



**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE  
(AUTONOMOUS)**

*(Affiliated to Bharathidasan University, Tiruchirappalli)*  
**Accredited by NAAC-An ISO 9001:2015 Certified Institution**  
**SUNDARAKKOTTAL, MANNARGUDI-614016.**  
**TAMILNADU, INDIA.**

**B.Sc., NUTRITION AND DIETETICS**  
**CHOICE BASED CREDIT SYSTEM- LEARNING OUTCOME BASED**  
**CURRICULUM FRAME WORK (CBCS-LOCF)**

*(For the candidates admitted in the academic year 2023-2024)*

**CHOICE BASED CREDIT SYSTEM**

The credit based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The choice based credit system provides a 'cafeteria' type approach in which the students can take courses of their choice, learn at their own pace, undergo additional courses and acquire more than the required credits, and adopt an interdisciplinary approach to learning. Our College has moved to CBCS and implemented the grading system.

**OUTCOME-BASED EDUCATION (OBE)**

**LEARNING OUTCOME-BASED CURRICULUM FRAMEWORK (LOCF)**

The fundamental premise underlying the learning outcomes-based approach to curriculum planning and development is that higher education qualifications are awarded on the basis of demonstrated achievement of outcomes (expressed in terms of knowledge, understanding, skills, attitudes and values) and academic standards expected of graduates of a programme of study. Learning outcomes specify what graduates completing a particular programme of study are expected to know, understand and be able to do at the end of their programme of study. The expected learning outcomes are used as reference points that would help to formulate graduate attributes, qualification descriptors, programme learning outcomes and course learning outcomes which in turn will help in curriculum planning and development, and in the design, delivery and review of academic programmes. They provide general guidance for articulating the essential learnings associated with programmes of study and courses within a programme, maintain national standards and international comparability of learning outcomes and academic standards to ensure global competitiveness, and to facilitate student/graduate mobility and provide higher education

institutions an important point of reference for designing teaching-learning strategies, assessing student learning levels, and periodic review of programmes and academic standards.

**Some important aspects of the Outcome Based Education Course:** is defined as a theory, practical or theory cum practical subject studied in a semester.

**Course Outcomes (COs):** are statements that describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course. Generally three or more course outcomes may be specified for each course based on its weightage.

**Programme:** is defined as the specialization or discipline of a Degree.

**Programme Outcomes (POs):** Programme outcomes are narrower statements that describe what students are expected to be able to do by the time of graduation. POs are expected to be aligned closely with Graduate Attributes.

**Programme Specific Outcomes (PSOs):** PSOs are what the students should be able to do at the time of graduation with reference to a specific discipline.

**Some important terminologies repeatedly used in LOCF.**

**Core Courses (CC)** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course. These are the courses which provide basic understanding of their main discipline. In order to maintain a requisite standard certain core courses must be included in an academic program. This helps in providing a universal recognition to the said academic program.

**Discipline Specific Elective Courses (DSE)** Elective course may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective (DSE). These courses offer the flexibility of selection of options from a pool of courses. These are considered specialized or advanced to that particular programme and provide extensive exposure in the area chosen; these are also more applied in nature.

**Generic Elective Courses** An elective course chosen generally from an **unrelated discipline/subject**, with an intention to seek exposure is called a Generic Elective. Generic Elective courses are designed for the students of **other disciplines**. Thus, as per the CBCS policy, the students pursuing particular disciplines would have to opt Generic Elective courses offered by other disciplines, as per the basket of courses offered by the college. The scope of the Generic Elective (GE) Courses is positively related to the diversity of disciplines in which programmes are being offered by the college.

**Non Major Elective (NME).** A student shall choose at least two Non – major Elective Courses (NME) from outside his /her department. Non –Major Elective I – Those who choose Tamil in Part

I can choose a non –major elective course offered by other departments. Those who do not choose Tamil in Part I must choose either a) Basic Tamil if Tamil language was not studied in school level or b) Special Tamil if Tamil language was studied upto 10<sup>th</sup> & 12<sup>th</sup> std.

**Skill Enhancement Courses (SECs)** These courses focus on developing skills or proficiencies in the student, and aim at providing hands-on training. Skill enhancement courses can be opted by the students of any other discipline, but are highly suitable for students pursuing their academic programme. These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge.

**Field Study/Industrial Visit/Case Study:** It has to be completed during the fifth semester of the degree programme. Credit for this course will be entered in the fifth semester's marks statement.

**Internship:** Students must complete internship during summer holidays after the fourth semester. They have to submit a report of internship training with the necessary documents and have to appear for a viva-voce examination during fifth semester. Credit for internship will be entered in the fifth semester's mark statement.

**Extra Credit Courses:** In order to facilitate the students, gaining knowledge/skills by attending online courses MOOC, credits are awarded as extra credits, the extra credit are at three semesters after verifying the course completion certificates. According to the guidelines of UGC, the students are encouraged to avail this option of enriching their knowledge by enrolling themselves in the Massive Open Online Courses (MOOC) provided by various portals such as SWAYAM, NPTEL etc.

### **Undergraduate Programme:**

**Programme Pattern:** The Under Graduate degree programme consists of **FIVE** vital components. They are as follows:

Part -I : Languages (Tamil / Hindi / French / Sanskrit)

Part-II : General English

Part-III: Core Course (Theory, Practicals, Generic Elective courses, Discipline Specific Elective courses, Compulsory and Optional Allied courses, Project)

Part-IV: Non Major Elective, Foundation Course, Value Education, Environmental studies, Skill Enhancement Courses/ Soft Skills, Internship / field visit / industrial visit/ Case Study), Professional Competency Course

### **Part –V**

Extension activity, Gender studies

## EXAMINATION

### Continuous Internal Assessment (CIA):

#### UG - Distribution of CIA Marks

##### Passing Minimum: 40 %

Assignment-3	=	30%
Tests-2	=	50%
Seminar	=	10%
Attendance	=	10%

#### Question Paper Pattern

##### Part A:

##### Part A 1 (10X1=10 marks)

One word question/ Fill in/ True or False/ Multiple Choice Questions Two Questions from Each unit

##### Part A 2 (5X2=10 marks)

Match the following

Short Answers

One question from Each unit

##### Total Marks – 20

##### Part B: (5X5=25 marks)

Paragraph Answers

Either/ or type, One Question from each unit

##### Part C: (10X3=30)

Essay Type Answers

Answer 3 out of 5 Questions

One Question from each unit

##### Part A: K1 Level

##### Part B: K2, K3 and K4 Level

##### Part C: K5 and K6 Level

#### Knowledge levels for assessment of Outcomes based on Blooms Taxonomy

S. No.	Level	Parameter	Description
1	K1	Knowledge/Remembering	<b>It is the ability to remember the previously learned</b>
2	K2	Comprehension/ Understanding	<b>The learner explains ideas or concepts</b>
3	K3	Application/Applying	<b>The learner uses information in a new way</b>
4	K4	Analysis/Analysing	<b>The learner distinguishes among different parts</b>
5	K5	Evaluation/Evaluating	<b>The learner justifies a stand or decision</b>
6	K6	Synthesis /Creating	<b>The learner creates a new product or point of view</b>

### WEIGHTAGE of K – LEVELS IN QUESTION PAPER

(Cognitive Level) K- LEVELS →	Lower Order Thinking			Higher Order Thinking			Total
	K1	K2	K3	K4	K5	K6	
<b>END SEMESTER EXAMINATIONS (ESE)</b>	20	25			30		<b>75</b>
<b>Continuous Internal Assessment (CIA)</b>	20	25			30		<b>75</b>
<b>QUESTION PATTERN FOR END SEMESTER EXAMINATION/Continuous Internal Assessment</b>							
<b>PART</b>							<b>MARKS</b>
<b>PART –A I.</b> (No choice ,One Mark) <b>TWO</b> questions from each unit					(10x1 =10)		20
<b>II.</b> (No choice ,Two Mark) <b>ONE</b> question from each unit					(5x2 =10)		
<b>PART -B</b> (Either/ or type ,5-Marks) <b>ONE</b> questions from each unit					(5x5 =25)		25
<b>PART -C</b> (3 out of 5) (10 Marks) <b>ONE</b> question from each unit					(3x10 =30)		30
<b>Total</b>							<b>75</b>

<b>BLUE PRINT OF QUESTION PAPER FOR END SEMESTER EXAMINATION</b>							
<b>DURATION: 3. 00 Hours.</b>						<b>Max Mark : 75</b>	
K- LEVELS	K1	K2	K3	K4	K5	K6	Total Marks
<b>PART</b>							
<b>PART –A</b> (One Mark, No choice) (10x1 =10)	10						10
(2-Marks, No choice) (5x2=10)	10						10
<b>PART –B</b> (5- Marks) (Either/or type) (5x5=25)		5	10	10			25
<b>PART -C</b> (10 Marks) (3 out of 5) (3x10=30) Courses having only <b>K5,K6</b> levels, K5 level- 3 Questions, K6 level- 2 Questions ( <b>One K6 level question is compulsory</b> )					20	10	30
<b>Total</b>	<b>20</b>	<b>05</b>	<b>10</b>	<b>10</b>	<b>20</b>	<b>10</b>	<b>75</b>

## EVALUATION

### GRADING SYSTEM

Once the marks of the CIA and the end-semester examination for each of the courses are available, they will be added and converted as final mark. The marks thus obtained will then be graded as per the scheme provided in Table-1.

Grade Point Average (GPA) will be calculated from the first semester onwards for all semester. From the second semester onwards, the total performance within a semester and the continuous performance starting from the first semester are indicated by semester Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) , respectively. These two are calculated by the following formulae:

$\text{GPA} = \frac{\sum_{i=1}^n C_i G_i}{\sum_{I=1}^n C_i}$	$\text{WAM (Weighted Average Marks)} = \frac{\sum_{i=1}^n C_i M_i}{\sum_{I=1}^n C_i}$
Where, $C_i$ is the Credit earned for the Course $i$ $G_i$ is the Grade Point obtained by the student for the Course $i$ $M_i$ is the marks obtained for the course $i$ and $n$ is the number of Courses <b>Passed</b> in that semester.	

**CGPA:** Average GPA of all the Courses starting from the first semester to the current semester.

### CLASSIFICATION OF FINAL RESULTS:

- 1.For each of the first three parts, there shall be separate classification on the basis of CGPA, as indicated in Table-2.
- 2.For the purpose of declaring a candidate to have qualified for the Degree of Bachelor of Arts/Science/Commerce/Management as Outstanding/Excellent/Very Good/Good/Above Average/Average, the marks and the corresponding CGPA earned by the candidate in Part-III alone will be the criterion, provided the candidate has secured the prescribed passing minimum in the all the Five parts of the Programme.
- 3.Grade in Part –IV and Part-V shall be shown separately and it shall not be taken into account for classification.
- 4.A Pass in PART- V will be mandatory although the marks will not count for the calculation of the CGPA.
- 5.Absence from an examination shall not be taken an attempt.

**Table-1: Grading of the Courses - UG**

<b>Marks Range</b>	<b>Grade Point</b>	<b>Corresponding Grade</b>
90 and above	10	O
80 and above and below 90	9	A+
70 and above and below 80	8	A
60 and above and below 70	7	B+
50 and above and below 60	6	B
40 and above and below 50	5	C
Below 40	NA	RA

The candidate's performance in every current semester is indicated by **Semester Grade Point Average (SGPA)** and from the second semester onwards, the continuous performance including previous semester /s is indicated by **Cumulative Grade Point Average (CGPA)**.

**Table-3: Final Result**

<b>CGPA</b>	<b>Corresponding Grade</b>	<b>Classification of Final Result</b>
9.00 and above	O	Outstanding
8.00 to 8.99	A+	Excellent
7.00 to 7.99	A	Very Good
6.00 to 6.99	B+	Good
5.00 to 5.99	B	Above Average
4.00 to 4.99	C	Average
Below 4.00	RA	Re-appearance

The candidates who have passed in the first appearance and within the prescribed duration of the UG programme are eligible. If the candidate's Grade is O/A+ with more than one attempt, the performance is fixed as "Very Good".

### **Vision**

Providing value based education in Nutritional Sciences, Dietetics and Public Health Nutrition to the rural women students to construct the healthy and blooming society.

### **Mission**

- Mentoring the students by imparting skill based knowledge to suit hospital and hospitality
- Industry requirements and promote a healthy society Conscientise the students on food, nutrition and diet and to develop entrepreneurial skills for self employment

## PROGRAMME OUTCOMES FOR B.Sc.,DEGREE PROGRAMMES

PO No.	Programme Outcomes (Upon completion of the B.Sc. Degree Programme, the Undergraduate will be able to)
PO-1	<b>Disciplinary knowledge:</b> Demonstrate comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate program of study in Bachelor of Science.
PO-2	<b>Critical thinking, Problem Solving and Reflective thinking:</b> think critically about the issues and identify, critically analyze and solve problems from the disciplines of concern using appropriate tools and techniques and the knowledge, skills and attitudes acquired and extrapolate the same to real life situations; show critical sensibility to life experiences, with self awareness and reflexivity of both self and society.
PO-3	<b>Analytical &amp; Scientific Reasoning:</b> evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples and addressing opposing viewpoints; critically evaluate ideas, evidence, and experiences from an open minded and reasoned perspective.
PO-4	<b>Research-related Skills:</b> develop a sense of capability for relevant/appropriate inquiry and asking questions, synthesize, articulate and report results and to recognize and predict cause and effect relationships, define problems, formulate and establish hypothesis, analyze and interpret and draw conclusions from data, execute and report the results of an experiment or investigation.
PO-5	<b>Digital literacy and Effective Communication:</b> use ICT in a variety of learning situations and speak, read, write and listen clearly in person and through electronic media in English and in one or more Indian languages, and make meaning of the world by connecting people, ideas, books, media and technology; efficiently communicate thoughts and ideas in a clear and concise manner.
PO-6	<b>Individual and Team Work:</b> effectively accomplish tasks individually as well as work effectively and respectfully as member or leader with diverse teams, facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interest so for a common cause and work efficiently as a member of a team.
PO-7	<b>Multicultural Competence and Social Interaction:</b> understand the values and beliefs of multiple cultures, global perspectives, engage and interact respectfully with diverse groups and elicit views of others, mediate disagreements and help reach conclusions in group settings.
PO-8	<b>Awareness of Ethical issues, Human values and Gender Issues:</b> embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work and understand the value of relationship between self and the community and aware of the various issues concerning women and society.
PO-9	<b>Awareness of Environment and Sustainability:</b> understand the impacts of technology and business practices in societal and environmental contexts, and sustainable development.
PO-10	<b>Self directed and Lifelong learning:</b> acquire knowledge and skills, including learning "how to learn", that are necessary for participating in learning activities throughout life and to engage in independent and life-long learning in the broadest context of socio-technological changes.



## PROGRAMME SPECIFIC OUTCOME (PSO)

PSO No.	Program Specific Outcomes (B.Sc., Nutrition and Dietetics)
PSO1	<b>Placement:</b> To prepare the students who will demonstrate respectful engagement with others' ideas, behaviors, beliefs and apply diverse frames of reference to decisions and actions
PSO2	<b>Entrepreneur:</b> To create effective entrepreneurs by enhancing their critical thinking, problemsolving, decision making and leadership skill that will facilitate startups and high potential organizations
PSO3	<b>Research and Development:</b> Design and implement HR systems and practices grounded in research that comply with employment laws, leading the organization towards growth and development.
PSO4	<b>Contribution to Business World:</b> To produce employable, ethical and innovative professionals to sustain in the dynamic business world.
PSO5	<b>Contribution to the Society:</b> To contribute to the development of the society by collaborating with stakeholders for mutual benefit



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**B.Sc., NUTRITION AND DIETETICS**  
**COURSE STRUCTURE UNDER CHOICE BASED CREDIT SYSTEM - LEARNING  
OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)**

*(For the candidates admitted from the academic year 2023-2024)*

**ELIGIBILITY: A Pass in 10+2 with Biology and Chemistry as two of the core subjects**

Sem	Part	Nature of the Course	Course Code	Title of the course	Ins. Hours/Week	Ins. Hours/Week				Credit	Exam Hours	Marks		Total
						L	T	P	S			CIA	ESE	
I	I	Language Course-I	U23LC101	Pothu Tamil - I	6	5	1	-	-	3	3	25	75	100
	II	English Language Course-I	U23ELC101	General English - I	6	5	1	-	-	3	3	25	75	100
	III	Core Course-I	U23ND101	Food Science	5	3	1	1	-	5	3	25	75	100
		Core Practical I	U23ND102P	Food Science	4	-	-	4	-	4	3	25	75	100
		Allied Course-I	U23AND101	Food Chemistry	3	2	1	-	-	2	3	25	75	100
		Allied Practical I	U23AND102P	Food Chemistry	2	-	-	2	-	-	-	-	-	-
	IV	Non Major Elective -I			2	1	1	-	-	2	3	25	75	100
		Foundation Course	U23FCND11	Introduction to Nutrition and Dietetics	2	1	1	-	-	2	3	25	75	100
<b>TOTAL</b>					<b>30</b>	<b>17</b>	<b>6</b>	<b>7</b>	<b>-</b>	<b>21</b>	-	-	-	<b>700</b>
II	I	Language Course- II	U23LC202	Pothu Tamil - II	6	5	1	-	-	3	3	25	75	100
	II	English Language Course-II	U23ELC202	General English - II	6	5	1	-	-	3	3	25	75	100
	III	Core Course-II	U23ND203	Human Physiology	5	4	1	-	-	5	3	25	75	100
		Core Practical -II	U23ND204P	Human Physiology	4	-	-	4	-	4	3	25	75	100
		Allied Course-II	U23AND203	Food Microbiology	2	-	-	2	-	2	3	25	75	100
		Allied Practical -I	U23AND102P	Food Chemistry	3	2	1	-	-	2	3	25	75	100
	IV	Non Major Elective -II			2	1	1	-	-	2	3	25	75	100
		Skill Enhancement Course-I	U23SEND21	Human Development	2	1	1	-	-	2	3	25	75	100
<b>TOTAL</b>					<b>30</b>	<b>18</b>	<b>6</b>	<b>6</b>	<b>-</b>	<b>23</b>	-	-	-	<b>800</b>
III	I	Language Course- III	U23LC303	Pothu Tamil - III	6	5	1	-	-	3	3	25	75	100
	II	English Language Course-III	U23ELC303	General English - III	6	5	1	-	-	3	3	25	75	100
	III	Core Course-III	U23ND305	Nutrition Through Life Cycle	5	4	1	-	-	5	3	25	75	100
		Core Practical- III	U23ND306P	Nutrition Through Life Cycle	4	-	-	4	-	4	3	25	75	100
		Allied Course-III	U23AND304	Food Preservation and Processing	3	2	1	-	-	2	3	25	75	100
		Allied Practical -II	U23AND305P	Food Preservation and Processing	2	-	-	2	-	--	--	--	--	--
	IV	Skill Enhancement Course -II	U23SEND32	Bakery and Confectionary	2	1	1	-	-	2	3	25	75	100
		Skill Enhancement Course -III	U23SEND33	Human Nutrition	2	1	1	-	-	2	3	25	75	100
<b>TOTAL</b>					<b>30</b>	<b>18</b>	<b>6</b>	<b>6</b>	<b>-</b>	<b>21</b>	-	-	-	<b>700</b>
IV	I	Language Course - IV	U23LC404	Pothu Tamil-IV	6	5	1	-	-	3	3	25	75	100
	II	English Language Course-IV	U23ELC404	General English-IV	6	5	1	-	-	3	3	25	75	100
		Core Course-IV	U23ND407	Nutritional Biochemistry	5	4	1	-	-	5	3	25	75	100

Sem	Part	Nature of the Course	Course Code	Title of the course	Ins. Hours/Week	Ins. Hours/Week				Credit	Exam Hours	Marks		Total
						L	T	P	S			CIA	ESE	
	III	Core Practical IV	U23ND408P	Nutritional Biochemistry	4	-	-	4	-	4	3	25	75	100
		Allied Course-IV	U23AND406	Resource Management and Interior Design	2	-	-	2	-	2	3	25	75	100
IV		Allied Practical - II	U23AND305P	Food Preservation and Processing	3	2	1	-	-	2	3	25	75	100
		Skill Enhancement Course-IV	U23SEND44	Public Health Nutrition	2	1	1	-	-	2	3	25	75	100
	IV	Skill Enhancement Course -V	U23SEND45	Computer Applications in Home Science	2	1	1	-	-	2	3	25	75	100
			<b>TOTAL</b>		<b>30</b>	<b>18</b>	<b>6</b>	<b>6</b>	<b>-</b>	<b>23</b>	-	-	-	<b>800</b>
V	III	Core Course-V		Dietetics I	6	5	1	-	-	5	3	25	75	100
		Core Course-VI		Food Service Management	5	4	1	-	-	5	3	25	75	100
		Core Course-VII		Functional foods for Chronic Disease	5	4	1	-	-	4	3	25	75	100
		Core Practical - V		Dietetics I	4	-	-	4	-	4	3	25	75	100
		Elective Course-I		Textile Science/General Home Science/ Concepts in Apparel Designing	4	3	1	-	-	3	3	25	75	100
	Elective Course-II		Changing Trends in Extension Education/Family and Child Welfare/ Family Dynamics	4	2	1	1	-	3	3	25	75	100	
	IV	Environmental Studies		Environmental Studies	2	2	-	-	-	2	3	25	75	100
	IV	Internship/ Industrial visit/ Field visit		Internship/ Industrial visit/ Field visit	-	-	-	-	-	2	-	-	-	-
			<b>TOTAL</b>		<b>30</b>	<b>20</b>	<b>5</b>	<b>5</b>	<b>-</b>	<b>28</b>	-	-	-	<b>700</b>
VI	III	Core Course-VIII		Dietetics II	6	4	1	1	-	4	3	25	75	100
		Core Practical - VI		Dietetics II	6	-	-	6	-	4	3	25	75	100
		Core Project		Project with viva- voce/ Group Project	5	-	1	4	-	5	3	25	75	100
		Elective Course-III		Food Product Development/ Food Safety and Quality Control/ Entrepreneurship Development	4	3	1	-	-	3	3	25	75	100
		Elective Course-IV		Front Office Management and House keeping / Food Service Facilities/ Food and Beverage Service	4	3	1	-	-	3	3	25	75	100
	IV	Value Education		Value Education	2	2	-	-	-	2	3	25	75	100
		Professional competency Course		Competitive Examinations for Home Science	2	2	-	-	-	2	3	25	75	100
	V	Gender Studies		Gender Studies	1	1	-	-	-	1	3	25	75	100
		Extension activity		Extension activity	-	-	-	-	-	1	-	-	-	-
			<b>TOTAL</b>		<b>30</b>	<b>15</b>	<b>4</b>	<b>11</b>	<b>-</b>	<b>25</b>	-	-	-	<b>800</b>
<b>GRAND TOTAL</b>					<b>180</b>	<b>106</b>	<b>33</b>	<b>41</b>	<b>-</b>	<b>141</b>	-	-	-	<b>4500</b>
Extra Credit				MOOC/ SWAYAM/ NPTEL	-	-	-	-	-	<b>2</b>	-	-	-	-
				Value Added Courses (Atleast One Per Year)	-	-	-	-	-	<b>2</b>	-	-	-	-

L-Lecture

T-Tutorial

P-Practical

S-Seminar

### Credit Distribution for B.Sc., Nutrition and Dietetics

S.No	Part	Subject	No. of Courses	Total Credits
1.	I	Language Course	4	12
2.	II	English - Language Course	4	12
3.	III	Core Course –Theory	8	38
4.		Core Practical	6	24
5.		Core Course-Project	1	5
6.		Allied Course - Theory	4	08
7.		Allied Course Practical	2	4
8.		Elective Course	4	12
9.	IV	Non-Major Elective	2	04
10.		Foundation Course	1	02
11.		Skill Enhancement Course	5	10
12.		Internship/ Industrial visit/ Field visit	1	02
13.		Environmental Studies	1	02
14.		Value Education	1	02
15.		Professional competency Course	1	02
16.	V	Gender Studies	1	01
17.		Extension Activity	1	01
<b>Total</b>			<b>47</b>	<b>141</b>

**Note:**

	CIA	ESE
1 Theory	25	75
2 Practical	25	75
3 Separate passing minimum is prescribed for Internal and External marks		

**FOR THEORY**

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]

The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30 marks]

**FOR PRACTICAL**

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]

The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30 marks]

**NON MAJOR ELECTIVE (NME) OFFERED BY THE DEPARTMENT**

Semester	Part	Course	Course Code	Title of the Course
I	IV	NME-I	U23NMEND11	Basics of Nutrition
II		NME-II	U23NMEND22	Women's Health and Wellness

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(AUTONOMOUS)**



**SUNDARAKKOTTAI, MANNARGUDI -614016.**

*(For the candidate admitted in the academic year 2023-2024)*

**DEPARTMENT OF NUTRITION AND DIETETICS**

**B.Sc., NUTRITION AND DIETETICS**

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**Semester: III Core Course- III Nutrition Through Life Cycle**

**Ins. Hrs./Week:5**

**Course Credit :5**

**Course Code: U23ND305**

**UNIT-I: Meal Planning**

**(14 Hours)**

Principles of meal planning, Recommended Dietary Allowances, Food groups and food exchange list; Factors affecting meal planning and types of eating behavior, Dietary guidelines for Indians.

**UNIT-II: Nutrition for Pregnancy and Lactation**

**(16 Hours)**

Nutrition during pregnancy, Importance of preconception nutrition; Pre pregnancy weight and foetal outcome. Foetal weight gain. Physiological changes during pregnancy, complications in pregnancy. Intrauterine growth retardation. High risk pregnancies. Importance of antenatal care. Maternal nutrient metabolism and recommended dietary allowances in pregnancy.

Nutrition during lactation- Breast feeding biology, Psycho – physiological aspects of lactation, Recommended Dietary Allowances and nutritional needs of a nursing mother, nutritional guidelines, composition of breast milk and advantages, disadvantages of bottle feeding, Factors affecting lactation capacity, Effect of breast feeding on maternal health.

**UNIT-III: Nutrition in infancy**

**(16 Hours)**

Nutrition during Infant – Growth and physiological development. Infant nutritional needs and concerns. Nutrition and brain development. Infant feeding, Weaning – Definition, types of supplementary foods, points to be considered in introducing weaning foods. Nutritional problems in infant feeding. Preterm and Low Birth Weight infants.

**UNIT-IV: Nutrition for Preschool Children, School Children and Adolescence**

**(15 Hours)**

Nutrition during preschool children- Growth and development, Nutritional needs and feeding for preschool children. Malnutrition among preschool children.

Nutrition during school children- Growth and development, Nutritional requirements and RDA. Feeding school children, behavioural characteristics and feeding problems. Dietary patterns, packed lunch – factors to be considered, sample menu, school lunch programmes and nutritional problems.

Nutrition during adolescence- Growth during adolescence, nutritional requirements, hormonal influences, age of menarche-factors affecting, physiological problems and nutritional problems in adolescence.

**UNIT-V: Nutrition for Adulthood and Nutrition for Old Age**

**(14 Hours)**

Nutrition for Adulthood- Food and nutritional requirements, dietary guidelines, nutritional problems. Nutrition for old age – Process of ageing, food and nutritional requirement, dietary guidelines, nutrition related problems, physiological and Biochemical changes.

**Total Lecture Hours- 75**

## **COURSE OUTCOME**

The students should be able to:

1. Apply the knowledge of the science of nutrition to human health across the life span.
2. Understand the physiological basis for nutritional needs of normal healthy humans throughout the life cycle.
3. Understand the importance of maternal nutrition on foetal outcome
4. Assess and compare the diet and nutritional requirements related to diseases.
5. Recognize the composition, quality, and appropriateness of nutrition products and formulate dietary interventions to address nutritional deficiencies.

## **TEXT BOOK(S)**

1. Khanna K. Gupta S. Passi S.J. Seth R. Mahna R. Puri S. 2013. Textbook of Nutrition and Dietetics. Phoenix Publishing House.
2. Mahtab S. Bamji, Kamala Krishnaswamy G.N.V Brahman. 2012. Text book of Human Nutrition. 3<sup>rd</sup> edition. Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi.
3. Ravinder Chadha and Pulkrit Mathur. 2015. Nutrition: A Lifecycle Approach Publisher The Orient Blackswan, First edition ISBN-10: 812505930X; ISBN-13: 978-8125059301
4. Seth V and Singh K. 2006. Diet planning through life cycle. Part 1. Elite publishing house Pvt. Ltd, New Delhi.
5. Srilakshmi B. 2013. Dietetics, New Age International (P). Ltd, New Delhi.
6. Swaminathan M. 2012. Advanced Textbook on Food and Nutrition. Vol-1, Second Edition, Bangalore Printing and Publishing Co. Ltd, Bangalore.

## **REFERENCE BOOK(S)**

1. Chadha R and Mathur P. 2015. Nutrition: A Lifecycle Approach. Orient Blackswan, Delhi.
2. Gopalan C. Rama Sastri BV. Balasubramanian SC. 2014. Nutritive Value of Indian Foods. National Institute of Nutrition. ICMR, Hyderabad.
3. Krause MV. and Hunscher M.A. Food, Nutrition and Diet Therapy, 14<sup>th</sup> Edition W.B. Saunders.
4. Park K. 2011. Text Book of Preventive and Social Medicine. 21<sup>st</sup> edn, Banarsidas Bhanot Publishers, Jabalpur, India.
5. Shills ME. Olson JA. Moshe S and Ross CA. 2006. Modern Nutrition in Health and Disease, 9<sup>th</sup> edn, Lippincott Williams and Wilkins. Smolin and Grosvenor. 2000. Nutrition Science and Applications, 3<sup>rd</sup> edn, Saunders College Publishing, Philadelphia.
6. Wardlaw GM. Hampi JS. DiSilvestro RA. 2004. Perspectives in Nutrition. 6<sup>th</sup> edition, McGraw Hill.

## **E – RESOURCES**

1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5104202/>
2. <https://www.ncbi.nlm.nih.gov/books/NBK525242/>
3. <https://www.health.gov.il/English/Topics/SeniorHealth/HealthPromo/Pages/nutrition-elderly.aspx>
4. <https://youtu.be/2d0ane8uuR8>
5. <https://youtu.be/TTIOQN24YJ4>

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE  
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*(For the candidate admitted in the academic year 2023-2024)*

**DEPARTMENT OF NUTRITION AND DIETETICS**

**B.Sc., NUTRITION AND DIETETICS**



**Semester: III CP – III: Nutrition Through Life Cycle**

**Ins Hrs./Week:4**

**Course Credit: 4**

**Course Code:U23ND306P**

**CONTENTS**

- 1. Prepare a days menu based on food groups**
  - a. Calculate Calories (Kcal)
  - b. Calculate Protein (g)
  - c. Calculate Fat (g)
- 2. Plan, prepare and calculate nutritive value for**
  - a. Pregnant women
  - b. Lactating women
  - c. Infant
  - d. Preschooler
  - e. School going children
  - f. Adolescent
  - g. Adult
  - h. Old age

**REFERENCE BOOK(S)**

1. Chadha R and Mathur P. 2015. Nutrition: A Lifecycle Approach. Orient Blackswan, Delhi.
2. Gopalan C. Rama Sastri BV. Balasubramanian SC. 2014. Nutritive Value of Indian Foods. National Institute of Nutrition, ICMR, Hyderabad.
3. Krause MV and Hunscher MA. Food. Nutrition and Diet Therapy. 14<sup>th</sup> Edition, W.B.Saunders.
4. Park K. 2011. Text Book of Preventive and Social Medicine. 21<sup>st</sup>edn, Banarsidas Bhanot Publishers, Jabalpur. India.
5. Shills ME. Olson JA. Moshe S and Ross CA. 2006. Modern Nutrition in Health and Disease, 9<sup>th</sup>edn, Lippincott Williams and Wilkins. .
6. Wardlaw GM. Hampi JS. DiSilvestro RA. 2004. Perspectives in Nutrition. 6<sup>th</sup> edition, McGrawHill.

**E- RESOURCES**

1. <https://youtu.be/kdfFTRbHsIU>
2. [https://youtu.be/\\_Ap4BXhig5c](https://youtu.be/_Ap4BXhig5c)
3. <https://www.healthychildren.org/English/healthy-living/nutrition/Pages/The-5-Food-Groups-Sample-Choices.aspx>
4. <https://heas.health.vic.gov.au/early-childhood-services/menu-planning/babies>
5. [http://www.efad.org/media/1351/nutritional\\_guidelines\\_and\\_menu\\_checklist\\_march2014.pdf](http://www.efad.org/media/1351/nutritional_guidelines_and_menu_checklist_march2014.pdf)

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**DEPARTMENT OF NUTRITION AND DIETETICS  
B.Sc., NUTRITION AND DIETETICS**



**Semester: III AC – III: Food Preservation and Processing**

**Ins Hrs./Week: 3**

**Course Credit: 2**

**Course Code:U23AND304**

**UNIT- I: Food Preservation and Processing (08 Hours)**

Definition and scope of food preservation, principles and role of preservation, preservatives and its types, shelf life of food products, Permitted Preservatives, FPO Specification. Principles of fresh food storage : storage, effect of cold storage and quality – storage of grains – Water activity, spoilage- Types of Spoilage ,Factors influencing the spoilage.

**UNIT-II: Processing of Cereals and Millets (08 Hours)**

Milling products and by products of wheat, rice, corn, barley, oats, sorghum and other millets, whole wheat atta, blended flour, fortified flour, flaked, puffed and popped cereals, malted cereals, processed foods – bakery products, pasta products and value added products.

**UNIT-III: Processing of Milk and Milk Products (10 Hours)**

Milk – manufacture of different types of milk, drying of whole and skim milk, cream separation, churning of butter, processing of different types of cheese, Probiotic milk products- yoghurt, dahi and ice-cream, indigenous milk products – khoa, burfi, kalakhand, gulab jamun, rasagola, srikhand, channa, paneer, ghee,lassi

**UNIT- IV: High Temperature – Processing and Preservation (09 Hours)**

Blanching, pasteurization, sterilization and Ultra High Temperature(UHT) processing, canning, dielectric heating microwave heating, baking, roasting and frying. Retort processing of Ready to Eat (RTE) products.

**UNIT-V: Low Temperature Processing and Preservations (10 Hours)**

Refrigeration, Freezing and thawing, Food irradiation: Introduction, freezing point and freezing rate, comparison of Freezing and thawing process; freezing methods: Air freezing, plate freezing, liquid immersion freezing and cryogenic freezing. Freezer selection. Advantages and disadvantages of freezing. Freezing curve and changes in food during freezing storage.

**Total Lecture Hours- 45**

**COURSE OUTCOME**

The students should be able to

1. Integrate knowledge on food preservation and spoilage.
2. Understand the fundamental principles of food processing.
3. Comprehend the role of milk in indigenous milk products.
4. Infer knowledge on high temperature food processing and preservation
5. Exemplify the low temperature food storage and preservation



### **TEXT BOOK(S)**

1. Avantina Sharma. 2019 Textbook of Food Science and Technology, 3<sup>rd</sup> edition, CBSpublishers, ISBN-10: 9789386478009, ISBN-13:978-9386478009.
2. Sivasankar. 2002. Food Processing and Preservation, Prentice Hall India Learning Private Limited. ISBN-10: 8120320867; ISBN-13:978-8120320864
3. Subbulakshmi G. 2006. Food Processing and Preservation. First edition. New age publishers; ISBN-10: 8122412831, ISBN-13:978-8122412833
4. Vijaya Khader. 2001. Text book of Food Science and Technology. Indian Council of Agricultural Research, NewDelh.
5. Warris DS. 2020. Food Processing and Preservation .2 –Vol, ISBN-10: 9389688590 ISBN-13:978-9389688597.

### **REFERENCE BOOK(S)**

1. Arthey D and Ashurst PR. 1996. Fruit processing, Blackie academic and professional. London.
2. Fellows PJ. 2016. Food Processing Technology. Second edition, Principles and Practice, CRC Wood head publishing Ltd, Cambridge.
3. Gould GW .1995. New methods of food preservation. Blackie academic and professional. London.
4. John, Kingslee. 2014. A professional text to Bakery and Confectionary, New Age International (P) Limited.
5. Neelam Khetarpaul, RajBala Grewal and Sudesh Jood. 2013. Bakery science and cereal technology, Daya publishing house.

### **E- RESOURCES:**

1. <http://labgraos.com.br/manager/uploads/arquivo/cap--26-handbook-of-food-preservation-pdf>
2. <http://www.uop.edu.pk/ocontents/Lecture%20no%202.pdf>
3. [https://www.canr.msu.edu/smprv/uploads/files/Safe\\_Practices\\_for\\_Food\\_Processes\\_Chpt.\\_3\\_Factors\\_that\\_Influence\\_Microbial\\_Growth.pdf](https://www.canr.msu.edu/smprv/uploads/files/Safe_Practices_for_Food_Processes_Chpt._3_Factors_that_Influence_Microbial_Growth.pdf)
4. <https://www.medicalnewstoday.com/articles/318630>
5. <https://www.ifst.org/resources/information-statements/food-irradiation>

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**Semester: III AP – II: Food Preservation and Processing**

**Ins Hrs./Week: 2**

**Course Credit: --- Course Code: U23AND305P**

**CONTENTS**

- Stages of preparation and observation of sugar syrup
- Preparation of Bakery Products – Cakes, Cookies, Breads, Pies, Pastries
- Extrusion Cooking – Preparation of Pastas
- Dehydration & Evaporation – Preparation of Condensed Milk & Salted Dry Fish
- Fruit & Vegetable Processing; Use of Chemical Additives for Preservation;
- Thermal Processing of Foods – Preparation of Jams, Jellies, Squashes, Pickles, Chutneys, Sauces (Preservation by salt, sugar and oil)
- Emulsions and Emulsifying Agents – Preparation of Mayonnaise and Vinaigrette
- Fermented Foods – Preparation of idlis and curds/ yoghurt
- Frozen Foods – Preparation of Ice Cream & Fruit/ Vegetable Pulp

**E – RESOURCES**

1. <https://youtu.be/DnwC8t8aCAQ>
2. <https://youtu.be/V5pddQGbHKQ>
3. <https://www3.epa.gov/ttn/chief/ap42/ch09/final/c9s09-5.pdf>
4. <https://www.indianhealthyrecipes.com/masala-pasta/>
5. <https://www.allrecipes.com/article/making-mayonnaise/>

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**Semester III –Skill Enhancement Course– II Bakery and Confectionary**

**Ins Hrs. /Week: 2**

**Course Credit: 2**

**Course Code:U23SEND32**

**UNIT-I: Basic Baking & Equipments (06 Hours)**

Baking: Meaning, process and scientific principles involved. Classification of baked products. Basic plan and layout of a bakery unit. Equipments used in bakery: Large and small equipments and tools; types of ovens. Nutritional aspects of bakery products Storage and evaluation (objective and subjective methods) of baked products.

**UNIT-II: Baking Ingredients (07 Hours)**

Ingredients used in bakery: Functional classification of ingredients- structure builders, tenderizers, moisteners, driers and flavors. Flour: Composition, types and quality characteristics. Sugar. Fats: Fats used as shortenings- Butter, margarine, emulsified fats and flavored oils; properties and uses of shortenings. Leavening agents: Definition and classification- physical; chemical- baking powder and its types, baking soda; biological- yeast- types and role in baking.; Moisturizing agents: Egg, water and milk- their role in baking.

**UNIT-III: Bread & Cakes (06 Hours)**

Bread: Ingredients used, steps in bread making process, processing methods, characteristics of good bread (external and internal), faults in shape, texture, crust and flavor of bread. Cakes: Ingredients, types, cake making methods, test for doneness, characteristics of good cake (external and internal), cake faults and remedies. Icing: Meaning, types, ingredients used and preparation guidelines.

**UNIT-IV: Cookies & Pastries (05 Hours)**

Cookies: Characteristics, preparation methods and problems in cookie making. Biscuits: Stepsinvolved in biscuit making. Pastries: Types and method of preparation.

**UNIT-V: Sugar Confectionaries (06 Hours)**

Sugar confectionery – Types, role of sugar in preparation, Candies –Fondant like toffee, fudge, marshmallows, gums, jellies, chocolates – properties of these candies.

**Total Lecture Hours- 30**

## **COURSE OUTCOME**

The students should be able to

- 1.Explain the properties and functions of various ingredients in bakery science.
- 2.Understand the role and use of equipments in the production of baked foods.
- 3.Apply, Prepare, variety of doughs, batters, and fillings for baking with a sound understanding of mixing methods and baking techniques.
- 4.Classify and prepare basic confectionary products.
- 5.Infer knowledge on role of sugar in confectionaries.

## **TEXT BOOK(S)**

1. Avantina Sharma . 2019. Textbook of Food Science and Technology. 3<sup>rd</sup> edition. CBS publishers, ISBN-10: 9789386478009, ISBN-13:978-9386478009.
2. Dubey SC. 2002. Basic Baking. society of Indian Bakers, New Delhi.
3. John Kingslee.2006. A professional text book to Bakery and Confectionary. New Age International Pvt Limited Publisher, New Delhi.
4. Uttam K. Singh. 2011.Theory of Bakery and Confectionary An operational approach. Kanishka Publishers and Distributors, New Delhi.
5. Yogambal Ashokkumar. 2012. Bakery and Confectionary. PHI publication.

## **REFERENCE BOOK(S)**

1. John Kingslee. 2014. A professional text to Bakery and Confectionary. New Age International (P) Limited.
2. Lilian Hiagl and Meyer.2004. Food chemistry. CBS publishers and Distributors.
3. Shakunthala Manay N and Shadak sharaswamy M. 2005. Food Facts and Principles, New Age International (P) Ltd Publishers.
4. Neelam Khetarpaul, Raj Bala Grewal and Sudesh Jood. 2013. Bakery science and cereal technology. Daya publishing house.
5. Vijaya Khader. 2001.Text book of Food Science and Technology. Indian Council of Agricultural Research, New Delhi

## **E- RESOURCES**

1. <https://www.sihmbalangir.org/upload/Cakes%20&%20Pastries%20Book.pdf>
2. <https://www.cookingandme.com/2010/05/31/types-of-ovens-how-tochoose-oven/>
3. <https://www.chinimandi.com/types-of-sugar/>
4. <http://penyrheol-comp.net/technology/wpcontent/uploads/sites/2/2014/06/Cake-Making-Methods>
5. <http://ecoursesonline.iasri.res.in/mod/resource/view.php?id=5880>

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**Semester III –Skill Enhancement Course– III- Human Nutrition**

**Ins Hrs. /Week: 2**

**Course Credit: 2**

**Course Code:U23SEND33**

**UNIT- I: Nutrition and Recommended dietary allowances**

**(8 Hours)**

Introduction to Nutrition– Definition of nutrition, health, nutrients, nutritional status and malnutrition- under nutrition, over nutrition, imbalance, specific deficiency.

Recommended dietary allowances – Definition, General principles of deriving Recommended Dietary Allowances -Dietary intake, Growth, nutrient balance, obligatory loss of nutrients, factorial approach, nutrient turnover, Factors affecting Recommended Dietary Allowances- variability in nutrient requirements, uses of Recommended Dietary Allowances.

**UNIT- II: Carbohydrates**

**(5 Hours)**

Classification, Sources, Requirements and Functions of carbohydrates in the body. Review of digestion, absorption and metabolism. Hormonal control of Blood sugar. Dietary fibre- Definition, soluble and insoluble fibres, sources of fibre, Role of fibre in human nutrition.

**UNIT- III: Proteins**

**(5 Hours)**

Amino acids - Classification, Sources, Requirements and functions of protein. Mutual supplementation of proteins. Protein deficiency-Protein Energy Malnutrition- Kwashiorkor and Marasmus – etiology, clinical features, treatment and prevention.

**UNIT- IV: Lipids**

**(5 Hours)**

Classification, Sources, Requirements and functions, Essential fatty acids- deficiency, food sources and functions, dietary lipids and its relation to Cardiovascular diseases.

**UNIT- V: Energy**

**(7 Hours)**

Units of Energy -Kilocalories, Kilojoules, Conversion of KJ to Kcal, determination of energy value of foods using Bomb calorimeter,

Basal metabolism, factors affecting BMR - Determination of energy requirements, Direct and Indirect calorimetry direct calorimetry. energy requirements for various types of activities, Energy requirements for different age groups.

**Total Lecture Hours- 30**

## **COURSE OUTCOME:**

The students should be able to,

1. Infer Knowledge on Nutrition, Recommended dietary allowances.
2. Identify the Sources, Requirements and Functions of carbohydrates in the body.
3. Understand the Knowledge on Sources, Requirements ,Functions and Evaluation of Protein quality
4. Predict the Requirements, functions, Essential fatty acids and deficiency.
5. Understand the role of macro nutrients and are able to evaluate the energyvalue of foods

### **TEXT BOOK(S)**

1. David A Bendor. 2021, Introduction to Nutrition Metabolism sixth Edition, CRC Press, New York, ISBN 9780367190811
2. Jyeshtha, 1939, Human Ecology and Family Sciences, National Council of Educational Research and Training, ISBN: 978-81-7450-972-7.
3. Keith Frayn. 2018. Human Metabolism, Fourth Edition, Wiley-Blackwell, ISBN-10. 1119331439
4. Sunetra Roday, Food Science and Nutrition Third Edition, Oxford ISBN 139780199489084.
5. William, S.R. – Nutrition and Diet Therapy (1985) 5<sup>th</sup> edition, Mosbey Co. St. Louis.

### **REFERENCE BOOK (S)**

1. Bogert, J.G.V. Briggs, D.H. Calloway Nutrition and physical fitness (1985), 11<sup>th</sup> edition – W.B. Saunders Co., Philadelphia, London, Toronto.
2. Guthrie H.A. – Introductory Nutrition C.V. Mosby Co. St. Louis.
3. M. Swaminathan “Principles of Nutrition and Dietetics”, 1993, Bappco 88, Mysore Road, Bangalore-560 018.
4. Maurice E. Shils, James A. Olson, Moshe Shike “Modern Nutrition in health and disease” (1994) eighth edition, Vol. I & II Lea & febiger Philadelphia, A waverly Company.
5. Wardlaw, G.M. Insel, P.H. – Perspectives in Nutrition (1990) TimesMirror / MosbyCollege Publishing Co. St. Louis, Toronto, Boston.

### **E-RESOURCES**

1. <https://www.healthline.com/nutrition/malnutrition>
2. <https://medlineplus.gov/definitions/nutritiondefinitions.html>
3. [https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp\\_content/S000444FN/P000552/M012213/ET/1533535925Q1.pdf](https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000444FN/P000552/M012213/ET/1533535925Q1.pdf)
4. [https://www.youtube.com/watch?v=bCjaT\\_WtwTU](https://www.youtube.com/watch?v=bCjaT_WtwTU)<https://www.youtube.com/watch?v=2UfjwZAGTIO>



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**Semester: IV CC – IV: Nutritional Biochemistry**

**Ins Hrs./Week:5**

**Course Credit: 5**

**Course Code:U23ND407**

**UNIT- I: Carbohydrate (15 Hours)**

Carbohydrate – Structure and classification, Metabolism of carbohydrate –glucose oxidation through Glycolysis, Krebs- TCA cycle, Pentose Phosphate Pathway, Gluconeogenesis. Inborn errors of metabolism – Fructosuria and galactosemia.

**UNIT II: Proteins (15 Hours)**

Proteins-primary, secondary, tertiary structure of proteins, Hydrolysis of proteins-Denaturation, precipitation, coagulation. Nutritional classification of proteins, Amino Acids – Classification, chemical properties due to amino and carboxyl groups. Metabolism of amino acids-Deamination, Transamination, Decarboxylation – urea cycle, fate of carbon skeleton of amino acids. Inborn errors of metabolism-Phenyl ketonuria, Alcaptonuria, Maple Syrup Urine Disorder.

**UNIT- III: Lipid and Lipid Metabolism (14 Hours)**

**Lipids and Lipid Metabolism**– Classification of fats, oxidation of fatty acids, Bio synthesis of fatty acids, ketogenesis. Nutritional importance of Saturated and Unsaturated fatty acids, Tri acylglycerols, Phospholipids and Cholesterol.

**UNIT-IV: Nucleotides, Nucleic Acids And Enzyme (15 Hours)**

**Nucleotides and nucleic acids:** Structure of purine and pyrimidines nucleotides, RNA – structure and types, double helical structure of DNA, biosynthesis and catabolism of purine and pyrimidine nucleotides.

**Enzyme-** Definition, Enzyme classification, Nomenclature, Factors affecting enzymatic activity, Mechanism of action. Co- enzyme and prosthetic group- role of B vitamins.

**UNIT- V: Vitamins and Minerals (16 Hours)**

**Vitamins:** Fat Soluble Vitamins (A, D, E, K) – Classification, functions, Sources and its metabolism. Water Soluble Vitamins (Vitamin B and Vitamin C) – Classification, functions, Sources and its metabolism

**Minerals: Macro Minerals** (Calcium, Phosphorus, Sodium, Potassium, Magnesium)– Sources, functions, Classification and its metabolism.

**Micro Minerals** (Iron, Fluorine, Zinc, Iodine, Selenium) – Classification, functions, Sources and its metabolism

**Total Lecture Hours- 75**

## **COURSE OUTCOME**

The students should be able to

1. Understand the role of enzymes in metabolism and clinical conditions.
2. Interpret the significance of macronutrient metabolism, and thereby understand the implications of disorders resulting from these.
3. Acquire skills in qualitative tests and quantitative estimation of nutrients.
4. Understand and gain theory & practical knowledge on Biological cycles involved in metabolism.
5. Evaluate and criticize the experimental approaches and scientific information presented in the research articles related to nutritional biochemistry.

## **TEXT BOOK(S)**

1. Ambika Shanmugam. 2008. Fundamentals of Biochemistry for Medical Students. Lippincott Williams & Wilkins.
2. Rafi MD. Dr. N.T.R. 2015. Textbook of Biochemistry for Medical Students. University of Health Sciences, Universities Press.
3. Ranganatha Rao. K. 2000. Text book of Biochemistry. Prentice Hall of India, New Delhi.
4. Sathyanarayanan U. Chakrapani U. 2010. Textbook of biochemistry. 3<sup>rd</sup> edition. books and allied (p) ltd, Kolkata.
5. Ambika Shanmugham. 1985. Fundamentals of bio-chemistry to medical students. NVABharat Printers, and traders, Madras.

## **REFERENCE BOOK(S)**

1. Agarwal GR. Meerut. 2014. Text Book of Biochemistry. Krishna Prakashan Media (p) New Delhi.
2. Conn EE. Stumpf PK. 1981. Outlines of Biochemistry. 4<sup>th</sup>. Ed. Wiley Eastern Ltd, New Delhi.
3. Harvey R. Ferrier D. Lippincott's Illustrated Reviews Biochemistry. 6<sup>th</sup> edition, Lippincott Williams and Wilkins, Philadelphia. Ltd.
4. Murray, R.K., Granner, D.K. and Rodwell, V. W. 2006. Harper's Illustrated Biochemistry. 27<sup>th</sup> ed. The McGraw-Hill Companies, USA.
5. Satyanarayanan, U. 2014. Biochemistry. Elsevier India Private Limited, New Delhi.

## **E- RESOURCES**

1. <http://eagri.org/eagri50/GBPR111/lec16.pdf>
2. <https://courses.lumenlearning.com/boundless-microbiology/chapter/the-citric-acid-cycle/>
3. <http://watcut.uwaterloo.ca/webnotes/Metabolism/Gluconeogenesis.html>
4. <https://www.nhs.uk/conditions/phenylketonuria/>
5. [https://ddu.collegedu.ac.in/Datafiles/cms/ecourse%20content/B.Sc.%20\(H\)%20Bot%20VI%20sem\\_Dr%20Sandeep%20Kumar%20Botay.pdf](https://ddu.collegedu.ac.in/Datafiles/cms/ecourse%20content/B.Sc.%20(H)%20Bot%20VI%20sem_Dr%20Sandeep%20Kumar%20Botay.pdf)



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**Semester: IV CP – IV: Nutritional Biochemistry**

**Ins Hrs./Week:4**

**Course Credit: 4**

**Course Code:U23ND408P**

**CONTENTS**

- Qualitative Tests for Carbohydrates – Glucose, Fructose, Lactose, Maltose, Starch
- Qualitative Test for Protein – Caesin, Egg albumin.
- Qualitative Tests for Lipids – Coconut oil, Gingelly oil.
- Qualitative Tests for Minerals – Copper Sulphate, Ammonium Phosphate.
- Quantitative Estimation of Glucose – BQR method
- Quantitative Estimation of Protein – Biuret Method
- Quantitative Estimation of Phosphorus – Fiske and Subarrow Method
- Quantitative Estimation of Ascorbic Acid – 2,6 Dichloro Indophenol Dye Method
- Determination of Iodine Value.

**REFERENCE BOOK(S)**

1. Oser BL. 2001. Harke's Physiological Chemistry. XIV Edition. Tata McGraw Hill Publishing Company Ltd, Bombay.
2. Raghuramulu N. Madhavannair K. and Kalyana Sundaram. 2003. A Manual of Laboratory Techniques, National Institute of Nutrition, Hyderabad, 500007.
3. Sadasivam S and Manickam A. 2003. Biochemical Method. Second Edition. New Age International P. Ltd Publishers, New Delhi.
4. Varley H. Gowenlak AH. and Hill M. 2000. Practical Clinical Biochemistry. William Itinmaon Medical Books, London.

**E - RESOURCES**

1. <https://youtu.be/fQ1hSNGnXYY>
2. <https://youtu.be/ZN3bz3EftJ0>
3. <http://www.chem.boun.edu.tr/wp-content/uploads-415-Experiment-1.pdf/2014/04/Chem>
4. <https://portlandpress.com/biochemj/article-abstract/62/4/675/50235/The-use-of-p-chloromercuribenzoic-acid-in-the?redirectedFrom=PDF>

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**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE  
(AUTONOMOUS)**

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*(For the candidate admitted from the academic year 2023-2024)*

**DEPARTMENT OF NUTRITION AND DIETETICS  
B.Sc., NUTRITION AND DIETETICS**

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**Semester: IV AC –IV:Resource Management and Interior Design  
Ins Hrs. /Week: 3      Course Credit: 2      Course Code:U23AND406**

**UNIT-I: Management and Concepts ( 9 Hours)**

Management – Definition, Principles and elements involved in management Process – planning, organizing, controlling, coordinating and motivating. Management Concepts - Goals and Values – their relationship to decision-making, Standard of Living – Definition, constituents, Means for raising the standard of living of families. Decision Making – steps, importance, types of decisions, Habitual versus Conscious decision making. Individual and group decisions, resolving conflicts in group decisions.

**UNIT – II: Resources and Family Income (9 Hours)**

Resources – Human and non-human resources. Characteristics of Resources, utilization of resources to achieve family goals. Family Income – Definition, Types - Money, Real and Psychic income, HUDCO classification, various ways of improving the income of the family, Family finance management,

Family Budget – Definition and meaning, importance of budgeting, steps, factors affecting the budget. Engles's Law of Consumption. Savings – Meaning, objectives, Needs for savings in the family, types of savings schemes.

**UNIT III: Basics in Interior Design (9 Hours)**

Concept of Interior Design-Meaning of Interior Design and Interior Decoration. Design – Definition, Meaning, Purpose. Types, elements and principles Concept of colour. Dimensions of colour – Hue, value and intensity, Colour therapy & Psychology of Colour systems, harmonies, Application of colour harmonies in the interiors and exteriors

**UNIT- IV: Lighting, Accessories & Furnitures (9 Hours)**

Importance of lighting. Sources, Types, Glare- Types, causes and prevention. Accessories-Meaning, Types-functional, decorative, both functional and decorative, Lighting accessories- fixtures, Lighting for areas and specific activities. Picture mounting, wall hangings.Styles of furniture – traditional, contemporary and modern design. Furniture for different purpose, furniture materials. Selection and arrangement – Furniture for various rooms, Furniture Dimensions, Care and maintenance.

**UNIT -V: Window/ Door Treatments & Flower Arrangements (9 Hours)**

Draperies, curtains - different doors and window and its coverings - Selection, Use & Care of furnishing materials. Use of flowers and containers for Interior Decoration – Importance, materials required, care and maintenance of flowers, vase selection, basic shapes. Styles in flower arrangement, dried and pressed flowers, and Japanese arrangements – IKEBANA, MORIBANA & SHABANA.

**Total Lecture Hours- 45**

## **COURSE OUTCOME**

The students should be able to

1. Recognize the importance of wise use of resources to achieve one's goals, & become a good home maker.
2. Gain knowledge in various aspects in home economics.
3. Recognize the effective use of resources and learn skills in using principles elements of art & design.
4. Acquire the ability to conceptualize and design interior spaces for homes, retails, hotels, offices.
5. Gain knowledge how to work as an interior designer, visual merchandiser and interior decorator.

### **TEXT BOOK(S)**

1. Anita T. 2011. Textiles for Apparel and Home Furnishing. Sonali Publications, New Delhi, India.
2. Chaudhari SN. 2005. Interior Design. Aavishkar Publishers, Jaipur, India.
3. Kasu AA. 2005. Interior Design. Ashish Book Centre Delhi.
4. Kharuna S. 2012. Fabrics for Fashion and Textile Design. Sonali Publications, New Delhi, India.
5. Neeru Garg Sushma Gupta. 2008. Text book of Family Resource Management, 9<sup>th</sup> Edition.
6. Seetharaman P and Pannu P. 2009. Interior Design and Decoration. CBS Publishers and Distributors Pvt Ltd, New Delhi.
7. Sylvia M., Asay, Tami, J., Moore. 2016. Family Resource Management, Third Edition,
8. Varghese MA. Ogale, Srinivasan K. 1992. Home Management. Wiley Eastern Ltd.

### **REFERENCE BOOK(S)**

1. Chaudhari SN. 2006. Interior Design. Aavishkar Publishers Jaipur.
2. Gary Gordon & Jamco L. Nuckolls. 1995. Interior lighting for Designers, Third edition John Wiley & Sons, New York.
3. Nickell P and Dorsey. J.M. 1960. Management in Family Living. John Wiley and Sons Inc, New York.
4. Sharma N. 2006. Home Management. Murari Lal Publishers, Ahmedabad.
5. Sharma V. 2005. Modern Home Management. Shree Niwas Publications, Jaipur.
6. Shukul M and Gandotra, V. 2006. Home Management and Family Finance. Dominant Publishers, New Delhi.
7. Tamilnadu State Council for Higher Education. 1974. Interior Design & Decoration, Fourth Edition, Sherrill Whiton Prentice Hall,
8. Varghese M.A et al. Home Management, Second Edition, New Age International (P) Limited, Publishers, New Delhi.
9. William Hardy & Steve Adams. 1988. The Encyclopaedia of Decorative Styles. New Burlington books, London.

### **E –RESOURCES**

1. <https://youtu.be/Q25Ig09kK-A>
2. <https://youtu.be/rkDquOipXLA>
3. <https://youtu.be/2YMCQAUnfm4>
4. [http://www.hillagric.ac.in/edu/coa/vegetables/lectures/VSF\\_233\\_HSc/VSF\\_233\\_HSc\\_Lect\\_15.pdf](http://www.hillagric.ac.in/edu/coa/vegetables/lectures/VSF_233_HSc/VSF_233_HSc_Lect_15.pdf)
5. [https://www.brainkart.com/article/Decision-Making\\_33511/](https://www.brainkart.com/article/Decision-Making_33511/)
6. <https://www.yourarticlelibrary.com/family/family-income-types-money-real-and-psychic-income/47908>



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**Semester: IV AP – II: Food Preservation and Processing**

**Ins Hrs./Week: 2**

**Course Credit: 2**

**Course Code: U23ND305P**

**CONTENTS**

- Stages of preparation and observation of sugar syrup
- Preparation of Bakery Products – Cakes, Cookies, Breads, Pies, Pastries
- Extrusion Cooking – Preparation of Pastas
- Dehydration & Evaporation – Preparation of Condensed Milk & Salted Dry Fish
- Fruit & Vegetable Processing; Use of Chemical Additives for Preservation;
- Thermal Processing of Foods – Preparation of Jams, Jellies, Squashes, Pickles, Chutneys, Sauces (Preservation by salt, sugar and oil)
- Emulsions and Emulsifying Agents – Preparation of Mayonnaise and Vinaigrette
- Fermented Foods – Preparation of idlis and curds/ yoghurt
- Frozen Foods – Preparation of Ice Cream & Fruit/ Vegetable Pulp

**E – RESOURCES**

1. <https://youtu.be/DnwC8t8aCAQ>
2. <https://youtu.be/V5pddQGbHKQ>
3. <https://www3.epa.gov/ttn/chief/ap42/ch09/final/c9s09-5.pdf>
4. <https://www.indianhealthyrecipes.com/masala-pasta/>
5. <https://www.allrecipes.com/article/making-mayonnaise/>

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**Semester: IV Skill Enhancement Course –IV:Public Health Nutrition**

**Ins Hrs. /Week: 2      Course Credit: 2      Course Code: U23SEND44**

**UNIT-I: Concept and scope of public nutrition (7 Hours)**

Definition, concept, scope and multidisciplinary nature of public nutrition  
Nutritional problems affecting the community. Etiology, prevalence, clinical features and preventive strategies for malnutrition related problems and deficiency disorders - Under nutrition (Protein energy malnutrition, Wasting, Stunting), Over nutrition (obesity and related risks), Nutritional anemia, Vitamin A deficiency, Iodine deficiency disorders, Fluorosis.

**UNIT-II: Assessment of nutritional status (5 Hours)**

Objectives and importance, Methods of assessment: Direct (Clinical signs, Anthropometry, Biochemical tests); Indirect (Diet surveys, vital statistics).

**UNIT-III: Nutrition policy and programs (6 Hours)**

National nutritional policy; Integrated child development scheme (ICDS), Midday Meal Program-State and National (Poshan Abhyan), National programs for the prevention of anemia, Vitamin A deficiency, Iodine deficiency disorders, Fortification of Foods and Public Distribution System as a preventive approach.

**UNIT-IV: Nutrition education (5 Hours)**

Objectives, principles and scope of nutrition and health education, creating awareness on current public health issues and devising strategies for prevention and management.

**UNIT-V : Role of National and International agencies in combating malnutrition (7 Hours)**

World Health Organization (WHO) Food and Agriculture Organization (FAO), United Nations International Children's Emergency Fund (UNICEF); National: Food Safety and Standards Authority of India (FSSAI), The Indian Agricultural Research Institute,( ICAR), Indian Council of Medical Research (ICMR), *National Institute of Nutrition (NIN)* Central Food Technological Research Institute(CFTRI) NATIONAL NUTRITION MONITORING BUREAU (NNMB)-Role, Target groups (if specified), Policies and Programs.

**Total lecture Hours- 30**

**Course Outcome:**

The students should be able to

1. Define terms related to Public Health nutrition.
2. Describe the nutritional problems prevalent in the community
3. Explain the significance of assessment of nutritional status
4. Assess the role of various organizations in combating nutritional problems.
5. Conduct nutrition education programs to create awareness on improving health and nutrition of the community at large.

**TEXTBOOK(S)**

1. Maity SP. 2016. Pharmacology for Second Professional Students. Books and Allied Pvt.Ltd.
2. Robinson CH. 1987. Normal and Therapeutic Nutrition. Oxford and IBH, publishing Calcutta, Bombay.
3. Shils EM, Olson AJ, and Shike MC. 1994. Modern Nutrition in Health and Diseases. Vol.II, Lea and Febiger Philadelphia.
4. Srilakshmi B. 2002. Dietetics .New Age International, New Delhi.
5. Swaminathan M. 1995. Essentials of Food and Nutrition. Vol.I and II, Ganesh and Company, Madras.

**REFERENCE BOOK(S)**

1. Wadhwa A and Sharma S (2003). Nutrition in the Community- A textbook. Elite Publishing House Pvt. Ltd. New Delhi.
2. Park K (2011). Park's Textbook of Preventive and Social Medicine, 21st Edition. M/s Banarasidas Bhanot Publishers, Jabalpur, India.
3. Jelliffe DB, Jelliffe ERP, Zervas A and Neumann CG (1989). Community nutritional assessment with special reference to less technically developed countries. Oxford University Press. Oxford.
4. WHO (2006). Child Growth Standards: Methods and development: height- for- age, weight-for-age, weight-for-length, weight-for-height and body mass index- for-age (<http://www.who.int/childgrowth/standards/en/>).
5. Gupta, MC. And Mahajan BK. (2003) Textbook of Preventive and Social Medicine 3rd Ed Jaypee brothers, Medical Publishers (p) Ltd.

**E-RESOURCES:**

1. <https://www.who.int/health-topics/malnutrition>
2. [Mohfw.nic.in/NRHM/NIDD](http://mohfw.nic.in/NRHM/NIDD)
3. [www.nrhmorissa.gov.in/NIDDCP.html](http://www.nrhmorissa.gov.in/NIDDCP.html)
4. [www.Scripts.mit.edu](http://www.Scripts.mit.edu)



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**Semester: IV Skill Enhancement Course –V:Computer Applications in Home Science**

**Ins Hrs. /Week: 2      Course Credit: 2      Course Code:U23SEND45**

**UNIT -I :-COMPUTER BASICS (5 Hours)**

Preparing slides in using MS-POWERPOINT, Introduction to Internet Using search engine Google search Exploring the next using Internet Explorer and Navigator Uploading and Download of files and images E-mail ID creation Sending messages - Attaching files in E-mail

**UNIT -II: COMPUTER APPLICATION IN SPACE PLANNING (8 Hours)**

AutoCAD in Interior Design - Need, Purpose and merits. Application – Preparing Plan, Elevation and section drawings for interiors and exteriors. Need for rendered views in design. Creating 3D models and 3D views using Google Sketchup. Advantages of software in design field.

**UNIT -III:COMPUTER APPLICATION IN NUTRITION (6 Hours)**

Software package in nutrition education and diet counselling - Patient's health record, Nutritive value of food items, Nutritional analysis, Meal planning and recipes, Types of nutrition Softwares – Nutrium, Nutrition maker, Nutritionist pro, Nutritics, Core plus.Benefits of Nutrition Software's to Nutritionists and Clients.

**UNIT- IV: HEALTH INFORMATION RETRIEVAL AND DIGITAL LIBRARIES**

**(6 Hours)**

Indexing and abstracting services, Factual databases, Information retrieval, Knowledge-based information, Evaluation. The Internet (advanced usage) E-mail, Mailing lists, Newsgroups, Health-related discussion forums, Telemedicine, E-health, Telepharmacy, Medical resources on the Internet Healthwebsites: PubMed & Medscape, Literature search strategies. Uses of computer applications within hospitals and the healthcare system.

**UNIT- V: COMPUTER APPLICATION IN PHOTOSHOP,ILLUSTRATOR AND DIETETIANS**

**(5 Hours)**

Editing of photos for posters and blog writing, Creating pamphlets, pictorial posters Role of computer non nutritional deficiencies for education. Uses of computers in Dietetians, ,menu generating and management system, computer aided learning in dietetics (CALID)

**Total lecture Hours- 30**

## **COURSE OUTCOME**

The students will be able to

1. Compute ideas into posters and develop printed reports with finesse
2. Create and combine various data into single report.
3. Categorize the nutritional calculation and assessment
4. Illustrate the enhanced pictures and create engaging content
5. Understand the computer aided in dietitian

## **TEXTBOOKS:**

1. Subramaniam.S – Introduction to Computers
2. Norton Peter-Introduction to Computers
3. DOS –Ready Reference
4. Inside Auto CAD
5. Business Applications of Computers, Oka, M. M. 10th ed Everest.

## **REFERENCES:**

1. AutoCAD 2018 for Novices (Learn By Doing),
2. CAD Practical Skills in Textile Technology and Design (TTD), Patience Chitura, 2020.
3. Microsoft Office 365 for Beginners 2022: [8 in 1] The Most Updated All-in-One Guide
4. Beginner to Advanced | Including Excel, Word, PowerPoint, OneNote, OneDrive, Outlook, Teams and Access, James Holler.
5. SPSS Statistics 2017, for Data Analysis and Visualization, Jesus Salcedo, Wiley Publishers.

## **E -RESOURCES**

1. [http://www.bcpls.org/Docs/Computer\\_Handouts/PowerPoint101.pdf](http://www.bcpls.org/Docs/Computer_Handouts/PowerPoint101.pdf)
2. <https://corporatefinanceinstitute.com/resources/excel/study/basic-excel-formulas-beginners/>
3. <https://business.tutsplus.com/tutorials/how-to-learn-powerpoint--cms-29884#:~:text=Think%20of%20slides%20as%20the,your%20content%20to%20in%20PowerPoint.>
4. <https://www.instructables.com/How-to-Create-a-PowerPoint-Presentation/>