# B.Sc., NUTRITION AND DIETETICS

## Course Structure with Syllabus

## PROGRAMME CODE :3USNUD

**2026-2027**


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

(Affiliated to Bharathidasan University, Tiruchirappalli)

(Accredited by NAAC)

Sundarakkottai, Mannargudi–614016,

Thiruvarur(Dt.),Tamil Nadu, India.

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**SUNDARAKKOTTAI, MANNARGUDI–614016.**
**TAMILNADU, INDIA.**

# B.Sc., NUTRITION AND DIETETICS
# CHOICE BASED CREDIT SYSTEM–LEARNING OUTCOMES BASED CURRICULUM FRAME WORK (CBCS–LOCF)
***(For the candidates admitted in the academic year 2026–2027)***

## 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 with in 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.**

**Ability Enhancement Courses (AEC):** Ability Enhancement Courses are designed to improve students' language proficiency, communication skills, analytical abilities, environmental awareness, and understanding of contemporary issues. These courses aim to enhance the overall academic and professional capabilities of students and facilitate their effective participation in higher education and employment.

**Core Courses (CC):** A course that is compulsorily studied by a student as a fundamental requirement of the programme is termed a Core Course (CC). These courses provide the basic knowledge and conceptual understanding of the major discipline. Core Courses constitute the foundation of the programme and ensure that all students acquire the essential competencies and academic standards prescribed for the degree. Successful completion of Core Courses is mandatory for the award of the degree.

**Core Practical Courses (CP):** Core Practical Courses are laboratory-based courses associated with the Core Theory Courses. These courses provide hands-on training, experimental skills, analytical techniques, and practical exposure necessary for understanding the concepts of the discipline. Students are required to successfully complete all prescribed practical courses as part of the programme requirements.

**Allied Courses (AC):** Minor Courses are courses offered from disciplines other than the major discipline. These courses provide students with opportunities to gain additional knowledge and skills in allied or complementary areas of study. Minor Courses promote multidisciplinary learning and broaden the academic perspective of students. The selection and completion of Minor Courses shall be governed by the regulations of the institution and the curriculum framework.

**Allied Practical (AP):** Minor Practical are practical components associated with the chosen Minor discipline. These courses provide laboratory or field-based exposure to the concepts learned in the Minor Courses and help students develop practical skills relevant to the selected area of study.

**Interdisciplinary Courses (IDC):** Interdisciplinary Courses are designed to provide knowledge and skills that integrate concepts from multiple disciplines. These courses encourage students to explore the interrelationship between different fields of study and develop a broader understanding of contemporary issues and applications. Students may choose Interdisciplinary Courses as prescribed in the curriculum and subject to eligibility requirements.

**Discipline Specific Elective Courses (DSE):** Discipline Specific Elective Courses are elective courses offered by the major discipline. These courses provide students with opportunities to acquire advanced knowledge and specialization in selected areas of the discipline. Students may choose courses from the prescribed list of electives based on their interests, aptitude, and career aspirations. These courses are generally application-oriented and provide in-depth exposure to specific domains of study.

**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.

**Value Added Courses (VAC):** Value Added Courses are intended to provide additional knowledge, skills, attitudes, and competencies that complement the regular curriculum. These courses focus on holistic development, professional ethics, environmental awareness, personality development, life skills, and emerging areas of knowledge. Successful completion of the prescribed Value Added Courses may be mandatory or optional as specified in the curriculum.

**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.

**Project Work:** Project Work provides students with an opportunity to apply the knowledge and skills acquired during the programme to investigate a specific problem or research topic. Students shall undertake the project under the guidance of a faculty member and submit a dissertation/report followed by evaluation and viva-voce examination, wherever prescribed.

**Extension Activities:** Students are encouraged to participate in extension and outreach activities such as National Service Scheme (NSS), National Cadet Corps (NCC), Youth Red Cross (YRC), Red Ribbon Club (RRC), community engagement programmes, environmental awareness campaigns, and other socially relevant activities. Such participation may be recognized through credits, certificates, or awards as prescribed by the institution.

**Undergraduate Programme:**

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

Part -I: Ability Enhancement Course (Tamil / Hindi / French / Sanskrit)

Part-II: Ability Enhancement Course (English)

Part-III: Core Course (Theory, Practicals, Minor courses, Minor Practicals and Group Project)

Part-IV: Skill Enhancement Courses, Discipline Specific Elective Courses, Interdisciplinary Courses, Value Education, Health & Wellness, Introduction to Disaster Management, Summer Internship, Value Added Course, Environmental studies, Gender studies and Extension activity.

**EXAMINATION**

**Continuous Internal Assessment (CIA):**

**UG - Distribution of CIA Marks**

**Passing Minimum: 40 %**

| | | |
|---|---|---|
| Assisgnment-3 | = | 30% |
| Test-2 | = | 50% |
| Seminar | = | 10% |
| Attendance | = | 10% |

**Question Paper Pattern**

**Section A1 (10x1=10 marks)**

One word question/ Fill in/ True or False/ Multiple Choice Questions

Two Questions from Each unit

**Section A 2 (5x2=10 marks)**

Short Answers / Match the following

One question from Each unit

**Total Marks – 20**

**Section B: (5x4=20 marks)**

Paragraph Answers

Either/ or type, One Question from each unit

**Section C: (10x3=30)**

Essay Type Answers

Answer 3 out of 5 Questions

One Question from each unit

**Section A1 & A2**: K1 Level

**Section B**: K2, K3 and K4 Level

**Section C**: K5 and K6 Level

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

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

**WEIGHTAGE of K – LEVELS IN QUESTION PAPER**

| (Cognitive Level) K- LEVELS → | Lower Order Thinking | | | Higher Order Thinking | | | Total |
|---|---|---|---|---|---|---|---|
| | K1 | K2 | K3 | K4 | K5 | K6 | |
| **END SEMESTER EXAMINATIONS (ESE)** | 20 | 20 | | | 30 | | **70** |
| **Continuous Internal Assessment (CIA)** | 20 | 20 | | | 30 | | **70** |

**QUESTION PATTERN FOR END SEMESTER EXAMINATION/ Continuous Internal Assessment**

| SECTION | MARKS |
|---|---|
| **SECTION – A1** (No choice ,One Mark) **TWO** questions from each unit (10x1 =10)<br>**SECTION –A2** (No choice ,Two Mark) **ONE** question from each unit (5x2 =10) | 20 |
| **SECTION - B** (Either/ or type, 4-Marks) **ONE** questions from each unit (5x4 =20) | 20 |
| **SECTION - C** (3 out of 5) (10 Marks) **ONE** question from each unit (3x10 =30) | 30 |
| **Total** | **70** |

| **BLUE PRINT OF QUESTION PAPER FOR END SEMESTER EXAMINATION** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **DURATION: 3. 00 Hours.** | | | | | | | **Max Mark : 70** |
| **K- LEVELS**<br>**SECTION** | **K1** | **K2** | **K3** | **K4** | **K5** | **K6** | **Total Marks** |
| **SECTION –A1** (1 Mark, No choice) (10x1 =10) | 10 | | | | | | 10 |
| **SECTION –A2** (2-Marks, No choice) (5x2=10) | 10 | | | | | | 10 |
| **SECTION –B** (4-Marks) (Either/or type) (5x4=20) | | 4 | 8 | 8 | | | 20 |
| **SECTION -C** (10 Marks) (3 out of 5) (3x10=30) Courses having only **K5, K6** levels, K5 level- 3 Questions, K6 level- 2 Questions **(One K6 level question is compulsory)** | | | | | 20 | 10 | 30 |
| **Total** | **20** | **04** | **08** | **08** | **20** | **10** | **70** |

## 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 twoare calculated by the following formulae:

| | |
|---|---|
| $GPA = \frac{\sum_{i=1}^{n} C_i G_i}{\sum_{I=1}^{n} C_i}$ | $WAM\ (Weighted\ Average\ Marks) = \frac{\sum_{i=1}^{n} C_i M_i}{\sum_{I=1}^{n} C_i}$ |
| Where,<br>$C_i$ is the Credit earned for the Course i<br>$G_i$ is the Grade Point obtained by the student for the Course i<br>$M_i$ is the marks obtained for the course i and<br>n is the number of Courses **Passed** 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 earnedby 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**

| Marks Range | Grade Point | Corresponding Grade |
|---|---|---|
| **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 pervious semester /s is indicated by **Cumulative Grade Point Average (CGPA).**

**Table-2: Final Result**

| CGPA | Corresponding Grade | Classification of Final Result |
|---|---|---|
| **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 ruralwomen 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

| PONo. | Programme Outcomes<br>(*Upon completion of the B.Sc. Degree Programme, the Undergraduate will be able to)* |
|---|---|
| **PO-1** | **Disciplinary knowledge**: 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** | **Critical thinking, Problem Solving and Reflective thinking: t**hink 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** | **Analytical & Scientific Reasoning:** 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** | **Research-related Skills:** 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** | **Digital literacy and Effective Communication:** use ICT in a variety of learning situations and **s**peak, 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** | **Individual and Team Work:** 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** | **Multicultural Competence and Social Interaction:** 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** | **Awareness of Ethical issues, Human values and Gender Issues:** 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** | **Awareness of Environment and Sustainability:** understand the impacts of technology and business practices in societal and environmental contexts, and sustainable development. |
| **PO-10** | **Self directed and Lifelong learning:** 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<br>(B.Sc., Nutrition and Dietetics) |
|---|---|
| PSO1 | **Placement:**<br>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 | **Entrepreneur:**<br>To create effective entrepreneurs by enhancing their critical thinking, problem solving, decision making and leadership skill that will facilitate startups and high potential organizations |
| PSO3 | **Research and Development:**<br>Design and implement HR systems and practices grounded in research that comply with employment laws, leading the organization towards growth and development. |
| PSO4 | **Contribution to Business World:**<br>To produce employable, ethical and innovative professionals to sustain in the dynamic business world. |
| PSO5 | **Contribution to the Society:**<br>To contribute to the development of the society by collaborating with stakeholders for mutual benefit |

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# B.Sc., NUTRITION AND DIETETICS
## CHOICE BASED CREDIT SYSTEM–LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS – LOCF)
**(For the candidates admitted in the academic year 2026–2027)**
**ELIGIBILITY: A pass in 10 +2 with Biology as one of the core subjects**

| Sem | Part | Courses | Course Code | Title | Ins. Hrs. | Credits | Exam. Hours | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Int. | Ext. | Total |
| I | I | Ability Enhancement Course -I (AEC- I) | U26TAEC11 | (Tamil$ / Other Languages+, #) | 6 | 3 | 3 | 30 | 70 | 100 |
| | II | Ability Enhancement Course -II (AEC-II) | U26EAEC11 | English Course – I | 6 | 3 | 3 | 30 | 70 | 100 |
| | III | Core Course –I (CC-I) | U26ND101 | Food Science | 4 | 4 | 3 | 30 | 70 | 100 |
| | | Core Practical-I (CP-I) | U26ND102P | Food Science Practical | 4 | 4 | 3 | 40 | 60 | 100 |
| | | Allied Course-I (AC-I) | U26AND101 | Food Chemistry | 3 | 3 | 3 | 30 | 70 | 100 |
| | | Allied Practical -I(AP-I) | U26AND102P | Food Chemistry Practical | 3 | 3 | 3 | 40 | 60 | 100 |
| | IV | Value Education | 26UGVED | | 2 | 2 | 3 | 30 | 70 | 100 |
| | | Interdisciplinary Course - I (IDC - I) # | | | 2 | 2 | 3 | 30 | 70 | 100 |
| | **Total** | | | | **30** | **24** | -- | -- | -- | **800** |
| II | I | Ability Enhancement Course-III (AEC -III) | U26TAEC22 | (Tamil$ / Other Languages+, #) | 6 | 3 | 3 | 30 | 70 | 100 |
| | II | Ability Enhancement Course –IV (AEC-IV) | U26EAEC22 | English Course – II | 6 | 3 | 3 | 30 | 70 | 100 |
| | III | Core Course - II(CC-II) | U26ND203 | Principles of Nutrition | 4 | 4 | 3 | 30 | 70 | 100 |
| | | Core Practical-II(CP-II) | U26ND204P | Principles of Nutrition Practical | 4 | 4 | 3 | 40 | 60 | 100 |
| | | Allied Course- II (AC-II) | U26AND203 | Human Physiology | 3 | 3 | 3 | 30 | 70 | 100 |
| | | Allied Practical-II (AP-II) | U26AND204P | Human Physiology Practical | 3 | 3 | 3 | 40 | 60 | 100 |
| | IV | Skill Enhancement Course -I (SEC- I) ## | U26SEND21 | Bakery and Confectionary | 2 | 2 | 3 | 30 | 70 | 100 |
| | | Interdisciplinary Course- II (IDC- II) # | | | 2 | 2 | 3 | 30 | 70 | 100 |
| | **Total** | | | | **30** | **24** | -- | -- | **--** | **800** |
| III | I | Ability Enhancement Course -V (AEC -V) | | (Tamil$ / Other Languages+, #) | 6 | 3 | 3 | 30 | 70 | 100 |
| | II | Ability Enhancement Course-VI (AEC -VI) | | English Course – III | 6 | 3 | 3 | 30 | 70 | 100 |
| | III | Core Course - III(CC-III) | | Nutrition Through Life Cycle | 4 | 4 | 3 | 30 | 70 | 100 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Core Practical -III (CP-III) | | Nutrition Through Life Cycle Practical | 4 | 4 | 3 | 40 | 60 | 100 |
| | | Allied Course-III (AC-III) | | Fundamentals of Biochemistry | 3 | 3 | 3 | 30 | 70 | 100 |
| | | Allied Practical -III (AP-III) | | Fundamentals of Biochemistry Practical | 3 | 3 | 3 | 40 | 60 | 100 |
| | IV | Skill Enhancement Course -II (SEC - II) ## | | Artificial Intelligence in Nutrition and Dietetics | 2 | 2 | 3 | 30 | 70 | 100 |
| | IV | Interdisciplinary Course- III (IDC - III) $$ | | | 2 | 2 | 3 | 30 | 70 | 100 |
| | | Health & Wellness @ | | | -- | 1 | -- | 20 | 80 | 100 |
| | **Total** | | | | **30** | **25** | -- | -- | -- | **900** |
| IV | I | Ability Enhancement Course -VII (AEC - VII) | | (Tamil$ / Other Languages+, # ) | 6 | 3 | 3 | 30 | 70 | 100 |
| | II | Ability Enhancement Course -VIII (AEC - VIII) | | English Course – IV | 6 | 3 | 3 | 30 | 70 | 100 |
| | III | Core Course-IV(CC-IV) | | Dietetics -I | 4 | 4 | 3 | 30 | 70 | 100 |
| | | Core Practical -IV(CP-IV) | | Dietetics –I Practical | 4 | 4 | 3 | 40 | 60 | 100 |
| | | Allied Course-IV (AC-IV) | | Food Processing and Preservation | 3 | 3 | 3 | 30 | 70 | 100 |
| | | Allied Practical-IV(AP-IV) | | Food Processing and Preservation Practical | 3 | 3 | 3 | 40 | 60 | 100 |
| | IV | Skill Enhancement Course- III (SEC - III) ## | | Food Adulteration | 2 | 2 | 3 | 30 | 70 | 100 |
| | IV | Interdisciplinary Course- IV (IDC - IV) $$ | | | 2 | 2 | 3 | 30 | 70 | 100 |
| | **Total** | | | | **30** | **24** | -- | -- | -- | **800** |
| | **Summer Internship / Industrial Activity during the Summer Vacation after II Year** | | | | | | | | | |
| V | III | Core Course - V(CC- V) | | Dietetics - II | 4 | 4 | 3 | 30 | 70 | 100 |
| | | Core Course -VI(CC-VI) | | Food Service Management | 5 | 4 | 3 | 30 | 70 | 100 |
| | | Core Course -VII(CC-VII) | | Fundamentals of Research Methodology and Statistics | 5 | 4 | 3 | 30 | 70 | 100 |
| | | Core Course -VIII(CC-VIII) | | Community Nutrition | 5 | 4 | 3 | 30 | 70 | 100 |
| | | Core Practical -V(CP-V) | | Dietetics - II Practical | 5 | 4 | 3 | 40 | 60 | 100 |
| | IV | Skill Enhancement Course-IV (SEC- IV) | | Textile and Clothing | 2 | 2 | 3 | 30 | 70 | 100 |
| | IV | Discipline Specific Elective Course -I (DSEC-I) | | Principles of Interior Design / Perspectives of Home Science/ Computer Applications in Research | 2 | 2 | 3 | 30 | 70 | 100 |
| | IV | Introduction to Disaster Management | | | 2 | 2 | 3 | 30 | 70 | 100 |
| | IV | Summer Internship / Industrial Activity @@ | | Summer Internship with Viva-Voce | -- | 2 | -- | 20 | 80 | 100 |
| | **Total** | | | | **30** | **28** | -- | -- | -- | **900** |
| VI | III | Core Course -IX(CC-IX) | | Functional Foods and Nutraceuticals | 4 | 4 | 3 | 30 | 70 | 100 |
| | III | Core Course - X(CC-X) | | Food Standards and Quality Control | 5 | 4 | 3 | 30 | 70 | 100 |
| | III | Core Practical -VI(CP-VI) | | Food Standards and Quality Control Practical | 5 | 4 | 3 | 40 | 60 | 100 |
| | III | Core Project Work (CPW) @@ | | Project Work (with Viva-Voce) | 6 | 4 | 3 | 20 | 80 | 100 |
| | IV | Skill Enhancement Course - V (SEC-V) | | Food Product Development | 2 | 2 | 3 | 30 | 70 | 100 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Discipline Specific Elective Course -II(DSEC-II) | | Paediatric Nutrition/ Maternal Nutrition/ Geriatric Nutrition | 2 | 2 | 3 | 30 | 70 | 100 |
| | | Environmental Studies | | | 2 | 2 | 3 | 30 | 70 | 100 |
| | | Gender Studies | | | 2 | 1 | 3 | 30 | 70 | 100 |
| | | Value Added Course | | General Studies for Competitive Examinations | 2 | 2 | -- | 30 | 70 | 100 |
| | | Extension Activities * | | | -- | 1 | -- | -- | -- | -- |
| | **Total** | | | | **30** | **26** | **--** | **--** | **--** | **900** |
| | **Grand Total** | | | | **180** | **151** | -- | **--** | **--** | **5100** |

## ALLIED COURSE

| S.No | Semester | Title of the Course |
|---|---|---|
| 1. | I | Food Chemistry |
| 2. | I | Food Chemistry Practical |
| 3. | II | Human Physiology |
| 4. | II | Human Physiology Practical |
| 5. | III | Fundamentals of Biochemistry |
| 6. | III | Fundamentals of Biochemistry Practical |
| 7. | IV | Food Processing and Preservation |
| 8. | IV | Food Processing and Preservation Practical |

## SKILL ENHANCEMENT COURSE (SEC)

| S.No | Semester | Title of the Course |
|---|---|---|
| 1 | II | SEC-I Bakery and Confectionary |
| 2 | III | SEC-II Artificial Intelligence in Nutrition and Dietetics |
| 3 | IV | SEC-III Food Adulteration |
| 4 | V | SEC-IV Textile and Clothing |
| 5 | VI | SEC-V Food Product Development |

## DISCIPLINE SPECIFIC ELECTIVE COURSE (DSEC)

| S.No | Semester | Title of the Course |
|---|---|---|
| 1 | V | DSEC-I Principles of Interior Design / Perspectives of Home science/ Computer Applications in Research |
| 2 | VI | DSEC-II Paediatric Nutrition/ Maternal Nutrition/ Geriatric Nutrition |

## INTERDISCIPLINARY COURSE (IDC)

| S.No | Semester | Course Code | Title of the Course |
|---|---|---|---|
| 1. | I | U26NDID11 | Basics of Nutrition |
| 2. | II | U26NDID22 | Nutrition for Women |
| 3. | III | | Adolescent Nutrition |
| 4. | IV | | Fitness Nutrition |

## VALUE ADDED COURSE **(VAC)

| Semester | Course | Title of the Course |
|---|---|---|
| II | VAC - I | Indian Knowledge System in Food as Medicine |
| IV | VAC - II | Data Science Using Python and R Programming |

| INTERDISCIPLINARY COURSE (IDC)# FOR WHO HAVE NOT OPT TAMIL AS PART - I | | |
|---|---|---|
| Those who have studied Tamil upto10th+2 but opt for other languages in degree | I Semester | Special Tamil - I |
| | II Semester | Special Tamil - II |
| Those who have not studied Tamil in school level | I Semester | Basic Tamil - I |
| | II Semester | Basic Tamil – II |

| INTERDISCIPLINARY COURSE(IDC) $$ FOR NCC CADETS ONLY | |
|---|---|
| **NCC Course is a Compulsory Course for the NCC Cadets in the III Semester:** | **NCC Course is a Compulsory Course for the NCC Cadets in the IV Semester:** |
| Introduction to NCC | 1. Special Subject Army **(or)**<br>2. Special Subject Navy **(or)**<br>3. Special Subject Air Force |

## SUMMARY OF CURRICULUM STRUCTURE OF UG PROGRAMMES – SCIENCE

| S. No. | Part | Types of the Courses | No. of Courses | Credits for each Course | Total Credits | Marks |
|---|---|---|---|---|---|---|
| 1. | I | Ability Enhancement Course (Tamil) | 4 | 3 | 12 | 400 |
| 2. | II | Ability Enhancement Course (English) | 4 | 3 | 12 | 400 |
| 3. | III | Core Course (CC) | 10 | 4 | 40 | 1000 |
| 4. | | Core Practical (CP) | 6 | 4 | 24 | 600 |
| 5. | | Allied Course (AC) | 4 | 3 | 12 | 400 |
| 6. | | Allied Practical (AP) | 4 | 3 | 12 | 400 |
| 7. | | Core Project Work (CPW) | 1 | 4 | 4 | 100 |
| 8. | IV | Skill Enhancement Course (SEC) | 5 | 2 | 10 | 500 |
| 9. | | Discipline Specific Elective Course (DSEC) | 2 | 2 | 4 | 200 |
| 10. | | Interdisciplinary Course (IDC) | 4 | 2 | 8 | 400 |
| 11. | | Value Education | 1 | 2 | 2 | 100 |
| 12. | | Health and Wellness | 1 | 1 | 1 | 100 |
| 13. | | Introduction to Disaster Management | 1 | 2 | 2 | 100 |
| 14. | | Summer Internship / Industrial Activity | 1 | 2 | 2 | 100 |
| 15. | | Value Added Course | 1 | 2 | 2 | 100 |
| 16. | | Environmental Studies | 1 | 2 | 2 | 100 |
| 17. | | Gender Studies | 1 | 1 | 1 | 100 |
| 18. | | **EXTENSION ACTIVITIES** (NCC / NSS / SPORTS / ANTI DRUG CELL / YRC & Any Other Activities) | -- | 1 | 1 | -- |
| **Total** | | | **51** | **-** | **151** | **5100** |
| **Additional Value Added Course in semester II and IV**** | | | **2**** | **2** | **4**** | **200** |
| **MOOC - SWAYAM/NPTEL Courses** | | | **-** | **2** | **2** | **-** |

<table>
<tr><td>$</td><td>For those who have studied Tamil upto10th+2 (Regular Stream)</td></tr>
<tr><td>+</td><td>Syllabus for other Languages should be on par with Tamil at degree level</td></tr>
<tr><td>#</td><td>Those who have studied Tamil up to10th +2 but opt for other languages in degree level under Part-I should study special Tamil and those who have not studied Tamil in the school level should study Basic Tamil in Part–IV under the Interdisciplinary Course.</td></tr>
<tr><td>$$</td><td>NCC Course is one of the Choices in the Interdisciplinary Course. Only the NCC Cadets are eligible to choose this course. However, NCC Course is a Compulsory Course for the NCC Cadets.</td></tr>
<tr><td>@</td><td>Health and Wellness: Assessments:<ul><li>Use self-reflective worksheets to assess their understanding</li><li>submit the worksheets to internal audit / external audit</li><li>Every student's activity report should be documented and the same have to be assessed by the Physical Director with Mentor. The evaluation should be for 100 marks. No examination is required.</li></ul>Scheme of Evaluation:<table><tr><th>Part</th><th>Description</th><th>Marks</th></tr><tr><td>A</td><td>Report</td><td>40</td></tr><tr><td>B</td><td>Attendance</td><td>20</td></tr><tr><td>C</td><td>Activities (Observation During Practice)</td><td>40</td></tr><tr><td colspan="2">Total</td><td>100</td></tr></table></td></tr>
<tr><td>@<br>@</td><td>Summer Internship / Industrial Activity<br>Internship will be carried out during the summer vacation after the second year. Viva-Voce will be conducted by the college and Marks shall be send to the University and the same will be included in the 5th semester Mark Statement.<br><br>Summer Internship / Industrial Activity& Project Work<br>Scheme of Evaluation:<table><tr><th>Description</th><th>Marks</th></tr><tr><td>Report</td><td>80</td></tr><tr><td>Viva-Voce</td><td>20</td></tr><tr><td>Total</td><td>100</td></tr></table></td></tr>
<tr><td>*</td><td>Extension Activities shall be outside instruction hours.</td></tr>
<tr><td>**</td><td>Additional value added courses credit will not be included in the total CGPA. These courses are extra-credit courses. Instruction hours for these courses is 30 hours</td></tr>
</table>

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE**
**(AUTONOMOUS)**
**SUNDARAKKOTTAI, MANNARGUDI -614016.**
*(For the candidate admitted in the academic year 2026-2027)*
**DEPARTMENT OF NUTRITION AND DIETETICS**
**B.Sc., NUTRITION AND DIETETICS**

**Semester: I –CC-I: Food Science**

**Ins. Hrs./Week: 4** **Course Credit : 4** **Course Code :U26ND101**

## COURSE OBJECTIVES:

- To provide fundamental knowledge on the classification, composition and nutritive value of foods.
- To understand the principles and methods of cookery and their effects on food quality and nutrients.
- To study the structure, composition and culinary applications of various food groups.
- To develop scientific understanding of food preparation, processing and preservation techniques.
- To enhance skills in evaluating foods and applying nutrition knowledge in everyday food selection and meal preparation**.**

**UNIT- I: Introduction to Food Science and Cooking Methods (12 Hours)**

Food Science: Definition, functional classification, Food groups (Four, Five, Seven and Eleven),Food pyramid. Nutrient content of foods and Cooking Methods **-** Classification of foods based on nutrient content. Different cooking methods- dry heat, moist heat and combination methods, solar cooking, microwave cooking - merits and demerits, Preparation of recipes based on cooking methods.

**UNIT- II: Cereals, Millets, Pulses, Legumes and Nuts (12 Hours)**

Cereals and Millets: Structure, composition and nutritive value of rice, wheat and oats; Nutritive value of maize, jowar, ragi and bajra. Cereal cookery: Effect of moist heat- Gelatinisation and factors affecting gelatinisation, gel formation, retrogradation and syneresis, Effect of dry heat, Role of cereals in cookery.

Pulses and Legumes - Types, nutritive value, methods of cooking, effect of soaking and germination, judicious combination of cereals and pulses- complementary effect, Soybeans, Fava beans and Kesari dhal – toxins, methods of toxin removal/inactivation and storage,Role of pulses in cookery.

Nuts - types, composition, market forms, roasting, steaming of nuts, nuts butters, uses in sweets,baking and confectionery; Storage.

**UNIT- III: Milk and Milk products, Egg, Meat, Poultry and Fish (12 Hours)**

Milk and Milk products: Composition and nutritive value of milk; Milk cookery- Effect of heat, effect of acid and effect of enzymes; Milk products- fermented and non- fermented products, Role of milk in cookery.

Egg: Structure, composition, nutritive value; Egg cookery- Effect of heat, factors affecting coagulation of egg proteins and effect of other ingredients on egg protein; Role of egg in cookery; Household methods of assessing egg quality.

Meat: Classification, composition, nutritive value, rigor mortis, ageing and tenderizing;
Meat cookery- Changes during cooking,Methods of meat preservation.
Poultry: Classification, composition and nutritive value.
Fish: Classification, composition, nutritive value, selection and principles of fish cookery.

**UNIT- IV: Vegetables, Fruits and Spices (12Hours)**

Vegetables: Classification (nutritional), composition, nutritive value; Pigments in vegetables-water-soluble and fat-soluble pigments; Enzymes, flavor compounds and bitter compounds; Vegetable cookery- Preliminary preparation, changes during cooking, loss of nutrients during cooking, effect of cooking on pigments, role of vegetables in cookery.
Fruits: Classification, composition, nutritive value, ripening of fruits; Storage of fruits; Browning reactions – types and preventive measures.
Spices: General functions, role in cookery; Medicinal value of commonly used spices.

**UNIT-V: Fats and Oils, Sugars and Beverages (12Hours)**

Fats and oils: Composition and nutritive value, basic knowledge about commonly used fats and oils (lard, butter, margarine, cotton seed oil, ground nut oil, coconut oil, soya bean oil, olive oil, rice bran oil, sesame oil, rape seed oil, mustard oil and palm oil); Spoilage of fat-Types and prevention; Effect of heating, role of fats and oils in cookery.
Sugars: Types and market forms of sugars; stages of sugar cookery, crystallization, factors affectingcrystallization, uses in confectionery. Role of sugar in cookery.
Beverages-Classification-fruit based beverages; milk-based beverages nutritive value and uses, alcoholic beverages, coffee, tea and cocoa, malted beverages. Sources, manufacture, processing, and service; methods of preparation of coffee and tea.

**UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Review and analyze recent literature on the effect of cooking on the nutritive value of foods. Prepare a Food Sample Booklet featuring millets, pulses, and spices with their nutritional significance and culinary uses. Design innovative educational games and interactive learning activities related to foods and nutrients for nutrition awareness.

**Total Lecture Hours -60**

**COURSE OUTCOMES:**

The students will be able to

1. Understand the basic concepts of food science, food groups, nutrients and cooking methods.
2. Evaluate the nutritional value and processing of cereals, millets, pulses, legumes and nuts.
3. Explain the composition and nutritional importance of milk, egg, meat, poultry and fish.
4. Describe the nutritional significance and functional properties of vegetables, fruits and spices.
5. Analyze the composition, functions and applications of fats, oils, sugars and beverages in foods.
6. Develop skills in planning nutritious recipes, identifying quality food products and promoting healthy food practices through practical and creative learning activities.

**TEXT BOOK(S)**


1. Brown,A.,2024,"Understanding Food: Principles and Preparation",7th Edition,Cengage Learning, ISBN: 9780357986833.
2. Manay,N.S.,and Shadaksharaswamy, M.,2021,"Food Facts and Principles", 4th Edition, New Age International Publishers, ISBN: 9788122439928.
3. Mudambi,S.R.,and Rajagopal,M.V.,2022,"Foods:Facts and Principles",3rd Edition,New Age International Publishers.
4. Sharma,A.,2017,"Textbook of Food Science and Technology",CBS Publishers and Distributors, New Delhi.
5. Srilakshmi, B.,2023,"Food Science", 8th Edition, New Age International Publishers.
6. Vaclavik,V.A.,andChristian, E.W., 2023, "Essentials of Food Science", 6th Edition, Springer Nature.


**REFERENCE BOOK(S)**


1. Damodaran,S.,Parkin,K.L.,and Fennema,O.R., 2017,"Fennema's Food Chemistry",5th Edition, CRC Press.
2. McGee,H.,2023,"On Food and Cooking: The Science and Lore of the Kitchen",Scribner.
3. Mehas,K.Y., and Rodgers,S. L.2023. "Food Science and You",Latest Edition.Glencoe McGraw-Hill Education, New York.
4. Potter,N.N.,and Hotchkiss,J.H.2022."Food Science",6th Edition.CBS Publishers and Distributors,New Delhi.
5. Roday,S.,2022,"Food Science and Nutrition", 3rd Edition, Oxford University Press, New Delhi.


**E-RESOURCES**

1. https://archive.nptel.ac.in/content/noc/Food_Processing.html
2. https://www.myplate.gov
3. https://www.icrisat.org/millets/
4. https://www.nin.res.in/ifct
5. www.nutritionfoods.in
6. www.eatrightnutrition.org
7. www.foodsciencecentral.com
8. www.openfoodfacts.org

**MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| CO2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 1 |
| CO3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 1 |
| CO4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 1 |

**S-Strong(3)** **M-Medium(2)** **L-Low(1)**

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE**

# (AUTONOMOUS)

**SUNDARAKKOTTAI, MANNARGUDI -614016.**

*(For the candidate admitted in the academic year 2026-2027)*

**DEPARTMENT OF NUTRITION AND DIETETICS**

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

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**Semester: I –CP-I: Food Science Practical**

**Ins. Hrs. /Week: 4 Course Credit: 4 Course Code: U26ND102P**

## COURSE OBJECTIVES:

- To gain in-depth understanding of different food groups ,functions and nutritional properties.
- To apply the scientific principles in various cooking methods to prepare safe, nutritious, and acceptable foods.
- To develop advanced practical skills in standardized preparation of dishes using cereals, pulses, vegetables, fruits, milk, eggs, fats, and oils.
- To ensure the precision in ingredient measurement, food handling and compliance with laboratory safety and hygiene practices.
- To critically evaluate food quality using sensory analysis techniques and improve decision-making in food acceptability and presentation.

## Course Content

**GENERAL:**

- Different types of cereals, pulses, vegetables, fruits and nuts and oil seeds-Observation Estimate the percentage of edible portion of foods
- Demonstration of Cooking Methods.
- Method of Measuring Ingredients.
- Guidelines to be followed in laboratory.

**PRACTICALS:**

1. Cereals - Preparation of rice by steaming, absorption method,Straining and Pressure cooking. Preparation of Batters and dough. Preparation of idli,millet upma, chapathi, poori, fried rice, briyani, bisibelabath string hoppers, puttu, and Millet based variety rice.
2. Pulses - Factors affecting the cooking quality of pulses.Preparation of sambar, sundal,bholi, mysore-pak, vada, channa masala,thuvaiyal,green gram, payasam,sprouted salad and koottu
3. Vegetables - Selecting, cleaning,coring,pitting and chopping of fruits and vegetables.Avial,porriyal, pugath,stew, kuruma, podimas, pachadi,stuffed chapathi, cauliflower manchurian,vegetable kofta,stuffed capsicum, baked vegetables
4. Fruits - Fritters,halwa,salad,stuffed items,payasam,panchamirtham.
5. Milk - Cottage Cheese,paneer, phirnee, payasam,ice cream,kova,buttermilk curry, basanthi and jamun,sweet lassi,shrikand
6. Egg - Boiled,scrambled,poached,curry,masala,omelette.
7. Fats and oils - Preparation-shallow fry- vegetable cutlet and deep fry; banana chips, vadai, diamond cuts.
8. Stages of sugar cookery.
9. Score card preparation and sensory evaluation

**COURSE OUTCOMES:**

The students will be able to

1. Identify the different food groups, ingredients and methods of measurement used in food preparation.
2. Demonstrate the various cooking methods and preparation techniques for cereals, pulses, and vegetables.
3. Prepare and evaluate recipes using fruits, milk, eggs, fats and oils.
4. Apply the principles of sugar cookery, food handling and laboratory safety practices.
5. Develop skills in sensory evaluation and score card preparation for food products.
6. Analyze and improve the food preparation techniques for enhancing nutritional quality, taste and overall acceptability of food products.

**TEXT BOOK(S)**


1. Chandrasekhar,U.,2002,"Food Science and Applications in Indian Cookery",Phoenix Publishing House Pvt. Ltd., New Delhi.
2. Manay,N.S.,and Shadaksharaswamy,M.,2023"Foods:Facts and Principles",5th Edition, New Age International Publishers, New Delhi.
3. McClements,D.J., 2023,"Food Chemistry and Food Physics: Principles and Applications",2nd EditionWiley-Blackwell,United Kingdom.
4. Sharma,A.,2017,"Textbook of Food Science and Technology",CBS Publishers and Distributors,New Delhi.
5. Srilakshmi,B.,2025,"Food Science",9th Edition, New Age International Publishers, New Delhi.


**REFERENCE BOOK(S)**


1. Arora,K.,2008, "Theory of Cookery",1st Edition, Frank Brothers & Co., New Delhi.
2. Martland,R.E., and Welsby,D.A.,1980,"Basic Cookery: Fundamental Recipes and Variations",1st Edition,William Heinemann Ltd., London.
3. Negi,J.,2013,"Fundamentals of Culinary Art",1st Edition,S. Chand & Company Ltd., New Delhi.
4. Peckham,G.C., and Freeland-Graves, J.H.,1987, "Foundations of Food Preparation", 4th Edition, Macmillan Publishing Company, New York.
5. Penfield,M.P., and Campbell,A.M.,2012, "Experimental Food Science",3rd Edition, Academic Press,San Diego.

**E-RESOURCES**

1. https://www.ihmnotes.in/assets/Docs/Books/Theory_of_Cookery.pdf
2. http://staffnew.uny.ac.id/upload/132318572/pendidikan/buku-esp.pdf
3. https://www.fssai.gov.in
4. https://www.who.int/health-topics/food-safety
5. www.icmr.gov.in
6. www.indianfoodacademy.com
7. www.foodprocessingindia.gov.in
8. www.fao.org

**MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 2 | 1 | 3 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 1 | 2 | 3 |
| **CO2** | 3 | 3 | 3 | 2 | 2 | 3 | 1 | 1 | 2 | 2 | 3 | 2 | 1 | 2 | 3 |
| **CO3** | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 3 | 3 | 1 | 3 | 3 |
| **CO4** | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 3 |
| **CO5** | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 2 | 3 | 2 | 2 |

**S-Strong(3)** **M-Medium(2)** **L-Low(1)**

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE**

# (AUTONOMOUS)

**SUNDARAKKOTTAI, MANNARGUDI -614016.**

*(For the candidate admitted in the academic year 2026-2027)*

DEPARTMENT OF NUTRITION AND DIETETICS

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

**Semester: I- AC-I: Food Chemistry**

**Ins. Hrs./Week:3** **Course Credit :3** **Course Code:U26AND101**

## COURSE OBJECTIVES:

- To understand the basic chemistry of food components like water, carbohydrates, proteins, and fats.
- To learn how food structure and composition affect quality, texture and stability.
- To study the chemical changes during cooking, processing and storage of foods.
- To understand the behavior of food systems like gels, emulsions, foams and solutions.
- To gain knowledge of enzymes, flavors and their role in food processing and industry.

**UNIT- I: Introduction to Food Chemistry and Water (9 Hours)**

Definition and history of food chemistry. Role of food chemist in the food industry; Physico-chemical properties of foods, Physical properties of water and ice, types of water, Water activity in foods and its effect on stability and packaging, sorption phenomenon and temperature dependence, Determination of moisture content in foods. True solutions, dispersions, sol, gel, foams, colloids and emulsions.

**UNIT- II: Chemistry of Starch and Sugars (9 Hours)**

Structure of important polysaccharides (starch, glycogen, cellulose, pectin, hemicellulose, gums) Modified celluloses and starches. Components of Starch, Swelling of Starch Granules, Gel Formation, Retrogradation, Syneresis, Effect of Sugar, Acid, Alkali, Fat and Surface-Active Agents on Starch. Stages of Sugar Cookery, Crystallization and factors affecting it. Chemistry of Milk Sugar, Non-enzymatic browning.

**UNIT- III: Chemistry of Proteins (9 Hours)**

Nature of Food Proteins (Plant and Animal) Properties of Protein- Electrophoresis, Sedimentation, Amphoterism and Denaturation, Solubility, Viscosity, Binding, Gelatin, Texturization, Emulsificationand Foaming.

**UNIT- IV: Chemistry of Fats and Oils (9 Hours)**

Classification and Characteristics of lipids. Physical properties-melting point, softening point, specific gravity, refractive index, Smoke point, flash point, and fire point, turbidity point. Chemical properties- Reichert–Meissl value, polenske value, Iodine value, peroxide value, saponification value. Effect of frying on fats, Changes in fats and oils- rancidity, lipolysis, flavor reversion. Technology of edible fats and oils- Refining, Plasticity, Hydrogenation and Interesterification. Shortening Power of Fats, Changes in Fats and Oils during Heating, Factors affecting fat absorption in foods.

**UNIT- V: Enzymes and Flavours** **(9 Hours)**

Enzymes- Introduction, classification, general characteristics, Enzymes in food processing, Industrial uses of enzymes, Immobilized enzymes

Flavors- Definition and basic tastes, chemical structure and taste, description of food flavors and flavor enhancers.

**UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Prepare e-content for stages of sugar cookery. Field visit to oil mills and preparation of a report on fat processing

**Total Lecture Hours -45**

**COURSE OUTCOMES:**

The students will be able to

1. Explain basic principles of food chemistry, water activity, moisture determination and colloids in foods.
2. Describe structure, properties, and changes of carbohydrates, starches, sugars and browning reactions.
3. Analyze properties and functions of food proteins in foods.
4. Evaluate characteristics, chemical values, processing and changes in fats and oils.
5. Understand enzymes and flavors, their types, functions and industrial applications.
6. Apply food chemistry concepts to improve food quality, stability and processing.

**TEXT BOOK(S)**


1. Belitz, H.D., Grosch, W., and Schieberle, P., 2018, "Food Chemistry", 4th Revised Edition, Springer Nature, ISBN: 9783540699336.
2. Coultate, T.P., 2016, "Food: The Chemistry of Its Components", 6th Edition, Royal Society of Chemistry, ISBN: 9781782626349.
3. Damodaran, S., 2017, "Food Proteins and Their Applications", 1st Edition, CRC Press, ISBN: 9780824706315.
4. Damodaran, S., Parkin, K.L., and Fennema, O.R., 2017, "Fennema's Food Chemistry", 5th Edition, CRC Press, Taylor & Francis Group, ISBN: 9781482208122.
5. Vaclavik, V.A., and Christian, E.W., 2014, "Essentials of Food Science", 4th Edition, Springer, ISBN: 9781461491374.


**REFERENCE BOOK(S)**


1. Chopra,H.K.,and Panesar,P.S., 2010,"Food Chemistry",Narosa Publishing House Pvt. Ltd., New Delhi.
2. DeMan, J.M., Finley,J.W., Hurst,W.J., and Lee,C.Y., 2018,"Principles of Food Chemistry", 4th Edition, Springer, New York,ISBN: 9783319636054.
3. Meyer, L.H.,2004,"Food Chemistry",4th Edition,CBS Publishers and Distributors, New Delhi.
4. Nielsen, S.S.,2017,"Food Analysis", 5th Edition, Springer, Cham,ISBN: 9783319833712
5. Paul,P.C., and Palmer, H.H., 2000,"Food Theory and Applications", Revised Edition, Wiley Eastern Ltd., New Delhi.

**E-RESOURCES**

1. https://link.springer.com/book/10.1007/978-3-540-69934-7
2. https://doi.org/10.1007/978-3-540-69934-7
3. https://www.routledge.com/Fennemas-Food-Chemistry/Damodaran-Parkin/p/book/9781482208122
4. https://link.springer.com/book/10.1007/978-3-319-63607-8
5. https://www.rsc.org
6. https://byjus.com/biology/applications-of-enzymes/
7. www.acs.org
8. www.egyankosh.ac.in
9. www.niftem.ac.in

**MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 |
| **CO2** | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| **CO3** | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 | 1 |
| **CO4** | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 1 |
| **CO5** | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 | 1 |

**S-Strong(3)** **M-Medium(2)** **L-Low(1)**

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE**
**(AUTONOMOUS)**
**SUNDARAKKOTTAI, MANNARGUDI -614016.**
*(For the candidate admitted in the academic year 2026-2027)*
**DEPARTMENT OF NUTRITION AND DIETETICS**
**B.Sc., NUTRITION AND DIETETICS**

**Semester: I -AP-I: Food Chemistry Practical**
**Ins. Hrs./Week:3** **Course Credit :3** **Course Code:U26AND102P**

## COURSE OBJECTIVES:

- To understand the chemistry of carbohydrates, proteins, fats, pigments and pectic substances in foods.
- To study the changes that occur in foods during processing and cooking.
- To examine the effects of ingredients and cooking methods on food quality.
- To develop practical skills in food chemistry experiments.
- To apply food chemistry principles in food preparation and evaluation.

## PRACTICAL CONTENT

### I. Food Chemistry

### 1. Chemistry of Starch and Sugars

- Gelatinization of starch.
- Microscopic examination of uncooked and gelatinized starch granules.
- Retrogradation and syneresis.
- Gluten formation.
- Stages of sugar cookery.
- Preparation of fondant, fudge, and toffee.
- Scum formation in milk.

### 2. Chemistry of Proteins

- Gluten formation.
- Effect of soaking, germination, and fermentation on pulses.
- Effect of soaking, hard water, sodium bicarbonate, and papaya on the cooking quality of pulses.
- Coagulation of egg proteins in boiled eggs, poached eggs, omelettes, custards, cakes, and mayonnaise.
- Formation of ferrous sulphide in boiled eggs and its prevention.
- Effect of acid, fat, salt, water, and sugar on the texture of omelettes.
- Coagulation and precipitation of milk proteins.
- Changes during cooking of meat, fish, and poultry.
- Testing the tenderness of meat.

### 3. Chemistry of Fats and Oils

- Smoking temperature of different fats and oils.
- Factors affecting fat absorption during cooking.

**4. Chemistry of Pectic Substances and Plant Pigments**

- Effect of acids, alkalis, and heat on water-soluble and fat-soluble pigments.
- Effect of varying amounts of water used during vegetable cooking on flavour and appearance.
- Enzymatic browning and methods of prevention.

**COURSE OUTCOMES:**

The students will be able to

1. Explain the chemistry of starches, sugars, proteins, fats, oils, and plant pigments.
2. Demonstrate the physical and chemical changes that occur in foods during cooking and processing.
3. Examine the effects of soaking, germination, fermentation, heat, acids, alkalis, and other ingredients on food quality.
4. Analyze factors affecting the texture, color, flavor, and appearance of food products.
5. Apply food chemistry principles to improve food preparation, quality, and nutrient retention.

**TEXT BOOK(S)**


1. Belitz, H. D., Grosch, W. and Schieberle, P., 2023. Food Chemistry, Sixth Edition, Springer Nature, Cham, Switzerland.
2. Manay, N. S. and Shadaksharaswamy, M., 2021. Foods: Facts and Principles, New Age International Publishers, New Delhi.
3. Potter, N. N. and Hotchkiss, J. H., 2021. Food Science, Fifth Edition, CBS Publishers and Distributors, New Delhi.
4. Roday, S., 2022. Food Science and Nutrition, Third Edition, Oxford University Press, New Delhi.
5. Zeece, M. G., 2020. Introduction to the Chemistry of Food, Second Edition, Academic Press, London.


**REFERENCE BOOK(S)**


1. Brown, Amy Christine, 2024. Understanding Food: Principles and Preparation, Eighth Edition, Cengage Learning, Boston.
2. Campbell-Platt, Geoffrey, 2022. Food Science and Technology, Second Edition, Wiley-Blackwell, Oxford.
3. Damodaran, S. and Parkin, K. L., 2025. Fennema's Food Chemistry, Sixth Edition, CRC Press, Boca Raton.
4. McGee, Harold, 2024. On Food and Cooking: The Science and Lore of the Kitchen, Revised Edition, Scribner, New York.
5. Mudambi, Sumati R. and Rajagopal, M. V., 2022. Fundamentals of Foods, Nutrition and Diet Therapy, Seventh Edition, New Age International Publishers, New Delhi.
6. Srilakshmi, B., 2023. Food Science, Seventh Edition, New Age International Publishers, New Delhi.

**E - RESOURCES**

1. https://www.fao.org/home/en
2. https://www.who.int/health-topics/nutrition
3. https://www.nin.res.in
4. https://www.ift.org/food-technology
5. https://www.sciencedirect.com/journal/food-science-and-human-wellness
6. https://link.springer.com/journal/13197
7. https://www.tandfonline.com/journals/iijf20
8. https://academic.oup.com/nutritionreviews

**MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 2 | 1 |
| **CO2** | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 2 | 1 |
| **CO3** | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 2 | 1 |
| **CO4** | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 1 |
| **CO5** | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |

**S-Strong(3)** **M-Medium(2)** **L-Low(1)**

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

**SUNDARAKKOTTAI, MANNARGUDI -614016.**

*(For the candidate admitted in the academic year 2026-2027)*

## DEPARTMENT OF NUTRITION AND DIETETICS

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

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**Semester: I – Value Education (Revised syllabus)**

**Ins. Hrs./Week:2 Course Credit :2 Course Code:26UGVED**

**OBJECTIVES**

1. To understand the philosophy of life and values through Thirukural
2. To analyse the components of values education to attain the sense of citizenship
3. To understand different types of values towards National Integration and international understanding
4. To learn yoga as value education to promote mental and emotional health
5. To understand human rights, women rights and other rights to promote peace and harmony

**UNIT I : PHILOSOPHY OF LIFE AND SOCIAL VALUES**

Human Life on Earth (Kural 629) -Purpose of Life (Kural 46) -Meaning and Philosophy of Life (Kural 131, 226) -Family (Kural 45), Peace in Family (Kural 1025) Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) Five responsibilities / duties of Man (a) to himself (b) to his family (c) to his environment (d) to his society, (e) to the Universe in his lives (Kural 43, 981).

**UNIT-II – HUMAN VALUES AND CITIZENSHIP**

Aim of education and value education: Evolution of value oriented education, Concept of Human values: types of Values- Character Formation – Components of Value education A P J Kalam's ten points for enlightened citizenship- The role of media in value building.

**UNIT-III VALUE EDUCATION TOWARDS NATIONAL AND GLOBAL DEVELOPMENT**

Constitutional or national values: Democracy, socialism, secularism, equality, Justice, liberty, freedom and fraternity - Social Values: Pity and probity, self-control, universal brotherhood - Professional Values - Knowledge thirst, sincerity in profession, regularity, punctuality and faith -Religious Values: Tolerance, wisdom, character - Aesthetic Values- Love and appreciation of literature and fine arts and respect for the same- National Integration and International Understanding.

**UNIT IV : YOGA AND HEALTH**

Definition, Meaning, Scope of Yoga - Aims and objectives of Yoga - Yoga Education with modern context - Different traditions and schools of Yoga - Yoga practices: Asanas, Pranayama and Meditation.

**UNIT V : HUMAN RIGHTS**

Concept of Human Rights: Indian and international perspectives- Evolution of Human Rights- definitions under Indian and International documents -Broad classification of Human Rights and Relevant Constitutional Provisions: Right to Life, liberty ad Dignity- Right to equality- Right against exploitation- Cultural and Educational Right- Economic Rights- Political Rights- Social Rights - Human Rights of Women and Children – Peace and harmony.

**COURSE OUTCOMES**

The student will be able to

1. Apply the values in thirukural to be peaceful, dutiful and responsible in family and society
2. Develop character formation and sense of citizenship
3. Be secular, self-control, sincere, respectful and moral.
4. Master yoga, asana and meditation to promote mental health
5. Be attitudinal to follow the constitutional rights

**REFERENCE BOOK(S)**


1. Thirukkural with English Translation of Rev. Dr. G.U. Pope, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613 004
2. □□□□□□□□□□□□ – □□.□□. □□□□ □□□□□□ □□□□□□□□□□□□□□□□□, □□□ □□□□, □□□□□□□□□□□□, □□□□□□□□□□
3. Leah Levin, Human Rights, NBT, 1998
4. V.R. Krishna Iyer, Dialetics and Dynamics of Human Rights in India, Tagore Law Lectures.
5. Yogic Thearpy - Swami Kuvalayananda and Dr.S.L.Vinekar, Government of India, Ministry of Health, New Delhi.
6. SOUND HEALTH THROUGH YOGA - Dr.K.Chandrasekaran, Prem Publications, Sedaptti, 1999. 7. Grose. D. N – "A text book of Value Education' New Delhi (2005)
7. Gawande . EN – "Value Oriented Education" – Vision for better living. New Delhi (2002) Saruptsons 9. Brain Trust Aliyar- "Value Education for Health, Happiness and Harmony" Erode (2004) Vethathiri publications

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)
SUNDARAKKOTTAI, MANNARGUDI -614016.
*(For the candidate admitted in the academic year 2026-2027)*
**DEPARTMENT OF NUTRITION AND DIETETICS**
**B.Sc., NUTRITION AND DIETETICS**

**Semester: I –IDC-I Basics of Nutrition**

**Ins. Hrs./Week:2** **Course Credit :2** **Course Code:U26NDID11**

## COURSE OBJECTIVES:

- To understand the fundamentals of nutrition and balanced diet.
- To learn the functions and sources of carbohydrates, proteins, and fats.
- To recognize the importance of vitamins and minerals for health.
- To understand the role of water in body functions and hydration balance.
- To develop awareness of healthy eating habits and current nutrition trends.

**UNIT- I: Basics of Nutrition** **(06 Hours)**

Basics of Nutrition - Definition of Nutrition, Importance of nutrition for health, Basic five food groups, portion size of foods and the functions of food, Food pyramid, Balanced Diet, Nutrients and their functions , Recommended Dietary Allowances (RDA), factors affecting recommended dietary allowances, malnutrition (undernutrition and overnutrition).

**UNIT- II: Carbohydrates, Proteins and Lipids** **(06 Hours)**

Carbohydrates- Sources, Requirements and Functions of carbohydrates in the body. Dietary fiber- Definition, soluble and insoluble fibers, sources of fiber, Role of fiber in human nutrition.

Proteins - Sources, Functions and requirements of proteins. Protein deficiency- Protein Energy Malnutrition- Kwashiorkor and Marasmus – etiology, clinical features, treatment and prevention.

Lipids- Sources, Requirements and functions, Essential fatty acids- food sources, functions and deficiency, dietary lipids and their relation to cardiovascular diseases.

**UNIT- III: Fat Soluble Vitamins and Water Soluble Vitamins** **(06 Hours)**

Fat Soluble Vitamins - Functions, food sources, requirements, units of measurement and hypervitaminosis of vitamins A, D, E and K, Effect of deficiency.

Water Soluble Vitamins - Ascorbic acid and B complex vitamins- Thiamine, Riboflavin and Niacin- functions, food sources and requirements for different age groups. Importance of folic acid, Pyridoxine, Vitamin B12.

**UNIT-IV: Macro and Micro Minerals** **(06 Hours)**

Macro Minerals- Calcium, Phosphorus, Magnesium, Potassium and Sodium – distribution in the body; functions, effects of deficiency, food sources and Recommended dietary allowances.

Micro / Trace Minerals- Iron, Zinc and Iodine – distribution in the body; functions, food sources and requirements for different age groups, effects of deficiency.

**UNIT- V: Water** **(06 Hours)**

Water- Sources, Functions, requirements. Distribution of water in the body, exchange of water in the body, Water balance, dehydration, water intoxication, Role of ADH in water balance.

**UNIT – VI: Current Contours (For Continuous Internal Assessment Only**

Recent trends and developments in basic nutrition and health. Importance of healthy eating habits, balanced diet, and physical activity in prevention of lifestyle diseases. Role of functional foods, fortified foods, probiotics, and immunity-boosting foods in health promotion. Current nutrition awareness programmes, nutrition labeling, and sustainable dietary practices**.** **Total Lecture Hours- 30**

**COURSE OUTCOMES:**

The students will be able to

1. Interpret the basic concepts of nutrition, food groups, balanced diet, nutrients and recommended dietary allowances in relation to health and well-being.
2. Analyze the sources, functions, requirements and deficiency disorders associated with carbohydrates, proteins and lipids.
3. Assess the nutritional significance, functions, food sources and deficiency manifestations of fat-soluble and water-soluble vitamins.
4. Evaluate the role of macro and micro minerals in maintaining physiological functions, growth and health.
5. Examine the importance of water balance, hydration status and fluid regulation in maintaining normal body functions.
6. Apply basic nutrition principles to promote healthy dietary practices and prevent nutrition-related disorders.

**TEXT BOOK(S)**


1. Brown,A.,2024,"Understanding Food: Principles and Preparation",7th Edition,Cengage Learning.ISBN:9780357986837
2. Khanna,K.,Gupta,S.,Passi,S.J., Seth, R., Mahna, R., and Puri,S.,2022,"Textbook of Nutrition and Dietetics",3rd Revised Edition, Phoenix Publishing House Pvt. Ltd.,New Delhi. ISBN: 9788194806868
3. Roday,S.,2022,"Food Science and Nutrition",3rd Edition,Oxford University Press,New Delhi.ISBN: 9780199489084
4. Srilakshmi, B.,2023,"Nutrition Science",8th Edition,New Age International Publishers,New Delhi.ISBN: 9789395161956
5. Whitney,E.,and Rolfes, S.R., 2023, "Understanding Nutrition",16th Edition, Cengage Learning. ISBN: 9780357909157

**REFERENCE BOOK(S)**


1. Gropper,S.S. & Smith, J.L.,2024."Advanced Nutrition and Human Metabolism." Eighth Edition. Cengage Learning.
2. Brown,J.E.,2023."Nutrition Through the Life Cycle."Seventh Edition. Cengage Learning.
3. Raymond,J.L.& Morrow,K.,2024. "Krause and Mahan's Food and the Nutrition Care Process." Sixteenth Edition. Elsevier.
4. Whitney, E. & Rolfes, S.R., 2023. "Understanding Nutrition." Sixteenth Edition. Cengage Learning.
5. Gibney, M.J., Lanham-New, S.A., Cassidy, A. & Vorster, H.H., 2023. "Introduction to Human Nutrition." Fourth Edition. Wiley-Blackwell.


**E - RESOURCES**

1. https://youtu.be/HxequpJWJ5U
2. https://youtu.be/WecTpcuha_4
3. http://www.kgmu.org/download/virtualclass/biochemistry/Fat%20Soluble%20Vitamins.pdf
4. https://www.megazyme.com/focus-areas/dietary-fiber-portal/what-is-dietary-fiber
5. https://www.ncbi.nlm.nih.gov/books/NBK218759/
6. https://www.aao.org/eye-health/diseases/vitamin-deficiency
7. https://www.medicalnewstoday.com/articles/248

**MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
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| **CO1** | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 3 |
| **CO2** | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **CO3** | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **CO4** | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| **CO5** | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 3 |

**S-Strong (3)** **M-Medium (2)** **L-Low (1)**

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**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE**

# (AUTONOMOUS)

**SUNDARAKKOTTAI, MANNARGUDI -614016.**

*(For the candidate admitted in the academic year 2026-2027)*

## DEPARTMENT OF NUTRITION AND DIETETICS

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

**Semester: II –CC-II-Principles of Nutrition**

**Ins. Hrs./Week:4 Course Credit :4 Course Code:U26ND203**

## COURSE OBJECTIVES:

- To understand basic concepts of nutrition, health, and malnutrition.
- To learn about Recommended Dietary Allowances and factors affecting nutrient needs.
- To study carbohydrates, proteins, and fats with their functions and sources.
- To understand vitamins, minerals, and water and their role in health.
- To learn energy needs, metabolism, and methods of energy calculation.

**UNIT- I: Nutrition and Recommended Dietary Allowances (12 Hours)**

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

Recommended Dietary Allowances –Definition, principles of derivation, factors affecting nutrient requirements, uses of RDA.

**UNIT- II: Carbohydrates, Dietary fibre and Energy (12 Hours)**

Classification, Sources, Requirements and Functions of carbohydrates in the body. Dietary fibre- Definition, soluble and insoluble fibres, sources of fibre, Role of fibre in human nutrition.

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.

Energy requirements for various types of activities, Energy requirements for different age groups.

**UNIT- III: Proteins (12 Hours)**

Amino acids - Classification, sources, requirements and functions of protein. Mutual supplementation of proteins. Evaluation of Protein quality – Biological Assays, Biological Value (BV), Net Protein Utilization (NPU), Protein Efficiency Ratio (PER), chemical score. Protein deficiency - Protein Energy Malnutrition - Kwashiorkor and Marasmus – etiology, clinical features, treatment and prevention.

**UNIT- IV: Lipids (12 Hours)**

Classification, sources, requirements and functions, Essential fatty acids- deficiency, food sources and functions, dietary lipids and their relation to cardiovascular diseases.

**UNIT- V: Vitamins, Minerals and Water (12 Hours)**

Fat Soluble Vitamins – Vitamin A, D, E and K – Functions, Requirements, Sources and deficiency.

Water soluble vitamins – Thiamine, Riboflavin, Niacin, Ascorbic acid, Folic acid, Vitamin B6 and B12 – functions, requirements, sources and deficiency.

Macro minerals – Calcium, Phosphorus, Magnesium, Sodium and Potassium - functions, requirements, sources, effects of deficiency
Micro Minerals – Iron, Iodine, Copper, Fluorine and Zinc – functions, requirements, sources and effect of deficiency.

Water – Definition, distribution of water, function, requirements, sources, water balance, maintenance of water balance, distribution of electrolytes, maintenance of electrolyte balance.

**UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**
Determine energy requirements of any five individuals by factorial approach method.
Record clinical symptoms of any one vitamin deficiency among the community.

**Total Lecture Hours- 60**

**COURSE OUTCOMES:**
The students will be able to
1. Infer knowledge on nutrition and recommended dietary allowances.
2. Identify the sources, requirements and functions of carbohydrates fiber, energy 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 vitamins minerals and water in human body.
6. Apply the knowledge of nutrition principles to assess energy needs and identify nutrient deficiency disorders in different populations.

**TEXT BOOK(S)**

1. Bender, D.A., 2021. "Introduction to Nutrition and Metabolism." Sixth Edition. CRC Press, New York. ISBN: 9780367190811.
2. Gibney, M.J., Lanham-New, S.A., Cassidy, A. & Vorster, H.H., 2022. "Introduction to Human Nutrition." Third Edition. Wiley-Blackwell.
3. Gibson, R.S., 2020. "Principles of Nutritional Assessment." Third Edition. Oxford University Press.
4. Gropper, S.S. & Smith, J.L., 2021. "Advanced Nutrition and Human Metabolism." Eighth Edition. Cengage Learning.
5. Mahan, L.K. & Raymond, J.L., 2020. "Krause's Food and the Nutrition Care Process." Fifteenth Edition. Elsevier.
6. Whitney, E. & Rolfes, S.R., 2023. "Understanding Nutrition." Sixteenth Edition. Cengage Learning.

**REFERENCE BOOK (S)**


1. Bogert, J.V.V., Briggs, D.H. & Calloway, D.H., 2000. "Nutrition and Physical Fitness." Tenth Edition. W.B. Saunders Company, Philadelphia.
2. Guthrie, H.A., 2004. "Introductory Nutrition." Tenth Edition. C.V. Mosby Company, St. Louis.
3. Shils, M.E., Olson, J.A., Shike, M. & Ross, A.C., 2006. "Modern Nutrition in Health and Disease." Tenth Edition. Lippincott Williams & Wilkins, Philadelphia.
4. Swaminathan, M., 2013. "Principles of Nutrition and Dietetics." Second Edition. BAPPCO Publishers, Bengaluru.
5. Wardlaw, G.M., Smith, A.M. & Collene, A.L., 2020. "Contemporary Nutrition." Seventh Edition. McGraw-Hill Education.


**E-RESOURCES:**

1. https://www.healthline.com/nutrition/malnutrition
2. https://www.healthline.com/nutrition/micronutrients#types-and-functions
3. https://www.uofmhealth.org/health-library/ta3868
4. https://egyankosh.ac.in/bitstream/123456789/333
5. https://open.umn.edu/opentextbooks/textbooks/622
6. www.icmr.gov.in
7. www.fao.org
8. www.myplate.gov

**MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
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| **CO1** | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 3 |
| **CO2** | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| **CO3** | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| **CO4** | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| **CO5** | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 3 |

**S-Strong (3)** **M-Medium (2)** **L-Low(1)**

# SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
## (AUTONOMOUS)
**SUNDARAKKOTTAI, MANNARGUDI -614016.**

*(For the candidate admitted in the academic year 2026-2027)*

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

**Semester: II –CP-II-Principles of Nutrition Practical**

**Ins. Hrs./Week:4** **Course Credit :4** **Course Code:U26ND204P**

## COURSE OBJECTIVES:
- To understand the preparation of nutrient rich foods for different nutritional needs.
- To develop skills in nutrient calculation of macro and micronutrient rich dishes.
- To acquire practical knowledge of vitamin and mineral rich food preparation.
- To understand laboratory methods used for nutrient estimation in foods.
- To develop analytical skills in assessing nutrient composition of foods.

**Practicals:**

1. Plan, prepare, and calculate the nutrient content of macronutrient rich dishes per serving:
   a. Energy – High Calorie and Low Calorie
   b. Carbohydrate – High Carbohydrate and Low Carbohydrate
   c. Protein – High Protein and Low Protein
   d. Fat – High Fat and Low Fat
   e. Dietary Fibre – High Fibre and Low Fibre
2. Plan, prepare, and calculate the nutrient content of micronutrient rich dishes per serving for vitamins: Vitamin A, Vitamin C, Thiamine, Riboflavin, Niacin, Pyridoxine, Folic Acid, and Cyanocobalamin.
3. Plan, prepare, and calculate the nutrient content of micronutrient rich dishes per serving for minerals: Calcium, Iron, Zinc, Phosphorus, Sodium, and Potassium.
4. Demonstration on the estimation of nitrogen in food using the Kjeldahl method.
5. Demonstration on the estimation of total fat in food using the Soxhlet method.

## COURSE OUTCOMES:
The students will be able to**,**

1. Design and prepare macronutrient-rich dishes and evaluate the nutrient content of energy, carbohydrates, proteins, fats, and dietary fibre.
2. Develop and prepare vitamin-rich dishes and analyze their nutrient content.
3. Develop and prepare mineral-rich dishes and assess their nutrient content.
4. Demonstrate the estimation of nitrogen in food using the Kjeldahl method.
5. Demonstrate the estimation of total fat in food using the Soxhlet method.
6. Apply practical skills in nutrient analysis and food preparation for dietary planning and nutritional improvement.

**TEXT BOOK(S)**


1. Bamji, M. S., Krishnaswamy, K. & Brahmam, G. N. V. 2023. *Textbook of Human Nutrition*. 5th Edition. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Damodaran, S. & Parkin, K. L. 2025. *Fennema's Food Chemistry*. 6th Edition. CRC Press, Taylor & Francis Group.
3. Gropper, S. S. & Smith, J. L. 2025. *Advanced Nutrition and Human Metabolism*. 9th Edition. Cengage Learning.
4. Nielsen, S. S. 2025. *Food Analysis*. 6th Edition. Springer Nature.
5. Srilakshmi, B. 2024. *Nutrition Science*. 8th Edition. New Age International Publishers, New Delhi.


**REFERENCE BOOK(S)**


1. Blake,J. S.&Thompson,J.2026.Nutrition: From Science to You.5th Edition. Pearson Educatio
2. Brown,A.C.2025.Understanding Food: Principles and Preparation.7th Edition.Cengage Learning.
3. Singh,N. &Singh, I. S.2025.Food Nutrition, Science and Technology.1st Edition. CRC Press.
4. Thompson,J.&Manore,M.2025.Nutrition:An Applied Approach.6thEdition.Pearson Education.
5. Thompson,J., Manore,M.&Vaughan L.2025.The Science of Nutrition.5th Edition. Pearson Education.


**E – RESOURCES**

1. https://onlinelibrary.wiley.com/journal/20421340
2. https://www.coursera.org/learn/biochemistry
3. https://www.edx.org/course/biochemistry-and-molecular-biology
4. https://www.edx.org/course/biochemistry-and-molecular-biology
5. www.labster.com
6. www.foodscienceindia.org
7. www.ifst.org
8. www.foodqualityandsafety.com

**MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
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| **CO1** | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 3 | 2 | 3 | 2 |
| **CO2** | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 3 | 2 | 3 | 2 |
| **CO3** | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 3 | 2 | 3 | 2 |
| **CO4** | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 1 |
| **CO5** | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 1 |

**S-Strong (3)** **M-Medium (2)** **L-Low(1)**

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)
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*(For the candidate admitted in the academic year 2026-2027)*
**DEPARTMENT OF NUTRITION AND DIETETICS**
**B.Sc., NUTRITION AND DIETETICS**

**Semester: II –AC-II-Human Physiology**

**Ins. Hrs./Week:3** **Course Credit :3** **Course Code:U26AND203**

## COURSE OBJECTIVES:

- To understand the structure and functions of major human body systems.
- To acquire knowledge of blood circulation, digestion, respiration, excretion and endocrine functions.
- To study the anatomy and physiology of the nervous, reproductive and sensory systems.
- To develop understanding of body coordination, regulation and maintenance of normal physiological functions.
- To apply physiological knowledge for understanding human health and body processes.

**UNIT: I- Blood and Circulatory System** **(9 Hours)**

Blood and Circulatory System-Blood:Composition,functions,Red Blood cells (RBCs)-Structure,functions,Erythropoiesis,Haemoglobin,White Blood Cells (WBCs)-Structure, classification- granulocytes, lymphocytes, monocytes, and functions.

Blood Platelets: Structure, functions; Reticuloendothelial system; Blood groups- Rh factor. Blood coagulation, Spleen –Structure and functions, Lymph – Lymphatic system- Components and functions.

Heart and Circulation – Structure of heart and circulation. Structure of blood vessels, Properties of cardiac muscle, Cardiac cycle-Cardiac rhythm, Cardiac output, Origin and conduction of heartbeat ; Measurement of arterial blood pressure; Regulation of cardiac activity..

**UNIT- II: Digestive System** **(9 Hours)**

Digestive System-General Anatomy of the digestive system. Digestion and absorption in the mouth, stomach and intestines, structure of Villi: Movements of the Gastrointestinal tract; Role of Liver, Gall bladder and Pancreas – Structure and Functions.

**UNIT-III : Respiratory and Excretory System** **(9 Hours)**

Respiratory System –Anatomy and physiology of Respiratory organs, Mechanism of respiration, Subdivisions of Lung air ; Control of respiration; chemistry of respiration; Artificial Respiration.

Excretory system –Structure and functions of kidney and nephron, Formation of urine; Micturition.

**UNIT-IV Endocrine and Reproductive System** **(9 Hours)**

Endocrine System – Role of hormones and functions of thyroid gland, pituitary gland, parathyroid gland, adrenal gland; Islets of Langerhans of pancreas.

Reproductive System – General anatomy – Female and male reproductive systems. Testis – Spermatogenesis, male sex hormones, ovaries – oogenesis, Female sex hormones, menstrual cycle. Phases and endocrine control. Fertilization, embryonic development, pregnancy and parturition. Mammary glands – Structure and process of lactation.

**UNIT-V Nervous System and Sense Organs (9 Hours)**

Nervous System – Anatomy and physiology of the brain. Structure and functions of the spinal cord and neuron., Conduction of nerve impulse.

Sense Organs:

Eye - Structure, functions, Physiology of vision, dark and light adaptation, accommodation of the eye,visual fields, Common disorders of the eye – presbyopia, cataract, astigmatism and blindness.

Ear - Structure and Physiology of hearing.

Skin – Structure and functions, Regulation of body temperature.

**UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Prepare an assignment on artificial respiration and electrocardiography (ECG), highlighting recent advancements.

Develop e-content on the structure and physiological functions of any one human organ using digital learning tools.

**Total Lecture Hours- 45**

## COURSE OUTCOMES:

The students will be able to

1. Know the role and importance of circulatory system and its regulation in body function
2. Gain knowledge on mechanism of digestive system, respiratory and excretory function and their rolein body regulation.
3. Understand the importance of endocrine system and its role in biological process.
4. Comprehend the reproductive system.
5. Gain knowledge about nervous system and sense organs.
6. Apply knowledge of human physiology to understand the coordination and maintenance of normal body functions.

## TEXT BOOK(S)


1. Arumugam, N. & Mariakuttikan, A., 2023. "Animal Physiology." Twelfth Edition. Saras Publication.
2. Barrett,K.E., Barman,S.M., Brooks, H.L. & Yuan, J.X.J., 2023. "Ganong's Review of Medical Physiology."Twenty-Seventh Edition. McGraw-Hill Education.
3. Hall,J.E. & Hall, M.E., 2020."Guyton and Hall Textbook of Medical Physiology." Fourteenth Edition. Elsevier.
4. Sembulingam,K. & Sembulingam,P., 2025."Essentials of Medical Physiology." Tenth Edition. Jaypee Brothers Medical Publishers.
5. Subramanyam,S.& Sarada, R., 2018."Textbook of Human Physiology."Second Edition.S.Chand & Company Ltd.

**REFERENCE BOOK(S)**


1. Chatterjee,C.C. and John, N.A.,2025."C.C. Chatterjee's Human Physiology." Fifteenth Edition. CBS Publishers & Distributors.
2. Hall,J.E. and Hall, M.E., 2020."Guyton and Hall Textbook of Medical Physiology." Fourteenth Edition. Elsevier.
3. Sembulingam, K. and Sembulingam,P.,2025."Essentials of Medical Physiology."Tenth Edition. Jaypee Brothers Medical Publishers.
4. Sri Nageswari,K.and Sharma, R., 2018. "Practical Workbook of Human Physiology." Jaypee Brothers Medical Publishers.
5. Waugh,A. and Grant,A.,2023. "Ross and Wilson Anatomy and Physiology in Health and Illness." Fourteenth Edition. Elsevier.


## E – RESOURCES

1. https://www.physiology.org
2. https://www.ncbi.nlm.nih.gov
3. https://www.visiblebody.com
4. https://www.khanacademy.org
5. https://www.medlineplus.gov
6. https://www.visiblebody.com
7. https://www.innerbody.com
8. https://egyankosh.ac.in
9. https://epgp.inflibnet.ac.in
10. www.medlineplus.gov
11. www.webmd.com
12. www.britannica.com/science/human-physiology

**MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
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| **CO1** | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 2 |
| **CO2** | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 2 |
| **CO3** | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| **CO4** | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 |
| **CO5** | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |

**S-Strong (3)** **M-Medium (2)** **L-Low(1)**

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE**
**(AUTONOMOUS)**
**SUNDARAKKOTTAI, MANNARGUDI -614016.**
*(For the candidate admitted in the academic year 2026-2027)*
**DEPARTMENT OF NUTRITION AND DIETETICS**
**B.Sc., NUTRITION AND DIETETICS**

**Semester: II -AP-II: Human Physiology Practical**

**Ins. Hrs./Week:3** **Course Credit :3** **Course Code: U26AND204P**

## COURSE OBJECTIVES:

- To understand the histology of tissues, muscles, and organs.
- To learn basic haematological investigations and blood grouping techniques.
- To assess haemoglobin, bleeding time, clotting time, blood pressure, pulse rate and respiratory rate.
- To gain knowledge of blood cell enumeration and differential leukocyte count procedures.
- To familiarize students with clinical laboratory procedures and practices.

## PRACTICAL CONTENT

1. Histology of Tissues – Columnar, cubical, ciliated, squamous, stratified squamous.
2. Microscopic structure of organs – lungs, artery, vein, stomach, ovary, testis, uterus, pancreas.
3. Histology of muscles – Cardiac, striated, non – striated
4. Estimation of Haemoglobin, Bleeding time, Clotting time
5. Measurement of Blood pressure – before and after exercise
6. Determination of Respiratory rate and Pulse rate – before and after exercise.
7. Determination of Blood group.
8. Determination of Rh factor.
9. Enumeration of Red blood cells – Demonstration.
10. Enumeration of White blood cells – Demonstration.
11. Differential Leukocyte count – Demonstration
12. Visit to a Clinical laboratory.

## COURSE OUTCOMES:

The students will be able to

1. Identify the microscopic structure of tissues, muscles, and organs.
2. Perform basic hematological tests, including haemoglobin estimation, blood grouping, and Rh factor determination.
3. Measure physiological parameters such as blood pressure, pulse rate, respiratory rate, bleeding time, and clotting time.
4. Explain the principles of blood cell enumeration and differential leukocyte count.
5. Demonstrate knowledge of clinical laboratory procedures and diagnostic techniques.

## TEXT BOOK(S)

1. Chatterjee,C.C.,2022."Human Physiology."Twelfth Edition.Medical Allied Agency, Kolkata.
2. Guyton,A.C.and Hall,J.E.,2024."Textbook of Medical Physiology."Fifteenth Edition. Elsevier.
3. Jain, A.K., 2022."Textbook of Physiology." Eighth Edition.Avichal Publishing Company.

4. Sembulingam,K.and Sembulingam,P.,2023."Essentials of Medical Physiology."Eighth Edition. Jaypee Brothers Medical Publishers.
5. Waugh,A. and Grant,A.,2023."Ross and Wilson Anatomy and Physiology in Health and Illness." Fourteenth Edition.Elsevier.

**REFERENCE BOOK(S)**

1. Mukherjee, K.L.,2022."Medical Laboratory Technology:A Procedure Manual for Routine Diagnostic Tests."Third Edition.McGraw-Hill Education, New Delhi.
2. Mescher,A.L.,2024."Junqueira's Basic Histology: Text and Atlas."Seventeenth Edition. McGraw-Hill Education, New York.
3. Ross,M.H. & Pawlina,W.,2024."Histology: A Text and Atlas."Ninth Edition. Wolters Kluwer, Philadelphia.
4. Marieb,E.N. &Hoehn, K.N.,2023. "Human Anatomy and Physiology."Twelfth Edition. Pearson Education,New York.
5. Tortora,G.J. & Derrickson, B.H.,2023. "Principles of Anatomy and Physiology." Sixteenth Edition. John Wiley & Sons, Hoboken.

**E - RESOURCES**

1. https://www.ncbi.nlm.nih.gov
2. https://www.medlineplus.gov
3. https://www.who.int
4. https://www.histologyguide.com
5. https://www.hematology.org
6. https://www.physiology.org
7. https://www.nin.res.in
8. https://www.cdc.gov
9. https://openstax.org/details/books/anatomy-and-physiology

**MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
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| **CO1** | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| **CO2** | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 2 |
| **CO3** | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 3 | 3 | 2 |
| **CO4** | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 2 |
| **CO5** | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |

**S-Strong (3)** **M-Medium (2)** **L-Low(1)**

**Semester: II –SEC-I Bakery and Confectionary**

**Ins. Hrs./Week:2** **Course Credit :2** **Course Code:U26SEND21**

**COURSE OBJECTIVES:**

- To understand the principles, processes, and equipment used in bakery production.
- To acquire knowledge of bakery ingredients and their functional role in baked products.
- To develop understanding of the preparation methods and quality characteristics of bread, cakes, cookies, biscuits, and pastries.
- To study sugar and confectionery products, including their preparation and properties.
- To apply scientific baking principles and modern bakery techniques in product preparation and evaluation.

**UNIT-I: Basic Baking and 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** **(06 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 types, baking soda; biological yeast-types and role in baking. Moisturizing agents: Egg, water and milk- role in baking.

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

Bread: Ingredients, 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 and Pastries** **(06 Hours)**

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

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

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

**UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Write assignments on bakery trends and scientific principles of baking. Develop e-content on selected bakery products and demonstrate awareness of modern bakery innovations.

**Total Lecture Hours- 30**

**COURSE OUTCOMES:**

The students will be able to

1. Explain the properties and functions of various ingredients used in bakery products.
2. Describe the types and uses of bakery equipment employed in the production of baked foods.
3. Apply baking techniques to prepare a variety of doughs, batters, and fillings using appropriate mixing and baking methods.
4. Classify and explain the preparation methods of basic confectionery products.
5. Analyze the role of sugar in the preparation and quality of confectionery products.
6. Evaluate the quality characteristics and storage stability of bakery and confectionery products using standard methods.

**TEXT BOOK(S)**


1. Ashokkumar,Y.,2024."Bakery and Confectionery."Revised Edition.PHI Learning Pvt. Ltd., New Delhi.
2. Cauvain,S.P. & Young, L.S.,2022."Technology of Breadmaking."Third Edition. Springer.
3. Dubey,S.C.,2023."Basic Baking."Revised Edition.Society of Indian Bakers,New Delhi.
4. Kingslee, J.,2022."A Professional Textbook to Bakery and Confectionery."Revised Edition.New Age International Publishers, New Delhi.
5. Singh,U.K.,2023."Theory of Bakery and Confectionery:An Operational Approach." Third Edition. Kanishka Publishers & Distributors, New Delhi.


**REFERENCE BOOK(S)**


1. Figoni, P., 2022. "How Baking Works: Exploring the Fundamentals of Baking Science." Fourth Edition. Wiley.
2. Khader, V., 2024. "Textbook of Food Science and Technology." Revised Edition. ICAR, New Delhi.
3. Khetarpaul, N., Grewal, R.B. & Jood, S., 2024. "Bakery Science and Cereal Technology." Revised Edition. Daya Publishing House, New Delhi.
4. Manay, N.S. & Shadaksharaswamy, M., 2023. "Food Facts and Principles." Third Revised Edition. New Age International (P) Ltd., New Delhi.
5. Meyer, L.H., 2022. "Food Chemistry." Revised Edition. CBS Publishers & Distributors Pvt. Ltd., New Delhi.

**E- RESOURCES**

1. https://www.kingarthurbaking.com/learn/guides/baking-basics
2. https://www.britannica.com/topic/baking
3. https://bakerpedia.com/ingredients/flour/
4. https://www.thekitchn.com/why-sugar-is-important-in-baking-23043235
5. https://bakerpedia.com/processes/cookie-making/
6. https://www.kingarthurbaking.com/learn/guides/cookies
7. https://bakerpedia.com/processes/confectionery/
8. https://www.candyusa.com/story-of-candy/types-of-candy/

**MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 1 |
| **CO2** | 3 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 1 |
| **CO3** | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 1 |
| **CO4** | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 1 |
| **CO5** | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 1 |

**S-Strong (3)** **M-Medium (2)** **L-Low(1)**

**Semester: II –IDC –II Nutrition for Women**

**Ins. Hrs./Week:2** **Course Credit :2** **Course Code:U26NDID22**

**COURSE OBJECTIVES:**

- To understand the importance of nutrition in women's health across different life stages.
- To acquire knowledge of nutritional requirements during adolescence, adulthood, pregnancy, lactation and postnatal period.
- To study the role of macro and micronutrients in maternal and reproductive health.
- To understand nutritional disorders affecting women and their dietary management.
- To develop awareness of public health nutrition, women's wellness, and emerging trends in women's nutrition.

**UNIT I: Foundations of Women's Nutrition (6 Hours)**

Concept and significance of nutrition in women's health. Energy balance and nutrient requirements. Determinants of nutritional status including biological, social, economic, and lifestyle factors. Overview of life cycle approach in women's nutrition.

**UNIT II: Nutrition during Adolescence and Adulthood (6 Hours)**

Physiological growth and hormonal changes during adolescence. Nutritional requirements of adolescent girls with emphasis on iron, calcium, and protein. Nutritional challenges such as anemia and eating disorders. Nutrition during adulthood and pre-menopausal stage with focus on maintenance of health and productivity.

**UNIT III: Maternal Nutrition – Pregnancy (6 Hours)**

Physiological adaptations during pregnancy. Increased requirements of macro and micronutrients. Role of nutrition in fetal growth and development. Impact of maternal malnutrition on pregnancy outcomes and complications. Principles of balanced and therapeutic diet planning during pregnancy.

**UNIT IV: Lactation and Postnatal Nutrition (6 Hours)**

Physiological changes during lactation. Nutritional requirements of lactating women. Composition of breast milk and factors affecting milk production. Importance of exclusive breastfeeding. Dietary guidelines for postnatal recovery and lactation support.

**UNIT V: Women's Health and Nutritional Disorders (6 Hours)**

Etiology, clinical features, prevention, and dietary management of nutritional anemia, osteoporosis, obesity, polycystic ovary syndrome (PCOS), and other lifestyle-related disorders affecting women

**UNIT-VI: CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Critical analysis of emerging issues and current trends in women's nutrition. Assignments, seminars, and case studies related to maternal health, adolescent nutrition, and women's wellness. Development of e-content and awareness programmes on women's health and nutrition. Recent trends, government policies, and public health programmes promoting women's nutrition and wellness.

**Total Lecture Hours- 30**

**COURSE OUTCOMES:**

The students will be able to

1. Explain the significance of nutrition in women's health and well-being.
2. Understand the nutritional requirements during adolescence and adulthood.
3. Analyze the role of nutrition during pregnancy and fetal development.
4. Apply dietary guidelines for lactation and postnatal care.
5. Identify nutritional disorders in women and recommend suitable dietary management.
6. Develop awareness programs and e-content related to women's nutrition and public health.

**TEXT BOOK(S)**


1. Bamji,M.S., Rao, N.P.& Reddy,V.,2019."Textbook of Human Nutrition." Fourth Edition. Oxford & IBH Publishing, New Delhi.
2. Gibson,R.S.,2005."Principles of Nutritional Assessment."Second Edition.Oxford University Press.
3. Mahan,L.K. & Raymond, J.L.,2020."Krause's Food & the Nutrition Care Process." Fifteenth Edition. Elsevier.
4. Srilakshmi,B.,2021."Nutrition Science."Seventh Edition.New Age International Publishers, New Delhi.
5. Wardlaw,G.M.&Smith,A.M., 2012."Contemporary Nutrition." McGraw-Hill Education.


**REFERENCE BOOK(S)**


1. Gropper, S.S., Smith, J.L. & Carr, T.P., 2021. "Advanced Nutrition and Human Metabolism." Eighth Edition. Cengage Learning.
2. Hall, J.E. & Hall, M.E., 2025. "Guyton and Hall Textbook of Medical Physiology." Fifteenth Edition. Elsevier.
3. Roche, H.M., Macdonald, I.A., Schols, A.M.W.J. & Lanham-New, S.A., 2024. "Nutrition and Metabolism." Third Edition. Wiley.
4. Silverthorn, D.U., 2024. "Human Physiology: An Integrated Approach." Eighth Edition. Pearson.
5. Whitney, E.N., Rolfes, S.R. & Smith, A., 2022. "Understanding Nutrition." Sixteenth Edition. Cengage Learning.

**E- RESOURCES**

1. https://www.who.int/health-topics/nutrition
2. https://www.unicef.org/nutrition
3. https://www.nin.res.in/
4. https://www.icmr.gov.in/
5. https://www.fao.org/nutrition/en/
6. https://www.cdc.gov/nutrition/
7. https://www.nhm.gov.in/
8. https://www.poshanabhiyaan.gov.in/
9. https://www.womenshealth.gov/nutrition/
10. https://ods.od.nih.gov/

**MAPPING WITH PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 2 | 1 | 2 | 1 | 2 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 3 |
| **CO2** | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 3 |
| **CO3** | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 3 |
| **CO4** | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 3 |
| **CO5** | 3 | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |

**S-Strong (3)** **M-Medium (2)** **L-Low(1)**