
	Immunity, Inflammation, Hypersensitivity, Infection, Immunodeficiency.	3	Tutorial
	Cellular Proliferation and Cancer: Biology of Cancer, Tumor spread and treatment, Clinical manifestations of cancer	3	Lecture
	Alterations of Haematologic functions: Nutritional Anemias Erythropoiesis and haemoglobin synthesis; Nutrients involved in erythropoiesis.	3	Blended Learning
	Classifications of Anemias and Nutritional Care i) Normocytic anemia – aplastic anemia, ii) Megaloblastic anemia	3	Peer Teaching
	iii) Microcytic anemia, iv) Sickle cell anemia and Thalassemia v) Hemolytic anemia.	3	Lecture
	<b>Pathophysiology of Cardiovascular, lymphatic and pulmonary system:</b> Alteration of cardiovascular functions, atherosclerosis, arteriosclerosis, Thrombus, embolus, dysrhythmias.	2	Blended Learning

UNIT II	Myocardial ischemia, Myocardial infarction, Heart failure, Stroke	3	Lecture
	Hypertension	2	Peer Teaching
	Dyslipidemias. Intestinal transport of lipids, Cellular uptake and metabolism of lipids	2	Blended Learning
	Beta-oxidation, de novo synthesis of fatty acids, synthesis and breakdown of unsaturated fatty acids, cholesterol, phospholipids and triacylglycerol	2	Blended Learning
	Lipoprotein metabolism, VLDL and LDL and HDL..	2	OER
	Regulation of lipid metabolism at substrate level, enzyme level, hormonal level and organ level	3	Lecture
	Disorders of lipid metabolism, Dyslipidemias, Lipid storage diseases	2	Seminar
UNIT III	<b>Manifestations of gastrointestinal dysfunction:</b> Hepatic dysfunction: Liver function tests; Pathophysiology of Liver disorders - Hepatitis, Cirrhosis, Hepatic encephalopathy; Etiology of Gallbladder disorders - Cholelithiasis, Gout.	3	Group Discussion
	Acute and chronic gastritis, Ulcers, Malabsorption syndrome. Pancreatic insufficiency and Pancreatitis.	6	Lecture
	Ulcerative colitis, Crohn's disease. Liver dysfunction, Hepatitis, Cirrhosis, Cholelithiasis	3	Peer Teaching
	Alteration of hormonal regulation: Hypo and Hyper functions of Pituitary, Adrenal cortex and medulla,	3	Blended Learning
	Hypo and Hyperthyroidism Hypocalcaemia. Functions of the adrenal cortex, thyroid and parathyroid gland, their insufficiencies, clinical symptoms and metabolic implications. Dietary treatment as supportive to other forms of therapy.	3	Blended Learning
UNIT IV	Renal dysfunction: Assessment of Renal function, GFR	5	Lecture
	Proteinuria, uremia, microalbuminuria; Creatine and Creatinine levels;	3	Group Discussion
	Pathophysiology of Nephritis, Nephrotic Syndrome - Acute and Chronic Renal Disease,	3	Peer Teaching
	Uremic Renal Failure; Dialysis and its types;	4	Flipped Classroom
	Nephrolithiasis - etiology and types	3	Blended Learning
UNIT V	<b>Disorders of Carbohydrate, Amino Acid metabolism:</b> Blood glucose monitoring,	3	Lecture
	Glycosylated hemoglobin, Urine testing.	3	Lecture
	Blood sugar lowering agents - Oral hypoglycemic, Insulin, Exercise.	3	Lecture
	Acute complications – pathophysiology, diagnosis, types, treatment - Ketoacidosis, Somogyi effect, Dawn phenomenon	3	Lecture
	Long term complications- pathophysiology, diagnosis, types, and treatment- Macrovascular and Microvascular.	3	OER
	Glycogen Storage disorders; Lipid Storage disorders.	3	Peer Teaching

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)							MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	
CO1	5	4	3	3	4	4	5	4	5	3	3	4	3.9
CO2	5	4	3	3	4	4	5	4	5	3	3	4	3.9
CO3	5	4	3	3	4	4	5	4	5	3	3	4	3.9
CO4	5	4	3	3	4	4	5	4	5	3	3	4	3.9
CO5	5	4	3	3	4	4	5	4	5	3	3	4	3.9
MEAN OVERALL SCORE													3.9

Result: The score of this course is 3.9(High Relationship)

Programme : M.Sc. HOME SCIENCE  
 Semester : II Core Paper VIII Hours per week: 3+3 90 hrs/Semester  
 Sub. Code : NL2 Credits: 3

**TITLE OF THE COURSE: CLINICAL INVESTIGATION PRACTICAL**

Pedagogy	Hours	Lecture	Practical Experience	Demo/ OER/ Tutorial	GD/ Seminar/ Flipped Classroom	ICT/ Blended Learning	IV/ DI
	90	25	56	9	-	-	-
<b>COURSE OUTCOME</b>						Unit	Hrs P/S
At the end of the Semester, the Students will be able to							
<b>CO1:</b> List the principles behind different clinical methods of investigation.						I	18
<b>CO2:</b> Demonstrate skill in collection and storage of biological samples for clinical investigation.							18
<b>CO3:</b> Perform qualitative analysis of urine.						II	18
<b>CO4:</b> Display skills in performing haematological examination.						III	18
<b>CO5:</b> Estimate urine and blood samples for their metabolic components.						IV&V	18
<b>CO6:</b> Translate skills in handling analytical equipment to careers in the healthcare industry.						I-V	
<b>SYLLABUS</b>							
<b>UNIT I</b>							
Collection and storage of biological samples for clinical investigations, Commonly used tests for diagnosis of various diseases.							
<b>UNIT II</b>							
Qualitative Analysis of urine- Sugar, Urea, Protein, Uric acid, Creatinine, Albumin							
<b>UNIT III</b>							
Haematological examination - Estimation of haemoglobin							
<b>UNIT IV</b>							
Quantitative Analysis of urine- Estimation of urea, creatinine and calcium							
<b>UNIT V</b>							
Quantitative Analysis of Blood and Serum- Estimation of glucose, cholesterol, triglyceride, Determination of LDL, HDL and VLDL, Estimation of creatinine, uric acid, bilirubin, calcium, Determination of Total Protein/Albumin/Globulin and AG ratio							
<b>REFERENCES</b>							
1. Jayaraman.J. Laboratory Manual in Biochemistry, 2006, New Age International Pvt. Ltd. Publishers, New Delhi. ISBN 0852264283.							
2. Mosby's Manual of Diagnostics and Laboratory Tests (2006) Elsevier.							

**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	Orientation about rules and regulations to be followed while working in Laboratory	5	Lecture
	Collection and storage of biological samples for clinical investigations	5	Demonstration
	Commonly used tests for diagnosis of various diseases	4	Demonstration
	Observation and Record writing	4	Lecture
UNIT II	Qualitative Analysis of urine- Sugar, Urea, Protein	6	Practical Experience
	Qualitative Analysis of urine- Uric acid, Creatinine, Albumin	6	Practical Experience
	Observation and Record writing	6	Lecture
UNIT III	Estimation of haemoglobin	18	Practical Experience

UNIT IV	Guidelines to use Semi Clinical Analyser	3	Lecture & Demonstration
	Quantitative Analysis of urine- Urea	4	Practical Experience
	Quantitative Analysis of urine- Creatinine	4	Practical Experience
	Quantitative Analysis of urine- Calcium	4	Practical Experience
	Observation and Record writing	3	Lecture
UNIT V	Blood and serum analysis- Estimation of glucose	2	Practical Experience
	Blood and serum analysis- Estimation of cholesterol	2	Practical Experience
	Blood and serum analysis- Estimation of triglyceride	2	Practical Experience
	Blood and serum analysis- Determination of LDL, HDL and VLDL	2	Lecture
	Blood and serum analysis- Estimation of creatinine	2	Practical Experience
	Blood and serum analysis-Estimation of uric acid	2	Practical Experience
	Blood and serum analysis- Estimation of bilirubin	2	Practical Experience
	Blood and serum analysis- Estimation of calcium	2	Practical Experience
	Blood and serum analysis- Determination of Total Protein/Albumin/Globulin and AG ratio	1	Lecture
	Observation and Record writing	1	Lecture

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	5	5	4	4	4	4	4	5	3	4	4	4.3
CO2	5	5	5	4	4	4	4	4	5	3	4	4	4.3
CO3	5	5	5	4	4	4	4	4	5	3	4	4	4.3
CO4	5	5	5	4	4	4	4	4	5	3	4	4	4.3
CO5	5	5	5	4	4	4	4	4	5	3	4	4	4.3
CO6	5	5	5	4	4	4	4	4	5	3	4	4	4.3
MEAN OVERALL SCORE													4.3

Result: The score of this course is 4.3 (Very High Relationship)

**Programme :** M.Sc. HOME SCIENCE  
**Semester :** II **Elective Paper II(a)** **Hours per week: 6** **90 hrs/Semester**  
**Sub. Code :** ENB3 **Credits : 4**

**TITLE OF THE COURSE: TRENDS AND ISSUES IN HUMAN DEVELOPMENT**

Pedagogy	Hours	Lecture	Peer Group Teaching	Demo/OER/Tutoria	GD/ Seminar	ICT/Blended Learning	IV/DI
	90	46	-	18	8	18	-

**PREAMBLE**

- To develop understanding of all round development of the individual from infancy to adulthood.
- To develop skills in achieving positive human relationships.

<b>COURSE OUTCOME</b>	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
<b>CO1:</b> Apply the acquired knowledge on ante, pre and postnatal care to real life situations.	I	18
<b>CO2:</b> Connect the milestones of growth and developmental tasks with child rearing practices.	II	18
<b>CO3:</b> Integrate the intricacies of early childhood development and behaviour with parenting techniques.	III	18
<b>CO4:</b> Promote positive habit formation to solve behaviour problems in late childhood.	IV	18
<b>CO5:</b> Suggest measures to promote inclusive environment for pre-school education	V	18
<b>CO6:</b> Integrate the understanding of all round development of individuals to achieve positive human relationships.		

**SYLLABUS**

**UNIT I**

**How life begins:** Conception-Prenatal Development, Pregnancy: Signs and symptoms of Pregnancy, ante-natal care, prenatal influences, Process of birth and types of birth, Postnatal care.

**UNIT II**

**Growth and Development:** Meaning and Principles of growth and Development. Basic concepts of development-maturation and learning, sensitive periods, individual differences, nature-nurture issues. Physical and motor, emotional, social and intellectual development during infancy and babyhood, Care during babyhood-feeding, weaning, clothing, immunization

**UNIT III**

Physical and motor development, emotional, social, intellectual development and developmental tasks during early and late childhood, Play behavior in children, early childhood education, early socialization, parenting and cultural processes, childhood illnesses, communicable diseases, deficiency diseases and other illnesses.

**UNIT IV**

Physical and motor, emotional, social, intellectual and moral development during adolescence, needs of children-Language Development- Perceptual, conceptual, common behavior problems, habits and habit formation. Adulthood- Characteristics and development, Old age- Characteristics, changes and problems

**UNIT V**

Preschool education; meaning, objectives, importance, types and Programme of a Preschool, Preschool building, (surroundings, site, plan) play equipment-selection of equipment, characteristics of preschool teacher. Children with special needs -definition, classification-physically handicapped, hearing impaired, visually impaired, speech impaired, mentally handicapped, gifted, emotionally and socially maladjusted.

**TEXT BOOKS**

- Hurlock, E.B. (2001), Child development, MCGraw Hill, New York
- Suriakanthi, A. (1989) Child Development- An Introduction, Kavitha Publications, Gandhigram

**REFERENCES**

- Devadas, R.P. and Jaya, N. (2003), A Textbook on Child Development, Macmillan India Ltd., Delhi,
- Neil J. Salkind (2004) .An Introduction to theories of Human Development, Saga Publications. New Delhi
- Dr. S.V. Kal. (2015), Child Psychology and Child Guidance, Himalaya Publishing house, Bombay.
- Dr. Sushma Gupta, (2003), Textbook of Nutrition, child care and Psychology, Kalyani Publisher, New Delhi.

5. Jersild, A.T., Telford, C.W. and Sawrey, J.M.(1975), Child Psychology, Prentice-Hall of India Private Limited, New Delhi

### Open Educational Resources

Language development - <https://epgp.inflibnet.ac.in/ahl.php?csrno=827>

Type of preschool - <https://epgp.inflibnet.ac.in/ahl.php?csrno=827>

Growth and development - <https://epgp.inflibnet.ac.in/ahl.php?csrno=827>

### LESSON PLAN

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	<b>How life begins:</b> Conception-Prenatal Development, Pregnancy: Signs and symptoms of Pregnancy..	5	Lecture
	Ante-natal care,	5	Lecture
	prenatal influences	4	Seminar
	Process of birth , Types of birth, Post-natal	4	Seminar
UNIT II	Meaning and Principles of growth and Development., immunization	6	Lecture
	Basic concepts of development- maturation and learning	3	OER
	Sensitive periods, individual differences, Nature-nurture issue	3	OER
	Physical ,motor, Emotional, Social and Intellectual development during infancy and babyhood.	3	OER,
	Care during babyhood-feeding, Weaning, clothing	3	OER
UNIT III	Physical and motor development, Emotional, social, intellectual development and Developmental tasks during early and late childhood	6	OER
	Play behavior in children, Early childhood education, Early socialization, Parenting and cultural processes	6	Lecture
	Childhood illnesses, communicable diseases, Deficiency diseases and other illnesses	6	Lecture
UNIT IV	Physical and motor, Emotional, Social	6	Lecture
	Intellectual , Moral development during adolescence, Needs of children-Language Development	6	Lecture
	Perceptual, Conceptual, Common behavior problems, Habits and habit formation	6	Lecture
UNIT V	Preschool education; meaning, objectives, Importance, types, Children with special needs –definition	5	Blended Learning
	Classification-physically handicapped, Hearing impaired, Visually impaired, Speech impaired	5	Blended Learning
	Mentally handicapped, Gifted, emotionally and socially maladjusted	4	Blended Learning
	Preschool building, (surroundings, site, plan) play equipment-selection , Characteristics of preschool teacher	4	Blended Learning

COURSE OUTCOMES (COS)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	4	3	3	3	4	5	5	3	3	4	4	3.8
CO2	5	4	3	3	3	4	5	5	3	3	4	4	3.8
CO3	5	4	3	3	3	4	5	5	3	3	4	4	3.8
CO4	5	4	3	3	3	4	5	5	3	3	4	4	3.8
CO5	5	4	3	3	3	4	5	5	3	3	4	4	3.8
CO6	5	4	3	3	3	4	5	5	3	3	4	4	3.8
MEAN OVERALL SCORE													3.8

Result: The score of this course is 3.8 (High Relationship)

Result: The score of this course is

Programme : M.Sc. HOME SCIENCE

Semester : II Elective Paper II(b)

Hours per week: 6

90 hrs/Semester

Sub. Code : ENB4

Credits : 4

**TITLE OF THE COURSE: DIABETES CARE AND EDUCATION**

Pedagogy	Hours	Lecture	Peer Teaching	Demo/OER/Tutorial	GD/Seminar/Flipped Classroom	ICT/Blended Learning	IV/DI
	90	45	12	-	18	15	-
<b>PREAMBLE</b>							
1. To obtain in-depth knowledge about Diabetes Mellitus (DM ) 2. To make the students aware of various complications during Diabetes Mellitus. 3. To gain knowledge about the management of Diabetes Mellitus through diet, exercise and medication							
<b>COURSE OUTCOME</b>						Unit	Hrs P/S
At the end of the Semester, the Students will be able to							
<b>CO1:</b> Identify diabetes as a rising public health concern in national and global scenario						I	18
<b>CO2:</b> Demonstrate diagnostic and monitoring procedures for diabetes care.						II	18
<b>CO3:</b> Familiarize with classic features and screening methods of diabetic emergencies.						III	18
<b>CO4:</b> Discuss the criteria for screening and diagnosis of chronic complications of diabetes.						IV	18
<b>CO5:</b> Promote adherence to drug, diet and physical activity in diabetes.						V	18
<b>CO6:</b> Evolve as diabetes educator.							
<b>SYLLABUS</b>							
<b>UNIT I</b>							
<b>Diabetes:</b> Introduction, definition, and meaning, classification of diabetes mellitus and risk factors, diabetic food pyramid. Prevalence - International, national and state.							
<b>UNIT II</b>							
Pathological changes in metabolism: Pathophysiology of Diabetes Mellitus. Pathological changes in other systems- Eye, C.V system, Neuropathy, Nephropathy and Micro vascular. Diagnosis and routine investigations-Monitoring the blood glucose level, Urine testing for the presence of sugar, random blood glucose, GTT.							
<b>UNIT III</b>							
<b>Complication in diabetic emergencies:</b> Diabetic ketoacidosis - hyperglycemia, hyper-osmolar non-keto coma, lactic acidosis. Complication in diabetes eye - types of ocular complication in diabetes - diabetic retinopathy-estimating burden, classification, features, diagnosis of screening - averting retinopathy tight control of blood glucose.							
<b>UNIT IV</b>							
<b>Cardiovascular complication in diabetes:</b> Prevention of CVD in diabetics; managing acute MI and unstable angina. <b>Diabetic nephropathy</b> Hyperglycemia and kidney function - correlation, population at risk and their chance to develop nephropathy - disease progression in diabetic kidney disease. Criteria for screening and diagnosis for diabetic nephropathy - treatment and prevention of nephropathy. End stage renal disease.							
<b>UNIT V</b>							
<b>Diabetic neuropathy:</b> Classification of neuropathy - peripheral neuropathy-sexual dysfunction - autonomic neuropathy - consequence of neuropathy - diagnosis and screening - glycemic control in management of diabetic neuropathy - diagnosis management of diabetic neuropathic foot ulceration.							

**TEXTBOOK**

1. Mohan, V, Unnikrishnan, R & Anjana,R.M.(2011) Dr.Mohan's Handbook of Diabetes Mellitus, 4<sup>th</sup> edition, Madras Diabetes Research Foundation, Chennai.

**REFERENCES**

1. L. Kathleen Mahan, Sylvia Escott-Stump, (2000). "Krause's Food Nutrition and Diet Therapy" W.B. Saunders Company, London.
2. Maurice E.Shils, James A. Olson, Moshe Shike, A. Catharine Ross, (1994), Modern Nutrition in Health AND Disease" Lippincott Williams and Wilkins publication, London.
3. American Diabetes Association guidelines (2010).
4. Rekha Sharma (2008) Diet Management, 3<sup>rd</sup> edition, Elsevier India, Noida.
5. Antia FP (2015) Clinical Dietetics and Nutrition, 4<sup>th</sup> edition, Oxford University Press, New Delhi.

**Open Educational Resources**

Diabetic in Renal failure - [https://epgp.inflibnet.ac.in/view\\_f.php?category=559](https://epgp.inflibnet.ac.in/view_f.php?category=559)

Diabetic Nephropathy - [https://epgp.inflibnet.ac.in/view\\_f.php?category=559](https://epgp.inflibnet.ac.in/view_f.php?category=559)

**LESSON PLAN**

UNITS	TOPIC	LECTUR E HOURS	MODE OF TEACHING
UNIT I	<b>Diabetes:</b> Introduction, definition, and meaning	5	Lecture
	Classification of diabetes mellitus	3	Peer Teaching
	Risk factors of Diabetes	3	Peer Teaching
	Diabetic food pyramid.	4	GD
	Prevalence - International, national and state	3	Blended Learning
UNIT II	Pathological changes in metabolism: Pathophysiology of Diabetes Mellitus.	4	Lecture
	Pathological changes in other systems- Eye, C.V system, Neuropathy, Nephropathy and Micro vascular.	4	Blended Learning
	Diagnosis and routine investigations	4	Lecture
	Monitoring the blood glucose level, Urine testing for the presence of sugar, random blood glucose	4	Blended Learning
	GTT.	2	Peer Teaching
UNIT III	<b>Complication in diabetic emergencies:</b> Diabetic ketoacidosis-hyperglycemia, hyper-osmolarnon-keto coma, lactic acidosis.	5	Lecture
	Complication in diabetes eye- types of ocular complication in diabetes	5	Seminar
	Diabetic retinopathy-estimating burden, classification, features, diagnosis of screening-averting retinopathy	5	Flipped Classroom
	Tight control of blood glucose.	3	Lecture
UNIT IV	<b>Cardiovascular complication in diabetes:</b> Prevention of CVD in diabetics	4	Lecture
	Managing acute MI and unstable angina	2	Lecture
	<b>Diabetic nephropathy</b> Hyperglycemia and kidney function-correlation, population at risk and their chance to develop nephropathy	4	Lecture

	Disease progression in diabetic kidney disease.	4	Peer Teaching
	Criteria for screening and diagnosis for diabetic nephropathy-treatment and prevention of nephropathy-End stage renal disease.	4	Lecture
UNIT V	<b>Diabetic neuropathy:</b> Classification of neuropathy-peripheral neuropathy-sexual dysfunction- autonomic neuropathy	4	Blended Learning
	Consequence of neuropathy-diagnosis and screening	5	Lecture
	Glycemic control in management of diabetic neuropathy	5	Lecture
	Diagnosis management of diabetic neuropathic foot ulceration	4	Group Discussion

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)							MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	
CO1	5	5	4	3	4	4	5	5	5	3	4	4	4.3
CO2	5	5	4	3	4	4	5	5	5	3	4	4	4.3
CO3	5	5	4	3	4	4	5	5	5	3	4	4	4.3
CO4	5	5	4	3	4	4	5	5	5	3	4	4	4.3
CO5	5	5	4	3	4	4	5	5	5	3	4	4	4.3
MEAN OVERALL SCORE													4.3

Result: The score of this course is 4.3 (Very High Relationship)

Programme : M.Sc. HOME SCIENCE  
 Semester : III Core Paper - IX Hours per week: 6 90 hrs/Semester  
 Sub. Code : NC1 Credits : 5

**TITLE OF THE COURSE: DIET IN METABOLIC DISEASES**

Pedagogy	Hours	Lecture	Peer Teaching	Demo/OER/Tutorial	GD/Seminar/Flipped Classroom	ICT/ Blended Learning	IV/DI
	90	42	5	6	20	17	-

**PREAMBLE**

To enable the students to

1. Understand the etiology, physiology and metabolic anomalies of acute and chronic diseases and patient needs
2. Know the effect of the various metabolic conditions on nutritional status, nutritional and dietary requirements
3. Obtain knowledge on therapeutic diets and to develop capacity and attitude for taking up dietetics as a profession

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to

	Unit	Hrs P/S
<b>CO1:</b> Explore new trends in dietary management of weight imbalances.	I	18
<b>CO2:</b> Integrate meal planning techniques for nutritional management of diabetes and its complications.	II	18
<b>CO3:</b> Integrate the cardiac, renal and liver functional tests with acute and chronic complications.	III	18
<b>CO4:</b> Distinguish the clinical aberrations and medical nutritional management of various organ systems.	IV	18
<b>CO5:</b> Familiarize with influences of clinical nutrition on inherited metabolic disorders.	V	18
<b>CO6:</b> Exhibit professional capacity and attitude for career in clinical nutrition.	I-V	

**SYLLABUS**

**UNIT I**

Nutrition in weight management. BMI and body composition. Weight imbalance – overweight, underweight, unintentional weight loss. Nutritional Management of obesity in children and adults. Total energy requirement - BMR and Physical Activity level. Role of complex carbohydrates. Reading nutrition labels - refined carbohydrates and empty calories. Macro modification for stubborn weight – Atkin’s, Ketogenic diet, Paleo, Low-carb High fat diet. Hormones that control hunger and fat storage - ghrelin, leptin, insulin, cortisol, estrogen. Nutritional management of hormonal imbalance – PCOD, hypo and hyperthyroidism.

**UNIT II**

Diabetes mellitus - Metabolic pattern of type-1 and type-2 diabetes. Abnormal metabolism in uncontrolled diabetes. Long term complications of diabetes and its management. Nutritional recommendations for management of diabetes – meal planning, food exchange system, carbohydrate counting, insulin carbohydrate ratio, portion control, dietary fibre, glycemic index and glycemic load.

**UNIT III**

Nutritional Management of Cardiovascular diseases - Coronary Artery Disease: Atherosclerosis, Thrombosis, Hyperlipidemia, Hypertension, Stroke. Inter-relationship between Diet and risk factors of CVD. Role of Dietary fibre, Saturated and Unsaturated fatty acids - omega 3 & 6 fatty acids, Mediterranean Diet, Prudent diet. Kempner’s rice diet, Dietary Approach to Stop Hypertension (DASH), Sodium intake in Hypertension. Lipoproteins and hyperlipidemia – risk factors and prevention.

**UNIT IV**

Nutritional management of Renal disorders – Acute and chronic glomerulonephritis, Nephrotic syndrome. Dietary management of Acute and Chronic Renal failure, End Stage Renal Disease; Importance of protein nutrition in

renal failure and uremia. Role of low protein, fluid restricted diet. Sodium and Potassium exchange list. Diet in Nephrolithiasis - Acid and Alkaline Ash Diet.

#### UNIT V

Nutritional management of Liver, gallbladder disorders – Jaundice, cirrhosis, hepatic coma, gallbladder stones. Nutritional management of Gout - Role of low purine diet in gout.

Nutritional management of Pancreatitis: Acute and chronic pancreatitis.

Nutritional management of inherited metabolic disorders – phenylketonuria (PKU), Maple syrup disease, Alkaptonuria, Primary hyperoxaluria, Cystinuria, Homocystinuria, Tyrosinemia, Albinism, Histidinemia. Glycogen storage diseases, Niemann-Pick disease and Farber's disease.

#### TEXT BOOKS

1. Rekha Sharma (2008) Diet Management, 3<sup>rd</sup> edition, Elsevier India, Noida.
2. Antia FP (2015) Clinical Dietetics and Nutrition, 4<sup>th</sup> edition, Oxford University Press, New Delhi.
3. Mahan L.K and Stump SE. (2012) Krause's Food, Nutrition and Diet Therapy, 13th edition, WB Saunders Co.

#### REFERENCES

1. Bamji MS, Rao NP, and Reddy V.(2010) Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi.
2. Michael J. Gibney, Hester V Vorster and Frans J Kok (2003) Introduction to Human Nutrition Blackwell publishing Oxford, U.K.
3. Shills, E.M,Olson, S.J. and Shils,M.C. (2011) Modern Nutrition in health and disease, 11th edition,Lea and Febringer, Philadelphia.
4. Williams SR (2009) Basic Nutrition and Diet Therapy, 13th edition, Mosby.
5. Satyanarayana U and Chakrapani U (2009) Biochemistry, 3<sup>rd</sup> edition, Books & Allied Pvt. Ltd., Vijayawada.

#### Open Educational Resources

Diabetic - [https://epgp.inflibnet.ac.in/view\\_f.php?category=559](https://epgp.inflibnet.ac.in/view_f.php?category=559)

PCOD - [https://epgp.inflibnet.ac.in/view\\_f.php?category=559](https://epgp.inflibnet.ac.in/view_f.php?category=559)

#### LESSON PLAN

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	Nutrition in weight management. BMI and body composition.	2	Blended Learning
	Weight imbalance – overweight, underweight, unintentional weight loss.	2	Peer Teaching
	Nutritional Management of obesity in children and adults.	2	Group Discussion
	Total energy requirement - BMR and Physical Activity level	2	Blended Learning
	Role of complex carbohydrates	2	Group Discussion
	Reading nutrition labels - refined carbohydrates and empty calories.	2	ICT
	Macro modification for stubborn weight – Atkin's, Ketogenic diet, Paleo, Low-carb High fat diet	2	Lecture
	Hormones that control hunger and fat storage - ghrelin, leptin, insulin, cortisol, estrogen.	2	Blended Learning
	Nutritional management of hormonal imbalance – PCOD, hypo and hyperthyroidism.	2	OER
UNIT II	Diabetes mellitus - Metabolic pattern of type-1 diabetes.	2	Lecture
	Metabolic pattern of type-2 diabetes	2	Lecture
	Abnormal metabolism in uncontrolled diabetes.	2	OER
	Long term complications of diabetes and its management.	2	OER

	Nutritional recommendations for management of diabetes – meal Planning	2	Flipped Classroom
	Nutritional recommendations for management of diabetes- food exchange system,	2	
	Nutritional recommendations for management of diabetes- carbohydrate counting, insulin carbohydrate ratio	2	
	Nutritional recommendations for management of diabetes, portion control	2	
	Nutritional recommendations for management of diabetes- dietary fibre, glycemic index and glycemic load	2	
UNIT III	Nutritional management of Atherosclerosis	3	Lecture
	Nutritional management of Coronary heart diseases.	3	Blended Learning
	Lipoproteins, Hyperlipidemia – risk factors	3	Lecture
	Hyperlipidemia- nutritional management, Role of restricted fat diet.	3	Peer Teaching
	Hypertension – primary prevention and nutritional Management	3	Seminar
	Role of DASH Diet, Mediterranean diet, sodium restricted diet in cardiovascular diseases.	3	Seminar
UNIT IV	Nutritional management of Renal disorders – Acute and chronic glomerulonephritis, Nephrotic syndrome	5	Lecture
	Dietary management of Acute and Chronic Renal failure; End Stage Renal Disease;	3	Blended Learning
	Importance of protein nutrition in renal failure and uremia, Role of low protein, fluid restricted diet. Sodium and Potassium Exchange	5	Lecture
	Diet in Nephrolithiasis - Role of Alkaline-Ash diet, Acid-Ash diet	5	Lecture
UNIT V	Nutritional management of Liver, gallbladder disorders – Jaundice, cirrhosis, hepatic coma, gallbladder stones	2	Lecture
	Nutritional management of Gout - Role of low purine diet in gout.	1	Lecture
	Acute and chronic pancreatitis - Role of low fat, high fibre diet.	3	Lecture
	Nutritional management of inherited metabolic disorders – phenylketonuria (PKU), Maple syrup disease, Alkaptonuria	3	Lecture
	Nutritional management of inherited metabolic disorders – Primary hyperoxaluria, Cystinuria, Homocystinuria, Tyrosinemia, Albinism, Histidinemia	3	Lecture
	Nutritional management of inherited metabolic disorders – Glycogen storage diseases	3	Lecture
	Nutritional management of inherited metabolic disorders – Niemann-Pick disease, Faber’s disease	3	Blended Learning

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)							MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	
CO1	5	5	4	4	4	4	5	4	4	3	4	4	4.2
CO2	5	5	4	4	4	4	5	4	4	3	4	4	4.2
CO3	5	5	4	4	4	4	5	4	4	3	4	4	4.2
CO4	5	5	4	4	4	4	5	4	4	3	4	4	4.2
CO5	5	5	4	4	4	4	5	4	4	3	4	4	4.2
MEAN OVERALL SCORE													4.2

Result: The score of this course is 4.2 (Very High Relationship)

**Programme :** M.Sc. HOME SCIENCE

**Semester :** III

**Core Paper - X**

**Hours per week: 6**

**90 hrs/Semester**

**Sub. Code :** NC2

**Credits : 5**

**TITLE OF THE COURSE: CLINICAL NUTRITION AND DIETETICS**

Pedagogy	Hours	Lecture	Peer Teaching	Demo/OER/Tutorial	GD/Seminar/Flipped Classroom	ICT/ Blended Learning	IV/DI
	90	34	7	3	24	22	-

**PREAMBLE**

To enable the students to

1. Understand the etiology, physiology and metabolic anomalies of acute and chronic diseases and patient needs
2. Know the effect of the various metabolic conditions on nutritional status, nutritional and dietary requirements
3. Obtain knowledge on therapeutic diets and to develop capacity and attitude for taking up dietetics as a profession

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to

	Unit	Hrs P/S
<b>CO1:</b> Assess nutritional status to identify high risk individuals in critical care.	I	18
<b>CO2:</b> Develop and implement feeding substrates for special feeding.	II	18
<b>CO3:</b> Discern the role of nutraceuticals in cancer and immune deficiency disorders.	III	18
<b>CO4:</b> Assess and recommend nutritional plans in pediatrics and geriatrics.	IV	18
<b>CO5:</b> Distinguish the etiology and clinical findings of GI diseases and suggest suitable dietary modifications.	V	18

**SYLLABUS**

**UNIT I**

**Nutritional screening and assessment:** Nutrition screening tools. Identification of high risk patients. Nutritional Assessment of hospitalized and outdoor patients based on clinical, biochemical, anthropometric data and diet history. Methods of dietary assessment. Identification of high risk patients. Implementation of nutritional care - techniques and feeding substrates. Dietary Counselling.

**UNIT II**

**Special nutritional needs in critical illness:** trauma, sepsis, burns. Medical nutrition therapy: Enteral nutrition – types, routes, composition of feeds, complications and precautions while feeding; Parenteral nutrition: types, modes, complications and precautions while feeding. Palliative care and rehabilitation diets.

**UNIT III**

**Medical Nutrition Therapy for immunodeficiency disorders** – HIV/AIDS, respiratory disorders – asthma and bronchitis. MNT for Novel viral infections.

**Nutritional management in Cancer** – Nutrition and Carcinogenesis. Medical nutrition therapy in cancer. Role of neutropenic diet. Nutraceuticals in cancer prevention. Nutritional impact of cancer treatment and its management.

**UNIT IV**

**Nutritional management in Paediatrics:** Assessment of nutritional needs, factors affecting nutritional intake; special feeding practices. Management of food allergy and food intolerance in infants.

**Nutritional management in Geriatrics:** Assessment of nutritional risks - physiological, metabolic and psychological needs. Nutritional support services. Bone health in elderly – osteoporosis, osteo-arthritis, vitamin D deficiency. Special feeding methods for elderly.

**Nutritional management of Neurological disorders** – Parkinson’s disease, Epilepsy, Alzheimer’s syndrome. Role of ketogenic diet.

**UNIT V**

**Nutritional management in Gastrointestinal Diseases** Clinical manifestations and dietary modifications for GERD, peptic ulcer, ulcerative colitis, Tropical sprue, celiac disease, irritable bowel syndrome. Role of FODMAP diet.

**Nutritional management in** Pancreatic disorders - acute and chronic pancreatitis, pancreatic cancer.

**Nutrient Drug interaction** – Effect of food, nutrients and nutritional status on drug dosage and efficacy.

**TEXT BOOKS**

1. Rekha Sharma (2008) Diet Management, 3<sup>rd</sup> edition, Elsevier India, Noida.
2. AntiaFP(2015) Clinical Dietetics and Nutrition, 4<sup>th</sup> edition, Oxford University Press, New Delhi.

**REFERENCES**

1. Judith Brown, Jennifer Kosto (2008) Nutrition Now-Interactive Learning Guide for Students, International Student edition.
2. Bamji, M.S., Rao, P.N. and Reddy, V. (1996). Textbook of Human Nutrition, Oxford & IBH Publishing Co. Pvt. Ltd.
3. Staci Nix Williams (2009). Basic Nutrition and Diet Therapy, 13TH ed. CV Mosby Inc.
4. Mahan K & Escott-Stump S (2012) Krause's Food, Nutrition and Diet Therapy, 13th edition, Saunders Elsevier Inc. Canada, ISBN 978-0-8089-2378-7.
5. Shills, M.E., Olson, J., Shike, M. and Roos, C. (1998): Modern Nutrition in Health and Disease. 9th Edition .Williams and Williams. A. Beverly Co. London.
6. SreeDevi.V. (1997). Nutrition Education. Discovery Publishing House, New Delhi.

**Journals**

1. Journal of American Dietetic Association.
2. British Journal of Dietetics.
3. Asia-Pacific Journal of Clinical Nutrition.
4. Journal of Academy of Nutrition and Dietetics
5. Indian Journal of Nutrition and Dietetics.

**Open Educational Resources**

Nutraceuticals in Cancer prevention - [https://epgp.inflibnet.ac.in/view\\_f.php?category=556](https://epgp.inflibnet.ac.in/view_f.php?category=556)

HIV/AIDS - [https://epgp.inflibnet.ac.in/view\\_f.php?category=559](https://epgp.inflibnet.ac.in/view_f.php?category=559)

**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	<b>Nutritional screening and assessment:</b> Nutrition screening tools.	5	Blended Learning
	Nutritional Assessment of hospitalized and outdoor patients based on clinical, biochemical, anthropometric data and diet history.	5	Blended Learning
	Methods of Dietary assessment. Identification of high risk patients.	4	Group Discussion
	Implementation of nutritional care - techniques and feeding substrates.	4	Flipped Classroom
UNIT II	<b>Special nutritional needs in critical illness:</b> trauma, sepsis, burns.	5	Lecture
	Medical nutrition therapy: Enteral nutrition – types, routes, composition of feeds, complications and precautions while feeding;	3	Group Discussion
	Parenteral nutrition: types, modes, complications and precautions while feeding.	5	Blended Learning
	Palliative care and rehabilitation diets.	5	Group Discussion
	<b>Medical Nutrition Therapy for immunodeficiency disorders - HIV/AIDS</b>	4	Lecture

UNIT III	MNT for Respiratory disorders – asthma and bronchitis. Novel viral infections	3	Peer Teaching
	<b>Nutritional management in Cancer</b> – Nutrition and Carcinogenesis. Medical Nutrition Therapy in cancer. Role of neutropenic diet.	5	Lecture
	Nutraceuticals in cancer prevention.	3	OER
	Nutritional impact of cancer treatment and its management.	3	Group Discussion
UNIT IV	<b>Nutritional management in Paediatrics:</b> Assessment of nutritional needs, factors affecting nutritional intake	4	Lecture
	Special feeding practices.	1	Blended Learning
	Management of food allergy and food intolerance in infants.	4	Lecture
	<b>Nutritional management in Geriatrics:</b> Assessment of nutritional risks - physiological, metabolic. physiological, metabolic and psychological needs. Nutritional support services.	4	Lecture
	Bone health in elderly – osteoporosis, osteo-arthritis, vitamin D deficiency	2	Seminar
	Special feeding methods for elderly	1	Peer Teaching
UNIT V	Nutritional management of Neurological disorders – Parkinson’s disease, Epilepsy, Alzheimer’s syndrome. Role of ketogenic diet.	2	Lecture
	<b>Nutritional management in Gastrointestinal Diseases</b> Clinical findings and dietary modifications for GERD	3	Blended Learning
	<b>Nutritional management in Gastrointestinal Diseases</b> Clinical findings and dietary modifications for GERD, Peptic ulcer	3	Peer Teaching
	Ulcerative colitis, Tropical sprue, celiac disease, Irritable bowel syndrome. Role of FODMAP diet.	3	Blended Learning
	Nutritional management in Pancreatic disorders - acute and chronic pancreatitis, pancreatic cancer.	3	Group Discussion
<b>Nutrient Drug interaction</b> – Effect of food, nutrients and nutritional status on drug dosage and efficacy.	6	Lecture	

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)							MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	
CO1	5	5	4	3	3	5	5	5	4	3	3	4	4.1
CO2	5	5	4	3	3	5	5	5	4	3	3	4	4.1
CO3	5	5	4	3	3	5	5	5	4	3	3	4	4.1
CO4	5	5	4	3	3	5	5	5	4	3	3	4	4.1
CO5	5	5	4	3	3	5	5	5	4	3	3	4	4.1
MEAN OVERALL SCORE													4.1

Result: The score of this course is 4.1 (Very High Relationship)

Programme : M.Sc. HOME SCIENCE  
 Semester : III Core Paper XI Hours per week: 6 90 hrs/Semester  
 Sub. Code : NC3 Credits: 5

**TITLE OF THE PAPER: RESEARCH METHODOLOGY AND STATISTICS**

Pedagogy	Hours	Lecture	Peer Teaching	Demo/OER/ Tutorial	GD/Seminar/Flipped Classroom	ICT/ Blended Learning	IV/DI
	90	24	4	19	25	18	--

**PREAMBLE**

1. To understand the significance of research methodology in Home Science research.
2. To understand the types, tools and methods of research and develop the ability to construct data gathering instruments appropriate to the research design.

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to	Unit	Hrs P/S
<b>CO1:</b> Define the objectives of research and identify research problem	I	18
<b>CO2:</b> Apply sampling techniques in data collection	II	18
<b>CO3:</b> Formulate research hypothesis, design and conceptual framework		
<b>CO4:</b> Differentiate variable types and statistical measures	III	18
<b>CO5:</b> Demonstrate application of digital tools in statistical analysis	IV	18
<b>CO6:</b> Display skills in writing research report and develop interest for future research activities	V	18

**SYLLABUS**

**UNIT I**

**Fundamentals of Research:** Meaning and Objectives of research; Types of research — pure, applied, historic, exploratory and descriptive, experimental, diagnostic, survey and case study. Advantages and limitations of research.

**Types of Research Design** Non-Experimental research designs – Observational, Cross-sectional, Longitudinal, Case study, Correlational and Quasi-experimental; Experimental research design – independent and dependent variables – pre-test, post-test study - between subjects, within subjects. Characteristics of good experimental design.

**UNIT II**

**Research methods: Types of Sampling and Data collection techniques:** Sampling — Sampling methods and techniques – probability, random, stratified, systematic, multi-stage, cluster, non-probability, judgement, convenience, quota, accidental, snow-ball sampling methods. Collection of data, sources of data — Primary and Secondary data. Scales of Measurement: nominal, ordinal, interval and ratio.

**Data gathering instruments:** observation, questionnaire, interview, case study, home visits. Reliability and Validity of measuring instruments.

**UNIT III**

**Description of variables** – categorical and numerical variables. Frequency distribution, percentage, proportions, ratios and rates.

**Tabulation:** Tabulation of data - graphic and diagrammatic presentations (Bar diagrams, Pie diagrams, Pictograms. graphs etc.).

**Statistical measures:** Measures of central tendency - Arithmetic mean, median and mode - application, advantages and disadvantages. **Measures of Dispersion:** Range, Standard deviation, standard error. Normal and symmetrical distribution, Confidence interval and Coefficient of variation.

**UNIT IV**

**Formulation and testing of hypothesis** - Null and alternative hypothesis, Hypothesis testing. Small sample tests and large sample tests, one tail test and two tail tests. (t - test and z - test).

**Tests of significance:** Chi Square Test and F-test, Anova- One way, two way.

**Correlation Analysis:** Meaning, types of correlation, methods of measuring correlation, algebraic methods -Karl Pearson's coefficient of correlation and Spearman's Rank correlation.

**Regression Analysis:** Regression - Meaning, Kinds of regression, Methods of measuring regression; Difference between Correlation and Regression. Application of computers in Statistical Analysis- SPSS, Excel.

#### UNIT V

**Writing a Research Report** - Purpose and characteristics of a good report. Contents and format of a research report - Introduction, Review of literature, Methodology, Results and Discussion, Summary, Bibliography. Styles of referencing. Use of footnotes. Editing and evaluation. Types of reports. Recent techniques in research report preparation - Digital tools for reference management.

#### TEXT BOOKS

1. Vijayalakshmi, G and Sivapragasam C. (2008). Research methods – Tips and techniques, MJP Publishers, Chennai. ISBN13 9788180940460.

2. Kothari, C.R. and Garg G (2014), Research Methodology - Methods and Techniques. 3<sup>rd</sup> edition, New Age International Publishers, New Delhi. ISBN 9788122436235.

#### REFERENCES

1. Bandarkar, P.L. and Wilkinson T.S. (2000). Methodology and Techniques of Social Research, Himalaya Publishing House, Mumbai.

2. Bhatnagar, G.L. (1990). Research Methods and Measurements in Behavioural and Social Sciences, Agri. Cole Publishing Academy, New Delhi.

3. Edwards, T. (2011). Research Design and Statistics – a Bio-Behavioural Focus, Tata McGraw Hill Education Pvt. Ltd., New Delhi.

4. Agarwal, Y.P.(1990) Statistical Methods, Sterling Publishers Pvt. Ltd.

5. Gupta S.P. (1996) Statistical Methods, Sultan Chand & Sons, New Delhi.

6. Sancheti, D.C. and Kapoor, V.K.(1993) Statistics, Theory, Method and Application, Sultan Chand & Sons, New Delhi.

7. Mahajan BK (2010) Methods in BioStatistics for Medical students and Research workers, 7<sup>th</sup> edition, Jaypee Brothers Medical Publishers Pvt. Ltd., New Delhi.

8. Biju Dharmapalan (2012) Scientific Research Methodology, Narosa Publishing House Pvt. Ltd., New Delhi.

#### JOURNAL

International Journal of Science and Research Methodology

International Journal of Social Research Methodology

Indian Journal of Medical Research

#### Open Educational Resources

Research Methods in Nutrition - [https://epgp.inflibnet.ac.in/view\\_f.php?category=1381](https://epgp.inflibnet.ac.in/view_f.php?category=1381)

Fundamental research: <https://epgp.inflibnet.ac.in/ahl.php?csrno=827>

Test of significance - <https://epgp.inflibnet.ac.in/ahl.php?csrno=827>

Correlations - <https://epgp.inflibnet.ac.in/ahl.php?csrno=827>

#### LESSON PLAN

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	Fundamentals of Research: Meaning and Objectives of research	4	OER
	Types of research — pure, applied, historic, exploratory and descriptive, experimental, diagnostic, survey and case study; Advantages and limitations of research	4	Seminar
	Types of Research Design: Non-Experimental research designs – Observational, Cross-sectional, Longitudinal, Case study, Correlational and Quasi-experimental	5	Lecture
	Experimental research design – independent and dependent variables – pre-test, post-test study. Characteristics of good experimental design; Types – between subjects, within subjects.	5	Lecture
UNIT II	Research methods: Types of Sampling and Data collection techniques: Sampling — Sampling methods and techniques – probability, random, stratified, systematic, multi-stage, cluster, non-probability, judgement, convenience, quota, accidental, snow-ball sampling methods	2	Flipped Classroom

	Collection of data, sources of data — Primary and Secondary data	2	Peer Teaching
	Scales of Measurement: nominal, ordinal, interval and ratio	2	Blended Learning
	Statistical Techniques: Non-Parametric and Parametric tests	2	ICT
	Steps in Research Process: Identification of a problem, devising a research question, objectives of study, selection and statement of research problem; formulation of hypothesis, limitations and delimitations of the problem	2	Flipped Classroom
	Defining the variable types - independent and dependent variables	2	Blended Learning
	Data gathering instruments: observation, questionnaire, interview, case study, scaling methods, home visits	2	ICT
	Reliability and Validity of measuring instruments	4	Lecture
UNIT III	Description of variables – categorical and numerical variables	4	Lecture
	Frequency distribution, percentage, proportions, ratios and rates	4	ICT
	Tabulation: Tabulation of data - graphic and diagrammatic presentations (Bar diagrams, Pie diagrams, Pictograms, graphs etc.)	2	Peer Teaching
	Statistical measures: Measures of central tendency - Arithmetic mean, advantages and methods of calculation: geometric mean, Harmonic 'mean; 'median - quartiles, significance and calculation, mode - application of mode, advantages	4	GD
	Measures of Dispersion: Range, Standard deviation, standard error. Normal and symmetrical distribution. Confidence interval. Coefficient of variation	4	Seminar
UNIT IV	Formulation and testing of hypothesis - Null and alternative hypothesis, Hypothesis testing, Small sample tests and large sample tests, one tail tests and two tail tests. (t - test and z - test)	3	OER
	Tests of Significance: Chi Square Test and F-test, Anova: One way, two way	3	ICT
	Correlation - Meaning, types of correlation, methods of measuring correlation. Algebraic methods (Karl Pearson's coefficient of correlation and Spearman's Rank correlation).	3	Blended Learning
	Regression Analysis: Regression - Meaning, Kinds of regression, Methods of measuring regression	6	Lecture
	Difference between correlation and Regression. Application of computers in Statistical Analysis – SPSS, Excel.	3	GD
UNIT V	Writing a Research Report - Purpose and characteristics of a good report.	6	OER
	Contents of a research report - Introduction, Review of literature, Methodology, Results and Discussion, Summary, Bibliography. Use of footnotes	6	Seminar
	Editing and evaluation. Types of reports. Recent techniques in research report preparation. Digital Tools for reference management.	6	Demonstration

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	4	3	3	5	4	4	4	4	3	2	4	3.8
CO2	5	4	3	3	5	4	4	4	4	3	2	4	3.8
CO3	5	4	3	3	5	4	4	4	4	3	2	4	3.8
CO4	5	4	3	3	5	4	4	4	4	3	2	4	3.8
CO5	5	4	3	3	5	4	4	4	4	3	2	4	3.8
CO6	5	4	3	3	5	4	4	4	4	3	2	4	3.8
MEAN OVERALL SCORE													3.8

Result: The score of this course is 3.8 (High Relationship)

**Programme :** M.Sc. HOME SCIENCE

**Semester :** III **Core Paper - XII** **Hours per week: 3+3** **90 hrs/Semesters**

**Sub. Code :** NL3 **Credits: 3**

**TITLE OF THE COURSE: CLINICAL NUTRITION AND DIETETICS PRACTICAL**

Pedagogy	Hours	Lecture	Practical Experience	Demo/OE R/ Tutorial	GD/Seminar/Flipped Classroom	ICT/ Blended Learning	IV/DI
	90	-	81	9	-	-	-

**PREAMBLE**

The practical exercises are aimed to facilitate the students to

- Understand the techniques in assessment of nutritional needs for different therapeutic conditions

Imbibe the skill set in planning therapeutic diets of higher order

- Practice the use of exchange lists, ready-reckoners and digital applications in planning diets

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to

Unit

Hrs P/S

**CO1:** Standardize food measures and practice use of exchange lists in planning diets.

I

18

**CO2:** Formulate novel modified diets for surgical conditions, food intolerance and special needs.

II

18

**CO3:** Demonstrate applications of meal planning tools for dietary management of chronic disorders.

III

18

**CO4:** Demonstrate applications of meal planning tools for dietary management of chronic disorders.

IV

18

**CO5:** Integrate digital applications for planning diets.

V

18

**CO6:** Evolve as an eligible clinical nutritionist.

I -V

**SYLLABUS**

**UNIT I**

Standardisation of household food weights and measures.

Preparation of routine hospital diets in surgical conditions – clear fluid, full fluid and soft diets.

**UNIT II**

Planning and preparing diets for the following conditions IBD – celiac disease and IBS – Lactose intolerance.

Planning and preparing diet for Type I and II Diabetes conditions with and without complications and on different drug therapy - carbohydrate counting, food exchange lists, ready reckoner based diet.

Planning and preparing a diet for individuals with hypertension – sodium restricted diet.

**UNIT III**

Planning and preparing diet for Liver failure condition - fat restricted diet.

Planning and preparing diet for renal failure – fluid and protein restricted diet

Planning and preparing a diet for post-burn condition – high calorie and protein diets.

**UNIT IV**

Planning and preparing a diet for HIV with and without comorbidities – protein and vitamin rich diet.

Planning and preparing a diet for poor nutritional status in cancer patients – nutraceutical based diet.

**UNIT V**

Planning and preparing diet for over-weight, obese and conditions of hyperlipidemia – macro modified diet.

Planning and preparing paediatric and geriatric diets.

**REFERENCES:**

1. Rekha Sharma (2008) Diet Management, 3<sup>rd</sup> edition, Elsevier India, Noida.
2. Antia FP (2015) Clinical Dietetics and Nutrition, 4<sup>th</sup> edition, Oxford University Press, New Delhi.
3. Vimala V. Advances in Diet Therapy Practical Manual, 2009, New Age International Pvt. Ltd. Publishers, New Delhi. ISBN 9788122426779.
4. Suganthi,V and Anitha,V. Manual on Diet Therapy, 2017, Dipti Press Pvt. Ltd., Chennai. ISBN 9788193103173.S

**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	Standardisation of household food weights and measures.	9	Demo
	Preparation of routine hospital diets in surgical conditions – clear fluid, full fluid and soft diets.	9	Practical Experience
UNIT II	Planning and preparing diets for the following conditions IBD – celiac disease and IBS – Lactose intolerance.	6	Practical Experience
	Planning and preparing diet for Type I and II Diabetes conditions with and without complications and on different drug therapy - carbohydrate counting, food exchange lists, ready reckoner based diet.	6	Practical Experience
	Planning and preparing diet for individuals with hypertension – sodium restricted diet.	6	Practical Experience
UNIT III	Planning and preparing diet for Liver failure condition - fat restricted diet.	6	Practical Experience
	Planning and preparing diet for renal failure – fluid and protein restricted diet	6	Practical Experience
	Planning and preparing diet for post-burn condition – high calorie and protein diets.	6	Practical Experience
UNIT IV	Planning and preparing diet for HIV with and without comorbidities – protein and vitamin rich diet.	9	Practical Experience
	Planning and preparing a diet for poor nutritional status in cancer patient – nutraceutical based diet.	9	Practical Experience
UNIT V	Planning and preparing diet for over-weight, obese	5	Practical Experience
	Conditions of hyperlipidemia – macro modified diet.	5	Practical Experience
	Planning and preparing paediatric	4	Practical Experience
	Geriatric diets.	4	Practical Experience

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)							MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	
CO1	5	5	5	4	4	4	5	5	4	3	3	4	4.3
CO2	5	5	5	4	4	4	5	5	4	3	3	4	4.3
CO3	5	5	5	4	4	4	5	5	4	3	3	4	4.3
CO4	5	5	5	4	4	4	5	5	4	3	3	4	4.3
CO5	5	5	5	4	4	4	5	5	4	3	3	4	4.3
MEAN OVERALL SCORE													4.3

Result: The score of this course is 4.3 (Very High Relationship)

Programme : M.Sc. HOME SCIENCE  
 Semester : III Elective Paper III (a) Hours per week: 5 75 hrs/Semester  
 Sub. Code : ENC5 Credits : 4

**TITLE OF THE COURSE: CURRENT TRENDS IN EXTENSION EDUCATION AND COMMUNICATION**

Pedagogy	Hours	Lecture	Peer Group Teaching	Demo/OER/Tutorial	GD/Seminar	ICT/Blended Learning	IV/DI
	75	38	-	18	15	9	-

**PREAMBLE**

1. To obtain necessary skills in extension teaching and field work
2. To study the existing organizations at village and block levels.
3. To know the role of extension workers in planning programmes for the community.

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to

	Unit	Hrs P/S
<b>CO1:</b> Apply the principles and philosophies of extension education to society.	I	15
<b>CO2:</b> Exhibit the qualities and responsibilities of women extension workers.	II	15
<b>CO3:</b> Display the individual, group and mass approaches for extension and communication.	III	15
<b>CO4:</b> Plan and execute community nutrition programmes for extension activities.	IV	15
<b>CO5:</b> Compare the objectives and implementation of community development programmes in India.	V	15
<b>CO6:</b> Act as change agents in extending health and nutrition knowledge to the community.	I-V	

**SYLLABUS**

**UNIT I**

Extension Education — Concept, aim, Philosophy and Principles of Extension education. Extension Education and its relationship with other Social Sciences. Home science extension - Meaning, Objectives and role of Home Science Extension in national development.

**UNIT II**

Administrative setup for rural development - Central, State, District, Block and village level. Extension personnel working at block level, role and functions of women extension workers, qualities of an extension worker, training women extension workers.

**UNIT III**

Communication and Extension - Approaches for development. Advantages - Individual, Group and mass approaches, Motivation, Methods of extension teaching, Teaching tools, Difference in methods of extension and formal education, Direct contact, demonstration method.  
 Audio visual aids-visual aids, audio aids and other teaching Aids. Communication through written words and satellite.

**UNIT IV**

Programme Planning, Meaning, and principles, developing a plan of work - Definition, analysis of the concept, Importance and scope of Extension. Steps in Programming evaluation- Criteria for judging the plan of the work.

**UNIT V**

Community Development Programme - meaning, objectives, types and principles of community development; Programmes in India - Socio-Economic programmes — IRDP, TRYSEM, DWCRA, ICDS, Social forestry. Community Organization - meaning, scope, role and characteristics of Community Organisation - Women's Club, Youth Club. Extension Training Institution — Meaning, need and importance; principles of training institutions- KVIC, RETC, NYK.

**Related Experience / Practical**

1. Visit to Block to understand its set up and importance in Rural Development
2. Visit to DRBA and discuss with officials on the current programme.
3. Visit to K.V.K / RETC.
4. Visit to a MahilaMandal.
5. Planning and Implementing a programme for Women and Children
6. Familiarizing with audio visual aids
7. Studying the functions of ICDS.

**TEXT BOOKS**

1. Adivi Reddy A. (1999). **Extension Education**, BapatlaSree Lakshmi Press.

**REFERENCES**

1. Serene Shekhar, (Gote) and Santosh Ahlawat, (2013). **Text Book of Home Science Extension Education**, New Delhi: Daya Publishing House.
2. Pankajam, G. (2000). **Extension – Third Dimension of Education**, New Delhi: Gyan Publishing House.
3. Adivi Reddy A. (1999). **Extension Education**, BapatlaSree Lakshmi Press.
4. Supe, S.V. (1983). **An Introduction to Extension Education**, New Delhi : Oxford AD IBH Publishing Company.
5. Dahama, O.P. and Bhatnagar, O.P. (1985). **Education and communication for development**, New Delhi: Oxford IBH publishing company.

**Open Educational Resources**

Concept of extension - <http://ecoursesonline.iasri.res.in/course/view.php?id=691>

Communication and Extension - <http://ecoursesonline.iasri.res.in/course/view.php?id=218-->

Community Development Programmes

[-http://vidyamitra.inflibnet.ac.in/index.php/home/subjects?domain=Social+Sciences&subdomain=Home+Science](http://vidyamitra.inflibnet.ac.in/index.php/home/subjects?domain=Social+Sciences&subdomain=Home+Science)

**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	Extension Education — Concept, aim, Philosophy and Principles of Extension education	5	OER
	Extension Education and its relationship with other Social Sciences, Home science extension - Meaning, Objectives	5	OER
	Role of Home Science Extension in national development	5	Seminar
UNIT II	Administrative setup for rural development – central, State, District	4	Lecture
	Block and village level, Extension personnel working at block level	4	Lecture
	Role and functions of women extension workers	4	Lecture
	Qualities of an extension worker, Training women extension workers	3	Seminar
UNIT III	Communication and Extension - Approaches for development , Advantages - Individual, Group and mass approaches	3	ICT
	Motivation, Methods of extension teaching, Teaching tools	3	Lecture
	Difference in methods of extension and formal education, Direct contact	3	Lecture
	Demonstration method, Audio visual aids-visual aids	3	BL
	Audio aids and other teaching Aids, Communication through written words and satellite	3	BL
UNIT IV	Programme Planning, Meaning, and principles , Developing a plan of work	3	Lecture
	Definition, analysis of the concept	4	Lecture
	Importance and scope of Extension	3	Lecture
	Steps in Programming evaluation, Criteria for judging the plan of the work.	5	Lecture

UNIT V	Community Development Programme - meaning, objectives, types and Principles of community development	4	OER
	community development — Programmes in India - Socio-Economic programmes — IRDP, TRYSEM, DWCRA, ICDS, Social forestry	4	OER
	Community Organization - meaning, scope, role and characteristics of Community Organisation, Women's Club, Youth Club.	3	Group Discussion
	Extension Training Institution — Meaning, need and importance; principles of training institutions KVIC, RETC, NYK.	4	Group Discussion

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF Cos
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	4	3	4	4	5	4	5	2	3	2	5	3.8
CO2	5	4	3	4	4	5	4	5	2	3	2	5	3.8
CO3	5	4	3	4	4	5	4	5	2	3	2	5	3.8
CO4	5	4	3	4	4	5	4	5	2	3	2	5	3.8
CO5	5	4	3	4	4	5	4	5	2	3	2	5	3.8
CO6	5	4	3	4	4	5	4	5	2	3	2	5	3.8
MEAN OVERALL SCORE													3.8

Result: The score of this course is 3.8 (High Relationship)

Programme : M.Sc. HOME SCIENCE  
 Semester : III Elective Paper III(b) Hours per week: 5 75hrs/Semester  
 Sub. Code : ENC6 Credits : 4

**TITLE OF THE COURSE: PUBLIC HEALTH & EPIDEMIOLOGY**

Pedagogy	Hours	Lecture	Peer Teaching	Demo/OER/Tutorial	GD/Seminar/Flipped Classroom	ICT/Blended Learning	IV/DI
	75	46	2	1	23	3	-
<b>PREAMBLE</b>							
To enable to students to-							
1. Understand the concept of health from the individual and community perspective.							
2. Know the importance of epidemiology and public health.							
<b>COURSE OUTCOME</b>						Unit	Hrs P/S
At the end of the Semester, the Students will be able to							
<b>CO1:</b> Interpret indicators of health in relation to the health situation of India.						I	15
<b>CO2:</b> Identify nutritionally vulnerable groups and the needs of special populations.						II	15
<b>CO3:</b> Describe the significance of vital statistics in public health epidemiology						III	15
<b>CO4:</b> Promote life style changes to prevent chronic diseases.						IV	15
<b>CO5:</b> Justify the significance of immunization for public health.						V	15
<b>CO6:</b> Interpret global burden of diseases in relation to Healthcare Index.						I - V	
<b>SYLLABUS</b>							
<b>UNIT I</b>							
Health and dimensions of health - Introduction to concept of health, indicators of health, health situation in India, Family and Community health.							
<b>UNIT II</b>							
Community and its organization - Concept of Community, factors affecting health of the community – environmental, social, cultural, dietary, organizational, economic, political. Vulnerable groups/needs of special populations.							
<b>UNIT III</b>							
Public Health - Vital statistics and their significance. Epidemiological methods Descriptive, analytical, experimental.							
<b>UNIT IV</b>							
Lifestyle and community health - Preventive and promotive aspects, public education and action, alcohol, cigarette smoking, drugs, AIDS, STD, diet in chronic diseases.							
<b>UNIT V</b>							
Immunisation - Importance and schedule for children, adults and for foreign travel, problems encountered-importance of cold chain, role of individual, family and community in promoting health.							
<b>TEXT BOOKS</b>							
1. Manelkar, R.K.(2004) A Textbook of Community Health for Nurses, 3 <sup>rd</sup> edition, Vora Medical Publications, Mumbai.							
<b>REFERENCES</b>							
1. Manelkar, R.K. (2009) Communicable Diseases, 2 <sup>nd</sup> edition, Vora Medical Pub., Mumbai.							
2. Muruges, N.(2004) Health Education and Community Pharmacy, 4 <sup>th</sup> edition, Sathya Publishers, Madurai.							
3. Park, K. (1994) Park's Textbook of Preventive Medicine, 9 <sup>th</sup> edition, M/s. Banarsidas Bhanot. Jabalpur.							
4. Parmar, N.S. (2009): Health Education and Community Pharmacy, CBS Publishers and Distributors Pvt. Ltd., New Delhi.							

5. Smith, G.W. (1957) Preventive Medicine and Health, 2<sup>nd</sup> edition, MacMillan Co., New York.
6. Vijay, E. (2007) Community Medicine, 3<sup>rd</sup> edition, B.I.Publications, Pvt. Ltd., Chennai.

**Open Educational Resources**

Life style - <http://ecoursesonline.iasri.res.in/course/view.php?id=218-->

**LESSON PLAN**

UNITS	TOPIC	LECTUR E HOURS	MODE OF TEACHING
UNIT I	Health and dimensions of health – definition of health, components of health, global health burden/ index	5	Lecture
	Introduction to concept of health indicators of health	2	Peer group learning
	Health situation in India	5	Lecture
	Family and Community health.	3	Group Discussion
UNIT II	Community and its organization - Concept of Community	5	Lecture
	Factors affecting health of the community – environmental, social, cultural, dietary, organizational, economic, political.	5	Seminar
	Vulnerable groups/needs of special populations.	5	Lecture
UNIT III	Public Health - Vital statistics and their significance.	3	Lecture
	Epidemiological method	3	Lecture
	Descriptive method	3	Lecture
	Analytical method	3	Lecture
	Experimental method	3	Lecture
UNIT IV	Lifestyle and community health - Preventive and promotive aspects	1	OER
	Public education and action for prevention and treatment of	2	Group Discussion
	Alcohol addiction	2	
	Drugs addiction	2	
	cigarette smoking		
	AIDS	2	
	STD	2	
Diet in chronic diseases.	2	Lecture	
UNIT V	Immunisation - Importance	3	Lecture
	Schedule for children	3	Lecture
	Immunisation for adults and for foreign travel	3	Blended Learning
	Problems encountered-importance of cold chain	3	Lecture
	Role of individual, family and community in promoting health.	3	Seminar

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)							MEAN SCORE OF Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	
CO1	5	4	3	3	4	5	5	4	4	3	4	4	4
CO2	5	4	3	3	4	5	5	4	4	3	4	4	4
CO3	5	4	3	3	4	5	5	4	4	3	4	4	4
CO4	5	4	3	3	4	5	5	4	4	3	4	4	4
CO5	5	4	3	3	4	5	5	4	4	3	4	4	4
MEAN OVERALL SCORE													4

Result: The score of this course is 4 (High Relationship)

Programme : M.Sc. HOME SCIENCE  
 Semester : III NON MAJOR ELECTIVE Hours per week: 2 30hrs/Semester  
 Sub. Code : NMPN Credits: 2

**TITLE OF THE COURSE: NUTRITION FOR HEALTH AND FITNESS**

Pedagogy	Hours	Lecture	Peer Teaching	Demo/OER/ Tutorial	GD/Seminar/Flipped Classroom	ICT/ Blended Learning	IV/DI
	30	6	-	8	10	6	-

**PREAMBLE**

This course will prepare the students to:

1. Understand the components of health and fitness and the role of nutrition in exercise regimens for pre and post-natal fitness.
2. Make nutritional, dietary and physical activity recommendations to achieve fitness and well-being.
3. Develop ability to evaluate fitness and well-being.

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to

	Unit	Hrs P/S
<b>CO1:</b> Identify the role of nutrition in health and fitness.	I	6
<b>CO2:</b> Apply nutrition management for exercise and fitness.	II	6
<b>CO3:</b> Assess the role of nutritional supplements for specific sports activities.	III	6
<b>CO4:</b> Plan and promote nutrition and exercise regimen for all age groups.	IV	6
<b>CO5:</b> Suggest self-help plans for stress management.	V	6
<b>CO6:</b> lifestyle modifications to achieve health and fitness of the community.	I-V	

**SYLLABUS**

**UNIT I**

Definitions, Components of Fitness -Introduction to fitness and training, benefits of exercise, components of fitness, Specific fitness in health status. Energy input and output. Effect of specific nutrients on work performance and physical fitness.

**UNIT II**

**Nutrition, exercise, physical fitness and health:** Review of different energy systems for endurance and power activity, Nutrition in weight management, BMI body composition, weight imbalance-overweight underweight, unintentional weight loss. Fuels and nutrients support physical activity, Shifts in carbohydrate and fat metabolism, Mobilisation of fat stores during exercise.

**UNIT III**

**Nutrition in sports:** Sports specific requirement, Diet manipulation, Pre-game and post-game meals. Assessment of different nutrigenic electrolyte aids and commercial supplements. Weight cycling. Water and balance (Losses and their replenishment during exercise and sports events, effect of dehydration, sports drink).

**UNIT IV**

Nutrition and exercise regimens for pre and post-natal fitness. Significance of physical fitness and nutrition in the prevention and management of weight control, obesity, diabetes mellitus, CV disorders, bone health and cancer.

**UNIT V**

**Diet and Lifestyle Modifications:** Alternative systems for health and fitness in yoga, Meditation, Vegetarianism. Role of nutrition in Stress management. Self-help plan for lifestyle changes. Types of diet in weight maintenance.

**PRACTICAL EXPERIENCE**

1. Assessment of nutritional status including body composition.
2. Physiological parameters like heart rate and blood pressure.
3. Planning diets and formulating dietary guidelines for:
  - Fitness and health
  - Prevention of chronic degenerative disorders
  - Obesity management
  - Management of diabetes mellitus and CVD.

## 4. Review of existing alternative diet related systems for physical fitness and health.

**TEXT BOOKS**

Ross, C. et al., (2016) 11<sup>th</sup> edition, Modern Nutrition in Health & Disease, Williams & Wilkins, New York.

**REFERENCES**

1. Mahan, L.K. Escott — Stump, S. (2000) Krause's Food, Nutrition and Diet Therapy, 10th edition, W.B. Saunders Ltd.
2. Whitney E.N. & Rolfs, S.R. (1999), Understanding Nutrition, 8th edition, West/ Wadsworth, An International Thomson Publishing Co.,
3. Ira Wolinsky (ED) (1998), Nutrition in Exercise and sports, 3rd edition, CF Press.
4. Parizkova, J. Nutrition, Physical activity and health in early life, Ed. Wolinst, CRC Press.
5. Shills, M.E. Olson, J.A., Shike, N. and Ross, A.C. (Ed), (1999), Mode Nutrition in health and Disease, 9th edition, Williams & Wilkins.
6. Mc Ardle, W. Katch, F. and Katch, V. (1996), Exercise Physiology, Energy Nutrition and Human Performance, 4th Edition, Williams and Williams and Wilkins, Philadelphia.

**JOURNALS**

1. Medicine and Science in Sports and Exercise.
2. International Journal of Sports Nutrition.

**Open Educational Resources**

Diet in exercise -[https://epgp.inflibnet.ac.in/view\\_f.php?category=558](https://epgp.inflibnet.ac.in/view_f.php?category=558)

Ergogenic Aids - [https://epgp.inflibnet.ac.in/view\\_f.php?category=558](https://epgp.inflibnet.ac.in/view_f.php?category=558)

Physical fitness -[https://epgp.inflibnet.ac.in/view\\_f.php?category=558](https://epgp.inflibnet.ac.in/view_f.php?category=558)

Health Benefits of Yoga-[https://epgp.inflibnet.ac.in/view\\_f.php?category=558](https://epgp.inflibnet.ac.in/view_f.php?category=558)

Gandhian Foods for Health and Fitness-[https://epgp.inflibnet.ac.in/view\\_f.php?category=558](https://epgp.inflibnet.ac.in/view_f.php?category=558)

**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	Definitions, Introduction to fitness and training, benefits of exercise	2	Lecture
	Components of fitness, Specific fitness in health status. Energy input and output	2	OER
	Effect of specific nutrients on work performance and physical fitness	2	Seminar
UNIT II	Nutrition, exercise, physical fitness and health: Review of different energy systems for endurance and power activity	2	Lecture
	Nutrition in weight management, BMI body composition, weight imbalance-overweight underweight, unintentional weight loss	2	Flipped Classroom
	Fuels and nutrients support to physical activity, Shifts in carbohydrate and fat metabolism, Mobilisation of fat stores during exercise	2	Flipped Classroom
UNIT III	Nutrition in sports: Sports specific requirement, Diet manipulation, Pre-game and post-game meals	2	OER
	Assessment of different nutrigenic electrolyte aids and commercial supplements	2	OER
	Weight cycling, Water and balance (Losses and their replenishment during exercise and sports events, effect of dehydration, sports drink)	2	Blended Learning
UNIT IV	Nutrition and exercise regimens for pre and post-natal fitness	2	Lecture
	Significance of physical fitness and nutrition in the prevention and management of weight control, obesity, diabetes mellitus	2	Blended Learning
	Significance of physical fitness and nutrition in the prevention and management of CV disorders, bone health and cancer	2	Flipped Classroom

UNIT V	Diet and Lifestyle Modifications: Alternative systems for health and fitness in yoga, Meditation, Vegetarianism	2	OER
	Role of nutrition in Stress management	2	Seminar
	Self-help plan for lifestyle changes. Types of diet in weight maintenance	2	ICT

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF Cos
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	4	3	3	2	5	5	5	2	2	2	4	3.5
CO2	5	4	3	3	2	5	5	5	2	2	2	4	3.5
CO3	5	4	3	3	2	5	5	5	2	2	2	4	3.5
CO4	5	4	3	3	2	5	5	5	2	2	2	4	3.5
CO5	5	4	3	3	2	5	5	5	2	2	2	4	3.5
CO6	5	4	3	3	2	5	5	5	2	2	2	4	3.5
MEAN OVERALL SCORE													3.5

Result: The score of this course is 3.5 (High Relationship)

Programme : M.Sc. HOME SCIENCE  
 Semester : IV Core Paper XIII Hours per week: 6 90 hrs/Semester  
 Sub. Code : ND1 Credits: 5

**TITLE OF THE COURSE: INSTITUTIONAL FOOD ADMINISTRATION**

Pedagogy	Hours	Lecture	Peer Teaching	Demo/OER/ Tutorial	GD/Seminar/ Flipped Classroom	ICT/ Blended Learning	IV/DI
	90	9	9	20	28	18	6

**PREAMBLE**

**Objectives:**

1. To develop skills in handling and maintenance of equipment
2. To understand the key areas of institutional food service administration

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to	Unit	Hrs P/S
<b>CO1:</b> Differentiate food service institutions based on the objectives and customers.	I	18
<b>CO2:</b> Integrate management tools for quality assurance in food service.	II	18
<b>CO3:</b> Apply the acquired skills in handling food service equipment and procedures.	III	18
<b>CO4:</b> Plan layout of food service establishments.	IV	18
<b>CO5:</b> Manage human resources within a food service organisation.	V	18
<b>CO6:</b> Administer a food service system in an effective manner.	I-V	

**SYLLABUS**

**UNIT I**

**Food Service Industry-** Commercial and Non Commercial Institutions. Commercial-Hotel, Motel, Restaurant, Bar, Pub and Fast Food Restaurant; Non Commercial-Transport Catering, Industrial catering, hospital catering and outdoor catering.

**Menu Planning and Design:** types and factors affecting menu planning, menu sequence, menu design. Essentials of a good menu card; method of display.

**UNIT II**

**Food Service Management:** Types of Organization - line, line and staff, functional, project, matrix, committee, hybrid; Leadership style - autocratic, laissez faire, democratic, intellectual, institutional, manipulative, paternalistic; functions of a good leader. Decision making: types and steps in decision making; Communication - purpose and process and types; Effective communication.

**Role of management in FSI:** planning, organizing, directing, controlling, evaluating.

**Concepts of quality assurance** - Total Quality Management (TQM), Management by Objectives (MBO).

**UNIT III**

**Equipment used in Food Service Industries** - Classification of equipment- electrical and non-electrical equipment for food storage, Preparation, serving, dishwashing and laundering. Base materials used for finishes

**Food plant** - Types of Kitchen, Layout of different food service areas - receiving and storage, kitchen, dining, cleaning, laundering, drainage, water lines, lighting and ventilation adopted in different units such as kitchen, storage and dining area, working heights in relation to equipment.

**Food Management in FSI:** Food Purchase: Buying and accounting procedures in food service institutions, Storage; Food Hygiene and Food Safety; Waste Management in food service.

**UNIT IV**

**Personnel Management:** Manpower planning, recruitment procedures, selection and induction, training, job description and specification, work schedule, work analysis. Laws governing staff management - Employee Law, Trade Union Contracts and Negotiations.

**Waste Management in food service** - rules for waste disposal- avoidance, reduction, reuse and recycle; techniques for waste disposal - incineration, landfill, recycle, composting.

**UNIT V**

**Financial Management:** Buying and receiving procedures in food service institutions; Budget, Inventory control, Cost analysis-Cost concepts- types of cost-fixed cost, semi fixed cost, variable cost. Food cost control - factors; methods of controlling food cost. Pricing - factors affecting pricing of food.

**Role of computers in management of FSI:** menu planning, point of sale, inventory management, financial management, food safety, front office, marketing.

**TEXT BOOKS**

1. Sethi, M.,Malhan,S.(2007) Catering Management: An integrated approach, New Age International

**REFERENCES**

1. Sudhir Andrews (1999) Food and Beverage Service Training Manual, Tata McGraw Hill Publishing Company Ltd New Delhi
2. Lilli Crap, D R and Cousins J A (1999) Food and Beverage Service, 4th Edition, Hodder and Stoughton.
3. Aggarwal D.K (2006) Housekeeping Management, AMAN Publications, New Delhi.
4. Singh.R.K (2006) Modern Trends in Hospitality industry, AMAN Publications,New Delhi.
5. John Wiley (2005), Book Of Yields:Accuracy in Food Costing and Purchasing,6th Edition.

**JOURNAL**

1. Journal of Foodservice Business Research
2. The Journal of Foodservice Management and Education

**Open Educational Resources**

Food service industry - [https://epgp.inflibnet.ac.in/view\\_f.php?category=547](https://epgp.inflibnet.ac.in/view_f.php?category=547)

Classification of equipment -[https://epgp.inflibnet.ac.in/view\\_f.php?category=547](https://epgp.inflibnet.ac.in/view_f.php?category=547)

Components of costing and Pricing

methods-<http://vidyamitra.inflibnet.ac.in/index.php/home/subjects?domain=Social+Sciences&subdomain=Home+Science>

**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	Food Service Industry- Commercial and Non Commercial Institutions. Commercial-Hotel, Motel, Restaurant, Bar, Pub and Fast Food Restaurant	6	OER
	Non Commercial-Transport Catering, Industrial Catering, hospital catering and Outdoor	6	Seminar
	Menu Planning and Design: Definition of a menu, Menu types, factors affecting menu planning, menu sequence, menu design. Essentials of a good menu card; method of display.	6	GD
UNIT II	<b>Food Service Management:</b> Types of Organization - line, line and staff, functional, project, matrix, committee, hybrid;	5	Lecture
	Leadership style - autocratic, laissez faire, democratic, intellectual, institutional, manipulative, paternalistic; functions of a good leader.	4	Seminar
	Decision making: types and steps in decision making; Communication - purpose and process and types; Effective communication.	3	GD
	<b>Role of management in FSI:</b> planning, organizing, directing, controlling, evaluating.	3	Peer Teaching
	<b>Concepts of quality assurance</b> - Total Quality Management (TQM), Management by Objectives (MBO).	3	ICT
UNIT III	<b>Equipment used in Food Service Industries</b> - Classification of equipment- electrical and non-electrical equipment for food storage, Preparation, serving, dishwashing and laundering. Base materials used for finishes.	6	OER

	<b>Food plant</b> - Types of Kitchen, Layout of different food service areas - drainage, water lines, lighting and ventilation adopted in different units such as kitchen, storage and dining area, working heights in relation to equipment	6	IV
	Food Management in FSI: Food Purchase: Buying and accounting procedures in food service institutions, Storage; Food Hygiene and Food Safety; Waste Management in food service.	6	ICT
UNIT IV	<b>Personnel Management:</b> Manpower planning, recruitment procedures, selection and induction, training, job description and specification, work schedule, work analysis.	6	Seminar
	Laws governing staff management - Employee Law, Trade Union Contracts and Negotiations.	6	ICT
	<b>Waste Management in food service</b> - rules for waste disposal- avoidance, reduction, reuse and recycle; techniques for waste disposal - incineration, landfill, recycle, composting.	6	Peer Teaching
UNIT V	<b>Financial Management:</b> Buying and receiving procedures in food service institutions; Budget, Inventory control	3	Blended Learning
	Cost analysis-Cost concepts- types of cost-fixed cost, semi fixed cost, variable cost.	4	Lecture
	Food cost control - factors; methods of controlling food cost.	3	Flipped Classroom
	Pricing - factors affecting pricing of food. Books of accounts.	5	OER
	<b>Role of computers in management of FSI:</b> menu planning. point of sale, inventory management, financial management, food safety, front office, marketing.	3	OER & Demonstration

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	5	4	4	4	4	4	3	5	3	2	4	3.9
CO2	5	5	4	4	4	4	4	3	5	3	2	4	3.9
CO3	5	5	4	4	4	4	4	3	5	3	2	4	3.9
CO4	5	5	4	4	4	4	4	3	5	3	2	4	3.9
CO5	5	5	4	4	4	4	4	3	5	3	2	4	3.9
CO6	5	5	4	4	4	4	4	3	5	3	2	4	3.9
MEAN OVERALL SCORE													3.9

Result: The score of this course is 3.9 (High Relationship)

Programme : M.Sc. HOME SCIENCE  
 Semester : IV Core Paper - XIV Hours per week:6 90 hrs/Semester  
 Sub. Code : ND2 Credits : 5

**TITLE OF THE COURSE: FOOD PRODUCT DEVELOPMENT AND MARKETING**

Pedagogy	Hours	Lecture	Peer Group Teaching	Demo/OER/Tutorial	GD/Seminar	ICT/Blended	IV/DI
	90	33	-	8	14	25	10

**PREAMBLE**

This course will enable students to:

1. Understand and know various aspects of food product development including food science and technology, marketing and consumer research, finance and communication.
2. Develop products which meet consumer needs, and nutritionally and commercially viable.
3. Recognize the potential for entrepreneurship through marketing.

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to	Unit	Hrs P/S
<b>CO1:</b> Generate ideas to formulate novel food product development.	I	18
<b>CO2:</b> Perform quality tests to conform to food laws and standards.	II	18
<b>CO3:</b> Determine costing and pricing of the developed product.	III	18
<b>CO4:</b> Judge packaging materials and distribution methods suitable for the developed product.	IV	18
<b>CO5:</b> Explore the avenues of entrepreneurship and financial support system.	V	18
<b>CO6:</b> Recognize the potential for entrepreneurship to meet consumer needs.	I-V	

**SYLLABUS**

**UNIT I**

**New Food Products:** Comparison of traditional and modern food habits - generation of new product idea, new products; definition - classification and characterization - social and health concerns - calories - hygiene factors - nutrition - balanced diet.

**New Food Product Planning and Development** Reasons for new food product development (influence of corporate, market, technology and government) – determination of needs from various perspectives.

**UNIT II**

**New Food Product Development** Stages in new product development; idea generation — screening — business analysis; **Screening Procedure** Sensory evaluation, shelf life testing, product integrity and conformance to standards.

**UNIT III**

Test marketing – Evaluating results and analyzing data. Pricing of New Product; Pricing policies; cost basis (determination of cost through cost sheet) — demand basis — cost demand basis (determination of cost through break — even charts) —competition basis, kinds of pricing — pricing strategies.

**UNIT IV**

**Promotion and Distribution of Products:** Sales promotion — importance — kinds of sales promotion — personal selling —advertising — advertising vs. popularity — advertising media — channels of distribution —middlemen — importance.

**Entrepreneurship:** Choice of production — plant location — investment decisions; return on investment — payback methods — financing the projects — availing of loans from commercial banks and other agencies.

**UNIT V**

**Consumer Psychology and Consumerism:** Buying motives — determination of buyer behavior — buying decisions —consumerism —. New products in the Food Service Industry & Food Ingredient Industry.

**TEXT BOOK**

1. Fuller, G.W. (1994); New Product Development: From Concept to MarketPlace CRC Press, New York.

**REFERENCES**

1. Man, C.M.D. and Jones A.A. (1994); Shelf Life Evaluation of Foods, Blackie Academic and Professional, London.
2. R.S.N. Pillai and Bagavathi, S.Q. Modern Marketing Chand Publications, New Delhi, 2002.

3. Olickle, J K (1990) New Product Development and value added. Food Development Division, Agriculture, Canada  
 4. Graf E and Saguy I S (1991), Food Product Development : From concept to the MarketPlace, Van Nostrand Reinhold New York

#### Open Educational Resources

Marketing - <https://epgp.inflibnet.ac.in/ahl.php?csrno=827>

Entrepreneurship - <https://epgp.inflibnet.ac.in/ahl.php?csrno=827>

#### LESSON PLAN

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	<b>New Food Products:</b> Comparison of traditional and modern food habits	4	Lecture
	Generation of new product idea, New products; definition – classification	5	Lecture
	Characterization, Social and health concerns - calories , Hygiene factors - nutrition - balanced diet.	3	ICT
	<b>New Food Product Planning and Development</b> Reasons for new food product development (influence of corporate, market, technology and government)	3	ICT
	Determination of needs from various perspectives.	3	Seminar
UNIT II	<b>New Food Product Development</b> Stages in new product development, Idea generation — screening	6	Lecture
	Business analysis; <b>Screening Procedure</b> , Sensory evaluation	6	Lecture
	Shelf life testing, Product integrity, Conformance to standards.	6	ICT
UNIT III	Test marketing – Evaluating results	4	ICT
	Analyzing data.- Pricing of New Product Pricing policies; cost basis , Demand basis	4	Seminar
	Cost demand basis (determination of cost through break — even charts) Competition basis	4	Seminar
	Kinds of pricing , Pricing strategies.	6	Lecture
UNIT IV	<b>Promotion and Distribution of Products:</b> Sales promotion- Importance, kinds of sales promotion, personal selling —advertising	6	Lecture
	Advertising vs. popularity , Advertising media, Channels of distribution, Middle men — importance.	4	ICT
	<b>Entrepreneurship:</b> Choice of production — plant location Investment decisions; return on investment	4	OER
	Payback methods — financing the projects, Availing of loans from commercial bank and other agencies.	4	OER
UNIT V	<b>Consumer Psychology and Consumerism:</b> Buying motives — determination of buyer behavior	3	Seminar
	Buying decisions	3	ICT
	Consumerism	2	ICT
	New products in Food Service Industry	5	IV
	Food Ingredient Industry.	5	IV

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	5	4	4	4	4	4	4	5	3	3	4	4.1
CO2	5	5	4	4	4	4	4	4	5	3	3	4	4.1
CO3	5	5	4	4	4	4	4	4	5	3	3	4	4.1
CO4	5	5	4	4	4	4	4	4	5	3	3	4	4.1
CO5	5	5	4	4	4	4	4	4	5	3	3	4	4.1
CO6	5	5	4	4	4	4	4	4	5	3	3	4	4.1
MEAN OVERALL SCORE													4.1

Result: The score of this course is 4.1 (Very High Relationship)

Programme : M.Sc. HOME SCIENCE  
 Semester : IV Core Paper - XV Hours per week: 6 90 hrs/Semester  
 Sub. Code : NL4 Credits : 3

**TITLE OF THE COURSE: DIETETIC INTERNSHIP**

Pedagogy	Hours	Lecture	Practical Experience	Demo/OER / Tutorial	GD/Seminar/ Flipped Classroom	ICT/ Blended Learning	IV/DI
	90	9	45	-	18	18	-
<b>PREAMBLE</b>							
The dietetic internship is aimed to facilitate the students to							
<ol style="list-style-type: none"> <li>1. Gain knowledge in the functioning of a dietary department</li> <li>2. Gain hands-on experience in the roles and responsibilities of dietitians</li> <li>3. Develop skills to assess patients' nutritional needs and plan suitable diets</li> <li>4. Learn diet counseling skills</li> <li>5. Know the trends in diet supplements and substitutes</li> </ol>							
<b>COURSE OUTCOME</b>						Unit	Hrs P/S
At the end of the Semester, the Students will be able to							
<b>CO1:</b> Utilize nutritional screening tools and assessment techniques in critical care.						I	18
<b>CO2:</b> Develop menu patterns for hospital diets and evaluate client acceptance.						II	18
<b>CO3:</b> Design layout and determine equipment requirements for food service facilities.						III	18
<b>CO4:</b> Organise diet counselling programmes.						IV	18
<b>CO5:</b> Perform case studies of specific disease conditions.						V	18
<b>CO6:</b> Interpret and apply current research findings to nutritional care.						I-V	
<b>SYLLABUS</b>							
<b>UNIT I</b>							
Nutritional screening and Nutritional Assessment techniques. Interpretation of patient data and diagnostic tests and drawing up of patient diet prescriptions, using a case study approach.							
<b>UNIT II</b>							
Preparation of diet counseling aids for common disorders. Planning diets for patients with common multiple disorders and complications and discharge diet plans.							
<b>UNIT III</b>							
Planning, preparing and monitoring special feeding. Use of parenteral feeds and nasal /tube feedings. Manage- Medical, Surgical, Obstetric, Neonatal and Paediatric specialties.							
<b>UNIT IV</b>							
Monitoring diet setting in the diet kitchen. Patient counselling methods and strategies. Follow up program to evaluate acceptability of diet prescription, compliance, discharge diet plan.							
<b>UNIT V</b>							
Case study of specific disease conditions, related diet counselling and evaluation. Market survey of commercial nutritional supplements and nutritional support substitutes.							
<b>Report to be submitted in the hospital:</b> Submit a bound copy of the word-processed, printed internship report to the dietician for evaluation at the end of the internship.							

## LESSON PLAN

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
<b>Contents</b>			
UNIT I	Nutritional screening and Nutritional Assessment techniques.	9	Lecture
	Interpretation of patient data and diagnostic tests and drawing up of patient diet prescription, using a case study approach.	9	Group Discussion
UNIT II	Preparation of diet counseling aids for common disorders.	9	Group Discussion
	Planning diets for patients with common multiple disorders and complications and discharge diet plans.	9	Blended Learning
UNIT III	Planning, preparing and monitoring special feeding. Use of parenteral feeds and nasal /tube feedings.	9	ICT
	Manage- Medical, Surgical, Obstetric, Neonatal and Paediatric specialties.	9	Practical Experience
UNIT IV	Monitoring diet setting in diet kitchen.	9	Practical Experience
	Patient counselling methods and strategies. Follow up program to evaluate acceptability of diet prescription, compliance, discharge diet plan.	9	Practical Experience
UNIT V	Case study of specific disease conditions, related diet counselling and evaluation.	9	Practical Experience
	Market survey of commercial nutritional supplements and nutritional support substitutes.	9	Practical Experience

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)							MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	
CO1	5	5	5	4	5	5	5	5	5	3	4	5	4.7
CO2	5	5	5	4	5	5	5	5	5	3	4	5	4.7
CO3	5	5	5	4	5	5	5	5	5	3	4	5	4.7
CO4	5	5	5	4	5	5	5	5	5	3	4	5	4.7
CO5	5	5	5	4	5	5	5	5	5	3	4	5	4.7
MEAN OVERALL SCORE													4.7

Result: The score of this course is 4.7 (Very High Relationship)

**Programme : M.Sc. HOME SCIENCE**  
**Semester : IV Elective Paper IV(a)**  
**Sub. Code : END7**

**Hours per week: 6**      **90 hrs/Semester**  
**Credits : 4**

**TITLE OF THE COURSE: TEXTILES AND CLOTHING**

Pedagogy	Hours	Lecture	Peer Group Teaching	Demo/OER/Tutorial	GD /Seminar	ICT/Blended Learning	IV/DI
	90	33	-	18	9	24	6

**PREAMBLE**

To enable the students to

1. Understand the textile fibers, their properties and uses
2. Impart knowledge on spinning, fabric production
3. Acquire knowledge on the finishing, dyeing, printing and laundering processes
4. Know the selection and care of clothing

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to	Unit	Hrs P/S
<b>CO1:</b> Classify textile fibres based on origin, properties and uses.	I	18
<b>CO2:</b> Familiarize with spinning and weaving.	II	18
<b>CO3:</b> Identify fabric processing and finishing methods.	III	18
<b>CO4:</b> Exhibit skills in identification, selection and care of clothing for different age groups.	IV	18
<b>CO5:</b> Choose appropriate methods of dyeing and printing of textiles and clothing.	V	18
<b>CO6:</b> Demonstrate stain removal techniques in fabrics.	I-V	

**SYLLABUS**

**UNIT I**

**Fiber** – Definition, Meaning, Classification of Textiles Fibers - Natural fiber - cotton, flax, silk, wool - origin, manufacturing process, properties and end uses. Minor Textile fibers, properties and uses. Synthetic Fibers - Nylon, Dacron, Orlon and Acrylic - origin, manufacturing process, properties and end uses.

**UNIT II**

**Spinning and Weaving:** Spinning – Definition, meaning, types of spinning. Yarn and Twist – Definition, counts of yarns. Meaning and Classification of natural, manmade and Novelty yarns. Blends and Mixtures. Weaving - Definition, Meaning, parts and functions of simple loom. Types of weaves - Basic weaves and fancy weaves. Non - woven - Classification of non-woven fabric - Bonding and Felting. Knitting – Definition, classification of knitting, braiding. Types of laces.

**UNIT III**

**Wet processing** - Importance of wet processing of textiles - Fiber, Yarn and Fabric processing. Basic finishes - Singeing, Desizing, Scouring, Bleaching, Calendering, Mercerizing, Napping, Sanforizing, Special finishes, finishes suitable to Natural and manmade fibers.

**UNIT IV**

**Dyeing** -Definition, Meaning and concept of Dyes, Classification of dyes, Methods of Dyeing.

**Printing** – Definition, Methods of printing -Block printing, Roller, Screen, Resist Printing – Batik, Tie and Dye, stencil.

**UNIT V**

Laundry – Method of washing, laundry agents, Laundry finishing of different fabrics, Clothing budget – selection, factors influencing the choice of clothing materials for different age groups. Stain removal – types, principles and techniques

**Related Experiences**

- Fiber, Yarn and Fabric – Identification
- Stain Removal - removal of food stains. blood, ink
- Field Visit to Dyeing and Printing units

**TEXTBOOK**

1. Dantyagi,S. (1996). **Fundamentals of Textiles and Their Care**, New Delhi. Orient Longman limited.

**REFERENCES**

1. E.P.G. Gohl, L.D. Velensky, (2003). **Textile Science**, New Delhi :CBS Publishers and Distributors, New Delhi
2. AJ. Hall. (2004). **The standard hand book of Textiles**, Wood head Publishing 8<sup>th</sup> edition.
3. P.V. Vidyasagar (2005). **Hand Book of Textiles**, Mittal Publications.
4. Sara J. Kadolph (2007). **Textiles**, Prentice Hall, 10<sup>th</sup> edition.

**Open Educational Resources**

Textile

Finishing

<http://vidyamitra.inflibnet.ac.in/index.php/home/subjects?domain=Social+Sciences&subdomain=Home+Science>
Textile fiber - <https://epgp.inflibnet.ac.in/ahl.php?csrno=827>**LESSON PLAN**

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT I	<b>Fiber</b> – Definition, Meaning, Classification of Textiles Fibers - Natural fiber - cotton, flax, silk, wool	6	OER
	Origin, manufacturing process, Properties and end uses.	6	OER
	Minor Textile fibers, properties and uses. Nylon, Dacron, Orlon, Acrylic	6	OER
UNIT II	<b>Spinning and Weaving:</b> Spinning – Definition, meaning, Types of spinning. Yarn and Twist – Definition, Definition, counts of yarns.	5	Lecture
	Meaning and Classification of natural, Manmade, Novelty yarns. Blends and Mixtures.	5	Lecture
	Weaving - Definition, Meaning, parts and functions of simple loom. . Types of weaves - Basic weaves and fancy weaves.	5	Lecture
	Non - woven, Classification of non-woven fabric - Bonding and Felting. Knitting - Definition, classification of knitting, braiding. Types of laces.	3	Lecture
UNIT III	<b>Wet processing</b> - Importance of wet processing of textiles - Fiber ,Yarn	6	ICT
	Fabric processing.- Singeing, Desizing, Scouring, Bleaching, Calendering, Mercerizing, Napping, Sanforizing	6	ICT
	Special finishes, Finishes suitable to Natural and manmade fibers	6	Lecture
UNIT IV	Dyeing -Definition, Meaning and concept of Dyes, Classification of dyes, Methods of Dyeing	9	Lecture
	Printing: Definition, Methods of printing- Block printing, Roller, Screen, Resist Printing - Batik, Tie and Dye, Stencil	9	Seminar
UNIT V	Laundry – Method of washing, laundry agents	6	IV
	Laundry finishing of different fabrics	4	ICT
	Clothing budget – Selection, Factors influencing the choice the clothing materials for different age groups	4	ICT
	Stain removal – types, principles and techniques.	4	ICT

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	4	4	3	4	4	4	3	2	5	3	4	3.8
CO2	5	4	4	3	4	4	4	3	2	5	3	4	3.8
CO3	5	4	4	3	4	4	4	3	2	5	3	4	3.8
CO4	5	4	4	3	4	4	4	3	2	5	3	4	3.8
CO5	5	4	4	3	4	4	4	3	2	5	3	4	3.8
CO6	5	4	4	3	4	4	4	3	2	5	3	4	3.8
MEAN OVERALL SCORE													3.8

Result: The score of this course is 3.8 (High Relationship)

Programme : M.Sc. HOME SCIENCE  
 Semester : IV Elective Paper – IV(b) Hours per week: 6 90 hrs/Semester  
 Sub. Code : END8 Credits : 4

**TITLE OF THE PAPER: GENDER STUDIES**

Pedagogy	Hours	Lecture	Peer Group Teaching	Demo/OER/Tutorial	GD/Seminar	ICT/Blended Learning	IV/DI
	90	49	-	6	25	10	-

**PREAMBLE**

To help the student to

1. Raise the information level and awareness regarding women's issues, personal, social, legal and political.
2. Acquaint with some of the major development programmes for women.

**COURSE OUTCOME**

At the end of the Semester, the Students will be able to	Unit	Hrs P/S
<b>CO1:</b> Interpret factors influencing sex role development in India with gender concepts.	I	18
<b>CO2:</b> Explore the history of women's status in the post – independence era.	II	18
<b>CO3:</b> Collect and analyse the role of women in different spheres of life.	III	18
<b>CO4:</b> Integrate the Government policy implications to women's issues.	IV	18
<b>CO5:</b> Apply women's rights and laws to women's issues.	V	18
<b>CO6:</b> Integrate development programmes for women empowerment.	I-V	

**SYLLABUS**

**UNIT I**

Introduction to Gender Studies: Sex-role development: biological, psychological and socio-cultural factors. Concept of Gender and Sex. Trends in women's movement with special reference to India.

**UNIT II**

Status of Indian women. Post –independence - legal, political, economic, social and educational status - relevant statistics.

**UNIT III**

Women in Society - Education and employment, Women and mass media.

**UNIT IV**

Issues related to women and policy implications - dowry, divorce, prostitution and sexual exploitation.

**UNIT V**

Women and Law - Rights of Women, Laws related to marriage, divorce and dowry.

**TEXTBOOK**

Jayapalan, N. (2000) Women Studies, Atlantic Publisher And Distributors, New Delhi.

**REFERENCES**

1. Menon,L. (1998) Women Empowerment And Challenge Of Change Kanishka Publisher and Distributors New Delhi.
2. Khanna,G & Varghese, M.A.(1978) Indian Women Today, Vikas Publishing House Pvt.Ltd., New Delhi.
3. Rehman,M.M. & Biswal, K.K.(1993), Education , Work and Women, Commonwealth Publishers, New Delhi.
4. Sharma,O.C.(1994) Crime Against Women, Sterling Publishers Pvt. Ltd., New Delhi.

**Open Educational Resources**

Status of Indian women

[-http://vidyamitra.inflibnet.ac.in/index.php/home/subjects?domain=Social+Sciences&subdomain=Home+Science](http://vidyamitra.inflibnet.ac.in/index.php/home/subjects?domain=Social+Sciences&subdomain=Home+Science)

Women and law -

<http://vidyamitra.inflibnet.ac.in/index.php/home/subjects?domain=Social+Sciences&subdomain=Home+Science>

## LESSON PLAN

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
Unit I	Introduction to Gender Studies , Sex-role development	4	Lecture, ICT,GD
	Biological, Psychological	4	Lecture, ICT,GD
	Socio-cultural factors, Concept of Gender and Sex.	4	Lecture, ICT,GD
	Trends in women's movement with special reference to India.	6	Lecture, ICT,Seminar
Unit II	Status of Indian women. Post –independence	6	Lecture
	Legal, Political, Economic, Social	6	OER
	Educational status - relevant statistics.	6	Lecture
Unit III	Women in Society - Education	6	Lecture
	Women in Society - Employment	6	ICT
	Women and mass media.	6	Seminar
Unit IV	Issues related to women and policy implications – dowry, Divorce	9	Lecture
	Prostitution, Sexual exploitation.	9	Seminar
Unit V	Women and Law - Rights of Women	5	Lecture, ICT, Seminar
	Laws related to marriage	5	Lecture, ICT, Seminar
	Laws related to Divorce	4	ICT
	Laws related to Dowry.	4	Seminar

COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)						PROGRAMME SPECIFIC OUTCOMES (PSOs)						MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	5	4	4	3	3	4	5	3	2	3	4	5	3.8
CO2	5	4	4	3	3	4	5	3	2	3	4	5	3.8
CO3	5	4	4	3	3	4	5	3	2	3	4	5	3.8
CO4	5	4	4	3	3	4	5	3	2	3	4	5	3.8
CO5	5	4	4	3	3	4	5	3	2	3	4	5	3.8
CO6	5	4	4	3	3	4	5	3	2	3	4	5	3.8
MEAN OVERALL SCORE													3.8

Result: The score of this course is 3.8 (High Relationship)

**SEMESTER IV**

**Sub Code: NPW**

**PROJECT**

**Total 100 Marks**

Allotment of different proposals to the students to carry out the projects under the supervision of the faculty concerned and viva voce by External Examiners.