



## Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)  
Approved by Government of Tamil Nadu & Accredited by NAAC with A++ Grade (3<sup>rd</sup> Cycle-3.64 CGPA)  
Dr. N.G.P.-Kalapatti Road, Coimbatore-641 048, Tamil Nadu, India  
Website: [www.drngpasc.ac.in](http://www.drngpasc.ac.in) | Email: [info@drngpasc.ac.in](mailto:info@drngpasc.ac.in) | Phone: +91-422-2369100

### REGULATIONS 2026-27 for Post Graduate Programme

(Outcome Based Education model with Choice Based Credit System)

### M.Sc. FOOD AND NUTRITION

(For the students admitted during the academic year 2026-27 and onwards)

#### Eligibility:

A pass in any one of the following Degree Courses of B.Sc. Nutrition and Dietetics, Nutrition, Food Service Management and Dietetics, Food Science and Quality Control, B.VOC- Food Processing Technology, Food Science and Nutrition, Botany, Zoology, Biochemistry, Biotechnology, Chemistry, Microbiology, Home science or Family and Community Science or an Examination accepted as equivalent thereto by the Academic Council, subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the M.Sc. Food and Nutrition Examination of this College after a course study of two academic years.

#### Programme Educational Objectives:

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. To provide advanced knowledge on food science and nutrition to enhance the quality of life through the improvement of human health and nutritional status
2. To enable the students to implement the basic food science in operation
3. To develop skills and techniques in food preparation with conservation of nutrients and palatability using cooking methods generally employed
4. To help the students to contribute proper utilization of foods and prevent wastes
5. To understand the prevalence of malnutrition in our Country and gain knowledge on effective methods to combat malnutrition.



### PROGRAMME OUTCOMES:

On the successful completion of the program, the following are the expected outcomes.

| PO Number | PO Statement                                                                                                                                                                                                   |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| P01       | To develop the knowledge of the students in the area of human nutrition, food science, food product development, food safety and quality management.                                                           |
| P02       | Apply recently advanced novel foods in medical nutrition therapy and recommend the physical activity to manage the common diseases and metabolic disorder to achieve the fitness and wellbeing.                |
| P03       | Familiarize with the problems and plan, implement, monitor and evaluate interventional programs related to food and nutrition and security to the community.                                                   |
| P04       | To build entrepreneurial values, attitudes, quality and desire in developing innovative food products by fulfilling quality parameters, used to meet the consumer needs nutritionally and commercially viable. |
| P05       | To develop skills and techniques for the students to become professionals in service industries.                                                                                                               |

### Total Credit Distribution

| Course             | Credits | Total    |             | Credits   | Cumulative Total |
|--------------------|---------|----------|-------------|-----------|------------------|
| Core               | 4       | 13 x 100 | 1300        | 52        | 92               |
| Core Practical     | 3       | 1 x 100  | 100         | 03        |                  |
|                    | 2       | 4 x 100  | 400         | 08        |                  |
| EDC                | 2       | 1 x 100  | 100         | 02        |                  |
| Mini Project Work  | 1       | 1 x 100  | 100         | 01        |                  |
| Core Project Work  | 12      | 1 x 200  | 200         | 12        |                  |
| Internship         | 2       | 1 x 100  | 100         | 02        |                  |
| Electives          | 4       | 1 x 100  | 100         | 04        |                  |
| Electives          | 3       | 1 x 100  | 100         | 03        |                  |
| Elective Practical | 2       | 1 x 100  | 100         | 02        |                  |
| Elective Practical | 3       | 1 x 100  | 100         | 03        |                  |
|                    |         |          | <b>2700</b> | <b>92</b> | <b>92</b>        |



**PG  
CURRICULUM**

**M.Sc. Food and Nutrition  
AY 26 - 27**

| Course Code    | Course Category     | Course Name                                | L  | T | P  | Duration |       | Exam (h) | Max Marks |     |       | Credits |
|----------------|---------------------|--------------------------------------------|----|---|----|----------|-------|----------|-----------|-----|-------|---------|
|                |                     |                                            |    |   |    | Week     | Total |          | CIA       | ESE | Total |         |
| First Semester |                     |                                            |    |   |    |          |       |          |           |     |       |         |
| 26FNP1CA       | Core – I            | Advanced Food Science                      | 4  | - | -  | 4        | 48    | 3        | 25        | 75  | 100   | 4       |
| 26FNP1CB       | Core – II           | Nutrition Through Life Cycle               | 4  | - | -  | 4        | 48    | 3        | 25        | 75  | 100   | 4       |
| 26FNP1CC       | Core – III          | Nutritional Biochemistry                   | 4  | - | -  | 4        | 48    | 3        | 25        | 75  | 100   | 4       |
| 26FNP1CD       | Core – IV           | Food Chemistry                             | 4  | - | -  | 4        | 48    | 3        | 25        | 75  | 100   | 4       |
| 26FNP1CP       | Core Practical – I  | Food Science and Food Chemistry            | -  | - | 4  | 4        | 48    | 3        | 40        | 60  | 100   | 2       |
| 26FNP1CQ       | Core Practical – II | Food Analysis                              | -  | - | 6  | 6        | 72    | 3        | 40        | 60  | 100   | 3       |
| 26FNP1DP       | DSE - I             | Food Product Development                   | -  | - | 4  | 4        | 48    | 3        | 40        | 60  | 100   | 2       |
| 26FNP1DQ       |                     | Indigenous Foods                           |    |   |    |          |       |          |           |     |       |         |
| 26FNP1DR       |                     | Harvest Technology of Agricultural Produce |    |   |    |          |       |          |           |     |       |         |
| Total          |                     |                                            | 20 | - | 10 | 30       | 360   |          |           |     | 700   | 23      |



BoS Chairman/HoD  
Department of Food Science & Nutrition  
Dr. N. G. P. Arts and Science College  
Coimbatore - 641 048

|                                                                                                                               |      |      |
|-------------------------------------------------------------------------------------------------------------------------------|------|------|
|  <b>Dr.N.G.P. Arts and Science College</b> |      |      |
| <b>APPROVED</b>                                                                                                               |      |      |
| BoS-21st                                                                                                                      | AC - | GB - |
| 06.04.26                                                                                                                      |      |      |



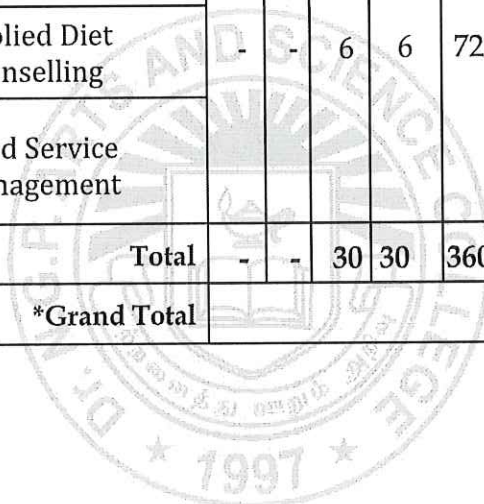
Dr. NGPASC  
COIMBATORE | INDIA

*M.Sc. Food and Nutrition (Students admitted during the AY 2026-27)*

| Course Code     | Course Category      | Course Name                                 | L  | T | P  | Duration |       | Exam h | Max Marks |     |       | Credits |
|-----------------|----------------------|---------------------------------------------|----|---|----|----------|-------|--------|-----------|-----|-------|---------|
|                 |                      |                                             |    |   |    | Week     | Total |        | CIA       | ESE | Total |         |
| Second Semester |                      |                                             |    |   |    |          |       |        |           |     |       |         |
| 26FNP2CA        | Core – V             | Macronutrients                              | 4  | - | -  | 4        | 48    | 3      | 25        | 75  | 100   | 4       |
| 26FNP2CB        | Core - VI            | Applied Physiology                          | 4  | - | -  | 4        | 48    | 3      | 25        | 75  | 100   | 4       |
| 26FNP2CC        | Core - VII           | Therapeutic Nutrition – Lifestyle Disorders | 4  | - | -  | 4        | 48    | 3      | 25        | 75  | 100   | 4       |
| 26FNP2CD        | Core - VIII          | Research Methodology and Statistics         | 4  | - | -  | 4        | 48    | 3      | 25        | 75  | 100   | 4       |
| 26CAP2CE        | EDC - I              | Computer Application in Nutrition           | 2  | - | -  | 2        | 24    | 3      | 25        | 75  | 100   | 2       |
| 26FNP2CP        | Core Practical – III | Food Analytical Techniques                  | -  | - | 4  | 4        | 48    | 3      | 40        | 60  | 100   | 2       |
| 26FNP2CQ        | Core Practical – IV  | Therapeutic Nutrition – Lifestyle Disorders | -  | - | 4  | 4        | 48    | 3      | 40        | 60  | 100   | 3       |
| 26FNP2DP        | DSE - II             | Food Fermentation                           | -  | - | 4  | 4        | 48    | 3      | 40        | 60  | 100   | 2       |
| 26FNP2DQ        |                      | Functional Foods                            |    |   |    |          |       |        |           |     |       |         |
| 26FNP2DR        |                      | Unit Operations in Food Industry            |    |   |    |          |       |        |           |     |       |         |
| 26FNP2CT        | IT                   | Internship                                  | -  | - | -  |          |       | 3      | 40        | 60  | 100   | 2       |
| Total           |                      |                                             | 18 | - | 12 | 30       | 360   |        |           |     | 900   | 27      |

| Course Code                                   | Course Category    | Course Name                                | L  | T | P  | Duration |       | Exam (h) | Max Marks |     |       | Credits |
|-----------------------------------------------|--------------------|--------------------------------------------|----|---|----|----------|-------|----------|-----------|-----|-------|---------|
|                                               |                    |                                            |    |   |    | Week     | Total |          | CIA       | ESE | Total |         |
| Third Semester                                |                    |                                            |    |   |    |          |       |          |           |     |       |         |
| 26FNP3CA                                      | Core – IX          | Micronutrients                             | 4  | - | -  | 4        | 48    | 3        | 25        | 75  | 100   | 4       |
| 26FNP3CB                                      | Core – X           | Therapeutic Nutrition – Systemic Disorders | 4  | - | -  | 4        | 48    | 3        | 25        | 75  | 100   | 4       |
| 26FNP3CC                                      | Core – XI          | Food Processing                            | 4  | - | -  | 4        | 48    | 3        | 25        | 75  | 100   | 4       |
| 26FNP3CD                                      | Core – XII         | Food Safety and Quality Management         | 4  | - | -  | 4        | 48    | 3        | 25        | 75  | 100   | 4       |
| 26FNP3CE                                      | Core – XIII        | Public Health Nutrition                    | 4  | - | -  | 4        | 48    | 3        | 25        | 75  | 100   | 4       |
| 26FNP3CV                                      | Core – XIV         | Mini Project                               | -  | - | 3  | 3        | 36    | 3        | 40        | 60  | 100   | 2       |
| 26FNP3CQ                                      | Core Practical - V | Therapeutic Nutrition – Systemic Disorders | -  | - | 4  | 4        | 48    | 3        | 40        | 60  | 100   | 3       |
| 26FNP3DP                                      | DSE - III          | Convenience Foods                          | -  | - | 3  | 3        | 36    | 3        | 25        | 75  | 100   | 2       |
| Nutritional Assessment Techniques<br>26FNP3DR |                    | 26FNP3DQ                                   | -  | - | 3  | 3        | 36    | 3        | 25        | 75  | 100   | 2       |
|                                               |                    | Instrumentation in Food Industry           | -  | - | 3  | 3        | 36    | 3        | 25        | 75  | 100   | 2       |
| Total                                         |                    |                                            | 20 | - | 10 | 30       | 360   |          |           |     | 800   | 27      |

| Course Code     | Course Category | Course Name                | L | T | P  | Duration |       | Exam (h) | Max Marks |     |       | Credits |  |
|-----------------|-----------------|----------------------------|---|---|----|----------|-------|----------|-----------|-----|-------|---------|--|
|                 |                 |                            |   |   |    | Week     | Total |          | CIA       | ESE | Total |         |  |
| Fourth Semester |                 |                            |   |   |    |          |       |          |           |     |       |         |  |
| 26FNP4CV        | Core – XV       | Project Work and Viva Voce | - | - | 24 | 24       | 288   | 3        | 80        | 120 | 200   | 12      |  |
| 26FNP4DP        | DSE - IV        | Food Quality Control       |   |   |    |          |       |          |           |     |       |         |  |
| 26FNP4DQ        |                 | Applied Diet Counselling   | - | - | 6  | 6        | 72    | 3        | 40        | 60  | 100   | 3       |  |
| 26FNP4DR        |                 | Food Service Management    |   |   |    |          |       |          |           |     |       |         |  |
| Total           |                 |                            | - | - | 30 | 30       | 360   |          |           |     | 300   | 15      |  |
| *Grand Total    |                 |                            |   |   |    |          |       |          |           |     | 2700  | 92      |  |



## DISCIPLINE SPECIFIC ELECTIVE

### Semester I (Elective I)

(Student shall select any one of the following courses as Elective in first semester)

#### List of Elective Courses

| S. No. | Course Code | Name of the Course                         |
|--------|-------------|--------------------------------------------|
| 1.     | 26FNP1DP    | Food Product Development                   |
| 2.     | 26FNP1DQ    | Indigenous Foods                           |
| 3.     | 26FNP1DR    | Harvest Technology of Agricultural Produce |

### Semester II (Elective II)

(Student shall select any one of the following courses as Elective in second semester)

#### List of Elective Courses

| S. No. | Course Code | Name of the Course               |
|--------|-------------|----------------------------------|
| 1.     | 26FNP2DP    | Food Fermentation                |
| 2.     | 26FNP2DQ    | Functional Foods                 |
| 3.     | 26FNP2DR    | Unit Operations in Food Industry |

### Semester III (Elective III)

(Student shall select any one of the following courses as Elective in Third semester)

#### List of Elective Courses

| S. No. | Course Code | Name of the Course                |
|--------|-------------|-----------------------------------|
| 1.     | 26FNP3DP    | Convenience Foods                 |
| 2.     | 26FNP3DQ    | Nutritional Assessment Techniques |
| 3.     | 26FNP3DR    | Instrumentation in Food Industry  |

**Semester IV (Elective IV)**

(Student shall select any one of the following courses as Elective in fourth semester)

**List of Elective Courses**

| S. No. | Course Code | Name of the Course       |
|--------|-------------|--------------------------|
| 1.     | 26FNP4DP    | Food Quality Control     |
| 2.     | 26FNP4DQ    | Applied Diet Counselling |
| 3.     | 26FNP4DR    | Food Service Management  |

**Self-study paper offered by the Department of Food Science and Nutrition**

| S. No. | Semester | Course Code | Course Name            |
|--------|----------|-------------|------------------------|
| 1      | III      | 26FNPSSA    | Composite Home science |
| 2      | III      | 26FNPSSB    | Diet Counseling        |



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|                                                                                                                               |      |      |
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| BoS- 21st<br>06.04.26                                                                                                         | AC - | GB - |

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## PG REGULATION (R6)

(2026-27 and onwards)

### (OUTCOME BASED EDUCATION WITH CBCS)

Effective from the academic year 2026-27 and applicable to the students admitted to the Degree of Master of Arts/Commerce/Management/Science.

#### 1. NOMENCLATURE

**1.1 Faculty:** Refers to a group of programmes concerned with a major division of knowledge. Eg. Faculty of Computer Science consists of Programmes like Computer Science, Information Technology, Computer Technology, Computer Applications, Cognitive Systems, Artificial Intelligence and Machine Learning and Cyber Security and Data Analytics etc.

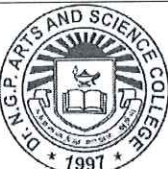
**1.2 Programme:** Refers to the Master of Arts/Management/Commerce/Science Stream that a student has chosen for study.

**1.3 Batch:** Refers to the starting and completion year of a programme of study. Eg. Batch of 2025–2026 refers to students belonging to a 2-year Degree programme admitted in 2025 and completing in 2027.

**1.4 Course:** Refers to component of a programme. A course may be designed to involve lectures / tutorials / laboratory work / seminar / project work/ practical training / report writing / Viva voce, etc or a combination of these, to effectively meet the teaching and learning needs and the credits may be assigned suitably.

**a) Core Courses** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.



|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                     |
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**b) Extra Departmental Course (EDC):** A course chosen generally from a related discipline/subject, with an intention to seek exposure in the discipline relating to the core domain of the student.

**c) Discipline Specific Elective Course (DSE):** Elective courses are offered under main discipline/ subject of study.

**d) Internship/Industrial Training (IT)**

Students must undertake industrial / institutional training for a minimum of 30 days during the II semester summer vacation. The students will submit the report for evaluation during III semester.

**e) Project Work:** It is considered as a special course involving application of knowledge in problem solving/analyzing/exploring a real-life situation. The Project work will be given in lieu of a Core paper.

**f) Extra credits** Extra credits will be awarded to a student for achievements in co-curricular activities carried out outside the regular class hours. The guidelines for the award of extra credits are given in section two, these credits are not mandatory for completing the programme.

**g) Advanced Learner Course (ALC):** ALC is doing work of a higher standard than usual for students at that stage in their education. Research work / internships carried out in University/ Research Institutions/ Industries of repute in India or abroad for a period of 15 to 30 days.

**h) Embedded Course:** To enhance practical competency, EC aims to provide both practical and theoretical knowledge and is conducted as a practical Examination.

**i) Self Study Course:** SS courses will be offered by the department. The course is an optional course offered in the III Semester with the approval of the syllabus by the BoS. It is not mandatory for programme completion, and only one attempt is permitted. The examination will be conducted for 50 marks with no CIA and no re-examination.

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                              |
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## j) DOMAIN-SPECIFIC SKILL COMPONENTS

Every student shall mandatorily complete **any two Domain-Specific Skill Components** during Semesters I to III as a requirement for the successful completion of the programme.

These components may include courses such as:

- NPTEL courses
- NCVRT-certified programmes
- Industry-relevant skill courses offered through Sector Skill Councils
- Programmes under the Board of Apprenticeship
- Student Skill Development Courses (SSDC) offered/specified by the respective departments

Each course shall comprise a minimum of **30 to 35 hours of structured learning**.

## 2. STRUCTURE OF THE PROGRAMME

- Core Course
- Extra Departmental Course (EDC)
- Discipline Specific Elective (DSE)
- Industrial Training (IT)
- Project
- Embedded Course (EC)
- Self Study Course (SS)

## 3. DURATION OF THE PROGRAMME

M.Sc. /M.Com. /M.A./MSW Programme must be completed within 2 Years (4 semesters) and maximum of 4 Years (8 semesters) from the date of acceptance to the programme. If not, the candidate must enroll in the course determined to be an equivalent by BoS in the most recent curriculum recommended for the Programme.

## 4. REQUIREMENTS FOR COMPLETION OF A SEMESTER

Every student shall ordinarily be allowed to keep terms for the given semester in a program of his/ her enrolment, only if he/ she fulfills at least eighty percent (80%) of the attendance taken as an average of the total number of lectures, practicals, tutorials, etc. wherein short and/or long excursions/field visits/study tours organized by the college and supervised by the faculty as envisaged in the syllabus shall be credited to his attendance. Every student shall have a minimum of 80% as an overall attendance.



|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                    |
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## 5. EXAMINATIONS

The end semester examinations shall normally be conducted after completing 90 working days for each semester. The maximum marks for each theory and practical course as follows,

### Mark distribution for Theory Courses

|                                      |             |
|--------------------------------------|-------------|
| Continuous Internal Assessment (CIA) | : 25 Marks  |
| End Semester Exams (ESE)             | : 75 Marks  |
| Total                                | : 100 Marks |

#### i) Distribution of Internal Marks

| S.No. | Particulars          | Distribution of Marks |
|-------|----------------------|-----------------------|
| 1     | CIA I (3 Units)      | 10                    |
| 2     | Model ( All 5 Units) | 10                    |
| 3     | Skill Enhancement *  | 05                    |
|       | <b>Total</b>         | <b>25</b>             |

**\*Components for "Skill Enhancement" include the following:**

Class Participation, Case Studies Presentation/Term paper, Field Study, Field Survey, Group Discussion, Term Paper, Presentation of Papers in Conferences, Industry Visit, Book Review, Journal Review, e-content Creation, Model Preparation, Seminar and Assignment.

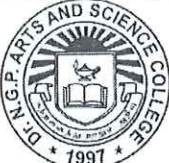
### Components for Skill Enhancement

Any one of the following should be selected by the course coordinator:

| S.No. | Skill Enhancement                      | Description                                                                                                                                                     |
|-------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Class Participation                    | <ul style="list-style-type: none"> <li>Engagement in class</li> <li>Listening Skills</li> <li>Behaviour</li> </ul>                                              |
| 2     | Case Study Presentation/<br>Term Paper | <ul style="list-style-type: none"> <li>Identification of the problem</li> <li>Case Analysis</li> <li>Effective Solution using creativity/imagination</li> </ul> |

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                              |
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|    |                                       |                                                                                                                                                                                                    |
|----|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3  | Field Study                           | <ul style="list-style-type: none"> <li>• Selection of Topic</li> <li>• Demonstration of Topic</li> <li>• Analysis &amp; Conclusion</li> </ul>                                                      |
| 4  | Field Survey                          | <ul style="list-style-type: none"> <li>• Chosen Problem</li> <li>• Design and quality of survey</li> <li>• Analysis of survey</li> </ul>                                                           |
| 5  | Group Discussion                      | <ul style="list-style-type: none"> <li>• Communication skills</li> <li>• Subject knowledge</li> <li>• Attitude and way of presentation</li> <li>• Confidence</li> <li>• Listening Skill</li> </ul> |
| 6  | Presentation of Papers in Conferences | <ul style="list-style-type: none"> <li>• Sponsored</li> <li>• International/National</li> <li>• Presentation</li> <li>• Report Submission</li> </ul>                                               |
| 7  | Industry Visit                        | <ul style="list-style-type: none"> <li>• Chosen Domain</li> <li>• Quality of the work</li> <li>• Analysis of the Report</li> <li>• Presentation</li> </ul>                                         |
| 8  | Book Review                           | <ul style="list-style-type: none"> <li>• Content</li> <li>• Interpretation and Inferences of the text</li> <li>• Supporting Details</li> <li>• Presentation</li> </ul>                             |
| 9  | Journal Review                        | <ul style="list-style-type: none"> <li>• Analytical Thinking</li> <li>• Interpretation and Inferences</li> <li>• Exploring the perception if chosen genre</li> <li>• Presentation</li> </ul>       |
| 10 | e-content Creation                    | <ul style="list-style-type: none"> <li>• Logo/ Tagline</li> <li>• Purpose</li> <li>• Content (Writing, designing and posting in Social Media)</li> <li>• Presentation</li> </ul>                   |
| 11 | Model Preparation                     | <ul style="list-style-type: none"> <li>• Theme/ Topic</li> <li>• Depth of background Knowledge</li> <li>• Creativity</li> <li>• Presentation</li> </ul>                                            |

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                    |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
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|    |            |                                                                                                                                                    |
|----|------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| 12 | Seminar    | <ul style="list-style-type: none"> <li>• Knowledge and Content</li> <li>• Organization</li> <li>• Understanding</li> <li>• Presentation</li> </ul> |
| 13 | Assignment | <ul style="list-style-type: none"> <li>• Content and Style</li> <li>• Spelling and Grammar</li> <li>• References</li> </ul>                        |

### ii) Distribution of External Marks

**Total : 75**  
**Written Exam : 75**

### Marks Distribution for Practical courses

**Total : 100**  
**Internal : 40**  
**External : 60**

### i) Distribution of Internals Marks

| S. No.       | Particulars           | Distribution of Marks |
|--------------|-----------------------|-----------------------|
| 1            | Experiments/Exercises | 15                    |
| 2            | Test 1                | 10                    |
| 3            | Test 2                | 10                    |
| 4            | Observation Notebook  | 05                    |
| <b>Total</b> |                       | <b>40</b>             |

### ii) Distribution of Externals Marks

| S.No.        | Particulars | External Marks |
|--------------|-------------|----------------|
| 1            | Practical   | 40             |
| 2            | Record      | 10             |
| 3            | Viva- voce  | 10             |
| <b>Total</b> |             | <b>60</b>      |

Practical examination shall be evaluated jointly by Internal and External Examiners.

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                     |                               |
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|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                     | <b>AY:2026-27</b>             |

### Mark Distribution for Project

|                 |          |            |
|-----------------|----------|------------|
| <b>Total</b>    | <b>:</b> | <b>200</b> |
| <b>Internal</b> | <b>:</b> | <b>80</b>  |
| <b>External</b> | <b>:</b> | <b>120</b> |

#### i) Distribution of Internal Marks

| S.No.        | Particulars | Internal Marks |
|--------------|-------------|----------------|
| 1            | Review I    | 40             |
| 2            | Review II   | 40             |
| <b>Total</b> |             | <b>80</b>      |

#### ii) Distribution of External Marks

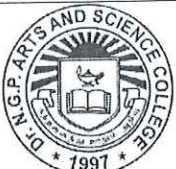
| S.No         | Particulars                 | External Marks |
|--------------|-----------------------------|----------------|
| 1            | Project Work & Presentation | 100            |
| 2            | Viva –voce                  | 20             |
| <b>Total</b> |                             | <b>120</b>     |

Evaluation of Project Work shall be done jointly by Internal and External Examiners.

### 6 .Credit Transfer

- a. Upon successful completion of 1 NPTEL Course (4 Credit Course) recommended by the department, during Semester I to II, a student shall be eligible to get exemption of one **4 credit course** during the 3<sup>rd</sup> and 4<sup>th</sup> semester. The proposed NPTEL course should cover content/syllabus of exempted core paper in 3<sup>rd</sup> and 4<sup>th</sup> semester.



|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                    |
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| S. No. | Course Code | Course Name | Proposed NPTEL Course  | Credit |
|--------|-------------|-------------|------------------------|--------|
| 1      |             |             | Option – 1 Paper title | 4      |
|        |             |             | Option – 2 Paper title |        |
|        |             |             | Option – 3 Paper title |        |

b. Upon successful completion of **2 NPTEL Courses** (2 Credit each) recommended by the department, during Semester I to II, a student shall be eligible to get exemption of **one 4 credit course** during the 3<sup>rd</sup> and 4<sup>th</sup> semester.

### Mandatory

The exempted core paper in the 3<sup>rd</sup> & 4<sup>th</sup> semester should be submitted by the students for approval before the end of 2<sup>nd</sup> semester

Credit transfer will be decided by equivalence committee

| S. No. | Course Code | Course Name | Proposed NPTEL Course  | Credit |
|--------|-------------|-------------|------------------------|--------|
| 1      |             |             | Option – 1 Paper title | 2      |
|        |             |             | Option – 2 Paper title |        |
|        |             |             | Option – 3 Paper title |        |
| 2      |             |             | Option – 1 Paper title | 2      |
|        |             |             | Option – 2 Paper title |        |
|        |             |             | Option – 3 Paper title |        |

### NPTEL Courses to be carried out during semester I – II.

| S. No. | Student Name | Class | Proposed NPTEL Course |                                                                         | Proposed Course for Exemption                                    |
|--------|--------------|-------|-----------------------|-------------------------------------------------------------------------|------------------------------------------------------------------|
|        |              |       | Course I              | Option 1- Paper Title<br>Option 2- Paper Title<br>Option 3- Paper Title | Any one Core Paper in 3 <sup>rd</sup> & 4 <sup>th</sup> Semester |
|        |              |       | Course II             | Option 1- Paper Title<br>Option 2- Paper Title<br>Option 3- Paper Title |                                                                  |

Class Advisor

HoD

Dean

*M.Sc. Food and Nutrition (Students admitted during the AY 2026-*



|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                    |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
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### 7. Internship/Industrial Training/ Field Work / Block Placement Course

#### Mark Distribution for Internship/ Industrial Training

|                 |          |            |
|-----------------|----------|------------|
| <b>Total</b>    | <b>:</b> | <b>100</b> |
| <b>Internal</b> | <b>:</b> | <b>40</b>  |
| <b>External</b> | <b>:</b> | <b>60</b>  |

#### i) Distribution of Internal Marks

| S.No.        | Particulars                          | Internal Marks |
|--------------|--------------------------------------|----------------|
| 1            | Review I/ Field Knowledge and Skills | 20             |
| 2            | Review II/ IC and Field Report       | 20             |
| <b>Total</b> |                                      | <b>40</b>      |

#### ii) Distribution of External Marks

| S.No         | Particulars                                                                 | External Marks |
|--------------|-----------------------------------------------------------------------------|----------------|
| 1            | Internship /Industrial training / Field Work / Block Placement Presentation | 40             |
| 2            | Viva –voce                                                                  | 20             |
| <b>Total</b> |                                                                             | <b>60</b>      |

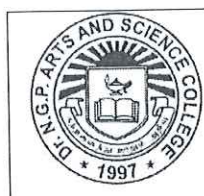
Internship/ Industrial training/Field Work / Block Placement shall be evaluated jointly by Internal and External Examiners.

### 8. Extra Credits: 14

Earning extra credit is not essential for programme completion. Student is entitled to earn extra credit for achievement in Curricular/Co-Curricular/ Extracurricular activities carried out other than the regular class hours.

A student is permitted to earn a maximum of 10 extra Credits during the programme period.





## Dr. N.G.P. ARTS AND SCIENCE COLLEGE

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Dr. N.G.P.-Kalapatti Road, Coimbatore-641 048, Tamil Nadu, India.  
Website: www.dnmgpsc.ac.in | Email: info@dnmgpsc.ac.in. | Phone: +91-422-2369100

REGULATION

6

AY:2026-27

A maximum of 1 credit under each category is permissible except ALC (Advanced Learner Course-2 Credit).

| S.No | Category                                                            | Credit |
|------|---------------------------------------------------------------------|--------|
| 1    | Self study Course                                                   | 1      |
| 2    | CA/ICSI/CMA (Foundation)                                            | 1      |
| 3    | CA/ICSI/CMA (Inter)                                                 | 1      |
| 4    | Publications                                                        | 1      |
| 5    | Conference Presentations (Oral/Poster)                              | 1      |
| 6    | Innovation / Incubation / Patent / Sponsored Projects / Consultancy | 1      |
| 7    | Representation in State / National level celebrations               | 1      |
| 8    | Awards/Recognitions                                                 | 1      |
| 9    | Advanced Learner Course (ALC)*                                      | 2      |
| 10   | Fellowships                                                         | 1      |
| 11   | Workshops/Training                                                  | 1      |
| 12   | Online courses                                                      | 1      |
| 13   | Sports and Games                                                    | 1      |

Credit shall be awarded for achievements of the student during the period of study only.

### GUIDELINES

#### Self study Course

A pass in the self study courses offered by the department.

The candidate should register the self study course offered by the department only in the III semester.

#### CA/ICSI/CMA (Foundation)

Qualifying foundation in CA/ICSI/CMA / etc.

#### CA/ICSI/CMA (Inter)

Qualifying Inter in CA/ICSI/CMA / etc.



|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                    |
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|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                    |

## **Publications**

Research Publications in Journals

## **Conference Presentations (Oral/Poster)**

Oral/poster presentation in Conference and Wining Awards

## **Innovation / Incubation / Patent / Sponsored Projects / Consultancy**

Development of model/ Products /Prototype /Process/App/Registration of Patents/ Copyrights/Trademarks/Sponsored Projects /Consultancy. Additional credit will be awarded if a patent application is published.

## **Representation in State/ National level celebrations**

State/National level celebrations such as Independence day, Republic day Parade, National Integration camp etc.

## **Awards/Recognitions/Fellowships**

Only Regional, State, or National Level Awards/Recognitions related to Academic Activities will be taken into consideration.

## **\*Advanced Learner Course (ALC):**

ALC is doing work of a higher standard than usual for students at that stage in their education.

Research work/internships carried out in University/ Research Institutions/ Industries of repute in India or abroad for a period of 15 to 30 days will be considered as Advanced Learners Course.

## **Fellowships:**

State / National fellowships

## **Workshops/Training**

Participation at renowned institutes or industries for a minimum period of one week.



|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                    |
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### Online courses

NPTEL and NEN (National Education Network) certificate courses completed by students from Semester I to Semester III may be submitted for purpose of obtaining Extra credit provided the students does not request waiver for a course in the curriculum. The Course shall comprise a minimum of 30 hours of learning and examination shall be conducted by the respective board.

### Sports and Games

Students can earn extra credit based on their achievements in sports in University/ State / National/ International levels.

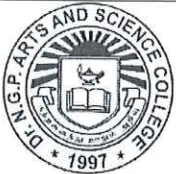
### QUESTION PAPER PATTERN

#### CIA Test I : [2 Hours-3 Units] - 50 Marks

| SECTION     | MARKS             | DESCRIPTION                                                           | TOTAL    | Remarks                                    |
|-------------|-------------------|-----------------------------------------------------------------------|----------|--------------------------------------------|
| Section – A | 7 x 1 = 07 Marks  | MCQ                                                                   | 50 Marks | Marks secured will be converted to 10 mark |
| Section - B | 3 x 3 = 09 Marks  | Answer ALL Questions (Either or Type) All Questions Carry Equal Marks |          |                                            |
| Section - C | 3 x 8 = 24 Marks  |                                                                       |          |                                            |
| Section- D  | 1 x 10 = 10 Marks | Compulsory Question                                                   |          |                                            |

#### CIA Test II/ Model [3 Hours-5 Units] - 75 Marks

| SECTION     | MARKS             | DESCRIPTION                                                                               | TOTAL    | Remarks                                                 |
|-------------|-------------------|-------------------------------------------------------------------------------------------|----------|---------------------------------------------------------|
| Section – A | 10 x 1 = 10 Marks | MCQ                                                                                       |          |                                                         |
| Section - B | 5 x 3 = 15 Marks  | Answer ALL Questions<br>(Either or Type Questions)<br>Each Questions Carry Equal<br>Marks | 75 Marks | Marks<br>secured will<br>be<br>converted<br>to 10 marks |
| Section - C | 5 x 8 = 40 Marks  |                                                                                           |          |                                                         |
| Section - D | 1 x 10 = 10 Marks | Compulsory Question                                                                       |          |                                                         |

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                       |  |                 |
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|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                       |  | AY:2026-27      |

### End Semester Examination [3 Hours-5 Units] - 75 Marks

| SECTION     | MARKS             | DESCRIPTION                                                                               | TOTAL    |
|-------------|-------------------|-------------------------------------------------------------------------------------------|----------|
| Section – A | 10 x 1 = 10 Marks | MCQ                                                                                       | 75 Marks |
| Section - B | 5 x 3 = 15 Marks  | Answer ALL Questions<br>(Either or Type Questions)<br>Each Questions Carry Equal<br>Marks |          |
| Section - C | 5 x 8 = 40 Marks  |                                                                                           |          |
| Section - D | 1 x 10 = 10 Marks | Compulsory Question                                                                       |          |

\* Self-Study Course Question Paper Pattern: 10 open-choice questions will be given, and students must answer any 5 questions. There will be no CIA.

| SECTION | MARKS            | Type        | TOTAL    |
|---------|------------------|-------------|----------|
| -       | 5x 10 = 50 Marks | Description | 50 Marks |

### 9. DOMAIN-SPECIFIC SKILL COMPONENTS

Every student shall mandatorily complete **any two Domain-Specific Skill Components** during Semesters I to III as a requirement for the successful completion of the programme.

These components may include courses such as:

- NPTEL courses
- NCVRT-certified programmes
- Industry-relevant skill courses offered through Sector Skill Councils
- Programmes under the Board of Apprenticeship
- Student Skill Development Courses (SSDC) offered/specified by the respective departments

Each course shall comprise a minimum of **30 to 35 hours of structured learning**.

Assessment and examination for these components shall be conducted as per the norms prescribed by the respective offering bodies / institution, and the successful completion shall be duly certified. The certificates obtained shall be duly verified by the institution.

Note: NPTEL Course opted for credit transfer and extra credit will not be considered for DSSC.



| Semester – I<br>CORE I: ADVANCED FOOD SCIENCE |             |                       |          |    |   |   |         |
|-----------------------------------------------|-------------|-----------------------|----------|----|---|---|---------|
| Semester                                      | Course Code | Course Name           | Category | L  | T | P | Credits |
| I                                             | 26FNP1CA    | ADVANCED FOOD SCIENCE | CORE     | 48 | - | - | 4       |

|                     |                                                                                                                                                                                                                                                                                                                  |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Preamble</b>     | <p>This course has been designed for students to learn and understand</p> <ul style="list-style-type: none"> <li>• The structure, classification and nutrient composition of foods.</li> <li>• The functional changes during cooking and processing.</li> <li>• The applications of foods in cookery.</li> </ul> |
| <b>Prerequisite</b> | Knowledge on basic nutrition and food science.                                                                                                                                                                                                                                                                   |

| Course Outcomes (Cos) |                                                                                                                                                     |                                  |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| CO Number             | Course Outcomes (COs) Statement                                                                                                                     | Bloom's Taxonomy Knowledge Level |
| CO1                   | Explain the structure, composition, and nutritive value of cereals and millets and their role in food preparation.                                  | K2                               |
| CO2                   | Apply appropriate processing methods to improve the nutritional quality of pulses, while minimizing anti-nutritional factors in nuts, and oilseeds. | K3                               |
| CO3                   | Analyze the effects of processing, storage, and cooking on the nutritional quality, and browning reactions of fruits and vegetables.                | K4                               |
| CO4                   | Evaluate the impact of processing methods and cooking on the nutritional and functional properties of milk, and eggs.                               | K5                               |
| CO5                   | Design nutritionally balanced and appropriate cooking methods for meat, poultry, and fish.                                                          | K6                               |

| Mapping with Program Outcomes: |     |     |     |     |     |
|--------------------------------|-----|-----|-----|-----|-----|
| Cos / POs                      | PO1 | PO2 | PO3 | PO4 | PO5 |
| CO1                            | S   | S   | M   | S   | M   |
| CO2                            | S   | S   | M   | S   | M   |
| CO3                            | S   | S   | M   | S   | M   |
| CO4                            | S   | S   | M   | S   | M   |
| CO5                            | S   | S   | M   | S   | M   |

|          |                         |
|----------|-------------------------|
| 26FNP1CA | / ADVANCED FOOD SCIENCE |
|----------|-------------------------|

### Syllabus

| Unit | Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Hrs | Resources |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------|
| I    | <b>Cereals</b><br>Rice - Structure, composition and nutritive value.<br>Wheat - Structure, composition and nutritive value. Wheat flour - types, baking qualities, manufacture of bread, pastries and cakes.<br>Millets: Jowar, Bajra, Maize and Ragi- composition and nutritive value and products.                                                                                                                                                                               | 9   | Text Book |
| II   | <b>Pulses, Nuts and Oilseeds</b><br>Pulses - Composition and nutritive value, methods of processing - dry and wet processing, vegetable protein mixes, Anti nutritional factors and eliminations.<br>Nuts and Oilseeds- Composition and nutritive value, nutritious food mixes from oil seeds, toxins and preventive measures.<br>Fats and Oil - Sources, nutritional composition, functions, rancidity - types and prevention, role of fat/oil in food preparations.              | 10  | Text Book |
| III  | <b>Fruits and Vegetables</b><br>Classification, composition and nutritive value, selection, storage, pigments, browning reactions (Enzymatic and Non-Enzymatic), pectic substances, ripening of fruits, changes on cooking.<br>Spices and condiments - type, uses and adulteration, role in cookery and medicinal uses.<br>Quality of foods - subjective and objective evaluation of foods.                                                                                        | 10  | Text Book |
| IV   | <b>Milk and Milk products and Egg</b><br>Composition, physical and chemical properties - effects of heat, acid and enzymes, processing of milk - pasteurization, homogenization, types of milk. Milk products - Butter, curd, yogurt, butter milk, cheese, milk powder, khoa, paneer, fresh cream, ghee. Role in cookery.<br>Egg - Structure, composition, grading and selection, effects of heat on egg protein, egg foam (factors affecting foam formation) and role in cookery. | 10  | Text Book |
| V    | <b>Meat, Poultry and Fish</b><br>Meat - Structure, composition, postmortem changes, Rigor mortis, Aging and Tenderization of meat, color of meat, changes of meat in cookery and methods of cooking, meat analogues.<br>Poultry - Classification, composition, market forms, selection factors and methods of cooking.                                                                                                                                                             | 9   | Text Book |

|  |                                                                                                                         |           |  |
|--|-------------------------------------------------------------------------------------------------------------------------|-----------|--|
|  | Fish - Classification, composition, kinds of fish, characteristics of fresh fish, fish products and methods of cooking. |           |  |
|  | <b>Total</b>                                                                                                            | <b>48</b> |  |

|                        |    |                                                                                                                                          |
|------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Text book</b>       | 1. | Shakuntala Manay, N. & Shadaksharaswamy, M., 2025, "Food Facts and Principles", Sixth Edition, New Age International Pvt Ltd, New Delhi. |
|                        | 2. | Srilakshmi, B, 2025, "Food Science", Ninth Edition, New Age International Publishers, New Delhi.                                         |
| <b>Reference Books</b> | 1. | Potter, N.N. & Hotchkiss, J.H., 2012, "Food Science", Fifth Edition, CBS Publishers and Distributors Pvt Ltd, New Delhi.                 |
|                        | 2. | Sunetra Roday, I.N, 2024, "Food Science and Nutrition", Fourth Edition, Oxford University Press.                                         |

|                                |                                                                                                                                                           |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Journal and Magazines</b>   | Journal of Food Science and Technology (JFST) - Springer<br><a href="https://link.springer.com/journal/13197">https://link.springer.com/journal/13197</a> |
| <b>E-Resources and Website</b> | <a href="https://ifst.onlinelibrary.wiley.com/journal/13652621">https://ifst.onlinelibrary.wiley.com/journal/13652621</a>                                 |

|                        |                                                                |
|------------------------|----------------------------------------------------------------|
| <b>Learning Method</b> | Chalk and Talk/Assignment/Seminar/ Group Discussion/Case Study |
|------------------------|----------------------------------------------------------------|

|                            |                                                                            |
|----------------------------|----------------------------------------------------------------------------|
| <b>Focus of the Course</b> | Skill Development/ Employability/ Entrepreneurial Development/ Innovations |
|----------------------------|----------------------------------------------------------------------------|

| Semester – I                          |             |                              |          |    |   |   |         |
|---------------------------------------|-------------|------------------------------|----------|----|---|---|---------|
| CORE II: NUTRITION THROUGH LIFE CYCLE |             |                              |          |    |   |   |         |
| Semester                              | Course Code | Course Name                  | Category | L  | T | P | Credits |
| I                                     | 26FNP1CB    | NUTRITION THROUGH LIFE CYCLE | CORE     | 48 | - | - | 4       |

|                     |                                                                                                                                                                                                                                                                                                                                                 |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Preamble</b>     | <p>This course has been designed for students to learn and understand</p> <ul style="list-style-type: none"> <li>• The role of adequate nutrition in stages of life cycle</li> <li>• The role of nutrition in the growth &amp; development of human body</li> <li>• The importance of proper dietary pattern and its health effects.</li> </ul> |
| <b>Prerequisite</b> | Knowledge about nutritional requirements for various stages of life                                                                                                                                                                                                                                                                             |

| Course Outcomes (Cos) |                                                                                  |                                  |
|-----------------------|----------------------------------------------------------------------------------|----------------------------------|
| CO Number             | Course Outcomes (COs) Statement                                                  | Bloom's Taxonomy Knowledge Level |
| CO1                   | Explain nutritional requirements and plan diets for preconception and pregnancy. | K2                               |
| CO2                   | Analyse dietary practices during lactation and feeding.                          | K4                               |
| CO3                   | Apply nutrition knowledge for growth and development in children.                | K3                               |
| CO4                   | Evaluate nutritional needs and issues in school-age children and adolescents.    | K5                               |
| CO5                   | Assess nutritional requirements and problems in adulthood and old age.           | K6                               |

| Mapping with Program Outcomes: |     |     |     |     |     |
|--------------------------------|-----|-----|-----|-----|-----|
| Cos / POs                      | PO1 | PO2 | PO3 | PO4 | PO5 |
| CO1                            | S   | S   | M   | S   | M   |
| CO2                            | S   | S   | M   | S   | M   |
| CO3                            | S   | S   | M   | S   | M   |
| CO4                            | S   | S   | M   | S   | M   |
| CO5                            | S   | S   | M   | S   | M   |

|          |                              |
|----------|------------------------------|
| 26FNP1CB | NUTRITION THROUGH LIFE CYCLE |
|----------|------------------------------|

## Syllabus

| Unit | Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Hrs | Resources |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------|
| I    | <b>Nutrition in Preconception and Pregnancy</b><br>Nutrition in Preconception-Introduction, premenstrual syndrome, obesity and fertility, eating disorder and fertility, polycystic ovary syndrome, factors contributing infertility in female, nutrient intake for pre-conceptual women<br>Nutrition in pregnancy - Stages of gestation, maternal physiological adjustments, weight gain during pregnancy, nutritional requirements and dietary guidelines for pregnancy, miscarriage, preterm delivery and complications of pregnancy.                        | 10  | Text Book |
| II   | <b>Nutrition in Lactation</b><br>Nutrition in Lactation - Physiological adjustments during lactation, Physiology of milk Production - hormonal controls and reflex action, lactation in relation to growth and health of infants, Breast feeding and problems of breast feeding, Factors affecting the quantity and quality of Breast Milk, Nutritional composition of colostrum and mature milk, special foods during lactation, nutritional requirements during lactation. Expressing and storing breast milk, Breast feeding promotion network of India.     | 10  | Text Book |
| III  | <b>Nutrition in Infancy, Toddlers and Preschool age</b><br>Nutrition in Infancy - Rate of growth, weight as the indicator, premature infant, feeding premature infants, low birth weight, breast vs. bottle feeding, nutritional allowances, complementary feeding, and weaning foods<br>Nutrition in Toddlers-Physiological and Cognitive development, feeding skill and behavior, common nutrition problems.<br>Nutrition in Preschool Children - Growth and development of preschool children, food habits, nutritional requirements and dietary guidelines. | 10  | Text Book |
| IV   | <b>Nutrition in School Age and Adolescence</b><br>Nutrition in School Age - Early and middle childhood, Growth and development, nutritional requirements and dietary guidelines, packed lunches, post school snacks, physical activity and nutrition.<br>Nutrition During Adolescence - Physical growth, physiological and psychological changes associated with puberty (menarche and menstruation in girls), nutritional requirements and dietary guidelines, eating disorders -                                                                              | 9   | Text Book |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |           |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|
|   | anorexia nervosa, bulimia nervosa, physiological and nutritional problems in adolescent pregnancy and its requirements and complications, physical activity and nutrition.                                                                                                                                                                                                                                                                                                                       |           |           |
| V | <b>Nutrition in Adulthood and Old age</b><br>Nutrition during Adulthood – Physiological changes in adulthood, menopause and associated nutritional concerns, work efficiency, nutritional requirements and dietary guidelines.<br>Nutrition for Old Age – senescence and sarcopenia – theories of ageing, physiologic changes, Common Nutrition problems, Factors affecting Food intake, Nutrition requirements and dietary guidelines during old age, community nutrition programme for old age | 9         | Text Book |
|   | <b>Total</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>48</b> |           |

|                 |    |                                                                                                           |
|-----------------|----|-----------------------------------------------------------------------------------------------------------|
| Text book       | 1. | Srilakshmi.B, 2010 "Dietetics", 7th edition., New Age International Pvt. Ltd, New Delhi.                  |
|                 | 2. | Ravinder Chandra, Pulkit Mathur, "Nutrition-A lifecycle approach" Orient Blackswan                        |
| Reference Books | 1. | Brown, J.E, 2011, "Nutrition Through the Lifecycle", 4th edition Wadsworth Cengage.                       |
|                 | 2. | Mahan and Escott, K & S, 2004, "Food Nutrition and Diet Therapy", 11th Edn., W.S. Saunders's Company, USA |

|                         |                                                                                                                                                             |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Journal and Magazines   | <a href="https://www.cambridge.org/core/journals/journal-of-nutritional-science">https://www.cambridge.org/core/journals/journal-of-nutritional-science</a> |
| E-Resources and Website | <a href="https://www.cambridge.org/core/journals/journal-of-nutritional-science">https://www.cambridge.org/core/journals/journal-of-nutritional-science</a> |

|                 |                                                       |
|-----------------|-------------------------------------------------------|
| Learning Method | Chalk and Talk/ Assignment/Seminar/ Group Discussion/ |
|-----------------|-------------------------------------------------------|

|                     |                                  |
|---------------------|----------------------------------|
| Focus of the Course | Skill Development/ Employability |
|---------------------|----------------------------------|

| Semester - I<br>CORE III: NUTRITIONAL BIOCHEMISTRY |             |                          |          |    |   |   |         |
|----------------------------------------------------|-------------|--------------------------|----------|----|---|---|---------|
| Semester                                           | Course Code | Course Name              | Category | L  | T | P | Credits |
| I                                                  | 26FNP1CC    | NUTRITIONAL BIOCHEMISTRY | CORE     | 48 | - | - | 4       |

|                       |                                                                                                                                                                                                                                                                                           |                                  |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Preamble              | This course has been designed for students to learn and understand <ul style="list-style-type: none"><li>• The application of biochemistry in the field of Food and Nutrition</li><li>• The on-assay techniques and instrumentation</li><li>• The role of nutrients in the body</li></ul> |                                  |
| Prerequisite          | Knowledge on metabolic process in human body                                                                                                                                                                                                                                              |                                  |
| Course Outcomes (COs) |                                                                                                                                                                                                                                                                                           |                                  |
| CO Number             | Course Outcomes (COs) Statement                                                                                                                                                                                                                                                           | Bloom's Taxonomy Knowledge Level |
| CO1                   | Infer on carbohydrate metabolism                                                                                                                                                                                                                                                          | K2                               |
| CO2                   | Illustrate the cholesterol metabolism and the inborn errors of fat metabolism                                                                                                                                                                                                             | K3                               |
| CO3                   | Explain the biosynthesis and importance of protein metabolism in biochemical analysis                                                                                                                                                                                                     | K3                               |
| CO4                   | Interpret the significance of nucleic acids in the field of biochemistry                                                                                                                                                                                                                  | K4                               |
| CO5                   | Editorialize the principle and techniques involved in the field of biochemistry                                                                                                                                                                                                           | K6                               |

| Mapping with Program Outcomes: |     |     |     |     |     |
|--------------------------------|-----|-----|-----|-----|-----|
| COs/POs                        | PO1 | PO2 | PO3 | PO4 | PO5 |
| CO1                            | S   | M   | M   | S   | M   |
| CO2                            | M   | S   | S   | M   | S   |
| CO3                            | M   | M   | S   | M   | M   |
| CO4                            | S   | M   | M   | M   | S   |
| CO5                            | M   | S   | S   | M   | S   |

## Syllabus

| Unit | Content                                                                                                                                                                                                                                                                                                                                                                                  | Hours | E-Contents / Resources |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------|
| I    | <b>Carbohydrates</b><br>Carbohydrates - classification, functions. Glycolysis, TCA Cycle, HMP Shunt and Energy Production, Glycogenesis, Gluconeogenesis. Renal threshold for Glucose. Inborn Error of Carbohydrate Metabolism - Lactose Intolerance, fructosuria, Galactosemia.                                                                                                         | 10    | Text Book              |
| II   | <b>Fatty Acids</b><br>Fatty Acids - Classification, Functions and Oxidation of Saturated and Unsaturated Fatty Acids, Biosynthesis of Cholesterol, Structure and Functions of Lecithin, Cephalin. Inborn errors of Fat Metabolism - Niemann-Pick Disease, Gouchers Disease                                                                                                               | 10    | Text Book              |
| III  | <b>Protein</b><br>Protein- Classification, Function & Metabolism of Protein, Denaturation, Transamination, Deamination, Decarboxylation, Urea Formation and Protein Synthesis.<br>Amino acids - Classification, Function & Metabolism of Amino acids, phenylalanine, leucine, methionine and tryptophane.<br>Inborn errors of Amino acids - maple syrup urine disease, phenyl ketonuria. | 08    | Reference Book         |
| IV   | <b>Nucleic acids</b><br>Nucleic acids - structure, function and properties of DNA and RNA. Biosynthesis and breakdown of purine and pyrimidine nucleotides. Assay Techniques: Bioassay techniques, molecular cloning, microbiological assay of vitamins. ELISA.                                                                                                                          | 10    | Text Book              |
| V    | <b>Techniques in nutritional biochemistry</b><br>in nutritional biochemistry- Separation of sugars and amino acids by chromatography. Electrophoresis separation of proteins. Colorimetry                                                                                                                                                                                                | 10    | Text Book              |

|  |                                                                                                                                                                                                                             |           |  |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--|
|  | and spectrophotometer - principle and procedures. pH meter – working and application. Principle and procedure of operation of GC, HPLC and HPTLC. Elemental analysis by atomic absorption spectroscopy and flame photometry |           |  |
|  | <b>Total</b>                                                                                                                                                                                                                | <b>48</b> |  |

Note: Structure not needed

|                        |    |                                                                                                                      |
|------------------------|----|----------------------------------------------------------------------------------------------------------------------|
| <b>Text Books</b>      | 1. | Lehninger A.L, 2000, "Biochemistry". 7Edition, Worth Publishers Inc., New York.                                      |
|                        | 2. | Deb A.C, 2004, "Fundamentals of Biochemistry", 8 Edition New Central Book Agency Pvt Ltd., Kolkata -India.           |
| <b>Reference Books</b> | 1. | Shanmugam. A, 2004, "Fundamentals of Biochemistry for Medical Students", 7th Edition Karthik Printers, India.        |
|                        | 2. | Sathyanarayana. U and Chakrapani. U, 2004, "Biochemistry". 3rd Edition Books and Allied Publication, Kolkata, India. |
|                        | 3. | Tom Brody, 2007, "Nutritional Biochemistry", 2nd Edition Academic press, U.K.                                        |
|                        | 4. | Sharma. D and Devanshi Sharma. C ,2015, "Nutritional Biochemistry", 2nd Edition CBS publishing pvt. Ltd., New Delhi. |

|                                |                                                                                                                                                                           |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Journal and Magazines</b>   | <a href="https://www.sciencedirect.com/journal/the-journal-of-nutritional-biochemistry">https://www.sciencedirect.com/journal/the-journal-of-nutritional-biochemistry</a> |
| <b>E-Resources and Website</b> | <a href="https://www.sabapub.com/index.php/jcnb">https://www.sabapub.com/index.php/jcnb</a>                                                                               |

|                            |                                                           |
|----------------------------|-----------------------------------------------------------|
| <b>Learning Method</b>     | Chalk and Talk / Assignment/ Seminar/ Interactive session |
| <b>Focus of the Course</b> | Skill Development/ Employability                          |

| Semester – I            |             |                |          |    |   |   |         |
|-------------------------|-------------|----------------|----------|----|---|---|---------|
| CORE IV: FOOD CHEMISTRY |             |                |          |    |   |   |         |
| Semester                | Course Code | Course Name    | Category | L  | T | P | Credits |
| I                       | 26FNP1CD    | FOOD CHEMISTRY | CORE     | 48 | - | - | 4       |

|                     |                                                                                                                                                                                                                                                                                                                                                         |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Preamble</b>     | <p>This course has been designed for students to learn and understand</p> <ul style="list-style-type: none"> <li>• The gain insight into the chemistry of foods</li> <li>• The chemistry underlying the properties of various food components</li> <li>• The properties of bioactive compounds in spices, condiments, fruits and vegetables.</li> </ul> |
| <b>Prerequisite</b> | Basic knowledge of general chemistry and basic nutrition concepts                                                                                                                                                                                                                                                                                       |

| Course Outcomes (Cos) |                                                                                                               |                                  |
|-----------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------|
| CO Number             | Course Outcomes (COs) Statement                                                                               | Bloom's Taxonomy Knowledge Level |
| CO1                   | Understand the structure and properties of water and ice, Learn the structure, permanence and Emulsions.      | K2                               |
| CO2                   | Explain the chemistry of mono and oligosaccharides, Use of Polysaccharides in gelatinization, retrogradation. | K3                               |
| CO3                   | Apply the structure, physicochemical properties, functional properties of amino acids.                        | K4                               |
| CO4                   | Comprehend the types, sources, and properties of fats and oils                                                | K5                               |
| CO5                   | Evaluate the chemistry of Individual aroma compounds-vegetable, fruit and spice and condiment.                | K6                               |

| Mapping with Program Outcomes: |     |     |     |     |     |
|--------------------------------|-----|-----|-----|-----|-----|
| Cos / POs                      | PO1 | PO2 | PO3 | PO4 | PO5 |
| CO1                            | S   | S   | M   | M   | M   |
| CO2                            | S   | M   | M   | M   | S   |
| CO3                            | S   | M   | M   | S   | S   |
| CO4                            | S   | M   | S   | S   | M   |
| CO5                            | S   | S   | M   | S   | M   |

|          |                |
|----------|----------------|
| 26FNP1CD | FOOD CHEMISTRY |
|----------|----------------|

## Syllabus

| Unit         | Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Hrs       | Resources      |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------|
| I            | <b>Chemistry of water, ice and colloidal system</b><br>Structure and properties of water and ice, types of water, concept of water activity and Food spoilage, Sorption phenomena. Gels: Structure, formation, strength, types and permanence Emulsions: formation, stability, surfactants and emulsifiers, Foams: Structure, formation and stabilization                                                                                                                                 | 08        | Text Book      |
| II           | <b>Chemistry of Starch and Non- starch polysaccharides</b><br>Starch: structure, properties of amylose and amylopectin, Characteristics of food starches and polysaccharide hydrolysis. Modified Food Starches - various processing techniques and its industrial applications<br>Non-starch polysaccharides: properties and applications of cellulose, hemicellulose, pectins, gums (gum arabic, guar gum, xanthan gum), agar, alginates, carrageenan, $\beta$ - Glucans and Glucomannan | 10        | Reference Book |
| III          | <b>Chemistry of Protein</b><br>Classification, structure, physicochemical properties, functional properties, chemical and enzymatic modifications - denaturation and other chemical changes, processing induced physical, chemical and nutritional changes, texturized proteins, protein isolates, concentrates, protein hydrolysate and complementary protein.                                                                                                                           | 10        | Reference Book |
| IV           | <b>Chemistry of Fats and Oils</b><br>Classification, distribution, composition, physical and chemical properties. Effect of processing on chemical structure and physical properties; functional properties of fat, inter-esterification of fats. Lipids exposed to frying conditions and hydrogenated fat. Lipid-protein complexes. Fat deterioration and antioxidants and fat substitutes.                                                                                              | 10        | Text Book      |
| V            | <b>Chemistry of Active Compounds</b><br>Fruits and vegetables - chemical and functional properties of quercetin, anthocyanin, flavonoids, tannin and gallic acid. Spices - chemical and functional properties of curcumin, capsaicin, eugenol, piperine, cinnamaldehyde and allyl sulphide (spices). Condiments - chemical and functional properties of anethole, aldehyde cumin, allicin, gingerol and myristicin.                                                                       | 10        | Text Book      |
| <b>Total</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>48</b> |                |

|                                                                                                |
|------------------------------------------------------------------------------------------------|
| <b>Note:</b> Case studies related to the above topics to be discussed (Examined Internal only) |
|------------------------------------------------------------------------------------------------|

|                        |    |                                                                                                                                                |
|------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Text book</b>       | 1. | Shakuntala Manay, Shadaksharaswamy M, 2022, "Foods, Facts and Principle", 2th Edition, New Age International Pvt Ltd Publishers, Delhi, India. |
|                        | 2. | Fennema, O. R. 2017, Fennema's Food Chemistry, 5 <sup>th</sup> Edn., CRC Press, Boca Raton, USA.                                               |
| <b>Reference Books</b> | 1. | Swaminathan, M. 2005, "Food Science, Chemistry and Experimental Foods", Bappco Publishers, Bangalore.                                          |
|                        | 2. | Paul, and Palmer, P.C, 2000, "Food Theory and Applications", John Wiley and Sons, New York.                                                    |
|                        | 3. | Belitz, H.D., Grosch, W. and Schieberle, P. 2009, Food Chemistry, 4 <sup>th</sup> Edn., Springer, Berlin, Germany.                             |
|                        | 4. | Potter, N. N. and Hotchkiss, J. H. 2012, Food Science, 5 <sup>th</sup> Edn., Springer, New York, USA.                                          |

|                                |                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Journal and Magazines</b>   | Journal of Food Science Chemistry - Springer                                                                                                                                                                                                                                                                                                    |
| <b>E-Resources and Website</b> | <a href="https://www.rsc.org">https://www.rsc.org</a> - Royal Society of Chemistry - For scholarly books and resources on food chemistry, including topics like bioactive compounds, metabolism, and analytical techniques<br><a href="https://www.sciencedirect.com">https://www.sciencedirect.com</a> - For scholarly food chemistry articles |

|                            |                                  |
|----------------------------|----------------------------------|
| <b>Learning Method</b>     | Chalk and Talk/ Group Discussion |
| <b>Focus of the Course</b> | Skill Development/ Employability |

| Semester – I<br>CORE PRACTICAL I: FOOD SCIENCE AND FOOD CHEMISTRY |             |                                 |          |   |   |    |         |
|-------------------------------------------------------------------|-------------|---------------------------------|----------|---|---|----|---------|
| Semester                                                          | Course Code | Course Name                     | Category | L | T | P  | Credits |
| I                                                                 | 26FNP1CP    | FOOD SCIENCE AND FOOD CHEMISTRY | CORE     | - | - | 48 | 2       |

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Preamble</b>     | <p>This course has been designed for students to learn and understand</p> <ul style="list-style-type: none"> <li>the physical, chemical, and biochemical changes that occur in food during processing and cooking</li> <li>practical techniques and principle involved in evaluating food quality, composition, and sensory characteristics</li> <li>the scientific principles with culinary applications.</li> </ul> |
| <b>Prerequisite</b> | Knowledge on basic food science and chemistry of foods.                                                                                                                                                                                                                                                                                                                                                               |

| Course Outcomes (Cos) |                                                                     |                                  |
|-----------------------|---------------------------------------------------------------------|----------------------------------|
| CO Number             | Course Outcomes (COs) Statement                                     | Bloom's Taxonomy Knowledge Level |
| CO1                   | Explain and demonstrate key physicochemical changes in foods        | K2                               |
| CO2                   | Analyse and interpret the effects of processing methods on foods    | K4                               |
| CO3                   | Perform laboratory techniques related to food analysis              | K3                               |
| CO4                   | Evaluate food quality through sensory analysis and identify defects | K5                               |
| CO5                   | Apply preventive and control methods for food quality improvement   | K6                               |

| Mapping with Program Outcomes: |     |     |     |     |     |
|--------------------------------|-----|-----|-----|-----|-----|
| Cos / POs                      | PO1 | PO2 | PO3 | PO4 | PO5 |
| CO1                            | M   | S   | S   | S   | S   |
| CO2                            | S   | M   | M   | S   | M   |
| CO3                            | M   | M   | S   | M   | S   |
| CO4                            | S   | M   | S   | M   | S   |
| CO5                            | M   | S   | M   | M   | M   |

|          |                                 |
|----------|---------------------------------|
| 26FNP1CP | FOOD SCIENCE AND FOOD CHEMISTRY |
|----------|---------------------------------|

| S.No. | Contents                                                                                                                            |
|-------|-------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Dextrinization, Gelatinization of Starch, Retrogradation and Syneresis, Malting of cereals.                                         |
| 2     | Microscopic examination of uncooked and gelatinized starch.                                                                         |
| 3     | Gluten Formation.                                                                                                                   |
| 4     | Effect of Soaking, germination and fermentation of Pulses.                                                                          |
| 5     | Enzymatic Browning and Methods of Prevention.                                                                                       |
| 6     | Effect of acids, alkali and heat on water soluble and fat-soluble pigments.                                                         |
| 7     | Scum formation, boiling over and scorching of milk.<br>Coagulation and precipitation of milk proteins.                              |
| 8     | Testing freshness of egg- Coagulation of egg white and egg yolk, Boiled Egg, Poached Egg, Omelettes, Custards, Cake and Mayonnaise. |
| 9     | Changes observed in cooking meat, fish and poultry, testing the tenderness of meat.                                                 |
| 10    | Smoking Temperature of different fats, Factors affecting absorption of fats.                                                        |
| 11    | Stages of Sugar Cookery, Preparation of Fondant, Fudge, Caramel and Toffee.                                                         |
| 12    | Sensory Evaluation of Food.                                                                                                         |

|                   |                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Text Books</b> | 1. Mohini Sethi & Eram. S. Rao, 2021, "Food Science – Experiments and Applications", 2nd Edition, CBS Publishers, India. |
|-------------------|--------------------------------------------------------------------------------------------------------------------------|

|                        |                                     |
|------------------------|-------------------------------------|
| <b>Learning Method</b> | Demonstration/ Hands on Experiments |
|------------------------|-------------------------------------|

|                            |                                  |
|----------------------------|----------------------------------|
| <b>Focus of the Course</b> | Skill Development/ Employability |
|----------------------------|----------------------------------|



| Semester - I<br>CORE PRACTICAL II: FOOD ANALYSIS |             |               |          |   |   |    |         |
|--------------------------------------------------|-------------|---------------|----------|---|---|----|---------|
| Semester                                         | Course Code | Course Name   | Category | L | T | P  | Credits |
| I                                                | 26FNP1CQ    | FOOD ANALYSIS | CORE     | - | - | 72 | 3       |

|                     |                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Preamble</b>     | <p>This course has been designed for students to learn and understand</p> <ul style="list-style-type: none"> <li>• the basic principles for analysing nutrients in food.</li> <li>• the quality control and assurance techniques in food analysis.</li> <li>• the application of classical and modern analytical methods in food composition and safety evaluation.</li> </ul> |
| <b>Prerequisite</b> | Basic knowledge of food chemistry and nutrition.                                                                                                                                                                                                                                                                                                                               |

| Course Outcomes (Cos) |                                                                           |                                  |
|-----------------------|---------------------------------------------------------------------------|----------------------------------|
| CO Number             | Course Outcomes (COs) Statement                                           | Bloom's Taxonomy Knowledge Level |
| CO1                   | Identify appropriate analytical methods for estimating nutrients in foods | K3                               |
| CO2                   | Demonstrate techniques in the estimation of phytochemical Constituents.   | K3                               |
| CO3                   | Interpret experimental results and assess food quality parameters         | K4                               |
| CO4                   | Interpret experimental results and assess food quality parameters         | K5                               |
| CO5                   | Analyze data from food tests to determine nutritional composition.        | K6                               |

| Mapping with Program Outcomes: |     |     |     |     |     |
|--------------------------------|-----|-----|-----|-----|-----|
| Cos / POs                      | PO1 | PO2 | PO3 | PO4 | PO5 |
| CO1                            | M   | S   | S   | S   | M   |
| CO2                            | S   | M   | M   | M   | M   |
| CO3                            | M   | M   | S   | M   | S   |
| CO4                            | M   | M   | S   | M   | M   |
| CO5                            | M   | S   | M   | M   | M   |

|          |               |
|----------|---------------|
| 26FNP1CQ | FOOD ANALYSIS |
|----------|---------------|

| S.No. | Contents                                          |
|-------|---------------------------------------------------|
| 1     | Determination of Moisture content and Ash content |
| 2     | Estimation of Carbohydrates by Anthrone Method    |
| 3     | Estimation of Cellulose in plant material         |
| 4     | Determination of Crude Fibre Content              |
| 5     | Estimation of protein by Lowry's Method           |
| 6     | Estimation of protein by Kjeldahl Method.         |
| 7     | Estimation of total Fat by Soxhlet Extraction     |
| 8     | Estimation of Starch by Anthrone Method.          |
| 9     | Estimation of Ascorbic Acid by volumetric method  |
| 10    | Estimation of Iron                                |
| 11    | Estimation of Phosphorus                          |
| 12    | Estimation of Calcium                             |

|            |    |                                                                                                                                                     |
|------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Text Books | 1. | Raghuramulu, N., Madhavan Nair, K., & Kalyanasundaram, S. (2003). <i>A Manual of Laboratory Techniques</i> . National Institute of Nutrition, ICMR. |
|            | 2. | Sadasivam, S. & Manickam, A. (2019). <i>Biochemical Methods</i> . New Age International Publishers.                                                 |

|                 |                                                   |
|-----------------|---------------------------------------------------|
| Learning Method | Demonstration/ Hands on Experiments/ Group Trials |
|-----------------|---------------------------------------------------|

|                     |                                                                            |
|---------------------|----------------------------------------------------------------------------|
| Focus of the Course | Skill Development/ Employability/ Entrepreneurial Development/ Innovations |
|---------------------|----------------------------------------------------------------------------|

| Semester – I<br>DSE I: FOOD PRODUCT DEVELOPMENT |             |                          |          |   |   |    |         |
|-------------------------------------------------|-------------|--------------------------|----------|---|---|----|---------|
| Semester                                        | Course Code | Course Name              | Category | L | T | P  | Credits |
| I                                               | 26FNP1DP    | FOOD PRODUCT DEVELOPMENT | DSE      | - | - | 48 | 2       |

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Preamble</b>     | <p>This course has been designed for students to learn and understand</p> <ul style="list-style-type: none"> <li>• Understand the complete process of new food product development.</li> <li>• Gain practical experience in recipe formulation, standardization, costing, packaging, and marketing.</li> <li>• Apply scientific principles to innovate, evaluate, and present food products for specific populations.</li> </ul> |
| <b>Prerequisite</b> | Knowledge in basic nutrition, food science, and meal management                                                                                                                                                                                                                                                                                                                                                                  |

| Course Outcomes (Cos) |                                                                                 |                                  |
|-----------------------|---------------------------------------------------------------------------------|----------------------------------|
| CO Number             | Course Outcomes (COs) Statement                                                 | Bloom's Taxonomy Knowledge Level |
| CO1                   | Understand the stages and types of food product development.                    | K2                               |
| CO2                   | Apply formulation principles to create recipes for different population groups. | K3                               |
| CO3                   | Conduct basic sensory evaluation and recipe standardization                     | K3                               |
| CO4                   | Estimate nutritive value, cost, and fix suitable packaging and pricing          | K4                               |
| CO5                   | Prepare marketing material and understand food labelling and regulations.       | K6                               |

| Mapping with Program Outcomes: |     |     |     |     |     |
|--------------------------------|-----|-----|-----|-----|-----|
| Cos / POs                      | PO1 | PO2 | PO3 | PO4 | PO5 |
| CO1                            | S   | M   | S   | M   | S   |
| CO2                            | M   | S   | M   | S   | M   |
| CO3                            | S   | S   | M   | S   | M   |
| CO4                            | S   | M   | S   | M   | S   |
| CO5                            | M   | S   | S   | S   | S   |

|          |                          |
|----------|--------------------------|
| 26FNP1DP | FOOD PRODUCT DEVELOPMENT |
|----------|--------------------------|

**S.No****Contents**

- 1 Brainstorm innovative product ideas and prepare a concept note.
- 2 Develop a basic prototype recipe for the selected product idea.
- 3 Standardize the recipe with multiple trials to finalize formulation.
- 4 Conduct sensory evaluation using scorecards or hedonic scale.
- 5 Calculate the nutritive value using ICMR/NIN data.
- 6 Determine appropriate portion size and suggested daily intake.
- 7 Estimate raw material cost and fix Suggested Retail Price (SRP).
- 8 Design a basic food label including nutrition facts and ingredients.
- 9 Observe and record shelf-life changes for 3-5 days.
- 10 Demonstrate suitable packaging material and techniques.
- 11 Prepare marketing posters, brochures, or social media ads.
- 12 Final presentation of product with label, costing, and demo.

|                |    |                                                                                                                    |
|----------------|----|--------------------------------------------------------------------------------------------------------------------|
| <b>Manuals</b> | 1. | Fuller, G. W. (2011). <i>New Food Product Development: From Concept to Marketplace</i> (Third Edition). CRC Press. |
|                | 2. | ICMR/NIN. <i>Indian Food Composition Tables</i> .                                                                  |

|                        |                                                               |
|------------------------|---------------------------------------------------------------|
| <b>Learning Method</b> | Demonstration/ Hands on Experiments/ Group Trials/Peer Review |
|------------------------|---------------------------------------------------------------|

|                            |                                                                     |
|----------------------------|---------------------------------------------------------------------|
| <b>Focus of the Course</b> | Skill Development/ Product Innovation / Entrepreneurial Development |
|----------------------------|---------------------------------------------------------------------|

| Semester – I<br>DSE I: INDIGENOUS FOODS |             |                  |          |   |   |    |         |
|-----------------------------------------|-------------|------------------|----------|---|---|----|---------|
| Semester                                | Course Code | Course Name      | Category | L | T | P  | Credits |
| I                                       | 26FNP1DQ    | INDIGENOUS FOODS | DSE      | - | - | 48 | 2       |

|                     |                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Preamble</b>     | <p>This course has been designed for students to learn and understand</p> <ul style="list-style-type: none"> <li>• preparation, nutritional value, and cultural significance of indigenous foods</li> <li>• traditional food practices and their application in modern nutrition</li> <li>• diversity, processing techniques, and health benefits of indigenous foods.</li> </ul> |
| <b>Prerequisite</b> | - Basic knowledge of indigenous food preparation methods.                                                                                                                                                                                                                                                                                                                         |

| Course Outcomes (Cos) |                                                                                                                 |                                  |
|-----------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------|
| CO Number             | Course Outcomes (COs) Statement                                                                                 | Bloom's Taxonomy Knowledge Level |
| CO1                   | Explain the significance, regional diversity, and traditional preparation methods of indigenous foods of India. | K2                               |
| CO2                   | Demonstrate the preparation of selected indigenous dishes using standard procedures and traditional techniques. | K3                               |
| CO3                   | Analyze the regional variations and preparation methods of indigenous foods across India.                       | K4                               |
| CO4                   | Evaluate the sensory attributes, quality, and acceptability of prepared indigenous dishes.                      | K5                               |
| CO5                   | Develop and standardize value-added indigenous food products with improved nutritional quality.                 | K6                               |

| Mapping with Program Outcomes: |     |     |     |     |     |
|--------------------------------|-----|-----|-----|-----|-----|
| Cos / POs                      | PO1 | PO2 | PO3 | PO4 | PO5 |
| CO1                            | S   | M   | M   | M   | M   |
| CO2                            | S   | M   | S   | M   | S   |
| CO3                            | S   | M   | S   | M   | M   |
| CO4                            | M   | S   | S   | M   | S   |
| CO5                            | S   | S   | M   | S   | S   |

|          |                  |
|----------|------------------|
| 26FNP1DQ | INDIGENOUS FOODS |
|----------|------------------|

| S.No. | Contents                                                                |
|-------|-------------------------------------------------------------------------|
| 1     | Preparation of Misal Pav and Sabudana Khichdi.                          |
| 2     | Preparation of Makki di Roti with Sarson da Saag.                       |
| 3     | Preparation of Dhokla and Thepla.                                       |
| 4     | Preparation of Litti Chokha and Malpua.                                 |
| 5     | Preparation of Hyderabad Biryani and Mirchi ka Salan.                   |
| 6     | Preparation of Dal Baati Churma and Ker Sangri                          |
| 7     | Preparation of Momos and Soibum Nga Thongba                             |
| 8     | Preparation of Pongal, Ragi Mudde and Kambu Koozh                       |
| 9     | Preparation of Appam with Coconut Milk and Puttu with Kadala Curry.     |
| 10    | Preparation of Goan Fish Curry and Cafreal                              |
| 11    | Preparation of North Indian Garam Masala and South Indian Sambar Powder |
| 12    | Preparation of West Indian Goda Masala.                                 |

|                   |    |                                                                                                                       |
|-------------------|----|-----------------------------------------------------------------------------------------------------------------------|
| <b>Text Books</b> | 1. | Sonal Ved, 2018, <i>Tiffin: 500 Authentic Recipes Celebrating India's Regional Cuisine</i> , 1st Edition, Roli Books. |
|                   | 2. | Chandra Padmanabhan, 2009, <i>Dakshin: Vegetarian Cuisine from South India</i> , 1st Edition, HarperCollins India.    |

|                        |                                     |
|------------------------|-------------------------------------|
| <b>Learning Method</b> | Demonstration/ Hands on Experiments |
|------------------------|-------------------------------------|

|                            |                                  |
|----------------------------|----------------------------------|
| <b>Focus of the Course</b> | Skill Development/ Employability |
|----------------------------|----------------------------------|

| Semester - I                                        |             |                                            |          |   |   |    |         |
|-----------------------------------------------------|-------------|--------------------------------------------|----------|---|---|----|---------|
| DSE - I: HARVEST TECHNOLOGY OF AGRICULTURAL PRODUCE |             |                                            |          |   |   |    |         |
| Semester                                            | Course Code | Course Name                                | Category | L | T | P  | Credits |
| I                                                   | 26FNP1DR    | HARVEST TECHNOLOGY OF AGRICULTURAL PRODUCE | DSE      | - | - | 48 | 2       |

|                       |                                                                                                                                                                                                                                                                                                                                                                                                          |                                  |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Preamble              | This course has been designed for students to learn and understand <ul style="list-style-type: none"><li>• The safety control measures in handling foods from harvest to consumption agencies of control.</li><li>• Good agricultural and horticultural practices for food safety management.</li><li>• Importance of pre-harvest physiology for the long-term storage of horticultural crops.</li></ul> |                                  |
| Prerequisite          | To learn the concepts of post-harvest handling of foods                                                                                                                                                                                                                                                                                                                                                  |                                  |
| Course Outcomes (COs) |                                                                                                                                                                                                                                                                                                                                                                                                          |                                  |
| CO Number             | Course Outcomes (COs) Statement                                                                                                                                                                                                                                                                                                                                                                          | Bloom's Taxonomy Knowledge Level |
| CO1                   | Identify physiological and biochemical changes in produce during post-harvest stages.                                                                                                                                                                                                                                                                                                                    | K1                               |
| CO2                   | Demonstrate proper harvesting, grading, and storage techniques for different crops.                                                                                                                                                                                                                                                                                                                      | K2                               |
| CO3                   | Analyse quality and shelf-life parameters of fresh and stored produce.                                                                                                                                                                                                                                                                                                                                   | K3                               |
| CO4                   | Apply pre-treatment and value-addition techniques to reduce losses.                                                                                                                                                                                                                                                                                                                                      | K5                               |
| CO5                   | Assess packaging and transportation systems for perishables.                                                                                                                                                                                                                                                                                                                                             | K6                               |

| Mapping with Program Outcomes: |     |     |     |     |     |
|--------------------------------|-----|-----|-----|-----|-----|
| Cos / POs                      | PO1 | PO2 | PO3 | PO4 | PO5 |
| CO1                            | S   | M   | M   | S   | M   |
| CO2                            | M   | S   | S   | M   | S   |
| CO3                            | M   | M   | S   | M   | M   |
| CO4                            | S   | M   | M   | M   | S   |
| CO5                            | M   | S   | S   | M   | S   |

### Syllabus

| S.No | Contents                                                                                |
|------|-----------------------------------------------------------------------------------------|
| 1    | Determination of maturity indices in fruits and vegetables                              |
| 2    | Assessment of physiological loss in weight during storage                               |
| 3    | Grading and sorting techniques of fruits and vegetables based on size, shape, and color |
| 4    | Post-harvest treatments: Washing, sanitizing, and drying practices                      |
| 5    | Effect of pre-cooling on the shelf life of produce                                      |
| 6    | Demonstration of traditional vs. modern harvesting tools                                |
| 7    | Study of ethylene's role in ripening and its control measures                           |
| 8    | Measurement of firmness, TSS (°Brix), and acidity in fruits                             |
| 9    | Packaging methods: Vacuum packaging, modified atmosphere packaging (MAP)                |
| 10   | Effect of cold storage on quality parameters of selected fruits                         |
| 11   | Storage studies: Room temperature vs. refrigerated vs. controlled atmosphere            |
| 12   | Determination of maturity indices in fruits and vegetables                              |

|         |    |                                                                                                                                                                       |
|---------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Manuals | 1. | Kadar, A.A., 1992, Postharvest Technology of Horticultural Crops. University of California, ANR Publications.                                                         |
|         | 2. | Wills, R., McGlasson, B., Graham, D., & Joyce, D, 2007, Postharvest: An Introduction to the Physiology and Handling of Fruit, Vegetables and Ornamentals. UNSW Press. |

|                 |                                                   |
|-----------------|---------------------------------------------------|
| Learning Method | Demonstration/ Hands on Experiments/ Group Trials |
|-----------------|---------------------------------------------------|

|                     |                                                                            |
|---------------------|----------------------------------------------------------------------------|
| Focus of the Course | Skill Development/ Employability/ Entrepreneurial Development/ Innovations |
|---------------------|----------------------------------------------------------------------------|

  
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|                                                                                                                               |      |      |
|-------------------------------------------------------------------------------------------------------------------------------|------|------|
|  <b>Dr.N.G.P. Arts and Science College</b> |      |      |
| <b>APPROVED</b>                                                                                                               |      |      |
| BoS-21st<br>06.04.26                                                                                                          | AC - | GB - |

M.Sc. Food and Nutrition (Students admitted during the AY 2026-27)