

**Dr. N.G.P. ARTS AND SCIENCE COLLEGE**  
**REGULATIONS 2022-23 for Under Graduate Programme**

**(Outcome Based Education model with Choice Based Credit System)**

**B.Sc. FOOD SCIENCE AND NUTRITION**

**(For the students admitted during the academic year 2022-23 and onwards)**

**Eligibility:**

A candidate who has passed in Higher Secondary Examination with any Academic stream or Vocational stream as one of the subject under Higher Secondary Board of Examination and as per the norms set by the Government of Tamil Nadu 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 **Bachelor of Science in Food Science and Nutrition Degree Examination** of this College after a course of study of three 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 enable the students to implement the basic food science in operation.
2. To provide basic knowledge and practice to enhance the quality of life through the improvement of human health and nutritional status.
3. To develop skill 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 food ravages.
5. To understand the prevalence of malnutrition in Indian scenario and gain knowledge on effective methods to combat malnutrition.





## PROGRAMME OUTCOMES

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

PO Number	PO Statement
PO1	Acquire knowledge and develop aptitude in Food Science and Nutrition intended for potential career opportunities.
PO2	Build self-empowerment in food Science and Nutrition and develop effective communication skills sufficient for entry in preprofessional practice.
PO3	Apply skills by planning, implementing and evaluating diets to the community in the current scenario.
PO4	Interpret and utilize nutrition techniques in developing novel products to improve the health status of society and promote entrepreneurship.
PO5	Develop professional attributes and portfolio in Food Science and Nutrition that are adopted to serve in diverse professional and community organizations.





**Guidelines for Programmes offering Part I & Part II for Four Semesters:**

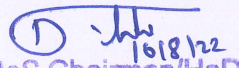
Part	Subjects	No. of Papers	Credit	Semester No.
<b>I</b> (12 Credits)	Tamil / Hindi / French/Malayalam	4	4 x 3 = 12	I & IV
<b>II</b> (12 Credits)	English	4	4 x 3 = 12	I & IV
<b>III</b> (108 Credits)	Core (Credits 2,3,4,5 )	16-19	70	I to VI
	Inter Departmental Course (IDC)	4	16	I to IV
	Discipline Specific Elective (DSE)	3	3 x 4 =12	V & VI
	Skill Enhancement Course(SEC)	4	8	III ,IV,V& VI
	Industrial Training	1	2	V
<b>IV</b> (8 Credits)	Environmental Studies(AECC)	1	2	I
	Basic Tamil/ Advance Tamil /Human Rights & Women's Rights(AECC)	1	2	II
	Innovation & IPR/Innovation, IPR & Entrepreneurship (AECC)	1	2	VI
	Generic Elective(GE) (AEEC)	1	2	V
<b>V</b> (2 Credits)	NSS/NCC/YRC/RRC/Yoga/Sports/Clubs	-	2	I -II
<b>TOTAL CREDITS</b>			<b>142</b>	





**CURRICULUM**  
**B.Sc. Food Science and Nutrition**

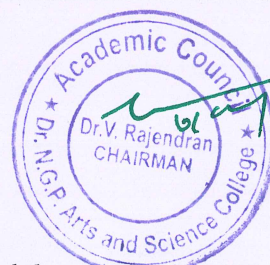
Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits	
							CIA	ESE	Total		
First Semester											
Part-I											
221TL1A1TA	Language-I	Tamil-I: Ikkala Illakiyam	4	1	-	3	50	50	100	3	
221TL1A1HA		Hindi-I: Modern literature									
221TL1A1MA		French-I : Grammar, Translation and civilization									
221TL1A1FA		Malayalam - I : Modern literature									
Part-II											
221EL1A1EA	Language-II	Professional English-I	4	-	1	3	50	50	100	3	
Part-III											
223FN1A1CA	Core-I	Fundamentals offFood Science	4	1	-	3	50	50	100	4	
223FN1A1CB	Core-II	Chemistry of Foods	4	1	-	3	50	50	100	4	
223FN1A1CP	Core practical-I	Food Science	-	-	5	3	50	50	100	2	
222CE1A1IA	IDC-I	Chemistry for Biologists	3	-	-	3	50	50	100	3	
Part-IV											
223MB1A1AA	AECC-I	Environmental studies	2	-	-	-	50	-	50	2	
Part - V											
22FN1A1XA	Extension Activity	NSS/NCC/YRC/RRC/Yoga/Sports/Club	-	-	-	-	50		50	1	
Total			21	4	5	-	-	-	700	22	

  
BoS Chairman/HoD  
Department of Food Science & Nutrition  
Dr. N. G. P. Arts and Science College  
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BOS 13 <sup>th</sup>	AC - 13 <sup>th</sup>	GB - 18 <sup>th</sup>
16-8-22	6-9-22	10-9-22




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Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits	
							CIA	ESE	Total		
Second Semester											
Part-I											
221TL1A2TA	Language-I	Tamil-II: Ara Illakiyam	4	1	-	3	50	50	100	3	
221TL1A2HA		Hindi-II: Modern literature									
221TL1A2MA		Malayalam – II : Modern literature									
221TL1A2FA		French-II : Grammar, Translation and civilization									
Part- II											
221EL1A2EA	Language- II	Professional English– II	4	-	1	3	50	50	100	3	
Part-III											
223FN1A2CA	Core-III	Principles of Nutrition	4	1	1	3	50	50	100	4	
223FN1A2CP	Core Practical - II	Nutrition Practical	-	-	5	3	50	50	100	2	
222CE1A2IP	IDC Practical-I	Applied Chemistry	3	-	4	3	50	50	100	5	
Part-IV											
221TL1A2AA/ 221TL1A2AB/ 225CR1A2AA	AECC-II	Basic Tamil/ Advanced Tamil /Human Rights and Women’s Rights	2			-	50	-	50	2	
Part-V											
223FN1A2XA	Extension Activity	NSS/NCC/YRC/R RC/Yoga/Sports					50	-	50	1	
Total			17	2	11				600	20	

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30.11.2022	19.01.2023	30.01.2023



  
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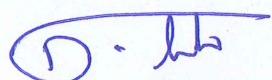


Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Third Semester										
Part-I										
221TL1A3TA	Language-I	Tamil-III	3	1	-	3	50	50	100	3
221TL1A3HA		Hindi-III								
221TL1A3MA		Malayalam – III								
221TL1A3FA		French-III								
Part- II										
221EL1A3EA	Language-II	Professional English–III	3	1	-	3	50	50	100	3
Part-III										
223FN1A3CA	Core -IV	Nutrition Through Life Span	4	1	-	3	50	50	100	4
223FN1A3CB	Core -V	Human Physiology	3	1	-	3	50	50	100	3
223FN1A3CC	Core -VI	Institutional Management	3	1	-	3	50	50	100	3
223FN1A3CP	Core Practical-III	Nutrition Through Life Span	-	-	4	3	50	50	100	2
223BC1A3IA	IDC-III	Biochemistry - I	3	-	-	3	50	50	100	3
223FN1A3SA	SEC- I	Basics of Research Techniques-Computer Application	2	-	-	3	50	50	100	2
Total			21	5	4				800	23






Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fourth Semester										
Part-I										
221TL1A4TA	Language-I	Tamil-IV	3	1	-	3	50	50	100	3
221TL1A4HA		Hindi-IV								
221TL1A4MA		Malayalam – IV								
221TL1A4FA		French-IV								
Part- II										
221EL1A4EA	Language-II	Professional English–IV	3	1	-	3	50	50	100	3
Part-III										
223FN1A4CA	Core-VII	Dietetics	4	-	-	3	50	50	100	4
223FN1A4CP	Core Practical-IV	Dietetics	-	-	4	3	50	50	100	2
223FN1A4CB	Core - VIII	Perspective Psychology	4	-	-	3	50	50	100	4
223BC1A4IA	IDC-IV	Biochemistry -II	3	-	-	3	50	50	100	3
223BC1A4IP	IDC Practical-II	Biochemistry	-	-	4	3	50	50	100	2
223FN1A4SA	SEC-II	Functional Foods	2	1	-	3	50	50	100	2
Total			19	3	8				800	23



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BoS- 16 <sup>th</sup> 16.10.23	AC - 16 <sup>th</sup> 13.12.23	GB - 21 <sup>st</sup> 05.01.24



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Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fifth Semester										
Part-III										
223FN1A5CA	Core-IX	Food Preservation	4	-	-	3	50	50	100	4
223FN1A5CB	Core-X	Fundamentals of Food Microbiology	4	-	-	3	50	50	100	4
223FN1A5CC	Core- XI	Food Processing	4	-	-	3	50	50	100	4
223FN1A5CD	Core - XII	Food Safety and Quality Control	4	-	-	3	50	50	100	4
223FN1A5CV	Core-XIII	Project work and viva voce	-	-	-	-	50	50	100	2
223FN1A5CP	Core Practical-V	Food Preservation	-	-	4	3	50	50	100	2
223FN1A5SP	SEC-III	Food Processing and Quality Control	-	-	4	3	50	50	100	2
223FN1A5DA	DSE-I	Post-Harvest Technology	4	-	-	3	50	50	100	4
223FN1A5DB		Clinical Nutrition								
223FN1A5DC		Food Commodities								
223FN1A5TA	IT	Industrial Training	-	-	-	3	50	50	100	2
Part - IV										
	GE		2	-	-	3	50	-	50	2
Total			22	-	8				950	30




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Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Sixth Semester										
Part-III										
223FN1A6CA	Core-XIV	Community Nutrition	4	-	-	3	50	50	100	4
223FN1A6CB	Core-XV	Food Product Development and Marketing	4	-	-	3	50	50	100	4
223FN1A6CV	Core-XVI	Community Project and Viva Voce	-	-	5	3	50	50	100	2
223FN1A6CP	Core Practical -VI	Food Product Development	-	-	5	3	50	50	100	2
223FN1A6SA	SEC-IV	Indigenous Foods	2	-	-	3	50	50	100	2
223FN1A6DA	DSE-II	Basics of Food Packaging	4	-	-	3	50	50	100	4
223FN1A6DB		Health and Fitness								
223FN1A6DC		Convenience Foods								
223FN1A6DD	DSE-III	Entrepreneurship in Food Industry	4	-	-	3	50	50	100	4
223FN1A6DE		Nutrition Care Process								
223FN1A6DF		Unit Operations in Food Industry								
Part-IV										
223BC1A6AA	AECC-III	Innovation, IPR and Entrepreneurship	2	-	-	-	50	-	50	2
Total			20	-	10				750	24
Grand Total									4600	142

  
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 Coimbatore – 641 043

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### DISCIPLINE SPECIFIC ELECTIVE

Students shall select the desired course of their choice in the listed elective course during Semesters V & VI

#### Semester V (Elective I)

##### List of Elective Courses

S. No.	Course Code	Name of the Course
1	223FN1A5DA	Post-Harvest Technology
2	223FN1A5DB	Clinical Nutrition
3	223FN1A5DC	Food Commodities

#### Semester VI (Elective II)

##### List of Elective Courses

S. No.	Course Code	Name of the Course
1	223FN1A6DA	Food Handling and storage
2	223FN1A6DB	Nutrition Care Process
3	223FN1A6DC	Unit Operation in Food Industry

#### Semester VI (Elective III)

##### List of Elective Courses

S. No.	Course Code	Name of the Course
1	223FN1A6DD	Basics of Food Packaging
2	223FN1A6DE	Diet Counseling
3	223FN1A6DF	Entrepreneurship In Food Industry





### GENERIC ELECTIVE COURSE (GE)

The following are the course offered under Generic Elective Course

#### Semester V

S. No.	Course Code	Course Name
1	223FN1A5GA	Food Preservation

### EXTRA CREDIT COURSES

The following are the courses offered under self-study to earn extra credits:

#### Semester III

S. No.	Course Code	Course Name
1	223FN1ASSA	Food Fortification
2	223FN1ASSB	Nutrition Education





## UG - REGULATION (R4)

(Students admitted in the AY 2022-23)

### (OUTCOME BASED EDUCATION WITH CBCS)

#### 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 disciplines like Departments of Computer Science, Information Technology, Computer Technology, Computer Applications, Data analytics, Cognitive Systems and Artificial Intelligence and Machine Learning.

**1.2 Programme:** Refers to the Bachelor of Science / Commerce / Arts 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 2022-25 refers to students belonging to a 3 year Degree programme admitted in 2022 and completing in 2025.

**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 meet effectively the teaching learning needs.

- a) **Core Course:** A course, which should compulsorily be studied by a candidate as a core requirement
- b) **Inter Disciplinary Course (IDC):** 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 (DSE) Course:** Elective courses offered under main discipline/ subject of study.
- d) **Skill Enhancement Courses (SEC):** Value-based and/or skill-based courses which are aimed at providing hands-on-training, competencies, skills, etc.
- e) **Ability Enhancement Compulsory Courses (AECC):** Mandatory courses that lead to Knowledge enhancement. Environmental Science, Human Rights and Women's Rights, Basic Tamil/Advanced Tamil, Innovation and IPR/Innovation, IPR and Entrepreneurship.
- f) **Ability Enhancement Elective Course (AEEC)/Generic Elective (GE)** An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is Generic Elective.





### 1.5 Project Work:

Course involving application of knowledge in problem solving / analyzing /exploring a real life situation / difficult problem. The Project work will be given in lieu of a Core paper.

### Internship/Industrial Training

Students must undertake industrial / institutional training for a minimum of 15 days during the IV semester summer vacation. The students will submit the report for evaluation during V semester.

### 1.6 Extra Credits:

Extra credits shall be awarded for achievements in identified Curricular/co-curricular activities executed outside the regular class hours. Extra credits are not mandatory for completing the programme.

## 2. STRUCTURE OF PROGRAMME

### 2.1 PART- I: LANGUAGE- I

Tamil or any one of the languages namely Malayalam, Hindi and French will be offered under Part – I in the first four semesters.

### 2.2 PART- II: LANGUAGE- II

English will be offered during the first four semesters.

### 2.3 PART- III:

- Core Course
- Inter Departmental Course (IDC)
- Discipline Specific Elective (DSE)
- Skill Enhancement Course (SEC)
- Industrial Training (IT)

### 2.4 PART- IV:

#### 2.4.1 Ability Enhancement Compulsory Course (AECC):

The Ability Enhancement Compulsory Courses such as i)Environmental Studies, ii) Human Rights and Womens' Rights, iii) Innovation and IPR/ Innovation, IPR and Entrepreneurship are offered during I,II and VI Semester.

Basic Tamil

a) Those who have not studied Tamil up to XII Std and taken a non-Tamil language under Part-I shall take one Basic Tamil course in the second semester.

(OR)





Advanced Tamil

b) Those who have studied Tamil up to XII Std and taken a non-Tamil language under Part-I shall take one Advanced Tamil course in the second semester.

**Note:** Students who come under the above a+b categories are exempted from Human Rights and Women's Rights in second semester.

**Ability Enhancement Elective Course (AEEC)/Generic Elective (GE)** An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is Generic Elective offered in V semester. (Theory/Practical/Non-Lab Practical)

## 2.5 PART- V: EXTENSION ACTIVITIES

The following extracurricular activities like NSS/YRC/NCC/RRC/Yoga/Sports/Clubs are offered under extension activities during semester I & II. Students will be evaluated based on their active participation in any one of the above activities. 75% Attendance is compulsory for extension activity.

## 3. CREDIT ALLOTTMENT

The following is the credit allotment:

- Lecture Hours (Theory) : 1 credit per lecture hour per week
- Laboratory Hours : 1 credit for 2 Practical hours per week
- Project Work : 1 credit for 2 hours of project work per week

## 4. DURATION OF THE PROGRAMME

The B.A. /B.Com./B. Sc. Programme must be completed within 3 years (6 semesters) and a maximum of 6 years (12 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.





## 5. 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 seventy five percent (75%) 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/her attendance. Every student shall have a minimum of 75% as an overall attendance.

## 6. 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 shall be 100 with the following breakup:

### a) Mark distribution for Theory Courses

Continuous Internal Assessment (CIA) : 50 Marks

End Semester Exams (ESE) : 50 Marks

Total :100 Marks

### i) Distribution of Internal Marks

S.No.	Particulars	Distribution of Marks
1	CIA I (2.5 Units) (On completion of 45 <sup>th</sup> working day)	15
2	Model ( All 5 Units) (On completion of 85 <sup>th</sup> working day)	15
3	Assignment	05
4	Attendance	05
5	Library Usage	05
6	Skill Enhancement *	05
Total		50





**Assignment Rubric****(Maximum -20 marks converted to 5 marks)**

Criteria	4 marks	3 Marks	2 Marks	1 Mark
Language	Excellent spelling and Grammar	Good spelling and Grammar	Reasonable spelling and Grammar	Bad spelling and Grammar
Style	Outstanding style beyond usual college level	Attains College level style	Approaches College level style	Elementary form with little or no variety in sentence structure
Referencing	Good use of wide range of reference sources	Moderate use of suitable reference materials	Shows signs of plagiarism & using sources without referencing	No reference material used
Development	Main points well developed with high quality and quantity support	Main points developed with quality and quantity supporting details	Main points are present with limited details and development	Main points lack detailed development
Critical thinking/Problem solving	Advanced attempt to interpret the process, content/ analyse and solve the problem	Proficient attempt to interpret the process, content/ analyse and solve the problem	Adequate attempt to interpret the process, content/ analyse and solve the problem	Limited attempt to interpret the process, content/ analyse and solve the problem

**Breakup for Attendance Marks:**

S.No	Attendance Range	Marks Awarded
1	95% and Above	5
2	90% - 94%	4
3	85% - 89%	3
4	80% - 84%	2
5	75% - 79%	1





**Note:**

Special Cases such as NCC, NSS, Sports, Advanced Learner Course, Summer Fellowship and Medical Conditions etc. the attendance exemption may be given by principal and Mark may be awarded.

**Break up for Library Marks:**

S.No	Attendance Range	Marks Awarded
1	10h and above	5
2	9h- less than 10h	4
3	8h - less than 9h	3
4	7h - less than 8h	2
5	6h - less than 7h	1

**Note:**

In exception, the utilization of e-resources of library will be considered.

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

Class Participation, Case Studies Presentation, 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.

**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/ 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>
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>
12	Seminar	<ul style="list-style-type: none"> <li>• Knowledge and Content</li> <li>• Organization</li> <li>• Understanding</li> <li>• Presentation</li> </ul>

#### ii) Distribution of External Marks

Total	:	50
Written Exam	:	50

#### Marks Distribution for Practical course

Total	:	100
Internal	:	50
External	:	50





## i) Distribution of Internals Marks

S.No.	Particulars	Distribution of Marks
1	Experiments/ Exercises	15
2	Test 1	15
3	Test 2	15
4	Observation Notebook	05
<b>Total</b>		<b>50</b>

## ii) Distribution of Externals Marks

S.No.	Particulars	External Marks
1	Materials and methods/ Procedures/ Aim	10
2	Experiment/ Performance/ Observations/ Algorithm	10
3	Results/ Calculations/ Spotters/ Output	10
4	Inference/ Discussion/ Presentation	10
5	Record	6
6	Viva- voce	4
<b>Total</b>		<b>50</b>

## A) Mark Distribution for Project/Internship/Industrial Training

<b>Total</b>	<b>:</b>	<b>100</b>
<b>Internal</b>	<b>:</b>	<b>50</b>
<b>External</b>	<b>:</b>	<b>50</b>

## i) Distribution of Internal Marks

S.No.	Particulars	Internal Marks
1	Review I	20
2	Review II	20
3	Attendance	10
<b>Total</b>		<b>50</b>





## ii) Distribution of External Marks

S.No	Particulars	External Marks
1	Project Work/Internship/ Industrial training presentation	40
2	Viva -voce	10

**Total** **50**

Evaluation of project Work/Internship/ Industrial training shall be done jointly by Internal and External Examiners

## 7. Credit Transfer

a. Upon successful completion of 1 NPTEL Course (4 Credit Course) recommended by the department, during Semester I to IV, a student shall be eligible to get exemption of one **4 credit course** during the V or VI semester. The proposed NPTEL course should cover content/syllabus of exempted core paper in V or VI semester.

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 IV, a student shall be eligible to get exemption of **one 4 credit course** during the V or VI semester. Out of 2 NPTEL proposed courses, **atleast 1 course** should cover content/syllabus of exempted core paper in V or VI semester.

### Mandatory

The exempted core paper in the V or VI semester should be submitted by the students for approval before the end of 4<sup>th</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 – IV.					
S.No.	Student Name	Class	Proposed NPTEL Course		Proposed Course for Exemption
			Course I	Option 1- Paper Title Option 2- Paper Title Option 3- Paper Title	Any one Core Paper in V or VI Semester
			Course II	Option 1- Paper Title Option 2- Paper Title Option 3- Paper Title	
Class Advisor		HoD		Dean	

Upon Successful outcome of Design Thinking / Copy right/Product/ Patent by the end of the V Semester, student shall be eligible to get exemption in AECC: Innovation, IPR & Entrepreneurship / Innovation & IPR offered during VI Semester.

### 9. Internship/Industrial Training

Students must undertake industrial / institutional training for a minimum of 15 days during the IV semester summer vacation. The students shall submit the report for evaluation during V semester.

### 10. Extra Credits: 10

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





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

A maximum of 1 credit under each category is permissible.

Category	Credit
Proficiency in foreign language	1
Proficiency in Hindi	1
Self study Course	1
Typewriting/Short hand	1
CA/ICSI/CMA (Foundations)	1
CA/ICSI/CMA (Inter)	1
Sports and Games	1
Publications / Conference Presentations (Oral/Poster)/ Awards	1
Lab on Project	1
Innovation / Incubation / Patent / Sponsored Projects / Consultancy/	1
Representation in State / National level celebrations	1
Awards/ Recognitions / fellowships	1

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

## GUIDELINES

### Proficiency in foreign language

A pass in any foreign language in the examination conducted by an authorized agency.

### Proficiency in Hindi

A pass in the Hindi examination conducted by Dakshin Bharat Hindi Prachar Sabha.

Examination passed during the programme period only will be considered for extra credit.

### 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.





**Typewriting/Short hand**

A Pass in short hand / typewriting examination conducted by Tamil Nadu Department of Technical Education (TNDTE) and the credit will be awarded.

**CA/ICSI/CMA(Foundations)**

Qualifying foundation in CA/ICSI/CMA / etc.

**Sports and Games**

The Student can earn extra credit based on their Achievement in sports in University/ State / National/ International.

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

Research Publications in Journals

Oral/Poster presentation in Conference

**Lab on Project (LoP)**

To promote the undergraduate research among all the students, the LoP is introduced beyond their regular class hours. LoP is introduced as group project consisting of not more than five members. It consist of four stages namely Literature collection, Identification of Research area, Execution of research and Reporting / Publication of research reports/ product developments. These four stages spread over from III to V semester.

**(Evaluation will be done internally)**

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

Development of model/ Products /Prototype /Process/App/Registration of Patents/ Copyrights/Trademarks/Sponsored Projects /Consultancy

**Representation in State/ National level celebrations**

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

**Awards/ Recognitions/fellowships**

Regional/ State / National level awards/ Recognitions/Fellowships





**100 % CIA Courses :**

- AECC
- AECC

S.No	Type of Course
1	Environmental Studies (AECC)
2	Human Rights and Women's Rights, Basic Tamil / Advanced Tamil (AECC)
3	Innovation & IPR/ Innovation, IPR and Entrepreneurship (AECC)
4	Generic Elective (AECC)

**Modalities for Implementing Internal Assessment Marks:**

- Student pertaining to 2022 Batch (2022-25) UG programme for the above mentioned courses shall secure a minimum of 40% out of the maximum marks in the continuous internal assessment (CIA) i.e., 20 marks out of 50 marks.
- Students who have not acquired the minimum marks shall be allowed to reappear to improve their marks in the exam components only within the time duration of the programme, in the forthcoming semesters.

**Distribution of Internal Marks for AECC & AECC**

Theory			Practical	
S. No.	Particulars	Distribution of Marks	Particulars	Distribution of Marks
1	CIA I (2.5 Units) (On completion of 45 <sup>th</sup> working day)	15	CIA I (Exercise 1-5)	5
2	Model (5 Units) (On completion of 85 <sup>th</sup> working day)	15	CIA II (Exercise 6 - 10)	5
3	Assignment	05	Class Participation	10
4	Attendance	05	Practical Record	10
5	Library Usage	05	Test -III & Viva-Voce (10+10)	20
6	Skill Enhancement*	05	---	---
<b>Total</b>		<b>50</b>	<b>50</b>	





### Question paper pattern AECC & AEEC

Test	MARKS	DESCRIPTION	TOTAL	Remarks
CIA Test I 1 Hour First 2.5 Units	50 x 1 = 50 Marks	MCQ	50 Marks	Marks secured will be Converted to 15 marks
CIA test II/ Model test 1 Hour All five Units	50 x 1 = 50 Marks	MCQ	50 Marks	Marks secured will be Converted to 15 marks

Question paper pattern		Total Marks -50	
<u>Basic Tamil</u>		<u>Advanced Tamil</u>	
Section -A		Section -A	
Choose the correct answer	10x2=20	Choose the correct answer	10 x1=10
Section -B		Section -B	
True or false	10x2=20	Fill in the blanks	10x2=20
Section -C		Section -C	
Answer in one page	1x10=10	Write an essay in two pages	2x10=20

### Question paper pattern for all other courses falling under Part I to Part III

#### CIA Test : [1 1/2 Hours-2.5 Units] - 25 Marks

SECTION	MARKS	DESCRIPTION	TOTAL	Remarks
Section - A	8 x 0.5 = 04 Mark	MCQ	25 Marks	Marks secured will be converted to 15 marks
Section - B	3 x 3 = 09 Mark	Answer ALL Questions Either or Type ALL Questions Carry Equal Marks		
Section - C	2 x 6 = 12 Mark			

#### Model Test: [3 Hours-5 Units] - 50 Marks

SECTION	MARKS	DESCRIPTION	TOTAL	Remarks
Section - A	5 x 1 = 05 Marks	MCQ	50 Marks	Marks secured will be converted to 15 marks
Section - B	5 x 3 = 15 Marks	Answer ALL Questions (Either or Type Questions) Each Questions Carry Equal Marks		
Section - C	5 x 6 = 30 Marks			





**End Semester Examination: [3 Hours-5 Units] - 50 Marks**

SECTION	MARKS	DESCRIPTION	TOTAL
Section - A	5 x 1 = 05 Marks	MCQ	50 Marks
Section - B	5 x 3 = 15 Marks	Answer ALL Questions (Either or Type Questions) Each Questions Carry Equal Marks	
Section - C	5 x 6 = 30 Marks		





Course Code	Course Name	Category	L	T	P	Credit
221TL1A1TA	TAMIL- I: IKKALA ILAKKIYAM	LANGUAGE-I	4	1	-	03

### PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடுநாகரீகம் ,பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத்திறன்கள்(Life Skills)- மாணவர்களின் செயலாக்கத்திறனை ஊக்குவித்தல்	K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K4
CO3	பாடஇணைச்செயல்பாடுகள் (Co-curricular activities)	K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு(Tamil knowledge)	K5

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓		✓
CO2	✓			✓	
CO3	✓	✓			✓
CO4	✓		✓		
CO5	✓			✓	✓

✓ Skill Development	✓ Entrepreneurial Development
✓ Employability	✓ Innovations
✓ Intellectual Property Rights	✓ Gender Sensitization
✓ Social Awareness/ Environment	✓ Constitutional Rights/ Human Values/ Ethics





221TL1A1TA	TAMIL- I: IKKALA ILAKKIYAM	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 60 h

## Syllabus

Unit I	மறுமலர்ச்சிக் கவிதைகள்	13 h
1. இலக்கிய வரலாறு	-மறுமலர்ச்சிக் கவிஞர்களின் தமிழ்ப்பணிகள்	
2. பாரததேசம்	- பாரதியார்	
3. படி	- பாரதிதாசன்	
4.தமிழரின் பெருமை	- நாமக்கல்கவிஞர்	
5. தமிழ்க் கொலை புரியாதீர்	- புலவர் குழந்தை	
6. திரைத்தமிழ்		
	அ) 'விஞ்ஞானத்த வளர்க்கப் போறண்டி' எனத்தொடங்கும் பாடல் - உடுமலை நாராயண கவி	
	ஆ) 'சும்மா கிடந்த நிலத்தை' எனத்தொடங்கும் பாடல் - பட்டுக்கோட்டை கல்யாண சுந்தரனார்	
	இ) 'சமரசம் உலாவும் இடமே' எனத்தொடங்கும் பாடல்- மருதகாசி	
	ஈ) 'உன்னை அறிந்தால்' எனத்தொடங்கும் பாடல் - கண்ணதாசன்	
Unit II	புதுக்கவிதைகள்	13 h
1.இலக்கிய வரலாறு	- புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்	
2. கடமையைச் செய்	- மீரா	
3. மலையாளக் காற்று	- சிற்பி	
4. ஒப்பிலாத சமுதாயம்	- அப்துல் ரகுமான்	
5. கன்னிமாடம்	- மு.மேத்தா	
6. கரிக்கிறது தாய்ப்பால்	- ஆரூர் தமிழ்நாடன்	
7. ஐந்தாம் வகுப்பு 'அ' பிரிவு	- நா. முத்துக்குமார்	
8. ஹைகூ கவிதைகள்	- 10 கவிதைகள்	
Unit III	பெண்ணியம்	09 h
1. தொலைந்து போனேன்	- தாமரை	





2. நீரில் அலையும் முகம் - அ. வெண்ணிலா 3. தற்காத்தல் - பொன்மணி வைரமுத்து 4. ஏனிந்த வித்தியாசங்கள் ?- மல்லிகா 5. புதையுண்ட வாழ்க்கை - சுகந்தி சுப்ரமணியன்		
Unit IV	சிறுகதைகள்	15 h
1.இலக்கிய வரலாறு -சிறுகதையின் தோற்றமும் வளர்ச்சியும் 2. கனகாம்பரம் - கு.ப.ராஜகோபாலன் 3. ஆற்றங்கரைப் பிள்ளையார் - புதுமைப்பித்தன் 4. பொம்மை - ஜெயகாந்தன் 5. காய்ச்சமரம் - கி. ராஜநாராயணன் 6. காட்டில் ஒருமான் - அம்பை 7.வேட்கை - சூர்யகாந்தன்		
Unit V	பயிற்சிப் பகுதி	10 h
<b>அ. இலக்கணம்</b> 1.வல்லின ஒற்று மிகும், மிகா இடங்கள் - ஒற்றுப்பிழை நீக்கி எழுதுதல் 2.ர,ற - ல,ழ,ள - ண,ந,னவேறுபாடு - ஒலிப்பு நெறி,சொற்பொருள் வேறுபாடு அறிதல்) <b>ஆ. படைப்பாக்கம்</b> 1. கவிதை- எழுதுதல் (15 வரிகள் முதல் 30 வரிகள் வரை) 2.சிறுகதை - எழுதுதல் (குறைந்தது 3 பக்கங்கள்)		

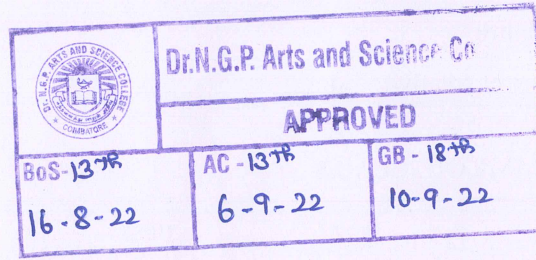


## Text Book

- தமிழ் மொழிப்பாடம் - 2022-2023 ,தொகுப்பு: தமிழ்த்துறை ,  
 1 டாக்டர்என்.ஜி.பி. கலை அறிவியல் கல்லூரி ,கோயம்புத்தூர் -  
 641048,வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை - 600 098.

## References

- 1 பேராசிரியர் புலவர் சோம. இளவரசு ,எட்டாம் பதிப்பு -2014 ,தமிழ் இலக்கிய வரலாறு - மணிவாசகர் பதிப்பகம்,சென்னை - 600 108.
- 2 பேராசிரியர் முனைவர் பாக்கியமேரி ,முதற் பதிப்பு- 2013 ,இலக்கணம் - இலக்கிய வரலாறு - மொழித்திறன்- பூவேந்தன் பதிப்பகம்,சென்னை-600 004.
- 3 இணையதள முகவரி: <https://www.tamilvu.org>





Course Code	Course Name	Category	L	T	P	Credit
221TL1A1HA	HINDI- I: MODERN LITERATURE	LANGUAGE-I	4	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- The techniques for expansion of ideas and translation process

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Apply the knowledge writing critical views on fiction	K3
CO4	Build creative ability	K3
CO5	Expose the power of creative reading	K2

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2	✓	✓			✓
CO3	✓		✓	✓	✓
CO4	✓		✓		✓
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input type="checkbox"/> Intellectual Property Rights	<input checked="" type="checkbox"/> Gender Sensitization
<input checked="" type="checkbox"/> Social Awareness/ Environment	<input checked="" type="checkbox"/> Constitutional Rights/ Human Values/ Ethics





221TL1A1HA	HINDI- I: MODERN LITERATURE	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 60 h

## Syllabus

Unit I 13 h

गद्य – नूतनगद्यसंग्रह(जयप्रकाश)पाठ 1- रजियापाठ 2- मक्रीलपाठ 3- बहुतापानीनिर्मला  
पाठ 4- राष्ट्रपितामहात्मागाँधी

Unit II 13 h

कहानीकुंज- डॉ.वी.पी. 'अमिताभ'(पाठ 1-4)

Unit III 12 h

व्याकरण : शब्दविचार ( संज्ञा, सर्वनाम,विशेषण)

Unit IV 12 h


अनुच्छेद लेखन

Unit V 10 h

अनुवाद अभ्यास-III (केवल अंग्रेजी से हिन्दी में) (पाठ 1 to 10)

## Text Books

- 1 प्रकाशक: सुमित्रप्रकाशन 204 लीलाअपाटर्मेंट्स, 15 हेस्टिंग्सरोड'अशोकनगरइलाहाबाद-211001
- 2 प्रकाशक: गोविन्दप्रकाशनसदरबाजार, मथुराउत्तरप्रदेश-281001
- 3 पुस्तक: व्याकरण प्रदिप – रामदेवप्रकाशक: हिन्दी भवन 36 टेगोर नगर इलाहाबाद-211024
- 4 पुस्तक: व्याकरण प्रदिप – रामदेवप्रकाशक: हिन्दी भवन 36 इलाहाबाद-211024
- 5 प्रकाशक: दक्षिण भारत प्रचार सभा चेन्नई -17

 <b>Dr.N.G.P. Arts and Science College</b>		
<b>APPROVED</b>		
BoS-13 <sup>th</sup>	AC-13 <sup>th</sup>	GE-13 <sup>th</sup>
16-8-22	6-9-22	10-9-22



Dr.NGPASC  
COIMBATORE | INDIA

B.Sc. Food Science and Nutrition (Students admitted during the AY 2022-23)



Course Code	Course Name	Category	L	T	P	Credit
221TL1A1MA	MALAYALAM- I: MODERN LITERATURE	LANGUAGE-I	4	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories.	K1
CO2	Understand the principles of translation work.	K2
CO3	Apply the knowledge writing critical views on fiction.	K3
CO4	Build creative ability.	K3
CO5	Expose the power of creative reading	K2

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2	✓				✓
CO3	✓	✓	✓		✓
CO4	✓		✓	✓	✓
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input checked="" type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input checked="" type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





221TL1A1MA	MALAYALAM- I: MODERN LITERATURE	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 60 h

## Syllabus

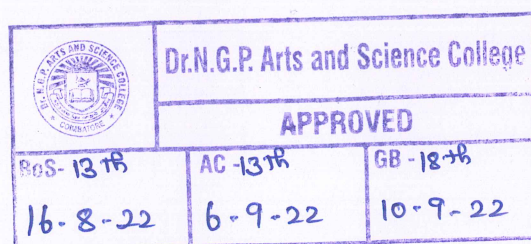
Unit I	Novel	14 h
	PathummayudeAdu	
Unit II	Novel	10 h
	PathummayudeAdu	
Unit III	Short Story	14 h
	Nalinakanthi	
Unit IV	Short Story	10 h
	Nalinakanthi	
Unit V	Practical Application	12 h
	Expansion of ideas, General Essay and Translation	

## Text Books

- 1 Vaikkam Muhammed Basheer, "PathummayudeAdu" (NOVEL), DC Books & Kottayam
- 2 T.Padmanabhan, "Nalinakanthi" (Short Story), DC Books & Kottayam.

## References

- 1 MalayalaNovel Sahithyam.
- 2 MalayalaCherukathaInnale Innu.





Course Code	Course Name	Category	L	T	P	Credit
221TL1A1FA	FRENCH- I: GRAMMAR, TRANSLATION AND CIVILIZATION	LANGUAGE - I	4	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written – Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Evaluate the Plural, Articles and the Hobbies	K3
CO4	Measure the Cultural Activity in France	K3
CO5	Select the sentiments, life style of the French people and the usage of the conditional tense	K2

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2	✓				✓
CO3	✓		✓		✓
CO4	✓		✓		✓
CO5	✓		✓		✓

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input checked="" type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input checked="" type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



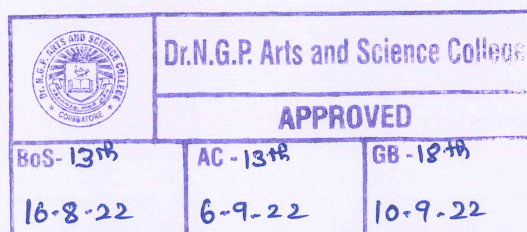


Objectifs de Communication	Tâche	Activités de réception et de production orale
<ul style="list-style-type: none"> <li>Présenter quelqu'un</li> </ul>	Dans un café, participer à une soirée de rencontres rapides et remplir de tâches d'appréciation	<ul style="list-style-type: none"> <li>Exprimer ses goûts.</li> <li>Comprendre une demande laissée sur un répondeur téléphonique.</li> <li>Parler de ses projets de week-end.</li> </ul>
Autoévaluation du module I Page 40 – Préparation au DELF A1 page 42		
Demander à quelqu'un de faire quelque chose. Demander poliment. Parler d'actions passées. Tu veux bien?	Organiser un programme d'activités pour accueillir une personne importante.	Comprendre une personne demande un service à quelqu'un.  Demander à quelqu'un de faire quelque chose.  Imaginer et raconter au passé à partir de situations dessinées.

Make in Own Sentences

### Text Book

- 1 Regine Merieux, Yves Loiseau, "LATITUDES - 1" (Page No: 9-55) (Méthode de Français), Goyal Publisher & Distributors Pvt. Ltd., 86 UB Jawahar Nagar (Kamala Nagar), Delhi-7 Les Editions Dider, Paris, 2008- Imprime en Roumanie par Canale en Janvier 2012.





221TL1A1FA	FRENCH- I: GRAMMAR, TRANSLATION AND CIVILIZATION	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 60 h

## Syllabus

## Unit I Salut I Page 10

12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
<ul style="list-style-type: none"> <li>• Saluer</li> <li>• Enter en contact avec quelqu'un.</li> <li>• Se présenter.</li> <li>• S'excuser</li> </ul>	Encours de cuisine, premiers contacts avec les membres d'un groupe	<ul style="list-style-type: none"> <li>• Comprendre des personnes qui se saluent.</li> <li>• Échanger pour entrer en contact, se présenter, saluer, s'excuser.</li> <li>• Communiquer avec <i>tu</i> ou <i>vous</i>.</li> <li>• Comprendre les consignes de classe</li> <li>• Épeler son nom et son prénom.</li> </ul> <p>Computer jusqu'à 10.</p>

## Unit II Enchanté I Page 20

12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
<ul style="list-style-type: none"> <li>• Demander de se présenter.</li> <li>• Présenter quelqu'un.</li> </ul>	Dans la classe de français, se présenter et remplir une fiche pour le professeur.	<ul style="list-style-type: none"> <li>• Comprendre les informations essentielles dans un échange en milieu professionnel.</li> <li>• Échanger pour se présenter et présenter quelqu'un.</li> </ul>

## Unit III J'adore I Page 30

12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
<ul style="list-style-type: none"> <li>• Exprimer ses goûts.</li> </ul>	Dans un café, participer à une soirée de rencontres rapides et remplir de tâches d'appréciation.	<ul style="list-style-type: none"> <li>• Dans une soirée de rencontres rapides comprendre des personnes qui échangent sur elles et sur leurs goûts</li> <li>• Comprendre une personne qui parle des goûts de quelqu'un d'autre.</li> </ul>





Course Code	Course Name	Category	L	T	P	Credit
221EL1A1EA	PROFESSIONAL ENGLISH- I	LANGUAGE- II	4	-	1	3

### PREAMBLE

This course has been designed for students to learn and understand

- the effect of dialogue, the brilliance of imagery and the magnificence of varied genres
- any spontaneous spoken discourse and respond to them with proper sentence structure
- the transactional concept of English language

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Identify the various aspects in poetry	K2
CO2	Infer linguistic and non-linguistic features of the context for understanding and interpreting	K3
CO3	Construct sentences and convey messages effectively in real life situations	K3
CO4	Apply different reading strategies with varying speed	K3
CO5	Prepare modules with their own ideas and present them coherently in a grammatically correct form	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓	✓	✓
CO2		✓			✓
CO3	✓	✓		✓	
CO4			✓		
CO5	✓	✓			✓

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
<input checked="" type="checkbox"/> Social Awareness/ Environment	<input checked="" type="checkbox"/> Constitutional Rights/ Human Values/ Ethics





221EL1A1EA	PROFESSIONAL ENGLISH- I	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 60 h

### Syllabus

#### Unit I Genre Studies 12 h

Nissim Ezekiel: The Worm- Author's Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques- Annotations

Niyi Osundare: Our Earth Will Not Die- Author's Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques- Annotations

A. G. Gardiner: On Superstitions- Author's biography- Narrative structure- Exploration of the text- passage analysis- insight of ideas- cohesion and context- style- language techniques- Annotations

Nancy Bella: Clever Thief- Author's Biography- Plot Summary- Detailed summary and Analysis- Themes- Important Quotations- Characters- Description - analysis- Terms- Symbols- Critical analysis

H. G. Wells: The Truth about Pyecraft- Author's Biography- narrative structure- passage analysis- insight of ideas- cohesion and context- style- language techniques

#### Unit II Listening Skills 12 h

Listening vs. hearing- Types of listening, Tips to enhance Listening Skills, Non-verbal and Verbal signs of active listening - Comprehensive Listening - Listening to pre-recorded audios on speeches, interviews and conversations - Listening Activities- Listening and responding to complaints (formal situation), Listening to problems and offering solutions (informal)

#### Unit III Speaking Skills 14 h

Formal occasions- Introducing oneself, Introducing others, Enquiries and Seeking permission, Making short presentations - Informal occasions- Requests, Offering help, Congratulating, Farewell party, graduation speech - Giving instructions to do a task and to use a device, Giving and asking directions





**Unit IV Reading Skills**

10 h

Study Skills: Skimming and Scanning- Reading different kinds of texts- Types of reading-Developing a good reading speed, reading aloud, Referencing skill - Word Power (Denotation and Connotation) - Reading comprehension, Data interpretation -Charts, Graphs, Advertisements

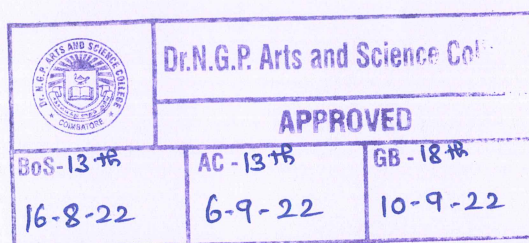
**Unit V Writing Skills**

12 h

Sentence patterns, Note- making and note taking-Strategies - Paragraph writing: Structure and Principles - Academic Writing - Formal and Informal Letters, Report, Book /Movie Review

**Text Books**


- 1 Gardiner, A. G. 1926. Alpha of the Plough: Second series, J.M. Dent & Sons Ltd., London, United Kingdom. pg.no-151-156. (Unit I)
- 2 Ezekiel, Nissim. "The Worm," Crazy Romantic Love, www.mianmawaisarain.live/2020/05/poem-worm-nissim-ezekiel.html. Accessed 3 Aug. 2022. (Unit I)
- 3 <<http://livros01.livrosgratis.com.br/ln000835.pdf/>>(Unit I)
- 4 Mithra,S.M. 1919. Hindu Tales from the Sanskrit, Macmillan & Co Ltd., London, United Kingdom. pg.no-127-142. (Unit I)
- 5 Nation, I. S. P and Jonathan Newton. 2009. Teaching ESL/EFLListening and Speaking. Routledge, New York, United States. (Unit II)
- 6 Prabha, Dr. R. Vithya & S. Nithya Devi. 2019. Sparkle. (1st Edn.) McGraw - Hill Education, Chennai, India. (Unit III- V)





## References

- 1 Our Earth Will Not Die By NiyiOsundare." Studocu.Com, studocu.com/in/document/bangalore-university/bachelor-of-computer-applications/1586771577-our-earth-will-not-die/27675462. Accessed 3 Aug. 2022.
- 2 OnSuperstitions."THEHISTORIAN,thehistorian1947.wordpress.com/2019/03/08/on-superstitions-by-a-g-gardiner. Accessed 3 Aug. 2022.
- 3 Swales, John M. & Feak, Christine B. 2012. Academic Writing for Graduate Students: Essential Tasks and Skills, University of Michigan Press, Michigan.
- 4 Rudzka, Brygida -Ostyn, 2003. Word Power: Phrasal Verbs and Compounds: A Cognitive Approach, Mouton de Gruyter, New York, United States.

 <b>Dr.N.G.P. Arts and Science College</b>		
<b>APPROVED</b>		
RGS-13 <sup>th</sup> 16-8-22	AC - 13 <sup>th</sup> 6-9-22	GB-18 <sup>th</sup> 10-9-22





Course Code	Course Name	Category	L	T	P	Credit
223FN1A1CA	FUNDAMENTALS OF FOOD SCIENCE	CORE	4	1	-	4

#### PREAMBLE

This course has been designed for students to learn and understand

- Principles and various methods of cooking foods
- composition of various foodstuffs
- apply food science knowledge to describe functions of ingredients in food

#### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the various sustainable food practices like energy and nutrient conservation methods	K3
CO2	Interpret the physical , chemical changes occurring in the nutritive constituents of different foods during various cooking processes	K2
CO3	Demonstrate the methods of beverage preparation. Outline medicinal uses of Spices and Condiments	K3
CO4	Illustrate milk processing Identify uses, methods and experiment with effects of cooking egg	K3
CO5	Analyze and understand the principles in cooking and its effect on sensory attributes and nutrients	K4

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223FN1A1CA	FUNDAMENTALS OF FOOD SCIENCE	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 60 h

### Syllabus

#### Unit I Food Groups & Cereal 12 h

Introduction to Food Science: Food groups- 4 (ICMR), 5 and 7, functional food groups-energy yielding, body building and protective foods (only sources), food pyramid.

Methods of cooking: Objectives of cooking. Cooking methods – Dry heat and moist heat methods, microwave and solar cooking

Cereals: Structure and composition of rice and wheat, parboiled rice, Fermentation of Cereal, role of cereals in cookery

Millet: Nutritive value of Ragi, Jowar and Maize.

#### Unit II Pulses, Fruits and Vegetables 12 h

Pulses and legumes: Varieties of pulses, legumes, composition, nutritive value, anti-nutritional factors, cooking quality of pulses.

Fruits: Classification, composition and nutritive value, changes during ripening, enzymatic browning and its prevention methods.

Vegetables: Classification, composition and nutritive value, selection and preparation for cooking, changes and loss of nutrients during cooking

#### Unit III Beverages, Fats and Spices 12 h

Beverages - Classification, nutritive value malted beverages and carbonated non-alcoholic beverages.

Fats and Oils: Types of oils, function of fats and oils, fat substitutes

Spices and Condiments: Functions of spices, medicinal values of Cumin, Pepper, Fenugreek, Cinnamon, Cloves, Cardamom, Onion, Turmeric, Ginger and Garlic.

Herbs – Basil, Wheat grass, Aloe Vera, Oregano – An overview

Difference test-paired comparison and duo -trio test, Rating test -ranking, hedonic, composite scoring test.

#### Unit IV Milk and Egg 12 h

Milk – Composition and nutritive value, kinds of milk, physical properties of milk,





pasteurization and homogenization of milk, changes in milk during heat processing, preparation of fermented (cheese) and non-fermented (milk powder), role of milk and milk products

Egg - Structure, composition, selection, nutritive value, Evaluation of egg quality uses of egg in cookery, foam formation and factors affecting foam formation

## Unit V Non Vegetarian Foods

12 h

Meat -Structure, composition, nutritive value, selection of meat, post mortem changes in meat, aging, tenderness and curing. Methods of cooking meat and their effects.

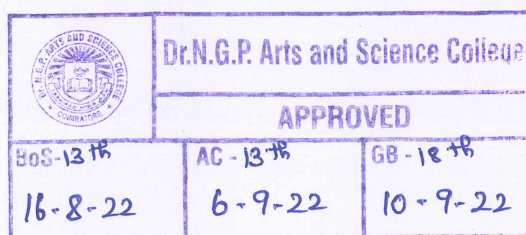
Poultry: Classification, composition, nutritive value, selection, methods of cooking. Fish - Structure, composition, nutritive value, selection of fish, methods of cooking and effects

## Text Books

- 1 Srilakshmi B, 2015, "Food Science", 3rd Edition, New Age International, New Delhi
- 2 ShakunthalaManay and ShadakhraSwamy M., 2008, "FoodFacts and Principles ", Third Edition, New Age International Publishers, New Delhi

## References

- 1 Mudambi .R. SumathiandRajagopal M.V, 2008, "Food Science, New Age International Publishers, New Delhi
- 2 Thangam E. Philip, 1998, "Modern Cookery", Volume II, Orient Longman, II Edition, Hyderabad





Course Code	Course Name	Category	L	T	P	Credit
223FN1A1CB	CHEMISTRY OF FOODS	CORE	4	1	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- The physio-chemical properties of foods
- The scientific principles involved in food preparation.
- The properties with advanced techniques protocols and instrumentation to explore its applications in the field of food science and nutrition

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Illustrate the physio-chemical properties of foods. Moisture in Foods, Hydrogen Bonding, Bound Water, Water Activity.	K2
CO2	List out the Components of Starch and treatment effects on starch. Explain the Stages of Sugar Cookery, Crystal Formation.	K2
CO3	Explain Structure of wheat proteins, pulse proteins, egg proteins, and vegetable proteins.	K3
CO4	Identify the Physical and Chemical Properties of fats and oils. Summarize the factors affecting Fat Absorption in Foods	K3
CO5	Identify the properties, importance of enzymes, enzymes involved in food reactions Choose the plant pigments and its abundant sources	K4

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1				✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223FN1A1CB	CHEMISTRY OF FOODS	SEMESTER I
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Total Credits: 4

Total Instruction Hours: 60 h

### Syllabus

#### Unit I      Physio-Chemical Properties of Foods      10 h

Moisture in Foods, Hydrogen Bonding, Bound Water, Water Activity in Foods, Determination of Moisture Content in Foods, True Solutions, Dispersions, Sols, Gels, Foams, Colloids and Emulsions, Sorption Phenomena.

#### Unit II      Chemistry of Starch and Sugars      13 h

Components of Starch, Swelling of Starch Granules, Gel Formation, Factors affecting gel formation, properties Retrogradation, Syneresis. Effect of Sugar, Acid, Alkali, Fat and Surface Active Agents on Starch.

Sugar: Types of Candies, Action of Acid, Alkali and Enzymes. Chemistry of Milk Sugar, Non Enzymatic Browning, Crystallization and factors affecting Crystallization of sugar, sugar related products and stages of sugar cookery

#### Unit III      Chemistry of Proteins      13 h

Components of Wheat Proteins, Structure, Gluten Formation, Factors affecting gluten formation, Effect of Soaking, Fermentation and Germination on Pulse Proteins, Malting of Pulse Proteins, Properties of Egg Protein, Chemistry of Milk Protein Changes in Milk, Egg and Meat Proteins during heat, action of heat, Acid, Alkalies on Vegetables Proteins and Animal Proteins

#### Unit IV      Chemistry of Fats and Oils      13 h

Physical and Chemical Properties of Fats and Oils Rancidity, Hydrogenation, Winterization, Decomposition of Triglycerides, Shortening Power of Fats, Changes in Fats and Oils during Heating, smoking point of oil, Factors Affecting Fat Absorption in Food, Fat Deterioration.

#### Unit V      Chemistry of Pectic Substances, Plant Pigments      11 h

Enzymes – definition, chemical classification, properties of enzymes, importance of enzymes, enzymes involved in food reactions – beneficial and deterioration and its prevention, Pigments – classification, properties and food sources



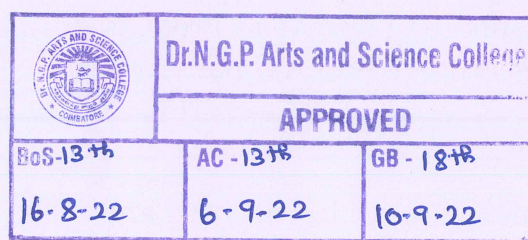


### Text Books

- 1 Srilakshmi, B., 2003, "Food Science", III Edition, New Age International, New Delhi
- 2 Potter, N. N., & Hotchkiss, J. H., 2012, "Food science", Springer Science & Business Media.

### References

- 1 Mudambi .R. Sumathi and Rajagopal M.V, 2008, "Food Science", New Age International Publishers, New Delhi.
- 2 Shakunthalamanay and ShadakhraSwamy, 2008, "Food Facts and Principles", Third Edition, New Age International Publishers, New Delhi.
- 3 SunetraRoday, 2000, "Food Science and Nutrition", Edition I, Mangal Deep Publications, New Delhi.
- 4 Swaminathan, M, 1974, "Essentials of food and nutrition", Vol. II, Applied aspects.





223FN1A1CP	FOOD SCIENCE	SEMESTER I
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Total Credits: 2

Total Instructions Hours: 48 h

S.No	Contents
1	Food group- Grouping of foods, discussion on nutritive value Cereals -Methods of cooking fine and coarse cereals. Examination of starch
2	Measuring ingredients - Methods of measuring different types of foods - grains, flours and liquids, Edible portion Determination of edible portion percentage
3	Moist heat methods- Boiling, Simmering, Steaming and Pressure cooking
4	Dry heat methods-baking, Fat as a medium for cooking- shallow and deep fat frying.
5	Cereals -Methods of cooking fine and coarse cereals. Examination of starch
6	Pulses - Cooking of soaked, unsoaked, germination and fermentation of pulses. Common preparation with pulses
7	Vegetables Experimental cookery using vegetables of different colors and textures.
8	Preparation of beverages soups and salads, Common preparation with vegetables
9	Fruits - Prevention of darkening in fruits and vegetables. Fruit salad
10	Experimental cookery - cream of tomato soup, cheese curry and cooking vegetables in milk, Coagulation of milk proteins, preparation of paneer, curd common preparation with milk
11	Fleshy foods Fish, meat and poultry- preparations
12	Experimental cookery of Egg - boiled egg, poached egg. Common preparations with egg.
	DBT
1	Estimation of gluten content in different types of four
2	Efficiency of Papain Enzyme in Meat Tenderization


Note: Out of 12 - 10 Mandatory



Dr.NGPASC

COIMBATORE | INDIA

B.Sc. Food Science and Nutrition (Students admitted during the AY 2022-23)

 <b>Dr.N.G.P. Arts and Science Co.</b>		
<b>APPROVED</b>		
50S-137B 16-8-22	AC - 137B 6-9-22	GB-137B 10-9-22



Course Code	Course Name	Category	L	T	P	Credit
222CE1A1IA	CHEMISTRY FOR BIOLOGISTS	IDC	3	-	-	3

#### PREAMBLE

This course has been designed for students to learn and understand

- The concept of expressing concentration of solutions.
- The concepts of Chemical kinetics and catalysis.
- About the bonding and basic organic chemistry.

#### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the concept of concentration of the solutions	K2
CO2	Infer the acid and basic properties of solutions	K2
CO3	Interpret the concept of the bonding in molecules	K2
CO4	Summarize the basic concepts of the stereo chemistry	K2
CO5	Explain the Chemical kinetics and catalysis	K2

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓		✓
CO2	✓		✓	✓	
CO3		✓		✓	✓
CO4			✓		
CO5	✓	✓		✓	✓

<input checked="" type="checkbox"/> Skill Development	<input type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input type="checkbox"/> Innovations
<input type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
<input type="checkbox"/> Social Awareness/ Environment	<input type="checkbox"/> Constitutional Rights/ Human Values/ Ethics





222CE1A1IA	CHEMISTRY FOR BIOLOGISTS	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 36 h

### Syllabus

#### Unit I Solutions 8 h

Normality, molarity, molality, mole fraction, mole concept. Primary and secondary standards – preparation of standard solutions. Principle of Volumetric analysis (with simple problems). Indicators – Theory of indicators- Oswald and quinonoid theory.

#### Unit II Acids and Bases 7 h

Acid base theories – Strength of acids and bases – Equilibrium constant and Ionic constant of water- pH, pKa, pKb, Buffer solution, pH and pOH simple calculations.

#### Unit III Chemical bonding 7 h

Types of bonding - Ionic Bond: Nature of ionic bond, factors influencing the formation of ionic bond, Covalent and coordinate bond- Molecular Orbital Theory- MO- configuration of H<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub> - bond order- diamagnetism and paramagnetism.

#### Unit IV Stereo Chemistry 7 h

Isomerism, Structural isomerism- Symmetry of elements (Plane, Centre and Axis of symmetry), Optical isomerism of lactic acid and tartaric acid, Enantiomers, Diastereomers – Separation of racemic mixture, Geometrical isomerism (maleic and fumaric acid). R/S and E/Z configuration assignments for simple molecules.

#### Unit V Chemical kinetics and catalysis 7 h

Rate of reaction, rate law, order, molecularity, first order rate law, half life period of first order equation, pseudo first order reaction, zero and second order reactions. Catalysis – homogenous, heterogeneous and enzyme catalysis, Industrial applications of enzyme catalysis.



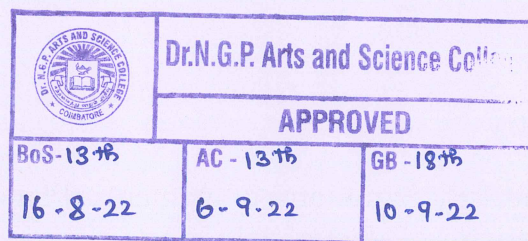


## Text Books

- 1 Puri. B.R, Sharma. L.R and Pathania. M.S, 2017, "Principles of Physical Chemistry", 47th Edition, John Wiley and Sons & USA
- 2 Madhan. R.D, 2016, "Modern Inorganic Chemistry", 10th Edition, Mc Graw Hill Company & USA.

## References

- 1 Lee. J.D, 2002, "A New Concise Inorganic Chemistry", 5th Edition, ELBS & UK.
- 2 Jain. M.K and Sharma. S.C, 2012, "Modern Organic Chemistry", Vishal publishing Co & New Delhi
- 3 Puri. B.R, Sharma. L.R and Kalia. K.C, 2016, "Principles of Inorganic Chemistry", Vishal Publishing & Co & New Delhi.
- 4 Glasstone. S and Lewis. D, 2014, "Elements of Physical Chemistry", 2nd Edition, Macmillan Ltd, London





Course Code	Course Name	Category	L	T	P	Credit
223MB1A1AA	ENVIRONMENTAL STUDIES	AECC	2	-	-	2

### PREAMBLE

This course has been designed for students to learn and understand

- Multi disciplinary aspects of Environmental studies
- Importance to conserve the Biodiversity
- Causes of Pollution and its control

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the importance of natural resources in order to conserve for the future.	K2
CO2	Infer on Natural resources and its conservation	K2
CO3	Apply the knowledge on Biodiversity and its conservation	K3
CO4	Relate effects, causes and control of air, water, soil and noise pollution etc.,	K2
CO5	Build awareness about sustainable development and Environmental protection	K2

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			
CO3		✓			
CO4		✓			
CO5		✓			

<input type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223MB1A1AA	ENVIRONMENTAL STUDIES	SEMESTER I
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Total Credits: 2

Total Instruction Hours: 24 h

### Syllabus

#### Unit I Introduction to Environmental studies & Ecosystems 5 h

Introduction to Environmental studies & Ecosystems: Multidisciplinary nature of environmental studies; components of environment – atmosphere, hydrosphere, lithosphere and biosphere. Scope and importance; Concept of sustainability and sustainable development. Ecosystem- Structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession.

#### Unit II Natural Resources: Renewable and Non-renewable Resources 5 h

Natural Resources: Renewable and Non-renewable Resources: Land Resources and land use change; Land degradation, soil erosion and desertification. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. Water: Use and overexploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs.

#### Unit III Biodiversity and Conservation 5 h

Biodiversity and Conservation: Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and global biodiversity hot spots. India as a mega-biodiversity nation; Endangered and endemic species of India. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

#### Unit IV Environmental Pollution, Environmental Policies & Practices 5 h

Environmental Pollution, Environmental Policies & Practices: Environmental pollution: types, causes, effects and controls; Air, water, soil, chemical and noise pollution. Nuclear hazards and human health risks. Solid waste management: Control measures of urban and industrial waste. Pollution case studies. Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture. Environment Laws: Environment Protection Act; Prevention & Control of Pollution Act – Air & Water. Wildlife Protection Act; Forest Conservation Act;





## Unit V Human Communities and the Environment& Field Work 4 h

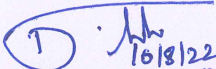
Human Communities and the Environment& Field Work: Human population and growth: Impacts on environment, human health and welfares. Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Environmental communication and public awareness. Visit to an area to document environmental assets; river/forest/flora/fauna, etc. Population explosion - Family Welfare Programmes. Role of Information Technology in Environment and human health. Role of the Colleges, Teachers and Students in village adoption towards clean, green and make in villages in various aspects.

### Text Books

- 1 Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
- 2 Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.

### References

- 1 Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge
- 2 Gleick, P.H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press
- 3 Groom, Martha J. Gary K. Meffe, and Carl Ronald carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006
- 4 Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36-37.
- 5 McCully, P. 1996. Rivers no more: the environmental effects of dams (pp. 29-64). Zed Books
- 6 McNeil, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century
- 7 Odum, E.P., Odum, h.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.

  
 16/8/22  
**BoS Chairman/HoD**  
 Department of Food Science & Nutrition  
 Dr. N. G. P Arts and Science College  
 Coimbatore - 641 048

Dr.N.G.P. Arts and Science College		
APPROVED		
BOS-13th	AC - 13th	GB - 18th
16-8-22	6-9-22	10-9-22



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Course Code	Course Name	Category	L	T	P	Credit
221TL1A2TA	TAMIL - II: ARA ILAKKIYAM	LANGUAGE-I	4	1	-	3

#### PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடுநாகரீகம்,பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

#### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத்திறன்கள் (Life Skills) - மாணவர்களின் செயலாக்கத்திறனை ஊக்குவித்தல்	K1
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K2
CO3	பாடஇணைச்செயல்பாடுகள் (Co-curricular activities)	K2
CO4	சூழலியல் ஆக்கம் (Ecology)	K3
CO5	மொழி அறிவு (Tamil knowledge)	K3

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2		✓		✓	
CO3					✓
CO4	✓			✓	
CO5		✓			✓

#### COURSE FOCUSES ON

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input checked="" type="checkbox"/> Gender Sensitization
<input checked="" type="checkbox"/> Social Awareness/ Environment	<input checked="" type="checkbox"/> Constitutional Rights/ Human Values/ Ethics





221TL1A2TA	TAMIL - II: ARA ILAKKIYAM	SEMESTER II
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Total Credits: 3

Total Instruction Hours: 60 h

## Syllabus

## Unit I அற இலக்கியம் 13 h

1. இலக்கிய வரலாறு- பதினென்கீழ்க்கணக்குநூல்கள்

2. திருக்குறள்

அ. அறன்வலியுறுத்தல்- அ. எண் 04

ஆ. நட்பாராய்தல் - அ. எண் 80

இ. நாடு- அ. எண் 74

ஈ. குறிப்பறிதல்- அ. எண் 110

## Unit II அற இலக்கியம் 13 h

1. நாலடியார் - அறிவுடைமை

2. மூதுரை - ஓளவையார் - 10 பாடல்கள்-6,7,9,10,14,16,17,23,26,30

3. இனியவைநாற்பது- பூதஞ்சேந்தனார் - முதல் 10 பாடல்கள்

## Unit III அறநெறிக் கட்டுரைகள் 09 h

1. இலக்கியவரலாறு - தமிழ் உரைநடையின் தோற்றமும் வளர்ச்சியும்

2. கலைகள்-உ.வே.சா

3. சங்க நெறிகள்- வ.சுப.மாணிக்கம்

## Unit IV அறநெறிக் கட்டுரைகள் 15 h

1. வீர வணக்கம் - க.கைலாசபதி

2. தமிழர் பண்பாடு - டாக்டர் சோ.நா.கந்தசாமி

3. இணையத் தமிழ் வளர்ச்சி - முனைவர் ப.அர.நக்கீரன்

## Unit V பயிற்சிப் பகுதி 10 h

1. இலக்கணம்-வழு, வழுவமைதி, வழாநிலை

2. அலுவலகம் சார்ந்த கடிதம் - விண்ணப்பங்கள், வேண்டுகோள், முறையீடு

3. படைப்பாக்கம்-பொதுத்தலைப்பில் கட்டுரைகள் எழுதுதல்



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## Text Book

- 1 தமிழ் மொழிப்பாடம்-2022-2023,தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி,கோயம்புத்தூர். வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை. (Unit I to V)

## References

- 1 பேராசிரியர் புலவர் சோம. இளவரசு,எட்டாம் பதிப்பு-2014,தமிழ் இலக்கிய வரலாறு- மணிவாசகர் பதிப்பகம்,சென்னை.
- 2 பேராசிரியர் முனைவர் பாக்கியமேரி,முதற் பதிப்பு- 2013,இலக்கணம்- இலக்கிய வரலாறு- மொழித்திறன்- பூவேந்தன் பதிப்பகம்,சென்னை.
- 3 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY வலைதள முகவரி : <https://www.tamilvu.org>

 <b>Dr.N.G.P. Arts and Science College</b>		
<b>APPROVED</b>		
<b>BoS- 1<sup>st</sup></b>	<b>AC- 1<sup>st</sup></b>	<b>GB- 1<sup>st</sup></b>
30.11.2022	19.01.2023	30.01.2023





Course Code	Course Name	Category	L	T	P	Credit
221TL1A2HA	HINDI- II: MODERN LITERATURE	LANGUAGE-I	4	1	-	3

#### PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- the techniques for expansion of ideas and translation process

#### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2			✓		
CO3	✓	✓		✓	
CO4	✓		✓	✓	
CO5			✓		✓

#### COURSE FOCUSES ON

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input checked="" type="checkbox"/> Gender Sensitization
<input checked="" type="checkbox"/> Social Awareness/ Environment	<input checked="" type="checkbox"/> Constitutional Rights/ Human Values/ Ethics





221TL1A2HA	HINDI- II: MODERN LITERATURE	SEMESTER II
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Total Credits: 3

Total Instruction Hours: 60 h

### Syllabus

Unit I 13 h

आधुनिकपद्य – शबरी(श्रीनरेशमेहता)

Unit II 13 h

उपन्यास: सेवासदन-प्रेमचन्द

Unit III 12 h

कहानी-किरीट- डा उषा पाठक / डा अचला पाण्डेय

पाठ 1.कफ़न, 3. चीफ़ की दावत

Unit IV 12 h

पत्र लेखन: (औपचारिक या अनौपचारिक)

Unit V 10 h

अनुवाद अभ्यास-III (केवल हिन्दी से अंग्रेजी में) (पाठ 1 to 10)

### Text Books

- 1 प्रकाशक: लोकभारती प्रकाशन पहली मंजिल, दरबारी बिल्डिंग, महात्मा गाँधी मार्ग, इलाहाबाद. (Unit I)
- 2 प्रकाशक: सुमित्र प्रकाशन 204 लीला अपार्टमेंट्स, 15 हेस्टिंग्स रोड अशोक नगर इलाहाबाद. (Unit II)
- 3 प्रकाशक: राधाकृष्ण प्रकाशन दिल्ली. (Unit III)
- 4 पुस्तक: व्याकरण प्रदीप – रामदेवप्रकाशक: हिन्दी भवन 36 इलाहाबाद. (Unit IV)
- 5 प्रकाशक: दक्षिण भारत प्रचार सभा चेन्नई. (Unit V)





Course Code	Course Name	Category	L	T	P	Credit
221TL1A2MA	MALAYALAM - II: MODERN LITERATURE	LANGUAGE -I	4	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓			✓
CO2	✓				
CO3	✓	✓			
CO4			✓		✓
CO5		✓	✓		✓

### COURSE FOCUSES ON

✓ Skill Development	✓ Entrepreneurial Development
✓ Employability	✓ Innovations
✓ Intellectual Property Rights	✓ Gender Sensitization
✓ Social Awareness/ Environment	✓ Constitutional Rights/ Human Values/ Ethics





221TL1A2MA	MALAYALAM- II: MODERN LITERATURE	SEMESTER II
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**Total Credits: 3**

**Total Instruction Hours: 60 h**

### Syllabus

**Unit I Novel 12 h**

Enmakaje: Chapter1- Chapter5

**Unit II Novel 10 h**

Enmakaje: Chapter 6- Chapter 10

**Unit III Novel 12 h**

Enmakaje: Chapter 11- Chapter 15

**Unit IV Autobiography 14 h**

NeermathalamPoothaKalam :Chapter 1- Chapter 10

**Unit V Autobiography 12 h**

NeermathalamPootha Kalam: Chapter 11- Chapter 20

### Text Books

- 1 Ambika SuthanMangad, Enmakaje (Novel), DC Books Kottayam, Kerala, India. (Unit I to III)
- 2 Madhavikkutty, NeermathalamPootha Kalam (Autobiography), DC Books Kottayam, Kerala, India. (Unit IV & V)

### References

- 1 MalayalaNovel Sahithyam, DC Books Kottayam, Kerala, India.
- 2 MalayalaSahithyaCharithram, National Books Kottayam, Kerala, India.





Course Code	Course Name	Category	L	T	P	Credit
221TL1A2FA	FRENCH- II: GRAMMAR, TRANSLATION AND CIVILIZATION	LANGUAGE-I	4	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written- Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Select the Plural, Articles and the Hobbies	K2
CO4	Measure the Cultural Activity in France	K3
CO5	Evaluate the sentiments, life style of the French people and the usage of the conditional tense	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓			✓
CO2	✓	✓	✓	✓	
CO3		✓	✓		✓
CO4	✓	✓			
CO5			✓	✓	✓

### COURSE FOCUSES ON

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input checked="" type="checkbox"/>	Intellectual Property Rights	<input checked="" type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input checked="" type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





221TL1A2FA	FRENCH- II: GRAMMAR, TRANSLATION AND CIVILIZATION	SEMESTER II
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Total Credits: 3

Total Instruction Hours: 60 h

## Syllabus

## Unit I

12 h

Proposer, accepter, refuser une invitation. Indiquer la date.	Organiser une soirée au cinéma avec des amis, par téléphone et par courriel.	Comprendre un message d'invitation sur un répondeur téléphonique. Inviter quelqu'un à accepter ou refuser l'invitation.
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## Unit II

12 h

Prendre et fixer un rendez-vous. Demander et indiquer l'heure.	Organiser une soirée au cinéma avec des amis, par téléphone et par courriel.	Comprendre des personnes qui fixent un rendez-vous par téléphonique. Prendre un rendez-vous par téléphone
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## Unit III

12 h

Exprimer son point de vue positif et négatif. S'informer sur le prix. S'informer sur la quantité. Exprimer la quantité.	En groupes, choisir un cadeau pour un ami.	Exprimer son point de vue sur des idées de cadeau. Faire des achats dans un magasin
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B.Sc. Food Science and Nutrition (Students admitted during the AY 2022-23)



## Unit IV

14h

Demander et indiquer une direction. Localiser (près de, en face de ....). Exprimer l'obligation l'interdit. Conseiller.	Suivre un itinéraire à l'aide d'indications par téléphone et d'un plan. Par courrier électronique, donner des informations et des conseils à un ami qui veut voyager.	Comprendre des indications de direction. Comprendre des indications de lieu. Comprendre une chanson. Comprendre de courts messages qui expriment l'obligation ou l'interdiction. Donner des conseils à des personnes dans des situations données.
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## Unit V

10 h

Make in Own Sentences

## Text Book

- 1 Regine Merieux, Yves Loiseau, "LATITUDES - 1" (Page No: 56-101) (Methode de Français), Goyal Publisher & Distributors Pvt.Ltd., 86 UB Jawahar Nagar (Kamala Nagar), New Delhi-7 Les Editions Dider, Paris, 2008- Imprimee en Roumanie par Canaleen Janvier 2012.( Unit I to IV)

 <b>Dr.N.G.P. Arts and Science College</b>		
<b>APPROVED</b>		
<b>BoS- 16<sup>th</sup></b>	<b>AC- 14<sup>th</sup></b>	<b>GB- 19<sup>th</sup></b>
30.11.2022	19.01.2023	30.01.2022



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B.Sc. Food Science and Nutrition (Students admitted during the AY 2022-23)



Course Code	Course Name	Category	L	T	P	Credit
221EL1A2EA	PROFESSIONAL ENGLISH - II	LANGUAGE - II	4	-	1	3

### PREAMBLE

This course has been designed for students to learn and understand

- the language for specific purposes through various literary manuscripts
- the process of communicative competences in academics through authentic contexts
- the different formats of business correspondence with lucidity and accuracy via various media

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Relate and appreciate the eminent writers works of various genres	K1
CO2	Infer and comprehend complex situational talks	K2
CO3	Identify formal and informal communicative context to speak fluently	K3
CO4	Construct the denotative and connotative meanings while reading specialized texts	K3
CO5	Develop the skill of writing through descriptions, narrations and essays	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓	✓		
CO2			✓		
CO3	✓	✓		✓	✓
CO4	✓	✓		✓	
CO5	✓		✓		✓

### COURSE FOCUSES ON

✓ Skill Development	✓ Entrepreneurial Development
✓ Employability	✓ Innovations
✓ Intellectual Property Rights	✓ Gender Sensitization
✓ Social Awareness/ Environment	✓ Constitutional Rights/ Human Values/ Ethics





221EL1A2EA	PROFESSIONAL ENGLISH - II	SEMESTER II
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**Total Credits: 3**

**Total Instruction Hours: 60 h**

### Syllabus

#### Unit I Genre Studies 12 h

John Keats: La Belle Dame Sans Merci - Author's Note - title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques- Annotations

A.G. Gardiner: On Keyhole Morals- Author's Note- Title indications- Outline - Passage Analysis - context of the Prose - Narrative techniques- Style

Charles Lamb: A Dissertation upon Roast Pig- Author's Note - title indications- outline- paraphrasing the Essay- context of Essay- form-devices- Narrative techniques

John Galsworthy: The Silver Box- Author's Note- Plot Summary- Critical Analysis- Themes- Characters- Description - analysis- Terms- Symbols

#### Unit II Listening Skills 10 h

Listening to Talks/Lectures by Specialists on selected subject specific topics- Listening to Public Announcements- Listening to Instructions & Directions- Listening to Speeches- Listening to process/event descriptions to identify cause & effects

#### Unit III Speaking Skills 14 h

Small Talk- Mini Presentations and Making Recommendations- Group Discussions, Debates, and Expressing opinions through Role play- Picture Description- Giving Instruction to Use a Product- Presenting a Product- Summarizing a Lecture- Narrating Personal Experiences/ Events- Interviewing a Celebrity- Scientific Lectures- Educational Videos- Debates- Different Viewpoints on an Issue

#### Unit IV Reading Skills 12 h

Reading Biographies, Newspaper Reports, Technical Blogs- Reading Advertisements- Gadget Reviews - Newspaper Articles- Journal Reports- Reading Editorials & Blogs- Case Studies- Excerpts from Literary Texts

#### Unit V Writing Skills 12 h

Inferring & Interpreting- Predicting Reorganizing Material- Summary Writing Based on the Reading Passages- Writing - Emails & Essay Writing (Descriptive or narrative)- Grammar - Tenses- Question Types: Wh/ Yes or No/ and Tags






## Text Books

- 1 <<https://www.poetryfoundation.org/poems/44475/la-belle-dame-sans-merci-a-ballad/>> (Unit I)
- 2 <<https://sittingbee.com/on-keyhole-morals-a-g-gardiner/>> (Unit I)
- 3 <<https://www.gradesaver.com/charles-lamb-essays/study-guide/summary-a-dissertation-upon-roast-pig/>> (Unit I)
- 4 <<https://public-library.uk/ebooks/41/61.pdf>> The Silver Box- John Galsworthy/> (Unit I)
- 5 Hart, Steve, Aravind R.Nair, Veena Bhambhani. 2016. Embark: English for Undergraduates. Cambridge University Press, New Delhi, India. (Unit II)
- 6 Lakshminarayanan. 2012. A Course Book On Technical English. Scitech Publications Pvt. Ltd, New Delhi, India. (Unit III)
- 7 Raman, Meenakshi & Sangeeta Sharma. 2016. Technical Communication- Principles And Practice, Oxford University Press, New Delhi, India. (Unit IV)
- 8 Viswamohan, Aysha. 2017. English For Technical Communication (With CD), McGraw Hill (India) Private Limited, New Delhi, India.( Unit V)

## References

- 1 Bajwa and Kaushik. 2010. Springboard to Success- Workbook for Developing English and Employability Skills. Orient Black Swan, Chennai, India.
- 2 Chellammal, V. 2003. Learning to Communicate. Allied Publishing House, New Delhi, India.
- 3 Krishnaswamy. N, Lalitha Krishnaswamy & B.S. Valke. 2015. Eco English, Learning English through Environment Issues. An Integrated, Interactive Anthology. Bloomsbury Publications, New Delhi, India.
- 4 Syamala. V. 2002. Effective English Communication for You. Emerald Publishers, Chennai, Tamil Nadu, India.

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Course Code	Course Name	Category	L	T	P	Credit
223FN1A2CA	PRINCIPLES OF NUTRITION	CORE	4	1	1	4

### PREAMBLE

This course has been designed for students to learn and understand

- the vital link between nutrition and health
- the functions, metabolism of macro and micro nutrients
- the effects of deficiency and toxicity of macro and micro nutrients

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the introduction and basic values to determine energy	K2
CO2	Illustrate the role of carbohydrate, dietary fiber and the significance of fats in human nutrition	K4
CO3	Construct the supplementation of dietary proteins in human nutrition and vital role of amino acids and mutual	K4
CO4	Speculate the role of vitamins and its implication in human nutrition	K5
CO5	Infer the general functions of minerals along with its role and implication in human nutrition	K4

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓			
CO2	✓	✓	✓		
CO3	✓		✓		✓
CO4	✓	✓	✓	✓	
CO5	✓	✓	✓	✓	✓

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



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*B.Sc. Food Science and Nutrition (Students admitted during the AY 2022-23)*



223FN1A2CA	PRINCIPLES OF NUTRITION	SEMESTER II
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Total Credits: 4

Total Instruction Hours: 72 h

### Syllabus

#### Unit I Energy 15 h

History of nutrition, Nutrition research in India

Definition of Energy and its unit (Calorie and Joule). Energy Metabolism- Direct and Indirect calorimetry, Determination of energy value of food- Bomb calorimeter, Thermic effect of food- definition & factors affecting, Physiological fuel value of food.

Basal Metabolic rate- Definition, measurement- direct and indirect method and determinants of BMR. Recommended Dietary Allowances for energy.

#### Unit II Carbohydrate, Fat and Lipid 14 h

Carbohydrates - Classification, functions, digestion, absorption, metabolism, utilization, deficiency, sources and requirements.

Dietary fiber - Definition, Types and sources, Role of fiber in human health.

Fats and Lipids - Classification, functions, digestion, absorption, metabolism, sources and requirements, types and sources of fatty acids.

#### Unit III Protein and Amino acids 14 h

Proteins - Classification, functions, digestion, absorption, metabolism, utilization, deficiency, sources and requirements.

Evaluation of protein quality-PER, BV and NPU, Digestibility Coefficient, Reference protein.

Amino acids - Essential amino acids and non-Essential amino acids.

#### Unit IV Vitamins 14 h

Vitamins - Classification and functions of vitamins in the body.

Fat soluble vitamins - Functions, absorption, metabolism, sources, requirements, deficiency and toxicity of Vitamin A, D, E and K.

Water Soluble Vitamins - Functions, sources, absorption, metabolism, requirements, deficiency and toxicity of B Complex Vitamins (Thiamine, Riboflavin, Niacin, Pyridoxine, Folic Acid, Pantothenic acid) and Vitamin C. Amygdalin (Vitamin B17)- Sources and significance.





**Unit V Minerals and Water**

15 h

**Minerals – Classification and Functions**

Micro minerals (Iron and Iodine – absorption and metabolism, Zinc, Copper, Fluorine) -Functions, sources, requirements, deficiency and toxicity.

Macro minerals (Calcium, Phosphorus and Magnesium)-Functions, absorption, metabolism, sources, requirements, deficiency and toxicity.

Water – Distribution, functions, requirements and sources of water, water depletion and intoxication, maintenance of water and electrolyte balance.


Electrolytes (Sodium, Potassium and Chloride) - Functions and sources.

**Text Books**

- 1 Srilakshmi B., 2021, "Nutrition Science", 7th Edition, New Age International Publishers, New Delhi.
- 2 Shubhangini A Joshi, 2021, "Nutrition and Dietetics", 5th edition, Mc Graw Hill Publishing Company Ltd, New York.

**References**

- 1 Bamji M S., 2019, "Textbook of Human Nutrition", 4th Edition, Oxford & IBH Publishing Company, United Kingdom
- 2 Gajalakshmi R, 2015, "Nutrition Science", 1st Edition, CBS publishers and Distributors, New Delhi.
- 3 Swami Nathan M., 2014, "Handbook of Food and Nutrition", 1st Edition, Bappco Printing Publishing Company, Mysore.

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223FN1A2CP	NUTRITION PRACTICAL	SEMESTER II
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Total Credits: 2  
Total Instructions Hours: 60 h

S.No	Contents
1	Determination of moisture content and mode of operation technique of Hot air oven and microwave oven
2	Determination of gluten content in wheat
3	Estimation of yield, cooking volume and time, water holding capacity in food products
4	Determination of physical properties, true density, bulk density and porosity
5	Estimation of pH in fruit juices
6	Estimation of titrable acidity
7	Determination of ash content in food
8	Estimation of iron and phosphorous content in food
9	Estimation of ascorbic acid in citrus fruits
10	Qualitative test for Vitamin A
11	Determination of smoking point of fat
12	Determination of oil absorption capacity of baked foods
13	Demonstration on estimation of fiber

#### EXPERIMENTS UNDER DBT

- |    |  |
|----|--|
| 14 | Determination of rancidity in oil        |
| 15 | Identification of starch content in food |

**Note:** Out of 13 – 11 Mandatory





Course Code	Course Name	Category	L	T	P	Credit
222CE1A2IP	APPLIED CHEMISTRY	IDC	3	-	4	5

### PREAMBLE

This course has been designed for students to learn and understand

- the concept of expressing water and water quality parameters.
- the preparation and structure of organic compounds and protein.
- the chemistry of milk products and carbohydrates.

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the concept of water quality parameters	K2
CO2	Describe the Amino acids, Proteins and peptides	K2
CO3	Examine the preparation and applications of organic molecules	K3
CO4	Illustrate the basic concepts and processing of milk	K3
CO5	Explain the structural elucidation of monosaccharide	K2

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓	✓	✓	
CO2	✓	✓			✓
CO3	✓	✓	✓	✓	
CO4	✓	✓		✓	
CO5		✓			✓

### COURSE FOCUSES ON

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





222CE1A2IP	APPLIED CHEMISTRY	SEMESTER II
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Total Credits: 5

Total Instruction Hours: 70 h

### Syllabus

#### Unit I Water 14 h

Sources and impurities, Water quality parameters: Definition and significance of color, odour, turbidity, pH, hardness, alkalinity, TDS, COD and BOD, flouride and chloride. Municipal water treatment: primary treatment and disinfection (UV, Ozonation, break-point chlorination). Desalination of brackish water: Reverse Osmosis.

- 1 Determination of total hardness of water by EDTA method
- 2 Determination of permanent hardness of water by EDTA method
- 3 Estimation of HCl using  $\text{Na}_2\text{CO}_3$  as primary standard and determination of alkalinity in water sample.
- 4 Determination of chloride content of water sample by Argentometric method

#### Unit II Amino acids, Proteins and peptides 14 h

Amino acids -Classification, zwitter ions - Peptides - Structure of proteins - Primary, secondary, tertiary and quaternary structure- Colour test for proteins. Denaturation of proteins.

- 5 Identification of amino acids by paper chromatography
- 6 Colour test for proteins- Biuret test and Xanthoproteic test.

#### Unit III Organic compounds 14 h

Preparation, properties and applications of Benzoic acid, Salicylic acid Benzaldehyde, benzophenone and Aniline.

- 7 Preparation of Methyl salicylate from Salicylic acid (esterification)
- 8 Preparation of Aspirin from Salicylic acid (acetylation)

#### Unit IV Processing of Milk 14 h

Milk: General composition of milk - Physical properties of milk - Recknagel effect

Viscosity and conductivity-Processing of Milk-Boiling -Pasteurization -





Sterilization and homogenization - Adulterants - Detection of Preservatives and neutralizers - Estimation of calcium and fat.

9 Estimation of calcium in milk powder.

10 Estimation of iodine in common salt.

**Unit V** Monosaccharide

14 h

Classification - Occurrence - Preparation - Structural elucidation - Properties of Glucose and Fructose.

11 Estimation of glucose


12 Analysis of simple mono saccharides.

### Text Books

- 1 Bahl Arun, Bahl B.S. 2016, Organic Chemistry, 22nd Edition, S. Chand & Company.
- 2 M. K. Jain, S. C. Sharma. 2007, Organic Chemistry, Shoban Lal Nayin Chand.

### References

- 1 Venkateswaran. V, Veeraswamy. R and Kulandaivelu. A.R, 2017, Principles of Practical Chemistry, 1st Edition, Sultan Chand & Sons & New Delhi.
- 2 Morrison R.T, 2016, Organic Chemistry, 7th Edition, Prentice Hall of India Pvt. Ltd., New Delhi.
- 3 Rangappa K. S, Achaya K.T, 2018, Indian Dairy Products, Reprint, Goel Publishing House, Meerut.
- 4 Jayashree Ghosh, 2016, Fundamental concepts of applied chemistry, 1st Edition, S. Chand & Company Pvt Ltd, New Delhi.

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221TL1A2AA	BASIC TAMIL	SEMESTER II
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Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2022 – 23ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது  
(10 மற்றும் 12 – ஆம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு)

(பருவத் தேர்வு இல்லை)

## Syllabus

Unit I	தமிழ் மொழியின் அடிப்படைக் கூறுகள்	05 h
	எழுத்துகள் அறிமுகம்	
	1. உயிர் எழுத்துக்கள் - குறில் , நெடில் எழுத்துகள்	
	2. மெய் எழுத்துக்கள் - வல்லினம், மெல்லினம், இடையினம்	
	3. உயிர்மெய் எழுத்துக்கள்	
	4. பயிற்சி	
Unit II	சொற்களின் அறிமுகம்	05 h
	1.பெயர்ச்சொல்	
	2.வினைச்சொல் – விளக்கம் (எ.கா.)	
	3.பயிற்சி	
Unit III	குறிப்பு எழுதுதல்	05 h
	1. பெயர், முகவரி, பாடப்பிரிவு , கல்லூரியின் முகவரி	
	2. தமிழ் மாதங்கள்(12), வாரநாட்கள் (7)	
	3. எண்கள் (ஒன்று முதல் பத்து வரை), வடிவங்கள், வண்ணங்கள்	
Unit IV	குறிப்பு எழுதுதல்	05 h
	1. ஊர்வன, பறப்பன, விலங்குகள்	
	2.மனிதர்களின் உறவுப்பெயர்கள்	
	3. ஊர்களின் பெயர்கள் (எண்ணிக்கை 10)	
Unit V	பயிற்சிப் பகுதி	04 h
	பயிற்சிப் பகுதி (உரையாடும் இடங்கள்)	
	வகுப்பறை, பேருந்து நிலையம், சந்தை – பேசுதல், எழுதுதல்.	





**Notes:****அக மதிப்பீட்டுத் தேர்வு - வினாத்தாள் அமைப்பு முறை****மொத்த மதிப்பெண்கள் - 50****பகுதி - அ**

சரியான விடையைத் தேர்வு செய்தல்

10x2=20

**பகுதி - ஆ**

சரியா? தவறா?

10x2=20

**பகுதி - இ**

ஒரு பக்க அளவில் விடையளிக்க

1x10=10

**குறிப்பு:**

- அனைத்து அலகுகளில் இருந்தும் வினாக்கள் அமைதல் வேண்டும்
- பகுதி இ -க்கான வினாக்கள் இது அல்லது அது என்ற அடிப்படையில் அமைதல் வேண்டும்

**Text Book**

அடிப்படைத் தமிழ் - 2022-2023, தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை

- 1 அறிவியல் கல்லூரி, கோயம்புத்தூர் - 641048, வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை. (Unit I to IV)

**References**

- 1 ஒன்றாம் வகுப்பு பாடநூல் - தமிழ்நாடு அரசு பாடநூல் கழகம், சென்னை.
- 2 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY. வலைதள முகவரி : <https://www.tamilvu.org>.

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221TL1A2AB	ADVANCED TAMIL	SEMESTER II
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Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2022-2023 ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது  
(10 மற்றும் 12 - ஆம் வகுப்புகளில் தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு உரியது)  
(பருவத் தேர்வு இல்லை)  
Syllabus

Unit I கவிதைகள் 06 h

1. தமிழ்நாடு - பாரதியார்
2. மனதில் உறுதி வேண்டும் - பாரதியார்
3. இன்பத்தமிழ் - பாரதிதாசன்
4. வேலைகளல்ல வேள்விகள் - தாராபாரதி
5. தமிழா! நீ பேசுவது தமிழா! - காசியானந்தன்
6. நட்புக் காலம் (10 கவிதைகள்) - அறிவுமதி கவிதைகள்

Unit II கட்டுரை 05 h

கட்டுரைத் தொகுப்பு - நல்வாழ்வு - டாக்டர் மு.வரதராசன்

1. நம்பிக்கை
2. புலனடக்கம்
3. பண்பாடு

Unit III இலக்கணம் 04 h

1. வல்லினம் மிகும் மற்றும் மிகா இடங்கள்
2. ர,ற,ல,ழ,ள,ந,ண,ன - வேறுபாடு அறிதல்

Unit IV கடிதங்கள் 05 h

1. பாராட்டுக் கடிதம்
2. நன்றிக் கடிதம்
3. அழைப்புக் கடிதம்
4. அலுவலக விண்ணப்பங்கள்

Unit V பயிற்சிப் பகுதி 04 h

படைப்பாக்கப் பகுதி

பொதுத் தலைப்புகளில் கவிதை, கட்டுரை எழுதச் செய்தல்



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## Notes

அக மதிப்பீட்டுத் தேர்வு - வினாத்தாள் அமைப்பு முறை

மொத்த மதிப்பெண்கள் - 50

பகுதி - அ

சரியான விடையைத் தேர்வு செய்தல்

10x1=10

பகுதி - ஆ

கோடிட்ட இடங்களை நிரப்புக.

10x2=20

பகுதி - இ

இரண்டு பக்க அளவில் விடையளிக்க

2x10=20

குறிப்பு:


- அனைத்து அலகுகளில் இருந்தும் வினாக்கள் அமைதல் வேண்டும்
- பகுதி இ -க்கான வினாக்கள் இது அல்லது அது என்ற அடிப்படையில் அமைதல் வேண்டும்

## Text Book

- 1 சிறப்புத் தமிழ் - 2022-2023, தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, கோயம்புத்தூர். வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை. (Unit- I to IV)

## References

- 1 பேராசிரியர் புலவர் சோம. இளவரசு, எட்டாம் பதிப்பு. 2014. தமிழ் இலக்கிய வரலாறு - மணிவாசகர் பதிப்பகம், சென்னை.
- 2 டாக்டர் மு.வரதராசன். 2010. நல்வாழ்வு, பாரி நிலையம், சென்னை.
- 3 பேராசிரியர் முனைவர் பாக்கியமேரி, முதற் பதிப்பு. 2013. இலக்கணம் - இலக்கிய வரலாறு - மொழித்திறன் - பூவேந்தன் பதிப்பகம், சென்
- 4 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY. வலைதள முகவரி : <https://www.tamilvu.org>

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B.Sc. Food Science and Nutrition (Students admitted during the AY 2022-23)



Course Code	Course Name	Category	L	T	P	Credit
225CR1A2AA	HUMAN RIGHTS AND WOMEN'S RIGHTS	AECC	2	-	-	2

### PREAMBLE

This course has been designed for students to learn and understand

- concepts of Human Rights.
- human Right Violations and Redressal Mechanism.
- rights to Women and Child.

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the Basic concepts of Human Rights	K1
CO2	Describe the Fundamental Rights	K2
CO3	Relate Human Right Violations and Redressal Mechanism.	K3
CO4	State the Rights to Women and Child	K2
CO5	Apply Civil and Political Rights of Women	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓		✓	✓
CO2		✓	✓	✓	✓
CO3				✓	✓
CO4		✓		✓	✓
CO5	✓	✓	✓	✓	✓

### COURSE FOCUSES ON:

<input type="checkbox"/> Skill Development	<input type="checkbox"/> Entrepreneurial Development
<input type="checkbox"/> Employability	<input type="checkbox"/> Innovations
<input type="checkbox"/> Intellectual Property Rights	<input checked="" type="checkbox"/> Gender Sensitization
<input checked="" type="checkbox"/> Social Awareness/ Environment	<input checked="" type="checkbox"/> Constitutional Rights/ Human Values/ Ethics





225CR1A2AA	HUMAN RIGHTS AND WOMEN'S RIGHTS	SEMESTER II
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**Total Credits: 2**

**Total Instruction Hours: 24 h**

### Syllabus

**Unit I** Introduction to Human Rights 04 h

Meaning - Definition - Nature - Content - Legitimacy of Human Rights - Origin and Development of Human Rights - Theories - Principles of Magna Carta - Modern Movements of Human Rights - The Future of Human Rights.

**Unit II** Human Rights in India 05 h

The Constitution of India - Fundamental Rights - Right to Life and Liberty - Directive Principles of State Policy - Fundamental Duties - Individual and Group Rights - Other facets of Human Rights - Measures for Protection of Human Rights in India.

**Unit III** Human Right Violations and Redressal Mechanism 05 h

Human Rights - Infringement of Human Right by State Machinery and by Individual - Remedies for State action and inaction - Constitutional Remedies - Public Interest Litigation (PIL) - Protection of Human Rights Act, 1993 - National Human Rights Commission - State Human Rights Commissions - Constitution of Human Right Courts.

**Unit IV** Rights to Women and Child 05 h

Matrimonial protection - Protection against dowry - Protection to pregnancy - Sexual offences - Law relating to work Place - Directive principles of Constitution (Article 39 a, d, e & Article 42, 43 & 46) - Trafficking of women - Constitutional Rights - Personal Laws - Protection of children against Sexual Offences Act 2012 (POCSO).

**Unit V** Civil and Political Rights of Women 05 h

Right of Inheritance - Right to live with decency and dignity - The Married women's Property Act 1874 - Women's right to property - Women Reservation Bill - National Commission for Women - Political participation - Pre independent political participation of women - Participation of Women in post independent period.





### Text Books

- 1 Lalit Parmar, 1998, "Human Rights", Anmol Publications Pvt. Limited, New Delhi.
- 2 Krishna Pal Malik, 2009, "Women & Law ", Allahabad Law University, New Delhi.

### References

- 1 Mandagadde Rama Jois, 2015, "Human Rights", Bharatiya Values, Bharatiya Vidya Bhavan Publications, Mumbai.
- 2 Paras Diwan and Piyush Diwan, 1994, "Women and Legal Protection", South Asia Books, Andhra Pradesh.
- 3 Venkataram and Sandhiya. N, 2001, "Research in Value Education", APH Publishing Corporation, New Delhi.
- 4 Anand A S, 2008, "Justice for Women: Concerns and Expressions", Universal Law Publishing Co., New Delhi.



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

Dr.N.G.P. Arts and Science College		
APPROVED		
BoS- 14 <sup>th</sup>	AC - 14 <sup>th</sup>	GB - 14 <sup>th</sup>
30.11.2022	19.01.2023	30.01.2023



Dr.NGPASC  
COIMBATORE | INDIA

*B.Sc. Food Science and Nutrition (Students admitted during the AY 2022-23)*



Course Code	Course Name	Category	L	T	P	Credit
221TL1A3TA	TAMIL - III	LANGUAGE - I	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடுநாகரீகம் , பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத்திறன்கள் (Life Skills) - மாணவர்களின் செயலாக்கத்திறனை ஊக்குவித்தல்	K1
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K2
CO3	பாடஇணைச்செயல்பாடுகள் (Co-curricular activities)	K2
CO4	சூழலியல் ஆக்கம் (Ecology)	K3
CO5	மொழி அறிவு (Tamil knowledge)	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓		
CO2				✓	
CO3		✓			
CO4	✓		✓		
CO5	✓			✓	

### COURSE FOCUSES ON

✓ Skill Development	✓ Entrepreneurial Development
✓ Employability	✓ Innovations
✓ Intellectual Property Rights	✓ Gender Sensitization
✓ Social Awareness/ Environment	✓ Constitutional Rights/ Human Values/ Ethics





221TL1A3TA	TAMIL - III	SEMESTER III
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Total Credits: 3

Total Instruction Hours: 48 h

## Syllabus

**Unit I காப்பியங்கள் 10 h**

1. சிலப்பதிகாரம் - வழக்குரை காதை
2. மணிமேகலை - ஆதிரை பிச்சையிட்ட காதை

**Unit II காப்பியங்கள் 10 h**

1. கம்பராமாயணம் - கும்பகர்ணன் வதைப்படலம்: பா. எண் : 60 முதல் - 100 வரை
2. பெரிய புராணம் - அதிபத்த நாயனார் புராணம்

**Unit III சிற்றிலக்கியங்கள் 10 h**

1. திருக்குற்றாலக்குறவஞ்சி - வசந்தவல்லி பந்தாடிய சிறப்பு (6: 4 கண்ணிகள்)
2. கலிங்கத்துப்பரணி- களம் பாடியது: போர்க்களக் காட்சி- பா.எண்: 472 முதல்- 502 வரை

**Unit IV இலக்கிய வரலாறு 10 h**

1. காப்பியங்களின் தோற்றமும் வளர்ச்சியும்
2. சிற்றிலக்கியங்களின் தோற்றமும் வளர்ச்சியும்
3. நாடகத்தின் தோற்றமும் வளர்ச்சியும்

**Unit V இலக்கணம் & பயிற்சிப் பகுதி 08 h**

அ. இலக்கணம்

1. 'பா' வகைகள் : வெண்பா, ஆசிரியப்பா, கலிப்பா, வஞ்சிப்பா - பொது இலக்கணம் மட்டும்.
2. அணி: உவமையணி, உருவக அணி, இல்பொருள் உவமையணி விளக்கம், உதாரணம்.

ஆ. பயிற்சிப் பகுதி

1. வாசகர் கடிதம் : நாளிதழ், வானொலி, செய்தி ஊடகங்களுக்கு விமர்சனம் எழுதுதல்
2. திரைக்கதை : மத்திய மற்றும் மாநில அரசு விருது பெற்ற தமிழ்த் திரைப்படங்கள் மட்டும்





## Text Book

- 1 தமிழ் மொழிப்பாடம் - 2022-2023, தொகுப்பு: தமிழ்த்துறை, டாக்டர் என். ஜி. பி. கலை அறிவியல் கல்லூரி, கோயம்புத்தூர். வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை. (Unit I to V)

## References

- 1 பேராசிரியர் புலவர் சோம. இளவரசு , எட்டாம் பதிப்பு - 2014, தமிழ் இலக்கிய வரலாறு- மணிவாசகர் பதிப்பகம், சென்னை.
- 2 பேராசிரியர் முனைவர் பாக்கியமேரி , முதற் பதிப்பு- 2013, இலக்கணம் - இலக்கிய வரலாறு - மொழித்திறன் - பூவேந்தன் பதிப்பகம், சென்னை. .
- 3 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY. வலைதள முகவரி : <https://www.tamilvu.org>





Course Code	Course Name	Category	L	T	P	Credit
221TL1A3HA	HINDI - III	LANGUAGE-I	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- the techniques for expansion of ideas and translation process

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2		✓			✓
CO3	✓		✓	✓	
CO4					✓
CO5	✓	✓	✓		✓

### COURSE FOCUSES ON

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input checked="" type="checkbox"/> Gender Sensitization
<input checked="" type="checkbox"/> Social Awareness/ Environment	<input checked="" type="checkbox"/> Constitutional Rights/ Human Values/ Ethics





221TL1A3HA	HINDI - III	SEMESTER III
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Total Credits: 3

Total Instruction Hours: 48 h

### Syllabus

**Unit I** 10 h

पद्य – काव्य पराशर (भोलानाथ)

(प्राचीन- कबीर, तुलसी, सुर, मीरा, आधुनिक- मैथिलीशरण गुप्त, अरूण कमल )

**Unit II** 10 h

हिन्दी साहित्य का इतिहास: (साधारण ज्ञान)

**Unit III** 10 h

अलंकार: अनुप्रास, यमक, श्लेष, वक्रोक्ति, उपमा, रूपक

**Unit IV** 10 h

संवाद लेखन

**Unit V** 08 h

अनुवाद अभ्यास-III (केवल हिन्दी से अंग्रेजी में)

(पाठ 10 to 20)

### Text Books

- 1 प्रकाशक: जवाहर पुस्तकालय सदर बाजार, मथुरा उत्तर प्रदेश-281001 (Unit I)
- 2 आचार्य रामचन्द्र शुक्ल लोकभारती प्रकाशन इलाहाबाद. (Unit II)
- 3 प्रकाशक: विनोद पुस्तक मंदिर आगरा-282002 (Unit III)
- 4 पुस्तक: व्याकरण प्रदिप - रामदेव प्रकाशक: हिन्दी भवन 36 इलाहाबाद-211024 (Unit IV)
- 5 प्रकाशक: दक्षिण भारत प्रचार सभा चेन्नई -17 (Unit V)





Course Code	Course Name	Category	L	T	P	Credit
221TL1A3MA	MALAYALAM - III	LANGUAGE-I	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	
CO2	✓				✓
CO3		✓	✓		
CO4	✓			✓	✓
CO5	✓	✓	✓		✓

### COURSE FOCUS ON

✓ Skill Development	✓ Entrepreneurial Development
✓ Employability	✓ Innovations
✓ Intellectual Property Rights	✓ Gender Sensitization
✓ Social Awareness/ Environment	✓ Constitutional Rights/ Human Values/ Ethics





221TL1A3MA	MALAYALAM - III	SEMESTER III
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**Total Credits: 3**

**Total Instruction Hours: 48 h**

### Syllabus

<b>Unit I</b>	<b>Poetry</b>	<b>10 h</b>
	Kumaranasan	
<b>Unit II</b>	<b>Poetry</b>	<b>10 h</b>
	Kumaranasan	
<b>Unit III</b>	<b>Poetry</b>	<b>10 h</b>
	Kumaranasan	
<b>Unit IV</b>	<b>Poetry</b>	<b>10 h</b>
	Vayalar Ramavarma	
<b>Unit V</b>	<b>Poetry</b>	<b>08 h</b>
	Vayalar Ramavarma	

### Text Books

- 1 Kumaranasan. 1998. Chinthavishtayaya Sitha. DC Books Kottayam, Kerala, India. (Unit I to III)
- 2 Ayisha (Poem), National Book Stall Kottayam, Kerala, India. (Unit IV & V)

### Reference

- 1 Dr.M.Leelavathy. Kavitha Sahithya Charithram. Sahithya Academy Thrissur, Kerala, India.





Course Code	Course Name	Category	L	T	P	Credit
221TL1A3FA	FRENCH - III	LANGUAGE-I	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written- Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Select the Plural, Articles and the Hobbies	K2
CO4	Measure the Cultural Activity in France	K3
CO5	Evaluate the sentiments, life style of the French people and the usage of the conditional tense	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2	✓	✓			
CO3			✓	✓	
CO4	✓	✓			✓
CO5	✓		✓	✓	✓

### COURSE FOCUSES ON

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input checked="" type="checkbox"/>	Intellectual Property Rights	<input checked="" type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input checked="" type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





221TL1A3FA	FRENCH - III	SEMESTER III
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Total Credits: 3  
Total Instruction Hours: 48 h

### Syllabus

#### Unit I

10 h

<ul style="list-style-type: none"> <li>° Décrire un lieu.</li> <li>° Situer</li> </ul>	A partir d'une recherche de documents, composer une présentation touristique pour un magazine ou un site internet.	Comprendre la description d'un lieu. Décrire une ville ou une région qu'on aime. Interroger sur la situation d'un lieu. Comprendre des indications sur la fréquence d'actions.	Comprendre une présentation de catalogue touristique. Comprendre des pictogrammes. Comprendre la description d'un lieu et d'une situation précise dans un message électronique.
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#### Unit II

10 h

Se situer dans le temps.	A partir d'une recherche de documents, composer une présentation touristique pour un magazine ou un site internet.	Comprendre la description d'un lieu. Décrire une ville ou une région qu'on aime. Interroger sur la situation d'un lieu. Comprendre des indications sur la fréquence d'actions.	Comprendre une présentation de catalogue touristique. Comprendre des pictogrammes. Comprendre la description d'un lieu et d'une situation précise dans un message électronique.
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#### Unit III

10 h

Raconter. <ul style="list-style-type: none"> <li>° Décrire les étapes d'une action.</li> </ul>	Raconter une scène insolite à l'oral et à l'écrit.	Comprendre le récit d'un voyage. Raconter ses actions quotidiennes.	Ecrire une biographie à partir d'éléments écrits.
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#### Unit IV

10 h

Exprimer l'intensité et la quantité. <ul style="list-style-type: none"> <li>° Interroger.</li> </ul>	Raconter une scène insolite à l'oral et à l'écrit.	Comprendre le récit d'un voyage. Raconter ses actions quotidiennes.	Ecrire une biographie à partir d'éléments écrits.
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#### Unit V

08 h

Make in Own Sentences based on the above Lessons

#### Text Book

- 1 LATITUDES 1 (Méthode de français) Pages from 102-127, Author : Regine Mérieux, Yves Loiseau (Unit I to IV)





Course Code	Course Name	Category	L	T	P	Credit
221EL1A3EA	PROFESSIONAL ENGLISH - III	LANGUAGE- II	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- the basics of English grammar and specific usage
- the importance of the vocabulary and use in different contexts
- the necessity of communication and composition writing skills

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Infer the specific usage of while-listening process	K2
CO2	Organize the various abilities and sub-skills involved in reading	K3
CO3	Utilize the importance of speaking skills and developing it through various practices	K3
CO4	Assume the sentence construction and paragraph development	K4
CO5	Acquire all-round mature outlook to function effectively in different context	K4

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1			✓		✓
CO2	✓	✓		✓	
CO3	✓		✓		✓
CO4	✓		✓		]
CO5	[]	[✓]	[]	[✓]	[]

### COURSE FOCUSES ON

✓ Skill Development	✓ Entrepreneurial Development
✓ Employability	✓ Innovations
✓ Intellectual Property Rights	✓ Gender Sensitization
✓ Social Awareness/ Environment	✓ Constitutional Rights/ Human Values/ Ethics





221EL1A3EA	PROFESSIONAL ENGLISH - III	SEMESTER III
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**Total Credits: 3**

**Total Instruction Hours: 48 h**

### Syllabus

#### **Unit I** Listening and Reading 08 h

Listening in casual conversation, Small group and Conference setting - Listening for Factual Information, Detail and Situation - Developing Listening skills- Why do we avoid Listening- Poor Listening - Disadvantages - Poor listening vs Effective Listening - Basics of Reading- efficient and inefficient readers- Advantages - Benefits and Effective reading and comprehension skills- Need for Developing Efficient Reading skills- Four Basic steps of Effective Reading - Stumbling blocks in becoming an effective Reader- Improving Vocabulary power- Strategies for Comprehending and Retaining content- Effective Note Taking while Reading

#### **Unit II** Speaking 11 h

Purpose of General Conversations- Advantages, features of a good conversation- Tips for improving conversation- public speaking- importance of public speaking- Benefits, Tips, Overcoming fear of public speaking- Preparatory steps - Structuring the contents- Audience Awareness- Mode of Delivery

#### **Unit III** Writing Skills 10 h

CV and Job Applications- How to make your letter stand out?- Employers expectation - Organize the material - Useful suggestions- Cover Letter- Content to be included - Tone of the letter - Report Writing- importance - features- Types - main parts - Feasibility report- Accident report- Scientific report- Memos - Introduction - Structure- Proposal Writing- Key factors- Types- Contents- Format- Evaluation

#### **Unit IV** Effective Skills in Language 10 h

Using Word's Effectively- Mastering Spelling Techniques- Structuring Phrases and Clauses- Writing Effective Sentences- Building Effective paragraphs- Revising, Editing and Proof reading

#### **Unit V** Soft Skills 08 h

Introduction- What are soft skills?- Importance of soft skills- Attributes- Social soft skills- Thinking- Negotiating- Exhibiting- Identifying- Improving- Will formal training enhance your soft skills? - Soft Skills training -Train Yourself- Practicing soft skills- Measuring attitude - Self-Discovery: Importance of knowing yourself- Process - SWOT analysis - Benefits - Usage - SWOT Analysis grid





### Text Books

- 1 Camp and Satterwhite. 1998. College English and Communication. 7th Edition Glencoe Mchrawtill Publishers, New York, Unites States of America. (Unit I, II, III)
- 2 Kumar, Sanjay and Lata Pushp. 2018. Language and Communication Skills for Engineers. First Edition, Oxford University Press, India. (Unit I, II, III)
- 3 Mohan, Krishna and Banerji, Meera. 2009. Developing Communication skills. 2<sup>nd</sup> Edition, Macmillcan, India. (Unit I, II, III, IV)
- 4 Alex. Soft Skills. 2009. S. Chand Publishing, New Delhi, India. (Unit V)

### References

- 1 Ghosh, B.N. Editor. 2017. Managing Soft Skills for Personality Development. McGraw- Hill Education, Chennai, India.
- 2 Miles Craven. 2008. Cambridge English Skills Real Listening and Speaking. First Edition, Cambridge University Press, United Kingdom.
- 3 Mishra, Gauri and Ranjana Kaul. 2016. Language Through Literature. Primus Books, India.
- 4 Pillai G, Radhakrishna. 2000. English for Success. Emerald Publishers, Chennai, India.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A3CA	NUTRITION THROUGH LIFE SPAN	CORE	4	1	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- The nutritional demands in various stages of life cycle
- The process of growth and development from birth until old age
- Acquire skills in planning adequate meals in different stages of life cycle

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Determine nutrient requirements/needs of individuals at different stages of life.	K4
CO2	Explain the nutritional needs during pregnancy and lactation for support of fetal and infant growth	K3
CO3	Assess the growth and development of infants and plan a diet to meet the nutrient requirements	K3
CO4	Infer the nutritional requirement of preschool and school going children	K4
CO5	Illustrate the nutritional problem and requirement for adolescent and senior citizen	K4

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓			
CO2	✓	✓			
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input checked="" type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223FN1A3CA	NUTRITION THROUGH LIFE SPAN	SEMESTER III
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Total Credits: 4

Total Instruction Hours: 60 h

### Syllabus

#### Unit I Introduction to RDA and Balanced Diet 10 h

Basics for Recommending the Dietary Allowances-Introduction, Purpose of RDA, Factors Affecting RDA, Recommended Dietary Allowances for Indians, Dietary Goals and 15 dietary guidelines steps, Concept of balanced diet, Principles and factors affecting of Meal Planning.

Nutritional needs of adults (men and women) –Nutritional requirement of the adult in relation to occupation (Consumption Units) and Reference Man and Woman

#### Unit II Nutritional Needs during Pregnancy and Lactation 12 h

Pregnancy-Stages, Physiological changes, Problems Nutritional requirements and dietary changes during pregnancy

Lactation- Physiological changes during lactation, hormonal control and relaxation, nutritional components of colostrum. Nutritional requirements and diet for lactating women

#### Unit III Nutrition during Infancy 13 h

Infancy- Growth and development (growth chart), Breast feeding and bottle feeding. Nutritional requirements of infants' up to one year in normal and premature infants. Problems of feeding.

Weaning Foods - Types of supplementary food, ARF, Point to be considered in introducing weaning foods, problems in weaning and Low cost supplementary foods in India.

#### Unit IV Nutritional needs of Pre-school & School children 12 h

Pre-school -Growth and development, and feeding problem, developing healthy eating habits Nutritional requirements and dietary guidelines for preschool children.

School children - Growth pattern, Nutritional requirement, feeding problem for schoolchildren, Importance of Packed lunch , Nutritional concerns.





**Unit V**      Nutrition during adolescence and Old age

13 h

Adolescence- Physical and Psychological Growth and development, changes in food habits, Nutritional problems, Eating disorder- anorexia nervosa and bulimia nervosa, Adolescent Pregnancy-Dual burden, Nutritional requirement.

Old Age - Physiological changes in ageing, Psychological and Nutritional problems of elderly and their management. Nutritional requirement.

**Text Books**

- 1      Srilakshmi, B., 2013, "Dietetics", New Age International (P) Ltd., New Delhi.
- 2      Mahtab, S, Bamji, Kamala Krishnasamy, G.N.V. Brahman, 2012, "Text Book of Human Nutrition ", Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.

**References**

- 1      Gopalan, C. Rama Sastri B.V. and Balasubramanian, 2014, "Nutritive Value of Indian Foods ", NIN, ICMR, Hyderabad.
- 2      Simon Langley-Evans, 2015, "Nutrition, Health and Disease: A Lifespan Approach", wiley publications, England.
- 3      Swaminathan, M, 2012, "Advanced Textbook on Food and Nutrition", Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore.
- 4      T. Longvah R. Ananthan K. Bhaskarachary and K. Venkaiah, 2017" Indian Food Composition Tables", National Institute of Nutrition, Hyderabad.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A3CB	HUMAN PHYSIOLOGY	CORE	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- Structure of various organs and integrate the function with human nutrition.
- Identify the structure of the cell & tissue.
- Basic knowledge of human anatomy and physiology.

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Apply the concept and knowledge of general terminology. Relates structure, functions of cell and digestive system	K2
CO2	Demonstrate understanding of the circulatory system. Describe the heartbeat, and relate it to the cardiac cycle	K2
CO3	Explain the reflexes associated with the senses. Discuss the process of gas exchange and transport in lungs	K2
CO4	Identify the major organs and functions of important reproductive systems.	K3
CO5	Explain the mechanism of nephron. Examine how the nervous system controls the body mechanism	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1			✓	✓	
CO2			✓	✓	
CO3			✓	✓	
CO4			✓	✓	
CO5			✓	✓	

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Business/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



Dr. NGPASC

COIMBATORE | INDIA

*B.Sc. Food Science and Nutrition (Students admitted during the AY 2022-23)*



223FN1A3CB	HUMAN PHYSIOLOGY	SEMESTER III
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**Total Credits: 3**

**Total Instruction Hours: 48 h**

### Syllabus

#### **Unit I** Cell & Gastrointestinal tract 08 h

Cell: Structure and functions, Tissues: Structure and functions of epithelial, connective, muscular and nervous tissue.

Digestive system: structure and functions, digestion, absorption of food. Associated organs of digestion- salivary gland, liver, gall bladder, pancreas and spleen

#### **Unit II** Circulatory system 10 h

Blood: Composition and functions, Red Blood cells: Formation and functions, White Blood cells: Types and functions, Platelets-function. Blood groups, blood coagulation and Rhesus factor, Disorders – Anemia, Leukemia, hemophilia.

Heart - Structure and functions, cardiac cycle, ECG and its significance. Blood pressure-factors affecting the blood pressure

#### **Unit III** Sense Organs and Associated diseases 10 h

Sense Organs -Eye, Ear, Tongue and Skin – Structure and functions. Diseases- vision – Conjunctivitis, trachoma, glaucoma, cataract, Tongue- Papilla and taste buds, Ear – Deafness, vertigo Lungs – Structure and functions, Exchange and Transportation of gases in the body. Disturbances in respiration – Apnea, Dyspnea, Hypoxia and Asphyxia.

#### **Unit IV** Reproductive system & Endocrinology 10 h

Male reproductive system – Structure and functions. Spermatogenesis and Structure of Sperm cell. Female reproductive system – Structure and functions, Oogenesis, Menstrual cycle, Puberty and Menarche.

Endocrine glands- Pituitary, Thyroid, Parathyroid, Pancreas (endocrine function), Adrenal –functions, Gonads, hypo and hyper activity of enzymes secreted.





**Unit V** Excretory, Muscular and Central nervous system

10 h

Excretory system – Structure and functions of kidney and Nephron, Mechanism of urine formation, composition of urine, Micturition.

Muscular system – Structure and Functions of the muscles & muscular action.

Central nervous system - Brain, spinal cord and Peripheral Nervous system – structure, function & action.

**Text Books**

- 1 Guyton and Hall, 2011, "Text Book of Medical Physiology", 12th Edition, Elsevier Inc., Netherlands.
- 2 K Sembulingam, Prema Sembulingam, 2019, "Essentials of Medical Physiology", 8th Edition, Jaypee Brothers Medical Publishers (P) Ltd., Hyderabad.

**References**

- 1 Pal G. K, 2021, "Textbook of Medical Physiology", 4th Edition, Ahuja Publishing House, Delhi.
- 2 Chatterjee C. C, 2017, "Human Physiology - Vol I and II", 11th Edition, CBS Publishers, Bengaluru.
- 3 Dee Unglaub Silverthorn, 2016, "Human Physiology: An Integrated Approach", 7th Edition, Pearson Publishers, London.
- 4 Eric Widmaier, Hershel Raff, Kevin Strang, 2010, "Vander's Human Physiology: The Mechanisms of Body Function", 12th Edition, McGraw-Hill Education, New York.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A3CC	INSTITUTIONAL MANAGEMENT	CORE	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- The principles of planning, organizing and controlling in food service institutions
- The Sanitation and hygiene practices in meal planning and catering institutions
- Illustrate the activities on personnel management of employees and employers

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Gain knowledge about various types of food services	K2
CO2	Gain knowledge about the principles and functions of Management	K3
CO3	To understand about personnel Management, financial management	K3
CO4	To understand concepts of resource management and legal aspects	K4
CO5	To realize the importance of sanitation and hygiene in food service institutions	K4

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓	✓	
CO2			✓		✓
CO3	✓	✓		✓	✓
CO4	✓	✓			
CO5	✓				✓

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223FN1A3CC	INSTITUTIONAL MANAGEMENT	SEMESTER III
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Total Credits: 3

Total Instruction Hours: 48 h

### Syllabus

#### Unit I Food Service 8 h

Review of different types of institutional food service in operation- classification based on functional – i.e., profit oriented, service oriented and public health facility oriented, with their objective feeding's programmes in the country.

#### Unit II Management and Organization 10 h

Definition, Principles and techniques of management, tools of management; leadership- qualities of good leader styles of leadership; art of delegation; Organization – Organizing- present and future trends. Process of organization. Principles of organization, types of organization, tools of management. Definition, theories and types.

#### Unit III Personnel Management 10 h

Definition, Sources of personnel, Criteria for selection of personnel orientation, training, motivation, supervision, importance of good human relations, employee facilities fringe benefits: Labor policies and legislation – labor laws governing food service establishments; Performance appraisal of employees.

Financial management: Definition, application of Management Accounts of catering operators, cost concepts, book keeping and accounting – systems of book keeping, book of account maintenance of account books, balance sheets and inventor budgetary control

#### Unit IV Fuels and Safety 10 h

Fuels: Types of fuel, advantages of fuel in relation to economy in quantity cookery, fuel saving economy in food service institutions.

Safety: Accidents in food service establishments, safety procedure, training, Education, legal responsibilities of food service manager

#### Unit V Hygiene, and Sanitation in Food Service Institutions 10 h

Definition, importance, environmental hygiene and sanitation; hygiene in food handling; personnel hygiene of personnel; importance of pest and rodent control in





food services. Safety in food procurement, storage, handling and preparation, control of spoilage, safety of leftover foods, disposal of food waste

### Text Books

- 1 Mohini Sethi and Surjeet Malham, 2014, "Catering Management - an integrated approach", Wiley Eastern limited, New Delhi.
- 2 West, B.B., Wood, L., Hager, V.F., and Shugart, G., 2007, "Food Services in institutions", John Wiley and Sons, New York.

### References

- 1 Bhushan, V.K., 2003, "Business Organization and Management", Sultan Chand & Co, New Delhi.
- 2 Longree, K. and Balaker, B.C., 1979, "Sanitary Techniques in Food Service", John Wiley and Sons, New York.





223FN1A3CP	NUTRITION THROUGH LIFE SPAN	SEMESTER III
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Total Credits: 2

Total Instructions Hours: 48 h

S.No	Contents
1	Standardization of portions for cooked food. Planning, preparation and nutritional evaluation of diets in relation to activity levels).
2	Planning and Preparation of a balanced diet for
3	Pregnant woman in first second and third trimesters
4	lactating woman (0-6 months and 6-12 months)
5	Infancy & toddlers
6	pre-school child
7	school going child
8	Adolescence boys and girls
9	Adult men and women belonging to different income group
10	Senior citizen.
11	Preparation of ARF, complementary and low cost weaning foods
12	Preparation of packed lunch
13	List of DBT Experiments
14	Planning and preparing recipes for a children :Nutritious Snacks
15	Planning and preparing recipes for a senior citizen: Break Fast/Dinner

Note: Out of 12 - 10 Mandatory





## References

- 1 Mahan and Escott ,K & S, 2000, "Food Nutrition and Diet Therapy", 11th Edn. , W.S. Saunder's Company, USA.
- 2 Srilakshmi, B, 2010 "Dietetics", 8thEdn., New Age International Pvt. Ltd, New Delhi.
- 3 Brown, J.E, 2002, "Nutrition Through The Lifecycle", Wadsworth Thomson Learning, USA.
- 4 Recommended Dietary Allowances, 2017, ICMR, National Institute of Nutrition, Hyderabad





Course Code	Course Name	Category	L	T	P	Credit
223BC1A3IA	BIOCHEMISTRY - I	IDC	3	-	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- The nature of biological macromolecules namely Carbohydrate, Lipids, Proteins and Nucleic acid
- The role of Vitamins, Minerals and Hormones in the functioning of cell.
- The properties of nucleotides, how they contribute to secondary and tertiary structures of nucleic acids at the molecular level.

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Outline the properties, types and importance of carbohydrates.	K1
CO2	Compare and contrast the different types of lipids.	K2
CO3	Describe the classification, properties and organization of protein structure	K2
CO4	Determine the structures of purines, pyrimidines, nucleoside and nucleotides, DNA and RNA	K3
CO5	Demonstrate the functions of vitamins and minerals in biological system.	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223BC1A3IA	BIOCHEMISTRY - I	SEMESTER III
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Total Credits: 3

Total Instruction Hours: 36 h

### Syllabus

#### Unit I Carbohydrates 8 h

Carbohydrates – Classification, structure, properties and chemical reactions of monosaccharide - Glucose, Fructose, Galactose, Mannose, Arabinose.

Disaccharides- Maltose, Lactose and sucrose.

Polysaccharides – Homo polysaccharides – Starch, Glycogen and Cellulose and Hetero polysaccharides – Hyaluronic acid, Heparin, Chondroitin sulphate. Biological importance of sugar derivatives - glycosaminoglycans, proteoglycan and glycoprotein – blood group antigens and Bacterial cell wall polysaccharides

#### Unit II Lipids 7 h

Lipids: Definition classification of lipids, physiochemical properties. Storage lipids- fatty acids- types. Structural lipids – phospholipids, glycolipids and sphingolipids. Structure and Biological role of cholesterol.

#### Unit III Aminoacids and Proteins 7 h

Classification of amino acids, general properties, Non protein amino acids. Peptide bond - Structure and conformation, Protein classification, Physiochemical properties of proteins. Organization of protein Structure – primary, secondary (keratin, collagen) Tertiary (Myoglobin), Quaternary structure (Hemoglobin).

#### Unit IV Nucleic acids 7 h

Structure of Purines, pyrimidines, Nucleosides and Nucleotides. Properties of nucleic acids. DNA Double helical structure – isoform. RNA – Types – m RNA, tRNA, rRNA – structure and function.

#### Unit V Vitamins and Minerals 7 h

Minerals in biological system and their importance - Iron, Calcium, Phosphorus, Iodine, Copper, Zinc. Vitamins – Definition, Classification: Fat soluble Vitamins (Vitamin A, D, E, K) and Water soluble Vitamins (Vitamin B and C) – Sources, Functions and deficiencies. Role of Vitamins as antioxidants and cofactors.





### Text Books

- 1 Jain J L, 2016, " Fundamentals of Biochemistry", 7th edition, S. Chand and company Ltd, New Delhi.
- 2 Sathyanarayan U, 2017, "Biochemistry", 5th edition, Books and Allied (P) Ltd, West Bengal.

### References

- 1 Stryer L, 2011, "Biochemistry", 7th Edition, W. H. Freeman and Company, New York.
- 2 Nelson D L, Cox M M, 2008, "Lehninger Principles of Biochemistry", 5th edition, W.H. Freeman and Company, New York.
- 3 Zubay, 1999, "Biochemistry", 4th Edition, William .C. Brain publishers, UK.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A3SA	BASICS OF RESEARCH TECHNIQUES - COMPUTER APPLICATIONS	SEC	2	-	-	2

### PREAMBLE

This course has been designed for students to learn and understand

- Understand the application of computer in various disciplines of Research
- To design and use computer-based projects and programs
- To use existing health and nutrition-based software

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Gain knowledge on computer operations and applications	K2
CO2	Understand the basics of MS Word	K2
CO3	Explore the uses of MS Excel and PowerPoint	K3
CO4	Apply the MS office for research techniques	K4
CO5	Emphasize the importance of computer application in nutrition	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input checked="" type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223FN1A3SA	<b>BASICS OF RESEARCH TECHNIQUES - COMPUTER APPLICATIONS</b>	<b>SEMESTER III</b>
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**Total Credits: 2**

**Total Instruction Hours: 24 h**

### Syllabus

**Unit I** Introduction to the world of computers 05 h

Basic concepts on computer - history, types of computers, input and output devices, peripheral devices, meaning of software and hardware. MS Windows – Introduction, basic concepts on a window, windows explorer, control panel, configuration, editor. Accessories – Paint brush.

**Unit II** MS Word 04 h

MS Word – concepts of document and template, creating documents and saving, concepts of editing, formatting, working with tables and tabs, tools, spell check, grammar check, file printing, mail merge, word art. Plagiarism check.

**Unit III** MS Excel & MS PowerPoint 05 h

Concepts of spread sheet, creating, work sheet, work space, formatting a work sheet, basic operations on data, sorting, total and subtotal, creating link between documents, programming in macros, working with charts, printing worksheets.

Concepts of PowerPoint, creating, opening, saving presentations, working with different views, working with slides – make a new slide, move, copy, go to a specific slide, layout, adding and formatting text, adding clipart and other pictures, designing slide show, tools – meeting minds, presentation conference.

**Unit IV** Computer Application in Research 05 h

Data collection – creating online form using Google forms, Data entry in MS Excel and data analysis using SPSS – Frequency analysis, Cross Tabulation, Chi-Square, T – test, ANOVA and Correlation Co-efficient. Export and saving results in Word document. Creating Tables.

**Unit V** Computer Application in Nutrition 05 h

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





### Text Books

- 1 Microsoft Office 365 for Beginners, 2022: "The Most Updated All-in-One Guide from Beginner to Advanced", Microsoft office, United States.
- 2 Jesus Salcedo, 2017, "SPSS Statistics for Data Analysis and Visualization", Wiley Publishers, New Jersey.

### References

- 1 Wallace Wang, 2016, "Absolute Beginners guide to computing", Apress Publishers, New York.





223FN1ASSA	SELF STUDY: FOOD FORTIFICATION	SEMESTER III
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Total Credits: 1

### Syllabus

#### Unit I Food Fortification

Needs, objectives, principles and rationale, selection and basis of fortificants.

#### Unit II Technology of fortifying cereal products

Characteristics of nutrients used in cereal fortification; Types and levels of micronutrients to be added; Fortification methods; Fortification premixes, Design and composition of premixes and quality control; Fortification of bread, pasta, noodles, biscuits, and breakfast cereals.

#### Unit III Technology of fortifying beverages, candies, snack products

a) Technology of fortifying beverages - Importance of beverage fortification, Health benefits of fortification, Selection of nutrients for fortification, Levels to be added, Characteristics of fortificants and method of fortification, Bioavailability, Organic Vs inorganic salts.

b) Technology of fortifying candies - Product formulation, Factors to be considered in selecting fortificants, Nutrient bioavailability and its interactions, Packaging, storage, shelf life and cos.

c) Snack products - Rationale for micronutrient fortification of snack products, Merits and demerits of fortification, Choice of products and selection of micronutrients, Setting level of fortification, Safety limits, Technological and cost limits, Challenges in fortifying snack products, Nutrient interaction and bioavailability.

#### Unit IV Other special fortified products

Salt, sugars, oils, Nutri-bars, Granola bars.

a) Salt -Technology of fortifying salt with iron and iodine, Iodine stability and quality of double fortified salt, Safety issues, Levels to be added.

b) Sugars - Fortification with iron and vitamin A, Premix formulation, Fortification level, Packaging.

c) Oils- Fortification with vitamin A, Rationale of vitamin A fortification, Stability of vitamin A in oil during storage and cooking, Effects of frying on Vitamin A content, Efficacy and safety of vitamin A added to oil, Technology of fortifying, Packaging.





d) Nutri bars - Selection of nutrient, Advantages and disadvantages of fortification, Technology of fortification, Packaging.

e) Granola bars- Production of the product, Physical parameters of bars, Incorporation of fortificants, Technology of fortification, Packaging.

## Unit V Health Foods

Selection of nutrients, Technology of incorporation, Bioavailability, Packaging.

### Text Books

1. Subbulakshmi and Udipi.S., 2001, "Food processing and Preservation Technology", New Age Publications, New Delhi.
2. Khader, 2001., "A Textbook of Food Processing Technology", ICAR, New Delhi.

### References

1. Shivashankar. B., 2002, "Food Processing and Preservation", PHI, New Delhi.
2. NIIR Board, 2002, "Modern Technology of Food Processing and Agro Based Industry", 2nd Edition, Asia Pacific Business Press, New Delhi.





223FN1ASSB	SELF STUDY: NUTRITION EDUCATION	SEMESTER III
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Total Credits: 1

### Syllabus

#### Unit I Nutrition Education

Nutrition education: definition, rationale, history, need and effectiveness. Role of nutrition educators.

#### Unit II Assessment

Needs assessment -educational assessment Assessing patients and family needs, coping techniques

#### Unit III Human behavior

Theories of human behavior and health choices. Health belief model, Theory of planned behavior and motivation. Stages of change. Social Cognitive Theory, Tran theoretical model and stages of change, Diffusion of Innovations Theory

#### Unit IV Health promotion

Public health nutrition and Health promotion. Planning nutrition education. Competencies and skills of nutrition education and nutrition education specialists.

#### Unit V Health communication, Communication skills


Information Education Communication approaches to improve health and nutrition: Concepts - Scope- Elements- Models of communication - Communication Process - Approaches and Barriers to communication, Communication for Extension Education and Development

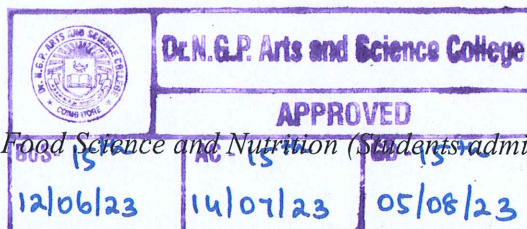
### Text Books

1. Reddy.V., Rao.P, Sastry.G. J and Kashinath K.C, 1995, "Nutrition Trends in India", NIN, Hyderabad, India.
2. Park and Park, 1993, "Text Book of Preventive and Social Medicine", Banarsidas Publication, JaBapur.

### References

1. Gibney, 2004, "Public Health Nutrition", 1st Edition, Black Well Scientific Publications, Oxford.

  
 BoS Chairman, HOD  
 Department of Food Science & Nutrition  
 V. G. P. Arts and Science College  
 Coimbatore - 561 048



B.Sc. Food Science and Nutrition (Students admitted during the AY 2022-23)



Course Code	Course Name	Category	L	T	P	Credit
221TL1A4TA	TAMIL - IV	LANGUAGE- I	3	1	-	3

#### PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு நாகரீகம், பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

#### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத் திறன்கள் (Life Skills)- மாணவர்களின் செயலாக்கத் திறனை ஊக்குவித்தல்	K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K4
CO3	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு (Tamil knowledge)	K5

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓	✓		✓
CO2	✓			✓	
CO3		✓			✓
CO4			✓		
CO5	✓			✓	✓

#### COURSE FOCUSES ON

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input checked="" type="checkbox"/> Gender Sensitization
<input checked="" type="checkbox"/> Social Awareness/ Environment	<input checked="" type="checkbox"/> Constitutional Rights/ Human Values/ Ethics





221TL1A4TA	TAMIL - IV	SEMESTER IV
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Total Credits: 3

Total Instruction Hours: 48 h

## Syllabus

## Unit I எட்டுத்தொகை 10 h

## 1. நற்றிணை – குறிஞ்சித் திணை

I.பா.எண் : 01 – கபிலர்

II.பா.எண் : 88 – நல்லந்துவனார்

III.பா.எண் : 102 – செம்பியனார்

## 2. குறுந்தொகை – முல்லைத்திணை

I.பா.எண் : 65 – கோலூர்கிழார்

II. பா.எண் : 167 – கூடலூர்கிழார்

மருதத்திணை

I.பா.எண் : 08 – ஆலங்குடி வங்கனார்

II.பா.எண் : 61 – தும்பிசேர்கீரனார்

III.பா.எண் : 196 – மிளைக் கந்தன்

நெய்தல் திணை

I.பா.எண் : 57 – சிறைக்குடி ஆந்தையார்

## Unit II எட்டுத்தொகை 08 h

## 1. கலித்தொகை – பாலைக்கலி

I.பா.எண் : 09 – பெருங்கடுங்கோ

## 2. அகநானூறு – மருதத்திணை

I.பா.எண் : 86 – நல்லாழர்கிழார்

## 3. புறநானூறு -

I.பா.எண் : 188 – பாண்டியன் அறிவுடை நம்பி

II.பா.எண் : 192 – கணியன் பூங்குன்றனார்

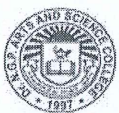
III.பா.எண் : 279 – ஒக்கூர் மாசாத்தியார்

IV.பா.எண் : 312 – பொன்முடியார்

## Unit III பத்துப்பாட்டு 10 h

## 1. பட்டினப் பாலை – கடியலூர் உருத்திரங் கண்ணனார் -1முதல் 218 வரிகள் வரை மட்டும்.

## Unit IV இலக்கிய வரலாறு 10 h





1. எட்டுத் தொகை நூல்கள்
2. பத்துப்பாட்டு நூல்கள்

## Unit V இலக்கணம் மற்றும் திறனாய்வுப் பகுதி

10 h

### I.இலக்கணம்

1. அகத்திணை - அன்பின் ஐந்திணை - விளக்கம்
2. புறத்திணை - 12 திணைகள் - விளக்கம்

### II.பயிற்சிப் பகுதி

சங்கப் பாடல்கள் குறித்து திறனாய்வு செய்தல்

**Note:** பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது

### Text Book

செய்யுள் திரட்டு - மொழிப் பாடம் - 2022- 23

- 1 தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, வெளியீடு : நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை - 600 098. (Unit I- V)

### References

- 1 பேராசிரியர் புலவர் சோம. இளவரசு, எட்டாம் பதிப்பு -2014, தமிழ் இலக்கிய வரலாறு - மணிவாசகர் பதிப்பகம், சென்னை.
- 2 பேராசிரியர் முனைவர் பாக்கியமேரி, முதற் பதிப்பு- 2013, இலக்கணம் -இலக்கிய வரலாறு - மொழித்திறன் -பூவேந்தன் பதிப்பகம், சென்னை.
- 3 தமிழ் இணையக் கல்விக்கழகம்.<<http://www.tamilvu.org/>>





Course Code	Course Name	Category	L	T	P	Credit
221TL1A4HA	HINDI - IV	LANGUAGE-I	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- the techniques for expansion of ideas and translation process

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2		✓			✓
CO3	✓		✓	✓	
CO4					✓
CO5	✓	✓	✓		✓

### COURSE FOCUSES ON

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input checked="" type="checkbox"/> Gender Sensitization
<input checked="" type="checkbox"/> Social Awareness/ Environment	<input checked="" type="checkbox"/> Constitutional Rights/ Human Values/ Ethics





221TL1A4HA	HINDI- IV	SEMESTER IV
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Total Credits: 3

Total Instruction Hours: 48 h

### Syllabus

<b>Unit I</b>	10 h
नाटक	
<b>Unit II</b>	10 h
एकांकी	
<b>Unit III</b>	10 h
काव्य मंजरी	
<b>Unit IV</b>	10 h
सूचना लेखन	
<b>Unit V</b>	08 h
अनुवाद अभ्यास- III	

### Text Books

- 1 लडाई – सर्वेश्वरदयाल सक्सेना प्रकाशक: वाणी प्रकाशन 21-A, दरियागंज नई दिल्ली-110002. (Unit I)
- 2 एकांकी पंचामृत – डॉ राम कुमार (भोर और तारा छोडकर) प्रकाशक: जवाहर पुस्तकालय सदर बाजार, मथुरा उत्तर प्रदेश-281001. (Unit II)
- 3 काव्य मंजरी- (डा मुन्ना तिवारी) मैथिलीशरण गुप्त- मनुष्यता, जयशंकर प्रसाद- बीती विभावरी जागरी सूर्यकान्त त्रिपाठी निराला- तोडती पत्थर और भिक्षुक. (Unit III)
- 4 सूचना लेखन पुस्तक: व्याकरण प्रदिप – रामदेव प्रकाशक: हिन्दी भवन 36 इलाहाबाद -211024. (Unit IV)
- 5 अनुवाद अभ्यास (केवल अंग्रेजी से हिन्दी में) (पाठ 10 to 20) प्रकाशक: दक्षिण भारत प्रचार सभा चेन्नई -17 (पाठ 10 to 20). (Unit V)





Course Code	Course Name	Category	L	T	P	Credit
221TL1A4MA	MALAYALAM- IV	LANGUAGE - I	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	
CO2	✓				✓
CO3		✓	✓		
CO4	✓			✓	✓
CO5	✓	✓	✓		✓

### COURSE FOCUS ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics





221TL1A4MA	MALAYALAM- IV	SEMESTER IV
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**Total Credits: 3**

**Total Instruction Hours: 48 h**

### Syllabus

<b>Unit I</b>	<b>Drama</b>	<b>10 h</b>
Saketham- Sreekandan Nair		
<b>Unit II</b>	<b>Drama</b>	<b>10 h</b>
Saketham- Sreekandan Nair		
<b>Unit III</b>	<b>Drama</b>	<b>10 h</b>
Saketham- Sreekandan Nair		
<b>Unit IV</b>	<b>Screen Play</b>	<b>10 h</b>
Perumthachan- Vasudevan Nair		
<b>Unit V</b>	<b>Screen Play</b>	<b>08 h</b>
Perumthachan- Vasudevan Nair		

### Text Books

- 1 Nair, Sreekandan C.N. 2023. Saketham, Drama. DC Books Kottayam, Kerala, India. (Unit I to III)
- 2 Nair, Vasudevan M.T. 1994. Perumthachan- Screenplay. DC Books Kottayam, Kerala, India. (Unit IV & V)

### Reference

- 1 Sankarapillai. 2005. Malayala Nataka Sahithya Charithram, Kerala Sahithya Akademi Publishers, Kerala, India.





Course Code	Course Name	Category	L	T	P	Credit
221TL1A4FA	FRENCH - IV	LANGUAGE- I	3	1	-	3

#### PREAMBLE

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written- Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

#### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Select the Plural, Articles and the Hobbies	K2
CO4	Measure the Cultural Activity in France	K3
CO5	Evaluate the sentiments, life style of the French people and the usage of the conditional tense	K3

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2	✓	✓			
CO3			✓	✓	
CO4	✓	✓			✓
CO5	✓		✓	✓	✓

#### COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics





221TL1A4FA	FRENCH - IV	SEMESTER IV
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Total Credits: 3

Total Instruction Hours: 48 h

## Syllabus

## Unit I

10 h

° Décrire quelqu'un. ° Comparer	En milieu professionnel, recruter quelqu'un et justifier son choix.	S'exprimer sur les styles de vêtements. Reconnaître des personnes à partir de descriptions.	Comprendre la description de personnes dans un extrait de roman.
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## Unit II

10 h

Exprimer l'accord ou le désaccord. ° Se situer dans le temps.	En milieu professionnel, recruter quelqu'un et justifier son choix.	Décrire des personnes. Comprendre des personnes qui expérimentent leur accord ou leur désaccord.	Comprendre des différences de points de vue exprimés dans un message électronique. Raconter un souvenir.
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## Unit III

10 h

° Parler de l'avenir.	Discuter de l'organisation d'un voyage de groupe puis préparer une fiche projet et la remplir.	Comprendre une chanson. Échanger sur des projets de vacances.	Comprendre le message d'une carte d'anniversaire.
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## Unit IV

10 h

° Exprimer des souhaits. ° Décrire quelqu'un.	Discuter de l'organisation d'un voyage de groupe puis préparer une fiche projet et la remplir.	Discuter du programme de la soirée à venir. Addresser des souhaits à quelqu'un.	Comprendre le message d'une carte d'anniversaire.
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## Unit V

08 h

Make in Own Sentences based on the above Lessons

## Text Book

- 1 LATITUDES 1 (Méthode de français) Pages from 128-151, Author : Regine Mérieux, Yves Loiseau (Unit I to IV)





Course Code	Course Name	Category	L	T	P	Credit
221EL1A4EA	PROFESSIONAL ENGLISH - IV	LANGUAGE- II	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- the skill-based learning for better communication
- the prevalent issues logically and present coherently
- the ideas accurately and clearly

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Develop the ability to appreciate ideas and think critically	K1
CO2	Integrate academic success into practical life skills	K2
CO3	Express challenges of a competitive environment and select the profession that best suits them	K2
CO4	Discuss with confidence in conversations, to initiate, sustain and close a conversation	K3
CO5	Identify a sense of social commitment	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓		✓
CO2	✓	✓		✓	
CO3			✓	✓	✓
CO4		✓			✓
CO5	✓		✓	✓	

### COURSE FOCUSES ON

✓ Skill Development	✓ Entrepreneurial Development
✓ Employability	✓ Innovations
✓ Intellectual Property Rights	✓ Gender Sensitization
✓ Social Awareness/ Environment	✓ Constitutional Rights/ Human Values/ Ethics





221EL1A4EA	PROFESSIONAL ENGLISH - IV	SEMESTER IV
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Total Credits: 3

Total Instruction Hours: 48 h

### Syllabus

#### Unit I Career 08 h

Leadership- Everyday leadership- Everyday leaders motivation- Qualities of a good leader- Professionalism- Creativity- Practical Application- Ways to become more creative- Six Thinking hats techniques

#### Unit II Art of Promoting 11 h

Selling your skills- Neuromarketing as a tool for influencing leaders- Using neuromarketing and psychology to get ahead- Recruiters and Clients decision making skills- Three steps to use neuromarketing for a successful life- Attention-storytelling- Perception and reputation- Recognize opportunities and openings before the competition- observation- Matching yourself with your leaders

#### Unit III Facing Challenges 10 h

Introduction-Panicky people- Negative people- Positive people- Facing challenges and taking initiatives - Importance of youth to face challenges and take initiative Benefits of Facing challenges- Facing challenges in life

#### Unit IV Effective Decision Making 10 h

Decision Making Process- Methods of Decision Making- Steps in DM- Theoretical Approaches to individual Decision Making- Optimizing Decision Theory- The Subjective Expected Utility Model- Steps to Effective Decision- Making- Effective Decision Making in Terms- Methods for team decision making- Confusion and decision making- Decision making styles

#### Unit V Practising Corporate Social Responsibility (CSR) 09 h

Corporate Social Responsibility (CSR)- definitions- Goal- Areas- Need- Benefits - Argument in favour/against of CSR- Factors that promote CSR - Limitations for implementing- India and Corporate Social Responsibility- Activities carried out by Companies in India- List of projects for funding under CSR- Implementation of CSR commitments





### Text Books

- 1 Sharma, Prashant. 2022. Soft Skills. BPB Publications, 3<sup>rd</sup> Edition, New Delhi, India. (Unit I & II)
- 2 Alex. 2013. Managerial Skills. S. Chand Publishing, New Delhi, India. (Unit III to V)
- 3 Alex. 2009. Soft Skills. S. Chand Publishing, New Delhi, India. (Unit II)
- 4 E H McGrath S J. 2011. Basic Managerial Skills for All, 9<sup>th</sup> Edition, New Delhi, India. (Unit III)

### References

- 1 Adair J. 1986. Effective Team Building: How to make a winning team. Pan Books, London, United Kingdom.
- 2 Dhanavel S P. 2010. English and Soft Skills, Orient Blackswan, Hyderabad, India.
- 3 Singh S R. 2011. Soft Skills. APh Publishing Corporation, New Delhi, India.
- 4 Lakshminarayanan K R, Murugavel T. 2015. Managing Soft Skills. Scitch Publications, Chennai, India.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A4CA	DIETETICS	CORE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- Basic concepts of dietetics
- Gain knowledge on the principles of diet therapy in various diseases
- Develop skills to plan and prepare diets to treat various diseases

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Interpret the concepts of diet therapy and nutrient calculation	K1
CO2	Plan diet therapy in energy imbalance, diabetes mellitus and cardiovascular diseases	K2
CO3	Develop knowledge in specialized nutritional care	K3
CO4	Apply the diet therapy in GI, liver, biliary and pancreas diseases	K4
CO5	Justify the dietary modifications in kidney, neurological diseases and febrile conditions	K1

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input type="checkbox"/> Innovations
<input type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
<input checked="" type="checkbox"/> Social Awareness/ Environment	<input type="checkbox"/> Constitutional Rights/ Human Values/ Ethics





223FN1A4CA	DIETETICS	SEMESTER IV
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### Syllabus

#### Unit I Basics of Dietetics 9 h

Menu plan using exchange list. Menu planning in hospital settings - basis, advantages and disadvantages of cyclical menu. Personal and Precision Nutrition. Diet therapy and types of therapeutic diets. Hospital diets and progressive modifications in texture and consistency. Modifications of a normal diet during illness and convalescence. Overview - cell line studies.

#### Unit II Diet Therapy in Energy Imbalance, Diabetes mellitus and Cardiovascular diseases 9 h

Energy imbalance - CED and Obesity, High and Low calorie diets. Diet supplementation and life style modification. Diabetes mellitus - classification, clinical manifestations, complications, diagnosis, diet therapy. Role of resistant starch, SCFA, High fibre diet in Diabetes mellitus. Role of medicinal plants in management of Diabetes mellitus. Cardiovascular diseases - diet therapy for hypertension, atherosclerosis, CAD, hyperlipidemia.

#### Unit III Specialized Nutritional Care 12 h

Nutrition Care Process and Terminology (NCPT) - Diagnosis, Intervention, Monitoring and Evaluation. Documentation of NCP. Tools for screening and nutritional assessment in hospital setting.

Special feeding methods - enteral and parenteral nutrition. Diet therapy for Critical care patients - burns, trauma. Pre-operative and post-operative nutrition. Diet therapy for cancer. Role of medicinal plants in cancer management and alleviation. Feeding problems related to cancer therapy.

#### Unit IV Diet therapy in Gastrointestinal, Hepatic, Biliary and Pancreatic diseases 9 h

Gastrointestinal diseases - diet therapy for diarrhoea, constipation, peptic ulcer. Liver diseases - diet therapy for fatty liver, hepatitis, cirrhosis. Gall bladder diseases - diet therapy for cholelithiasis. Pancreatic disease - diet therapy for acute and chronic pancreatitis.





**Unit V**      Diet therapy in Renal, Neurological diseases and Febrile conditions      9 h

Kidney diseases - diet therapy for renal calculi, nephritis, nephrotic syndrome, and Chronic Kidney Disease, End Stage Renal Disease. Dialysis - types, nutritional considerations in hemodialysis and peritoneal dialysis. Neurological diseases - diet therapy for dementia, dysphagia, Parkinson's disease. AIDS - diet therapy for HIV infection, AIDS. Febrile conditions - diet therapy for typhoid, influenza and fevers, tuberculosis, dengue, malaria, filaria, COVID - 19.

**Text Books**

- 1 Kane K. and Prelack K., 2019, "Advanced medical nutrition therapy", Jones & Bartlett Learning, USA.
- 2 Sheila John, 2016, "Essentials of Nutrition and Dietetics for Nursing", Wolters Kluwer India Pvt. Ltd, Gurugram.

**References**

- 1 Srilakshmi B, 2023, "Dietetics", New Age International Publishers, New Delhi.
- 2 Nix S. Williams S. R. and Mowry L., 2022, "Williams' basic nutrition and diet therapy", Elsevier, USA.
- 3 Mahan L. K. and Escott-Stump S., 2021, "Krause's food & nutrition therapy", Saunders/Elsevier, USA.
- 4 Escott-Stump S, 2015, "Nutrition and diagnosis-related care", Wolters Kluwer India Pvt. Ltd, Gurugram.



223FN1A4CP	DIETETICS	SEMESTER IV
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Total Credits: 2  
Total Instructions Hours: 48 h

S.No	Contents
1	Observation and sensitization on the various scientific formulas in dietetics
2	Planning and preparation of consistency modified diet - normal diet, soft diet, bland diet, full liquid diet, clear liquid diet
3	Energy imbalance - preparation of high and low calorie diet
4	Enteral nutrition - sensitization on the various scientific formulas for tube feeding
5	Surgery - preparation of diet for pre- and post-operative period
6	Cancer - preparation of diet for breast cancer, colorectal cancer, hepatocellular carcinoma
7	Diabetes mellitus - preparation of diet for type 2 and gestational diabetes mellitus
8	Cardiovascular diseases - preparation of diet for hypertension, atherosclerosis
9	Gastrointestinal diseases - preparation of diet for diarrhoea, constipation, peptic ulcer
10	Liver diseases - preparation of diet for hepatitis, cirrhosis
11	Kidney diseases - preparation of diet for renal calculi, chronic kidney disease, hemodialysis, peritoneal dialysis
12	Febrile conditions - preparation of diet for typhoid, tuberculosis
13	AIDS - preparation of diet for HIV infection, AIDS, Covid-19
14	Gall bladder diseases - preparation of diet for cholelithiasis
15	Neurological disorders - preparation of diet for dysphagia, Parkinson's disease
	Experiments under DBT
1	Diet for psychological inadequacies - Memory Enhancement, Cognitive Abilities and stress Management
2	Alternate therapy for immunity enhancement

Note: Out of 15 - 12 Mandatory



Dr. NGPASC  
COIMBATORE | INDIA

B.Sc Food Science and Nutrition (Students admitted during the AY 2022-23)



## References

- 1 Vimla V., 2022, "Advances in diet therapy - practical manual", New Age International Publishers, New Delhi.
- 2 Kane K. & Prelack K., 2019, "Advanced medical nutrition therapy", Jones & Bartlett Learning, Burlington.
- 3 Nix S. Williams S. R. & Mowry L., 2022, "Williams' basic nutrition and diet therapy" Elsevier, Netherlands.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A4CB	PERSPECTIVE PSYCHOLOGY	CORE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- the basic concepts in Psychology and their applications.
- to develop psychological aspects in dealing with every day issues.
- socio-cultural influences on human development and behavior.

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Interpret the methods and disciplines of psychology and to learn the modern perspective in psychology.	K3
CO2	Classify the types of attitudes and various communication styles including the types and barriers.	K2
CO3	Appraise the self management, self esteem and stress management techniques.	K4
CO4	Examine the nature, character, types, aspects and the importance of personality.	K4
CO5	Analyze the relationship between body and mind and to evaluate the barriers to modify poor health behaviours.	K4

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2		✓			✓
CO3		✓			✓
CO4		✓			✓
CO5	✓	✓		✓	✓

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics

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223FN1A4CB	PERSPECTIVE PSYCHOLOGY	SEMESTER IV
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Total Credits: 4

Total Instruction Hours: 48 h

### Syllabus

#### Unit I Introduction to Psychology 10 h

Psychology as a Science, Methods in Psychology- Experimental Methods, Systematic Observation, clinical method. Disciplines of Psychology. Early Schools of Psychology- Structuralism, Gestalt Psychology, Functionalism, Behaviorism, Psychoanalysis. Modern Perspectives - Behavioral, Biological, Cognitive, Social, Developmental, Humanistic, Psychoanalytic.

#### Unit II Attitudes 8 h

Attitude -Meaning, Types of Attitudes, How Attitude Develop, Importance of Attitudes, Improving Attitude, Developing Positive Attitudes, attitude and behavior.

Communication Channels - Communication Barriers, Communication Openers, Communication Styles.

#### Unit III Self-Motivation 10 h

Importance of Self-Motivation Activities and projects - Case study for Critical Thinking. Self-Management - Efficient Work Habits, Stress Management. Self Esteem Knowing Oneself and Accepting Oneself. Self Enhancement- Plan to Improve- Actively Working to Improve Oneself.

#### Unit IV Personality 10 h

Definition, Nature of Personality, Characteristics of Personality, elements of Personality, Types of Personality, Aspects of Personality, methods of measuring personality, Basic Theories of Personality-Albert Bandura, Sigmund Freud's Psychoanalytic Theory, Charles Horton Cooley Laws and George Herbert Mead Theory, Importance of Personality, Techniques to Improve Personality.

#### Unit V Health Psychology 10 h

Definition, Mind-Body Relationship, Biopsychosocial Model, Health Behavior Meaning, Barriers to Modify Poor Health Behaviors. Health Promotion, Primary Prevention, Intervening with Children, Adolescents and at-risk people





Transtheoretical Model of Behavior Change, Need, Functions of Health Psychologists.

### Text Books

- 1 Clifford.T.Morgan ,Richard A.King ,John R.Weisz & John Scholper,2012, "Introduction to Psychology" ,Seventh edition ,Tata McGraw Hill Publishing Company Limited, New Delhi.
- 2 Hans Raj Bhatia,2017, "General Psychology", CBS Publishers & Distributors pvt ltd, New Delhi.

### References

- 1 Taylor,S.E., 2003, "Health Psychology", Fifth edition, McGraw Hill Inc.New York.
- 2 David G.Myers, "Social Psychology",Eighth edition, Tata McGraw Hill Publishing Company Limited, New Delhi.





Course Code	Course Name	Category	L	T	P	Credit
223BC1A4IA	BIOCHEMISTRY-II	IDC	3	-	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- The overview of information related to carbohydrate, fat and protein metabolism that takes place in our body
- The interrelationship between carbohydrate, fat and protein metabolism.
- The basic principles underlying chromatography and electrophoresis methods

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Tell the basic concepts of pH and Buffers and their role of buffers system in our body fluids.	K1, K2
CO2	Outline the various electrophoretic techniques. Compare colorimetry and spectrophotometry.	K1, K2
CO3	Understand the concepts involved in thermodynamics. Recall respiratory chain and oxidative phosphorylation.	K1,K2&K3
CO4	Understand the chemical logic of metabolic pathways.	K1,K2&K3
CO5	Outline how amino acids are synthesized and degraded. Interrelations of CHO, lipid and protein metabolism.	K1&K2

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	S	M	S	S	S
CO3	M	M	M	M	M
CO4	S	M	S	S	S
CO5	S	M	S	S	S

<input checked="" type="checkbox"/> Skill Development	<input type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input type="checkbox"/> Innovations
<input type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization

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ETHICS





223BC1A4IA	BIOCHEMISTRY-II	SEMESTER IV
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Total Credits: 3

Total Instruction Hours: 36 h

### Syllabus

#### Unit I Buffers-and separation techniques 7 h

Buffers: Concept of acid base indicators, buffer systems of blood and body fluids, Components of the pH meter and the concept of PH. Chromatography: Paper, TLC, molecular sieve and affinity chromatography - their applications. Centrifugation techniques - Types, working principles and applications. Electrophoresis: Paper and Gel electrophoresis - working principles and applications.

#### Unit II Quantitative Measurement techniques 7 h

Principles and applications of colorimetry and spectrophotometry.

Isotopes: Definition, types and units of radioactivity: examples of isotopes in biological investigations.

#### Unit III Bioenergetics 8 h

Basic principles of thermodynamics- entropy, enthalpy and free energy; high energy phosphates, oxidation-reduction reactions.

Mitochondria: Respiratory chain and oxidative phosphorylation.

#### Unit IV Metabolic pathways 7 h

Carbohydrate metabolism: Glycolysis, TCA cycle, HMP shunt, Glycogenesis and glycogenolysis.

Lipid metabolism: Beta-oxidation, biosynthesis of saturated fatty acids - Palmitic acid.

#### Unit V Protein metabolism 7 h

General pathway of amino acid metabolism - deamination, transamination and decarboxylation. Urea cycle. Glycine and phenylalanine metabolism (structures not required).

Inter-relationship of carbohydrate, fat and protein metabolism (Flow chart only)



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### Text Books

1. Deb A.C, 2001, Fundamentals of Biochemistry, 9th edition, New Central Book Agency, Kolkatta.
2. Chatterjea M. N, 2012, Textbook of Medical Biochemistry, 8th edition, Jaypee Brothers, New Delhi.

### References

1. Nelson, D.L., Cox, M.M, 2008, Lehninger Principles of Biochemistry, 5th edition, W.H. Freeman and Company, New York.
2. Murray R.K., Granner D.K, Mayes P.A and Rodwell U. W., 2015, Harper's Biochemistry, 30th edition, Lange Medical Publications.
3. D.T. Plummer, 2006, An Introduction to Practical Biochemistry, 3rd edition, TMH, New Delhi.





223BC1A4IP	BIOCHEMISTRY	SEMESTER- IV
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Total Credits: 2

Total Instructions Hours: 48 h

S.No

## List of Experiments

## Analysis of Carbohydrates

1. Monosaccharide - Pentose- Arabinose.
2. Hexoses- Glucose and Fructose
3. Disaccharides - Sucrose, Maltose and Lactose
4. Polysaccharide - Starch

## Analysis of Amino acids

5. Histidine
6. Tyrosine.
7. Tryptophan
8. Arginine

## Characterization of lipids

9. Determination of acid number
10. Determination of iodine number

## Quantification technique

11. Quantification of Protein by Lowry et al method
12. Quantification of Carbohydrate by DNSA method

**Note:** out of 12-10 mandatory



## References

1. D.T. Plummer, (2006), An Introduction to Practical Biochemistry, 3rd edition, TMH, New Delhi.
2. Pattabiraman T. N and Sitarama Acharya U. (2015). Laboratory Manual in biochemistry, 4th Edition. All India Traveller Book Seller.
3. J Jayaraman, (2015). Laboratory manual in Biochemistry. 5th Edition. New Age International (P) Ltd.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A4SA	FUNCTIONAL FOODS	SEC	2	1	-	2

### PREAMBLE

This course has been designed for students to learn and understand

- the concepts of different functional foods
- natural occurrence and classification of functional foods
- the potential of various functional foods in promoting human health

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Develop comprehensive understanding of different functional foods	K1
CO2	Understand the types and market scenario of functional ingredients	K1
CO3	Summarize the various sources of functional foods	K2
CO4	Highlight the importance of safety and efficacy of functional food ingredients	K2
CO5	Emphasize the importance of nutraceuticals and their potential health benefits	K2

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	
CO2		✓		✓	✓
CO3	✓	✓	✓	✓	✓
CO4			✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
<input checked="" type="checkbox"/> Social Awareness/ Environment	<input type="checkbox"/> Constitutional Rights/ Human Values/ Ethics

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223FN1A4SA	FUNCTIONAL FOODS	SEMESTER IV
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**Total Credits: 2**

**Total Instruction Hours: 36 h**

### Syllabus

#### **Unit I** Functional foods 08 h

Definitions, sources, health benefits, bioactive components of functional foods. Development of functional foods, challenges and safety considerations. Future trends of functional foods. Dietary supplements and fortified foods- need, health benefits adverse effects.

#### **Unit II** Types of functional foods 07 h

Whole foods, enriched foods, enhanced foods, fortified foods, modified foods. Market of functional foods, Challenges for Functional food delivery, Factors affecting consumer interest.

#### **Unit III** Functional foods of plant & animal origin 07 h

Functional foods of plant origin: Fruits, vegetables, nuts, spices, cereals, beverages. Functional foods of animal origin: Dairy products, sea foods, egg. Probiotics, prebiotics and symbiotic as functional foods. Effects of probiotics on health.

#### **Unit IV** Legal aspects 07 h

Nutrition and health claims, food component – approved health claims, labeling considerations for functional ingredients, permissible and impermissible functional claims. FSSAI regulations for functional foods. Consumer acceptance and assessment of health claims.

#### **Unit V** Nutraceuticals 07 h

Background, status of nutraceutical market, definition, difference between nutraceuticals and functional foods, types of nutraceutical compounds and their health benefits, current scenario.



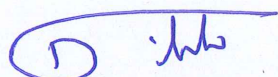


### Text Books

- 1 Wildman, 2007, "Handbook of Nutraceuticals and Functional Foods", CRC Press, USA.
- 2 Schmidl MK and Labuza TP., 2000, "Essentials of Functional Foods", Aspen Publication, Maryland, USA.

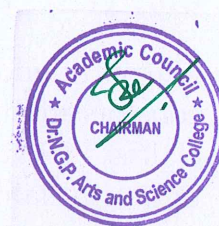
### References

- 1 N. Shakuntalamanay and M. Shadaksharaswam, 2008, "Food Facts and Principles", New Age International Publications, New Delhi.
- 2 Gibson RG and Williams MC, 2000, "Functional Foods Concept to Product", Woodhead Publishing Ltd., England and CRC Press, USA.



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

Dr.N.G.P. Arts and Science College		
APPROVED		
BoS- 16 <sup>th</sup>	AC - 16 <sup>th</sup>	GB - 21 <sup>st</sup>
16.10.23	13.12.23	05.01.24





Course Code	Course Name	Category	L	T	P	Credit
223FN1A5CA	FOOD PRESERVATION	CORE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- the principle and method of preservation
- the preservation techniques by thermal and non-thermal processing
- the effects of preservation methods on the food composition

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Define the principles and explain the concepts of post-harvest technology	K1
CO2	Elaborate on the types of additives and their applications in food preservation	K2
CO3	Apply the fact on significance of moisture content in food and their effect on shelf life	K3
CO4	Analyze the use of heat and energy as a tool for processing and preservation	K4
CO5	Comprehend on the concepts of enhancing food preservation by the indirect approach	K4

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓		✓	✓
CO2		✓	✓	✓	
CO3	✓	✓		✓	
CO4	✓	✓			
CO5	✓	✓	✓	✓	✓

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics	<input type="checkbox"/>	





223FN1A5CA	FOOD PRESERVATION	SEMESTER V
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Total Credits: 4

Total Instruction Hours: 48 h

### Syllabus

**Unit I** Preservation of fresh food produce 08 h

Food preservation - definition, principles and methods. Postharvest physiology of fruit and vegetables, postharvest handling and minimal processing of fruits and vegetables, grains and pulses, fresh fish and seafood, meat and meat products, milk, spices and condiments.

**Unit II** Preservation using preservatives and microbes 08 h

Food preservation using preservatives - natural antimicrobials, antioxidants, additives and preservatives, biopreservatives, mold inhibitors and fermentation.

**Unit III** Preservation by controlling water, structure and atmosphere 12 h

Role of water activity in preservation. Drying and dehydration of foods - principles, advantages, limitations and applications. Glass transition and state diagram of foods. Food preservation using membranes, Encapsulation and stabilization. Modified and controlled, atmosphere packaging of produce.

**Unit IV** Preservation using heat and energy 12 h

Thermal Processing - sterilization, pasteurization, blanching, canning and bottling, microwave and retort process - principles, advantages, limitations and applications.

Freezing - Principles of freezing, fast and slow freezing. Freeze drying and refrigeration - working, advantages and disadvantages, thawing, and cold storage.

Novel processing technologies - irradiation, ohmic heating, pulsed electric field, ultrasound processing, high pressure processing, hurdle technology and cold plasma processing.

**Unit V** Enhancing food preservation by indirect approach 08 h

Food Packaging - packaging as a preservation technique, types of packaging materials used for foods, food packaging interaction. Food manufacturing control - hygienic design and sanitation, HACCP and GMP, Commercial considerations - managing profit and quality.





### Text Books

- 1 Subulakshmi.G and Shoba A Udipi V.K, 2017, "Food Processing and Preservation", New Age International Publishers, New Delhi.
- 2 M. Shafiur Rahman, 2007, "Handbook of Food Preservation", 2<sup>nd</sup> Edn., CRC Press, London.

### References

- 1 Manoranjan Kalia and Sangita Sood, 2012, "Food Preservation and Processing", 2<sup>nd</sup> Edn., Kalyani Publishers, Ludhiana, India.
- 2 Srivastava.R.P and Sanjeev Kumar, 2002, "Fruit and Vegetable Preservation Principle and Practices", 3<sup>rd</sup> Edn., CBS publishers, New Delhi.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A5CB	FUNDAMENTALS OF FOOD MICROBIOLOGY	CORE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- The nature of foods and causes of deterioration in food products
- The principles underlying food processing and the improvement of foods for public consumption
- The effect of food poisoning and food borne intoxication on human health

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Illustrate the general characters and the factors affecting the growth of microorganisms in food.	K2
CO2	Appraise the principles involved in the contamination, preservation and spoilage of different food.	K4
CO3	Identify the role of microorganism in various food products.	K3
CO4	Explain the food borne intoxication and food borne infections.	K5
CO5	Justify the role of microorganism in Food Safety Outline FSO, GMP and HACCP.	K5

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		✓
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223FN1A5CB	FUNDAMENTALS OF FOOD MICROBIOLOGY	SEMESTER V
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### Syllabus

#### **Unit I** Food and Microorganisms 10 h

Importance and types of microorganisms in food industry - Bacteria, Mold and yeast, Scope of food microbiology.

Factors affecting the growth of microorganisms in food - Ph, moisture, temperature, oxidation - Reduction potential, Nutrient content, Inhibitory substances and combined effects of factors.

#### **Unit II** Contamination, Preservation and Spoilage of different food 08 h

General principles underlying spoilage - causes of spoilage, classification of food based on spoilage.

Contamination, preservation and spoilage -cereals and cereal products, sugar and sugar products, meat and meat products, vegetables and fruits, milk and milk products and canned foods.

#### **Unit III** Microorganisms as a Food 10 h

Single cell protein, algae and mushroom as a food. Concept of probiotics, prebiotics and synbiotics.

Manufacture of fermented foods, Fermented dairy products - Yoghurt and cheese.

Fermented plant products - Bread, sauerkraut and pickles. Fermented beverages - types of wine and beer. Fermented meat products - Sausages. Industrial importance of yeasts. Oriental Fermented Foods.

#### **Unit IV** Food Poisoning 10 h

Food borne intoxication - Staphylococcus, clostridium, Bacillus cereus, Vibrio parahaemolyticus and Campylobacter jejuni.

Food borne Infections - E.Coli, Salmonella, Shingella, and Listeria monocytogenes.

Algal toxins and Mycotoxins.

#### **Unit V** Microbiology and Food Sanitation 10 h

Food sanitation - control and inspection, microbiological criteria and food safety.





Quality Assurance - Microbiological quality standards of food.

Food Safety objectives, Good Manufacturing Practices (GMP), Good Hygiene Practices (GHP) and Hazard Analysis and Critical Control Point (HACCP).

### Text Books

- 1 William C. Frazier and Dennis C. Westhoff, 2021, "Food Microbiology", Mc Graw Hill Publishers.
- 2 Adams M.R. and Moss M.O, 2008, " Food Microbiology", 3rd Edition, Panima Publishers.

### References

- 1 Roger.Y.Stainer, 2004, " Basic Food Microbiology", 3rd Edition, CBS Publishers.
- 2 Foster VM, 2016, "Food Microbiology, 1st Edition, CBS Publishers.
- 3 Prasad and Vijaya Raghava D, 2015," Essentials of Food Microbiology",2nd Edition, SBW Publishers.,
- 4 Anjena, 2018,"Modern Food Microbiology",1st Edition, Medtech Science Press.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A5CC	FOOD PROCESSING	CORE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- The basic processing methods of foods
- Equipments used in food processing
- Significance of non - thermal food processing techniques

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Identify and apply the suitable processing methodology for cereals and pulses.	K5
CO2	Suggest the processing technique of dairy products and Outline the processing steps of edible oil production	K5
CO3	Apply the suitable process technique to meat, poultry, fish and egg products.	K4
CO4	Justify the best method to process fruit and vegetable and mushroom process.	K5
CO5	Process beverages and spices with effective technology.	K5

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

<input type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223FN1A5CC	FOOD PROCESSING	SEMESTER V
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Total Credits: 4

Total Instruction Hours: 48 h

### Syllabus

#### Unit I Cereals and Pulses Processing 10 h

Paddy Processing - Types, milling of rice, by products of rice and their utilization. Wheat processing - Milling of wheat, by products of wheat, extruded products. Millet processing - Types of millet and its processing. Innovative Millet Products. Pulse processing - Wet and dry processing, protein concentrates and protein isolates. Development of low cost protein foods and snacks.

#### Unit II Milk and Edible Oils Processing 10 h

Processing of Milk and milk products - Kinds of milk, Cheese and its types, butter, Probiotic milk products - Yoghurt, Kefir, Indigenous Milk products - Panneer, khoa, curd, ghee. Frozen milk products - Ice cream. Technology of oil seeds - Processing of edible oils, vegetable oils, by products of edible oil processing.

#### Unit III Vegetables and Fruit Processing 10 h

Vegetable and fruit processing - Minimal processing, Cold storage, Drying techniques - drum drying, vacuum drying, freeze drying, infra red drying, oven drying, foam mat drying, solar drying and mechanical dehydration - use of kiln drier and tunnel drier, osmotic dehydration.

#### Unit IV Processing of Meat, Poultry, Egg and Fish 08 h

Meat and poultry processing - Curing, smoking, freezing and cryogenic and vacuum packaging, Egg - Whole egg powder, egg yolk powder, Fish - Fish protein concentrate, fish protein isolate, fish meal and fish oil.

#### Unit V Processing of beverages and spices 10 h

Non - alcoholic beverages - Manufacturing process of tea and coffee, Processing of cocoa bean into cocoa powder, manufacture of dark chocolate. Alcoholic beverages - Manufacturing process of Beer and wine. Spices - processing, grading specifications of spices, manufacturing process of spice oil and oleoresin.





### Text Books

- 1 Fellows P.J , 2016, "Food Processing Technology" - Principles and Practices, Third Edition, CRC Press, Woodland Publishers, England.
- 2 Shakuntala Manay, N. and Shadaksharaswamy, M., 2008, " Foods - Facts and Principles", Third Edition, New Age International Publishers, Newdelhi.

### References

- 1 Subbulakshmi and Shobha Udipi 2020, "Food Processing and Preservation Technology", First Edition, New Age Publishers, New Delhi.
- 2 Sivasankar.B, 2002, " Food Processing and Preservation," First edition, PHI Pvt. Ltd, New Delhi
- 3 Srilakshmi. B, "Food Science", 8th Edition, New Age International Publishers, New Delhi.
- 4 Bawa AS, Raju PS, Chauhan OP, 2013, "Food Science", New India Publishing Agency, New Delhi.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A5CD	FOOD SAFETY AND QUALITY CONTROL	CORE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- Food safety and food laws followed in food industries
- The quality control and common food standards
- The microbial analysis and shelf life of the products

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Define food safety and principles of quality control in food industry.	K1
CO2	List down the national and international organizations and identify the HACCP principles.	K2
CO3	Illustrate the pre-requisite programs followed by the food industry.	K3
CO4	Explain the methods for determining the quality and sensory attributes of foods.	K4
CO5	Outline the standards for food products and identify the food adulterants.	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics

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223FN1A5CD	FOOD SAFETY AND QUALITY CONTROL	SEMESTER V
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Total Credits: 4

Total Instruction Hours: 48 h

### Syllabus

#### Unit I Food safety and Quality control 8 h

Food Safety - definition of food safety and food spoilage, factors affecting food Safety and food spoilage. Quality control- definition of quality control, Principles of Quality control of food, Quality Assurance-Raw material control, process control and finished product inspection.

#### Unit II Regulation in Quality Control 10 h

Codex Alimentarius, ISO, ISI, AGMARK, FSSAI-Food Safety Act 2006, Food Safety Rules and Regulation, APEDA, JECFA

#### Unit III Pre-requisite Programs 10 h

GHP - Personal hygiene - occupational health and safety specification, Food Plant Sanitation Management - Plant facilities construction and maintenance - exterior of the building- interior of the building- equipment's. GHP in Processing, Storage, transportation, traceability, recalling procedures, training and Documentation.

#### Unit IV HACCP 10 h

HACCP principles- Types of Hazards, HACCP team, Conduct a hazard analysis, CCP identification, establish critical limits for each CCP, establish CCP monitoring procedures, establish corrective actions procedures, establish procedures for HACCP verification and validation, documenting the HACCP Program.

#### Unit V Quality evaluation of foods 10 h

Determination and Compliance of finished product quality with FSSAI Standards, assessment of food quality, Panel selection, sensory Laboratories, Subjective and Objective method of evaluation





## Text Books

- 1 Pulkit Mathur, 2008, " Food Safety and Quality Control" Orient Black Swan publication.
- 2 Norman G. Marriott, 2006, "Principles of Food Sanitation", 5th Ed, Springer publication, USA.

## References

- 1 Naomi Rees. David Watson. 2000, " An Aspen Publications. International standards for food safety, An Aspen Publication.
- 2 Mortimore, S., and Wallace.C, 2005, "HACCP: A practical approach", 2nd Ed, Aspen Publication.
- 3 Victoria.B.C, 2015, "Food Safety, Sanitation, and Personal Hygiene" The BC Cook Articulation Committee.
- 4 Mahindru.S.N, (2000), Food Additives, Edition I, TMH, New Delhi.





223FN1A5CP	FOOD PRESERVATION	SEMESTER V
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Total Credits: 2  
Total Instructions Hours: 48 h

S.No	Contents
1	Prepare a preserved product and evaluate its sensory attributes
2	Conduct a consumer acceptability trial for a preserved product
3	Methods of food preservation by sugaring
4	Methods of food preservation by salting
5	Methods of food preservation by pickling
6	Methods of food preservation by canning and bottling
7	Methods of food preservation by drying
8	Methods of food preservation by osmotic dehydration
9	Methods of food preservation by freezing and refrigeration
10	Methods of food preservation by sterilization and pasteurization
11	Methods of food preservation by fermentation
12	Methods of food preservation by smoking

#### Experiments under DBT

- 1 Preservation of foods by fats – confit & sous vide method
- 2 Preservation of foods using protein based edible coatings

**Note:** Out of 12 – 10 Mandatory

#### References

- 1 M. Shafiur Rahman, 2007, "Handbook of Food Preservation", 2<sup>nd</sup> Edn., CRC Press, London.





223FN1A5SP	FOOD PROCESSING AND QUALITY CONTROL	SEMESTER V
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Total Credits: 2  
Total Instructions Hours: 48 h

S.No	Contents
1	Determination of physical dimensions of cereals and pulses
2	Estimation of pH and titratable acidity of a fruit
3	Estimation of total solids in milk
4	Analyzing the presence of antioxidants in processed foods
5	Determination of rancidity in oil using Kries test
6	Minimal processing of fresh vegetable produce
7	Determine the brix value and relative density of sugar rich foods
8	Determine the quality index of an egg
9	Analyze the tenderness of poultry meat with and without tenderizer
10	Detect the common adulterants present in various foods
11	Determination of cooking properties of raw and parboiled millets
12	Determination of rehydration ratio of dehydrated foods

#### Experiments under DBT

- 1 Analyzing the texture of processed foods using TPA & Viscometer
- 2 Detection of non-permitted food additives in market food samples

**Note:** Out of 12 – 10 Mandatory

#### References

- 1 Vedpal Yadav, 2014, "Food Analysis and Quality Control - A Practical Manual", Government Polytechnic, Haryana, India.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A5DA	POST-HARVEST TECHNOLOGY	DSE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- the concept of post-harvest process and managements
- causes of post-harvest losses and its control measures
- government initiatives and role in controlling food losses

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Identify the importance of post-harvest technology.	K1
CO2	Categorize the handling techniques of produce at farm level.	K2
CO3	Prioritize the importance of packing house operations and food storage structures.	K3
CO4	Categorize the food loss and its control measures.	K4
CO5	Understand the role of government in food distribution and improve entrepreneurial skills.	K1

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223FN1A5DA	POST-HARVEST TECHNOLOGY	SEMESTER V
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### Syllabus

#### **Unit I** Introduction to Post-Harvest Technology 10 h

Introduction to Post Harvest Technology - Definition, importance. Elements of Post-harvest system. Scenario of Food Processing and Post-Harvest Management-Agro Processing Centers, Cold Storages, Food Parks, Agri Export Zones, Agri Logistics-Long & Short Holding Produce, Record Keeping System on food supply chain.

#### **Unit II** Harvesting and Field Handling 10 h

Maturity Indices, Harvesting Techniques and Operations-Hand Harvesting, Machine Harvesting, Transport -Types of Transport from the farm level and distribution of agricultural produce, Grading and its Equipment's

#### **Unit III** Packinghouse and storage 8 h

Packing house- Need, Packhouse Operations, Storage- Principles, Types of Storage operations, Factors affecting storage, Storage structures and Temperature for fruits, vegetables and root crops, milk, and meat products.

#### **Unit IV** Post-Harvest Loss and its Control 10 h

Food loss -Types, Agents- Physical agents (moisture, temperature), Chemical losses, biological losses- insect infestation, rats and rodents, birds, animals, and Control of Spoilage Agents- Methods to prevent the entry of rats and rodents, Fumigation, Controlling the inhouse conditions.

#### **Unit V** Post-Harvest Distributions 10 h

MOFPI-Integrated Cold Chain and Value Addition Infrastructure Scheme-Objectives and Components, Grains- Underground & Above ground storage, Food Corporation of India- Godown, Functions of Central Warehouse Corporation, State Warehouse Corporation, PDS.





## Text Books

- 1 Florkowski, W. J., Banks, N. H., Shewfelt, R. L., and Prussia, S. E., 2021, "Postharvest handling: a systems approach", 3rd Edition, Academic Press, Amsterdam.
- 2 Chakravarty, A., 1995, "Post harvest technology of cereals, pulses and oilseeds", 3rd Edition, Oxford and IBH, New Delhi.

## References

- 1 Sudheer, K. P., and Indira, V. 2007, "Post harvest technology of horticultural crops" , Vol. 7. New India Publishing, New Delhi
- 2 Boumans, G., 2012, Grain handling and storage. 4th Edition, Elsevier, Netherland.
- 3 Mor, R. S., Kumar, D., and Singh, A., 2022, "Agri-Food 4.0: Innovations, Challenges and Strategies". Emerald Publishing Limited, Bingley.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A5DB	CLINICAL NUTRITION	DSE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- The intricate mechanisms governing metabolism, energy balance, water-electrolyte equilibrium, process of digestion, and stress management
- The dynamic interplay between various metabolic pathways and how the body maintains homeostasis and responds to challenges
- The complexities of human metabolism and develop critical skills for nutritional care planning and stress management in health and disease

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the energy homeostasis, role of regulatory enzymes, integration of metabolism across various tissues.	K3
CO2	Analyze the regulatory mechanisms underlying energy balance, incorporating hormonal influences as well as lifestyle factors.	K4
CO3	Explain the principles governing water and electrolyte balance, body water distribution, hormonal controls.	K3
CO4	Understand the coordination and regulation of the digestive process.	K2
CO5	Assess the role of stress as a risk factor for health and disease	K4

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				
CO2			✓		
CO3				✓	
CO4			✓		
CO5			✓		

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>		<input type="checkbox"/>	Ethics



Dr. NGPASC

COIMBATORE | INDIA

areness/ En Bio Food Science and Nutrition Cons Students Rights during the V (2022-23)



223FN1A5DB	CLINICAL NUTRITION	SEMESTER V
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Total Credits: 4

Total Instruction Hours: 48 h

### Syllabus

#### Unit I Integration and regulation of metabolism 10 h

Energy homeostasis in the cell: regulatory enzymes. Integration of Carbohydrate, lipid, and protein metabolism: interconversion of fuel molecules, energy distribution among tissues such as liver, muscle, adipose tissue, brain, RBCs, kidneys.

#### Unit II Regulation and influences of energy balance 11 h

The FED - FAST cycle (The Fed state, The Post-absorptive state, The Fasting state, The Starvation state). Hormonal regulation of metabolism (Insulin, Glucagon, Epinephrine, Cortisol, Growth Hormone, Adiponectin). Hormonal influences (Leptin, Insulin, Adiponectin, Ghrelin, other anorexigenic hormones). Lifestyle influences.

#### Unit III Water and electrolytes balance 8 h

Water functions, body water content and distribution, water losses, sources and absorption.

Extracellular fluid volume, osmolarity and hormonal controls (Vasopressin, Renin-Angiotensin-Aldosterone System, and sodium balance, Natriuretic peptides).

#### Unit IV Coordination and regulation of the digestive process 11 h

Regulation of gastric secretions. Effects of selected gastrointestinal hormones/peptides on gastrointestinal tract secretions and motility. Regulation of gut motility and gastric emptying, Regulation of Intestinal Motility and Secretions. Regulation of Pancreatic Secretions. Colonic Secretions and Motility and Their Regulation. Neural regulation, regulatory peptides of the digestive system.

#### Unit V Stress Management 8 h

Basic Stress: Definition. Estimating stress. Factors responsible for good stress and bad stress. Physiologic-Metabolic response to stress. Management of Stress through Nutrients: Complex carbohydrates, Omega 3 fatty acids, Proteins, Vitamin C, Vitamin B, Magnesium, Selenium. Stress-busting foods.





## Text Books

- 1 Sareen S. Gropper, Jack L. Smith and Timothy P. Carr, 2022, "Advanced Nutrition and Human Metabolism", Cengage Learning, Inc.
- 2 Larry Hoover, 2017, "Metabolic States: Notes on Stress, Nutrition and Exercise", Xlibris.

## References

- 1 Gilbert, J., Schlenker, E. D, 2015, "Williams' Essentials of Nutrition and Diet Therapy", United Kingdom: Elsevier - Health Sciences Division.
- 2 Whitney E. N. Rolfes S. R. Crowe T. and Walsh A, 2023, "Understanding nutrition", Cengage Learning.
- 3 Nix S. Williams S. R. and Mowry L, 2022, "Williams' basic nutrition and diet therapy", Elsevier.
- 4 Kane K. and Prelack K, 2019, "Advanced medical nutrition therapy", Jones & Bartlett Learning.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A5DC	FOOD COMMODITIES	DSE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- The principles and various methods of cooking foods
- The knowledge on composition of various foodstuffs
- The food science knowledge to describe functions of ingredients in food

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Discuss the methods of handling and transport of commodities. Explain nutrient losses in the food grains.	K1
CO2	Paraphrase the positions of kitchen production. Illustrate the equipment operations & common culinary tools.	K2
CO3	Analyze various cooking techniques and safety hazards, employ preventative safety measures.	K3
CO4	Illustrate the processing of foods and utilization of stock exchange.	K4
CO5	Describe the portion control and personal hygiene to be maintained in the kitchen.	K1

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Environmental Awareness/ Environmental Science	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



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COIMBATORE | INDIA

Environmental Awareness/ Environmental Science

B.Sc. Food Science and Nutrition (Students admitted during the AY 2022-23)



223FN1A5DC	FOOD COMMODITIES	SEMESTER V
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### Syllabus

#### **Unit I** Introduction to Food Commodities 10 h

Introduction to Food Commodities – Definition, and Classification of Commodities food commodification in the early markets, raise of commodity exchanges and their impact, Food commodities - cereals, pulses dairy, meat, fruits and vegetables, Potatoes, Poultry, eggs and sugar. Handling and Transport of Food Commodities - Traditional and improved methods, Nutrient losses in spoiled grains and National program to save grains.

#### **Unit II** Kitchen and kitchen equipments 10 h

Kitchen – Definition, parts, Different Positions, Designing a kitchen, Functions of kitchen. Kitchen equipments – Traditional and Modernized kitchen equipments, Culinary hand tools – Importance, Functions and safety measure.

#### **Unit III** Cooking Skills, Techniques and Safety 8 h

Cooking Skills – Equipment operating knowledge and handling skills. Cooking Techniques – Classification of Cooking techniques, Importance of cooking techniques. Safety – Safety hazards, employ preventive safety measures, safe work habits.

#### **Unit IV** Preparation and processing of foods 10 h

Preparation of foods – selection of raw ingredients. Employment of preliminary methods - cleaning, grading, sorting, Processing of foods, utilization of basic stocks and storage. Maintenance of records.

#### **Unit V** Portion control and personal hygiene 10 h

Portion control – workflow, plating and garnishing principles. Personal hygiene – principles, Importance of personal hygiene, points to be noted while entering the kitchen.





### Text Books

- 1 Sethi M. and Malhan S.M, 2015, "Catering Management an Integrated Approach", 3rd edition, New Age International Private Limited, India.
- 2 Thangam Philip, 2005, "Modern Cookery", 3rd edition Orient Longman Limited, India.

### References

- 1 Cessarani, V. Kinton, R, 2002, "Practical Cookery", seventh Edition, Hodder and Stoughton publishers.
- 2 Khan, M.A, 2003, "Food Service Operations", AVI Publications Co., Connecticut.
- 3 John Cousins, Dennis, Lillicrap and Suzanne Weekes, 2014 "Food and Beverage Service", 9th Edition, Published by Hachette, UK.
- 4 Parvinder S. Bali, 2011, "Quantity Food Production Operations and Indian Cuisine", Published by Oxford University Press, India.





223FN1A5GA	FOOD PRESERVATION	SEMESTER V
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Total Credits: 2

Total Instruction Hours: 24 h

## Syllabus

Unit I Food Preservation 4 h

Food Preservation- Definition, importance of food preservation, principles and methods of preservation.

Unit II Preservation by Sugar 5 h

Preservation by addition of Sugar- General principles, Preparation of Jam, Jelly, Marmalade, Squash, Syrups.

Unit III Preservation by Salt 5 h

Preservation by addition of Salt- General principles, Preparation of Pickles, Sauerkraut, Dill pickles.

Unit IV Preservation by High temperature 6 h

Preservation by High temperature - Principles, Pasteurization, Sterilization, Blanching, Canning, Drying and Dehydration.

Unit V Preservation by Low temperature 4 h


Preservation by Low temperature - Principles, Refrigeration, Freezing, Freeze drying.

## Text Books

- 1 Manoranjan Kalia, Sangita Sood, 2012 "Food Preservation and Processing", Kalyani Publishers, New Delhi.
- 2 B.Srilakshmi, 2018, "Food science", New Age International Publishers, New Delhi.

D. Jhu

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-05-04-24	AC-17-04-24	GB-
B.Sc. Food Science and Nutrition (Students admitted during the AY 2022-23)		



B.Sc. Food Science and Nutrition (Students admitted during the AY 2022-23)



Course Code	Course Name	Category	L	T	P	Credit
223FN1A6CA	COMMUNITY NUTRITION	CORE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- the concept of community nutrition and its relevance to developing countries.
- interpret and apply nutrition concepts to evaluate and improve the nutritional health of the community.
- the leadership qualities in conducting various extension and community outreach programs.

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of community nutrition and food security	K2
CO2	Comprehend the nutritional programs in India to combat nutritional deficiency diseases	K3
CO3	Acquire the skills to assess the nutritional status of community and an individual	K2
CO4	Plan, execute and evaluate a nutrition education programs for a community	K3
CO5	Analyze the role of Nutrition intervention programs for prevention of nutritional problems India	K4

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization





223FN1A6CA	CORE: COMMUNITY NUTRITION	SEMESTER VI
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Total Credits: 4

Total Instruction Hours: 48 h

### Syllabus

#### Unit I Community-food security and Food Production 10 h

Definitions - Community, family, village and block, Definition of Optimum Nutrition, Malnutrition- Under nutrition and over nutrition. Effects of malnutrition in different age groups, IMR, MMR, morbidity. Causes of malnutrition-Factors contributing to malnutrition in the community-habits, customs and practices, availability of food, Socio-economic factors.

Food Security and Nutritional security- concept. Factors affecting food security and nutritional security. Management of food insecurity-Food Fortification and enrichment.

Food Production- Agriculture Planning in Relation to Nutrition, Green, Blue, Pink, Red , White, Yellow, Gold, Silver. Protein and Ever green revolution - Overview

#### Unit II Nutritional Problems of the Community 08 h

Vitamin A deficiency, Vitamin D deficiency, Anaemia (Iron, Folic acid, Vitamin B6 and B12), Iodine and Fluorosis -Prevalence, etiology, clinical features and prevention through food sources.

#### Unit III Nutritional Status 10 h

Methods of Nutritional Assessment-Need for nutritional assessment, Direct Assessment Methods - Nutritional Anthropometry Status - Height, Body Weight, Mid- arm circumference, head , chest circumference and skin -fold thickness(biceps and triceps), BMI and WHR Uses and Limitations. Clinical examination. Diet Survey- (Food frequency, 3day food weighment and 24 hrs recall method) and Biochemical tests.

Indirect Assessment Methods- vital statistics.

#### Unit IV Nutrition Education 10 h

Nutrition Education-Importance, objective, Nutrition Education methods- Individual, Group and Mass Method, Principles of Planning (Cart wright's Theory), Executing and Evaluating, Nutrition Education Programs, Use of ICT Tools in nutrition education programs





**Unit V**      Nutrition Intervention programs

10 h

Governmental Policies and Programs – Objectives, Functions and Beneficiaries of Public Distribution System (PDS), Food For Work (FFW), Special Nutrition Program (SNP), Balawadi Nutrition Program (BNP), Wheat Based Nutrition Program (WNP), Applied Nutrition Programs (ANP), Integrated Child Development Services (ICDS), Poshan Abhiyan and Eat Right India movement.

Sustainable Development Goals related to Nutrition(2,3,9and12goals) and Millennium Development Goals (1,4,5 and6 goals)

National Organization- Role of ICMR, NIN, ICAR, CFTRI, DFRL and NNMB.

International organization - Role of FAO, WHO and UNICEF

Health Care - PHC, ESI

**Text Books**

- 1 Vinodini Reddy, Praihad Rao, Gowrinath Sastry, J. and Kashinath, K.C., 1993, "Nutrition Trends in India", NIN, Hyderabad .
- 2 Suryatapa das, 2018, "Text Book of Community Nutrition", Academic Publishers, Kolkata.

**References**

- 1 Michael J. Gibney, 2004, "Public Health Nutrition", Edition I, Black Well Scientific Publications, Oxford
- 2 ArvindWadhwa, 2003, "Nutrition in the Community", Edition 1, Elite Publications, New Delhi.
- 3 Boyle M.A., 2021, "Community Nutrition in Action", 8<sup>th</sup> Edition. Cengage Learning, USA
- 4 Park and Park, 1995, "Text book of Preventive and Social Medicine", Banarsidas Published by Jabalpur.



Course Code	Course Name	Category	L	T	P	Credit
223FN1A6CB	FOOD PRODUCT DEVELOPMENT AND MARKETING	CORE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- and apply the principles of food science for formulation of a food product
- the principles of sensory evaluation, food formulation, and quality control
- role of sustainability, regulatory requirements, and labeling in food product development

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Explore the industry trends and consumer demands that drive new product development	K1
CO2	Learn about processing techniques and their impact on food quality and safety	K2
CO3	Assess the organoleptic food quality and interpret sensory data to improve product development	K3
CO4	Understand the fundamentals of food marketing and consumer behavior	K2
CO5	Gain knowledge about the product life cycle and managing product portfolios effectively	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓		✓	
CO3	✓		✓	✓	✓
CO4	✓		✓		
CO5	✓	✓			✓

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input checked="" type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223FN1A6CB	CORE: FOOD PRODUCT DEVELOPMENT AND MARKETING	SEMESTER VI
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Total Credits: 4

Total Instruction Hours: 48 h

### Syllabus

**Unit I** Introduction to food product development 10 h

Overview of Food Product Development Process - ideation, concept development, formulation, testing, scale-up, and commercialization, market trends, analyzing consumer behavior and preferences, Types of food products, challenges in product development.

Analysis of case studies on successful product launches, consumer trends, and brand strategies.

**Unit II** Food formulation and processing techniques 10 h

Ingredients selection and functionality, Food processing techniques - steps in formulation and aseptic processing, Formulation principles, Prototyping and pilot testing - Creating prototypes and testing scalability for large-scale production.

**Unit III** Sensory evaluation and quality assurance 8 h

Sensory evaluation techniques, Consumer testing and acceptability - focus groups and surveys, Quality control and assurance, Shelf-life testing and stability studies - factors affecting shelf-life, storage conditions, and accelerated stability studies.

**Unit IV** Food marketing and labeling 10 h

Food marketing and positioning, Packaging and labeling regulations, Consumer behavior and purchasing patterns - targeting demographics, psychographics, and analyzing purchase trends, Marketing strategies for food products - digital marketing, Influencer partnerships, Point-of-sale tactics and Sustainability marketing.

**Unit V** Sustainability, ethics, and innovation in food product development 10 h

Sustainability in product development, Ethical Considerations and social responsibility - transparency, fair trade, animal welfare, and environmental impact, Innovation and future trends, Regulatory compliance and food safety standards - FSSAI, FDA, HACCP, IPR in new product development, Food forensics.



### Text Books

- 1 Fuller G. W., 2011, "New Food Product Development: From Concept to Marketplace", CRC Press, USA.
- 2 Brody A. L., and Lord J. B., 2007, "Developing New Food Products for a Changing Marketplace", CRC Press, USA.

### References

- 1 Cohen J., 2017, "The Next Gen Industry - Innovations in Sustainable Food Production", Emerald Publishing, UK.
- 2 Lawley M., Birch D. and Hamblin D., 2009, "The Marketing and Development of New Products", Oxford University Press, UK





223FN1A6CV	CORE: COMMUNITY PROJECT AND VIVA VOCE	SEMESTER VI
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Total Credits: 2

Total Instructions Hours: 60 h

## S.No.

## Contents

- 1 Anthropometric measurements for assessing nutritional status of:
  - i) Infants and Preschoolers: Crown-heel length, height, weight, circumference of head, chest and mid arm
  - ii) Adult-Height, weight, BMI, Waist circumference, Hip circumference, Waist: Hip Ratio
- 2 Comparison of anthropometric measurement with standards of pre-school group
  - i) Weight for age
  - ii) Height for age
  - iii) Weight for height
  - iv) BMI
- 3 Plotting and interpretation of growth charts for
  - i) Infants
  - ii) Pre-school children
- 4 Identification of clinical signs of common nutritional disorders-Anemia, B complex deficiencies, vitamin A deficiency, IDD
- 5 Estimation of food and nutrient intake:
  - i) 24 hrs food recall
  - ii) Three Day Food Weighment
  - iii) Food Frequency data
- METHODS OF EXTENSION USED IN THE COMMUNITY
- 6
  - i) Interpersonal Communication- Home visits, Personal contact/ interviews
  - ii) Mass media- Preparation of visual aids, charts, poster/ e-poster, models, Newspaper, Role play/Drama
  - iii) Digital Media- You tube videos, reels, Magazines, Cookery competition, Exhibition/Melas
  - iv) Traditional media- Folk music and dance - Puppetry, Therukootu, Villuppaatu.
- 7 Demonstration of a low- cost recipe for infants(Kuzhanthai Amudhu and ARF), preschoolers, pregnant/nursing mothers for nutrition education.
- 8 Develop 5-10 relevant messages for nutrition and health education of rural mothers (using ICT tools)
- 9 Planning of skill development programmes for an immediately available group of women. (Kitchen Garden/ roof garden/Nutrition Garden)



- 10 Formulation of Nutrition Education Tool To Assess Knowledge, Attitude And Practices
- 11 Popularization of Traffic Signal Lights (Antioxidant Rich Foods)
- 12 Visit to Observe the working of Nutrition and Health oriented Programs. (ICDS) Centre and preparation of report
- 13 Conduct a survey in any community setting to identify any one major nutritional problem in any vulnerable group. Suggest strategies/actions to tackle the problem through Nutrition Education





223FN1A6CP	<b>CORE PRACTICAL: FOOD PRODUCT DEVELOPMENT</b>	<b>SEMESTER VI</b>
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**Total Credits: 2**

**Total Instructions Hours: 60 h**

<b>S.No.</b>	<b>Contents</b>
1	Introduction to food product development and types of food products
2	Ingredient selection and functionality analysis
3	Develop a prototype for a novel food product
4	Product preservation techniques
5	Sensory evaluation - Standardization of test methods
6	Flavor and texture modification
7	Nutritional profiling and labeling
8	Quality control tests (physical and chemical)
9	Product stability and shelf-life testing (moisture and water activity)
10	Selection and testing of packaging material
11	Costing and economic feasibility
12	Final product presentation and report preparation

#### **Experiments under DBT**

- 1 Reduction of sugar in confectionery using natural sweeteners
- 2 Formulation of fermented foods

**Note:** 10 out of 12 mandatory

#### **References**

- 1 Fuller G. W., 2016, "New Food Product Development: From Concept to Marketplace", CRC Press, USA.
- 2 Stone H., and Sidel J. L., 2004, "Sensory Evaluation Practices", Science Direct, Netherlands.



Course Code	Course Name	Category	L	T	P	Credit
223FN1A6SA	INDIGENOUS FOODS	SEC	2	-	-	2

### PREAMBLE

This course has been designed for students to learn and understand

- The meaning, concept, benefits, and diversity of indigenous foods
- The history and origins of popular traditional dishes across various regions of World and India
- The use of medicinal plants, healing spices, and indigenous herbs for home remedies

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Analyze the relationship between food habits and specific social, cultural, and religious contexts.	K1
CO2	Identify familiar indigenous foods and understand how some regional dishes have gained popularity beyond their origin.	K2
CO3	Explore how specific dishes are closely associated with particular regions of India	K3
CO4	Compare and contrast traditional and modern food processing methods, assessing the benefits and limitations	K4
CO5	Summarize the use of healing spices and seasonings in indigenous diets and its functional properties	K1

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓			
CO3	✓	✓	✓	✓	✓
CO4	✓		✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/> Skill Development	<input type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input type="checkbox"/> Innovations
<input type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
<input type="checkbox"/> Awareness/ Environment	<input type="checkbox"/> Constitutional Rights/ Human Values/ Ethics





223FN1A6SA	SEC: INDIGENOUS FOODS	SEMESTER VI
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Total Credits: 2

Total Instruction Hours: 24 h

### Syllabus

#### Unit I Introduction to Indigenous Foods 05 h

Meaning, concept, benefits and types of indigenous foods, Impact of customs and traditions on food habits, heterogeneity within cultures (social groups) and specific social contexts - festive occasions, specific religious festivals etc. Kosher, Halal foods; foods for religious and other fasting.

#### Unit II Indigenous Food system 05 h

Regional cuisines of India- Traditional foods of south Indian, north Indian, west Indian and east Indian cuisine; Specialty ingredients in regional cuisines – herbs, spices, masala powders and cooking oils of different regions. Familiar indigenous foods; Regional foods that have gone Pan Indian / Global; Traditional fermented foods.

#### Unit III History of Indigenous Foods 04 h

History of Misal Pav, Makki di roti, sarso da saag, Dhokla, Litti chokha, Hydrebadhi biryani, Daal bhaati churma, Momos, Appam, Rugra and Pongal.

#### Unit IV Conventional processing methods 05 h

Traditional methods of milling grains – rice, wheat and corn – equipments and processes as compared to modern methods; Comparison of traditional and modern processing methods; Traditional methods of food preservation – sun-drying.

#### Unit V Indigenous healing foods 05 h

Medicinal plants and herbs in indigenous diets, Nutritive value of indigenous foods, Benefits of indigenous diets for chronic disease prevention, Healing Spices and Seasonings in Indigenous Diets, Indigenous Herbs and Plants for Home Remedies.



## Text Books

- 1 Smith A., 2021, "Eating the land: Indigenous food traditions and sustainability", University Press.
- 2 Krishnan R., 2020, "Indian spices: The cultural and culinary role of spices in Indigenous Indian cuisine", Routledge.

## References

- 1 Kumar V., and Sharma, A., 2020, "Forgotten vegetables: Rediscovering Indigenous grains and greens of India", Niyogi Books.
- 2 Anderson R. B., and Sandor M., (Eds), 2014, "Food sovereignty: Reconnecting food, nature, and culture in Indigenous communities" (2<sup>nd</sup> ed.), Food First Books.
- 3 Manchanda S., 2015, "Traditional Indian foods and their health benefits", Cambridge University Press.
- 4 Ruth N. D., 2001, "Indian Food Science: A Health and Nutrition Guide to Traditional Recipes", East West Books.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A6DA	BASICS OF FOOD PACKAGING	DSE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- The importance and functions of food packaging
- Food packaging and its applications in various food products
- The packaging systems, labeling and packaging standards

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the functions of packaging materials for different foods.	K2
CO2	Comprehend the different packaging materials its purpose and requirements.	K2
CO3	Identify the packaging materials of different food products.	K3
CO4	Demonstrate the various packaging techniques and systems.	K3
CO5	Apply the labeling and packaging standards for food products	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓		✓	✓
CO2		✓	✓		
CO3	✓	✓			✓
CO4	✓		✓	✓	✓
CO5	✓			✓	✓

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



223FN1A6DA	DSE: BASICS OF FOOD PACKAGING	SEMESTER VI
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Total Credits: 4

Total Instruction Hours: 48 h

### Syllabus

**Unit I** Food packaging 10 h

Definition, functions of packaging for different foods, requirements for effective food packaging. Types of Packaging -primary, secondary and tertiary, characteristics, applications in food industry, Packaging Hazards and precautions.

**Unit II** Packaging materials 10 h

Packaging materials - Introduction, purpose, requirements, types of containers. Modern packaging materials and forms - Glass containers, metal cans, composite containers, aerosol containers, rigid plastic packages, semi rigid packaging, flexible and edible packaging.

**Unit III** Packaging of different food products 10 h

Packaging of cereal products and whole grains, Packaging of milled grains, Packaging of Cereal based convenience products and weaning products.

Packaging for Fruits, Vegetables and Processed Foods, Packaging for Dry Foods, Dairy, Meat, and Seafood Products.

**Unit IV** Packaging techniques and systems 9 h

Packaging system - Aseptic packaging, Controlled Atmosphere Packaging, Modified Atmosphere Packaging, Active packaging, Intelligent and Smart Packaging.

Vacuum Packaging, Shrink Wrap, and Skin Packaging, Brik-Pak, Bag-in-Box, and Tetra Pak Systems.

**Unit V** Labeling and packaging standards 9 h

Labeling- Purpose of labels, Critical elements of food label, type of label, Labels for freight containers, labeling regulations, bar code, Nutrition labeling, health claims, mandatory labeling provisions, The Food Safety and Standards (Labelling and Display) Regulations, 2020.

International Packaging Standards: ISO, HACCP, and GMP in Packaging.





### Text Books

- 1 Gordon L. Robertson, 2013, "Food Packaging Principles and Practice", 3<sup>rd</sup> Edition, CRC Press, Baco Raton.
- 2 NIIR Board, 2020, "Food Packaging technology", 3<sup>rd</sup> edition, NIIR Project Consultancy Services, New Delhi.

### References

- 1 N. I. I. R. Board, 2010, "Handbook on modern packaging industries". Asia Pacific Business Press Inc., New Delhi
- 2 Griffirin R.C., 2002, "Principles of Food Packaging", 2nd Edition, Avi pub Co. Westport.



Course Code	Course Name	Category	L	T	P	Credit
223FN1A6DB	HEALTH AND FITNESS	DSE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- The foundational principles and science behind fitness and sports nutrition, focusing on the energy metabolism in athletic performance
- Dietary and nutritional needs specific to various types of sports and athletic goals, addressing nutrient timing, hydration, and supplementation strategies
- Importance of personalized diet plan, monitoring, and ethical considerations in supporting athletes, attention to health, performance, and safety

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Gain knowledge of the fundamentals of sports nutrition, role of macronutrients, micronutrients for athletes.	K1
CO2	Formulate effective pre-exercise, during-exercise, and post-exercise nutrition strategies.	K2
CO3	Comprehend the significance of vitamins, minerals, and antioxidants in athletic performance and recovery.	K3
CO4	Develop ability to formulate nutrition plans for endurance, strength, power, and team sports.	K4
CO5	Create personalized nutrition plans for athletes, implementing effective monitoring and adjustment practices.	K1

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/> Skill Development	<input type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input type="checkbox"/> Innovations
<input type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization





223FN1A6DB	DSE: HEALTH AND FITNESS	SEMESTER VI
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### Syllabus

**Unit I** Introduction to fitness and sports nutrition 10 h

Fundamentals of Fitness and Sports Nutrition. Overview of Macronutrients and Micronutrients for Athletes. Energy Systems and Metabolism in Exercise. Physiological and Psychological Effects of Exercise on the Body. VO<sub>2</sub> max. Basic Assessment of Fitness and Wellness Levels and Nutritional Status.

**Unit II** Energy requirements and macronutrient needs 10 h

Calculating Energy Needs for Athletes and Non athletes. Role of Carbohydrates in Exercise and Recovery. Protein Requirements for Muscle Repair and Growth. Role of Fats in Endurance and Long-Duration Sports. Pre-Exercise, During-Exercise, and Post-Exercise Nutrition Strategies.

**Unit III** Micronutrients, hydration, and supplements in sports 8 h

Importance of Vitamins and Minerals in Athletic Performance. Hydration and Electrolyte Balance During Exercise. Role of Antioxidants in Recovery and Performance. Safe Use of Ergogenic Aids and Supplements in Sports Nutrition. Common Supplementation Protocols and Risks.

**Unit IV** Nutrition strategies for specific types of sports 10 h

Nutrition for Endurance Sports (e.g., marathon, cycling). Nutrition for Strength and Power Sports (e.g., weightlifting, sprinting). Team Sports Nutrition (e.g., football, basketball). Weight Management Strategies for Athletes. Special Considerations: Vegetarian Athletes, Female Athletes, and Youth. Sports Anemia, Calcium deficiency, RED, CED, FAT. Nutrition Education for Sports Persons.

**Unit V** Diet planning, monitoring, and ethical considerations 10 h

Developing Personalized Nutrition Plans for Athletes. Monitoring Nutritional Status and Adjusting Diet Plans. Addressing Common Issues: Eating Disorders in Athletes, Overtraining Syndrome. Ethics in Sports Nutrition: Anti-Doping Guidelines, Supplement Safety. Case Studies and Practical Applications in Sports Nutrition. Sports Injuries and Management.



### Text Books

- 1 McArdle, William D, 2013, "Sports and Exercise Nutrition", 4<sup>th</sup> ed., Wolters Kluwer.
- 2 Dan Benardot, 2011, "Advanced Sports Nutrition", 2nd ed., Human Kinetics.

### References

- 1 Angela Lumpkin, 2017, "Modern Sports Ethics", 2nd ed., Santa Barbara, California.
- 2 William D. McArdle, Frank I. Katch, and Victor L. Katch, 2011, "Essentials of Exercise Physiology", 4th ed., Wolters Kluwer.
- 3 Bean A, 2017, "The complete guide to sports nutrition", 8th ed., Bloomsbury Publishing.
- 4 Srilakshmi B, Suganthi V, and Kalaivani C, 2017, "Exercise Physiology, Fitness and Sports Nutrition", 1st ed., New Age International (P) Ltd Publishers.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A6DC	CONVENIENCE FOODS	DSE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- An overview and importance of convenience foods
- Composition and nutritive value of convenience foods
- Acquire knowledge on food processing technique

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Develop new products and plan a strategy for marketing the developed products	K3,K4
CO2	Categorize the processing techniques and inspect the quality of the processed foods. Recommend innovative food products	K4, K5
CO3	Prioritize the convenience food in IMF and hurdle technology. Infer the types of DRDO designed foods	K4, K5
CO4	Criticize the RTE Products and rate the feasibility and reliability of RTE in India	K4, K5
CO5	Perceive the extrusion techniques in trend appraise the applications of extruded products	K5

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
<input type="checkbox"/> Awareness/ Environment	<input type="checkbox"/> Constitutional Rights/ Human Values/ Ethics



223FN1A6DC	DSE: CONVENIENCE FOODS	SEMESTER VI
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### Syllabus

**Unit I** Food product development 10 h

Development of new product, need for developing new products, Developing marketing strategy for new product, Strategies in product development, success and failure factors for new products.

**Unit II** Snack foods popped snacks 10 h

Popcorn -popping procedures, loss during popping, measurement of expansion, factors affecting quality of popcorn, storage. Puffed snacks – Puffable materials, extrusion methods, drying, addition of flavors and colors, Simulated popcorn. Baked snacks –Proportion and role of ingredients; Sweet based –plain cookies, wire-cut cookies; Salt based soda crackers and cheese crackers.

**Unit III** Convenience foods for defense services 8 h

IMF and Hurdle Technology-Principles, Processing of dehydrated vegetables, vegetable powder, IMF fruit slices, IMF fruit bars, fruit- milk, soup powders. Foods designed by DRDO for defense services –list and principle of processing applied.

**Unit IV** Ready-to-eat foods 10 h

Principle of retort processing, technique, production, merits and demerits. Commercial availability, marketing and future prospects in India.

**Unit V** Extruded foods 10 h

Principle of extruders, Production of pasta-noodle and macaroni products, Common extruders used in food industry, Merits and demerits of extruder technology, Uses of extruded foods, physico - chemical changes in extruded products





**Text Books**

- 1 Subbulakshmi and Udipi.S., 2001., "Food processing and Preservation Technology"., New Age Publications., New Delhi, India.
- 2 Khader.V, 2001., "A Textbook of Food Processing Technology", ICAR, New Delhi, India

**References**

- 1 Sivashankar. B., 2002., "Food Processing and Preservation", PHI, New Delhi, India.
- 2 NIIR Board, 2002, "Modern Technology of Food Processing and Agro Based Industry", 2nd Edition, Asia Pacific Business Press.



Course Code	Course Name	Category	L	T	P	Credit
223FN1A6DD	ENTREPRENEURSHIP IN FOOD INDUSTRY	DSE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- The need and scope of entrepreneurship
- The legal and managerial aspects to run small scale enterprises
- The forms and practices adopted at small scale enterprises

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Illustrate the scope of entrepreneurship for career opportunities	K4
CO2	Examine the Marketing strategy in Food processing industry	K2
CO3	Develop the Product and Brand Management	K3
CO4	Establish the Setting up of micro, small and medium enterprises	K4
CO5	Analyze the Role of institutions/schemes in entrepreneurial development	K4

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓		✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓	✓	✓

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223FN1A6DD	DSE: ENTREPRENEURSHIP IN FOOD INDUSTRY	SEMESTER VI
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Total Credits: 4

Total Instruction Hours: 48 h

### Syllabus

**Unit I** Introduction to entrepreneurship 10 h

Introduction to Entrepreneurship- Meaning, definition and concepts, characteristics, functions, entrepreneurial traits and motivation, role of entrepreneur in economic development, factors affecting entrepreneurial growth. Types of entrepreneurs, Women entrepreneurship- significance, problems, solutions to the problems.

**Unit II** Marketing strategy in food processing industry 10 h

Strategic planning and the marketing process, the marketing environment, consumer markets. Rural marketing, industrial marketing, overview, advertising and promotion. Product and services strategy, pricing products, distribution and supply chain management channels. Direct and online marketing, competitive strategies.

**Unit III** Product and brand management 8 h

Consumer Preference and buying behavior, sales management and sales promotion. Food product handling and transportation. Place of retailing in the marketing mix- Trends in retailing, communication and customer relations. Managing People at Work - recruitment and motivation, total quality management, product development, globalization in food industries.

**Unit IV** Setting up of micro, small and medium enterprises 10 h

Setting up of micro, small and medium enterprises, location significance, green channel, Bridge capital, Seed capital assistance, Margin money scheme, Sickness, Causes-Remedies.

**Unit V** Role of institutions/schemes in entrepreneurial development 10 h

MOFPI, NABARD, SIDCO, SIDBI, NIESBUD, EDII, SISI, NREG Scheme- SWARNA JAYANTHI, Rozgar Yojana Schemes, etc.



**Text Books**

- 1 Jaya Shree Suresh, 2007, "Entrepreneurial Development", Margham Publications, Chennai.
- 2 Kavi Ramachandran, 2008, "Entrepreneurship Development", McGraw Hill Publisher.

**References**

- 1 Rathore.B.S and Saini.J.S, 2005, "A Handbook of Entrepreneurship", Aapga Publications, Panchkula (Haryana).
- 2 S.S.Khanka, 2005, "Entrepreneurial Development", Sultan Chand & Co, Ltd, New Delhi.





Course Code	Course Name	Category	L	T	P	Credit
223FN1A6DE	NUTRITION CARE PROCESS	DSE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- Core methods of nutritional assessment to evaluate and improve nutritional status in clinical settings
- Nutrition Care Process to create personalized nutrition plans, with a focus on managing non-communicable diseases
- Economically and culturally sensitive diet planning, food delivery methods, and counseling techniques for effective, patient-centered care

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the processes of digestion, absorption, and excretion of nutrients in the gastrointestinal tract.	K1
CO2	Comprehend the factors involved in energy requirements and methods for estimating energy needs.	K2
CO3	Understand the methods of assessment of food and nutrient intake and evaluating physical activity and nutrition quality of life.	K3
CO4	Acquire an idea on nutrition-related histories and behaviors which determine nutritional status.	K4
CO5	Identify the impact of medications and alternative medicines on nutrition and overall health.	K1

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/> Skill Development	<input type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input type="checkbox"/> Innovations
<input type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization





223FN1A6DE	DSE: NUTRITION CARE PROCESS	SEMESTER VI
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### Syllabus

#### **Unit I**      Assessment of energy intake and energy needs      10 h

Overview of digestive and absorptive processes, The small intestine: Primary site of nutrient absorption, The large intestine - remaining nutrient absorption.

Energy - Energy requirements, Components of energy expenditure, estimating energy requirements, Physical activity in children, Calculating food energy. Determining energy balance - Energy Gap.

Assessment of food- and nutrition-related history - Nutrition screening, Nutritional status assessment, Nutrition-related history, Food and nutrient intake, Nutrition knowledge, beliefs, and attitudes, Nutrition behaviors, Medication and complementary or alternative medicines, Nutrition access, Physical activity and physical function, Nutrition quality of life.

#### **Unit II**      Biochemical and clinical nutrition assessment      9 h

Biochemical and functional assessment - Biochemical assessment of nutrition status, Nutrition interpretation of routine medical laboratory tests - CBC, Thyroid function test, Blood glucose test, Lipid panel, Renal test, Electrolyte panel. Assessment of hydration status and water balance, Assessment for nutritional anemia. Clinical: Nutrition-focused physical examination.

#### **Unit III**      Nutrition diagnosis and patient-centered intervention      10 h

Overview of nutrition diagnosis and intervention, Documentation in the nutrition care record, Influences on nutrition and health care, Nutrition interventions, Nutrition for the terminally ill or hospice client.

Education and counseling: Behavioral change - Behavior change, Models for behavior change, Models for counseling strategies, Models for educational program development, Skills and attributes of the nutrition educator or counselor, Assessment results: Choosing focus areas, Counseling approaches after the assessment, Evaluation of effectiveness.

#### **Unit IV**      Food and nutrient delivery in clinical practice      10 h

Planning the diet with economic and cultural competence - Determining nutrient needs, worldwide guidelines, National guidelines for diet planning, Food and nutrient labeling, Dietary patterns and counseling tips, Socio-economic and cultural





aspects of dietary planning.

Dietary supplement regulation, Assessment of dietary supplement use in patients.

Food and Nutrient delivery: Nutrition support methods - Rationale and criteria for appropriate nutrition support, Enteral nutrition, Enteral nutrition access, Parenteral nutrition, Complications, Refeeding syndrome, Transitional feeding, Nutrition support in long-term and home care.

**Unit V**      Nutrition care process for non-communicable diseases      9 h

Nutrition Care Process, Prevention, Control and Management for Overweight, Obesity, Diabetes, Hypertension, CAD, ESRD, Renal calculi, Cancer - A case study approach.

### Text Books

- 1 Krause and Mahan's, 2021, "Food and the Nutrition Care Process", 15th ed., Elsevier, Netherlands.
- 2 Escott-Stump S., 2015, "Nutrition and diagnosis-related care", 8th ed., Wolters Kluwer, United States.

### References

- 1 Shubhangini, A Joshi, 2021, "Nutrition and dietetics", Mc Graw Hill.
- 2 Kane K. and Prelack K, 2019, "Advanced medical nutrition therapy", Jones & Bartlett Learning.
- 3 Mahan L. K. & Escott-Stump S., 2021, Krause's "Food & nutrition therapy", 15th ed., Elsevier, Netherlands.
- 4 Srilakshmi B, 2023, "Dietetics", New Age International Publishers, New Delhi.



Course Code	Course Name	Category	L	T	P	Credit
223FN1A6DF	UNIT OPERATIONS IN FOOD INDUSTRY	DSE	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- The need and scope of equipment used in food service industry
- The unit operations and food processing equipment
- The design and working of the equipment

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the design of food processes and food processing plant	K2
CO2	Summarize the design and selection of food processing equipment	K3
CO3	Explain the unit operations and processes	K3
CO4	Illustrate the size reduction and separation processes	K4
CO5	Describe the principle and working of the equipment used for unit operations	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





223FN1A6DF	<b>DSE: UNIT OPERATIONS IN FOOD INDUSTRY</b>	<b>SEMESTER VI</b>
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### Syllabus

**Unit I** Design of Food Processes and Food Processing Plants 8 h

Introduction, Overview of Chemical Process and Plant Design, Design of Food Processes, Food Plant Design

**Unit II** Design and Selection of Food Processing Equipment 10 h

Introduction, Sizing and Costing of Equipment, Materials of Construction, Fabrication of Equipment, Hygienic Design of Food Processing Equipment, Selection of Food Processing Equipment

**Unit III** Unit Operations and Processes 10 h

Introduction, Units and Dimensions, Heat Transfer-Conduction, Convection and Radiation, membrane separation processes, Steam generation and Boilers, Evaporation, Drying and dehydration, Refrigeration, Freezing

**Unit IV** Separation and Size Reduction Processes 10 h

Principles and equipment used in separation, Extraction, sedimentation, filtration, centrifugation, Size reduction – Milling, grinding and mixing of foods

**Unit V** Equipment used for unit operations 10 h

Principle and working of Heat Transfer Equipment, Food Evaporation Equipment, Food Dehydration Equipment, Refrigeration and Freezing Equipment, Thermal Processing Equipment, Equipment for Novel Food Processes, Food Packaging Equipment



## Text Books

- 1 George Saravacos Athanasios E. Kostaropoulos, 2016, "Handbook of Food Processing equipment", Springer international publications.
- 2 Kenneth J Valentas and R. Paul Singh. 1997, "Handbook of food engineering practice", CRC Press.

## References

- 1 R. Paul Singh and Dennis R Heldman, 2009, "Introduction to Food Engineering" Elvesier Inc.
- 2 Zeki Berk, 2009, "Food process engineering and technology", Elvesier Inc.
- 3 P. Fellows, 2000, "Food Processing and Technology- Principles and Practice" Wood head Publications.
- 4 Albert Ibaz, 1997, "Unit operations in Food processing", CRC Press.





Course Code	Course Name	Category	L	T	P	Credit
223BC1A6AA	INNOVATION, IPR AND ENTREPRENEURSHIP	AECC	2	-	-	2

### PREAMBLE

This course has been designed for students to learn and understand

- the role of entrepreneurship in economic development and basics of intellectual property rights, copy right laws, trademarks and patents
- ethical and professional aspects related to intellectual property law context
- Intellectual Property (IP) as an career option

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the concept of innovation, IPR, entrepreneurship and its role in economic development	K2
CO2	Know the value , purpose and process of Patent	K2
CO3	Understand the basics of trademarks and industrial designs	K2
CO4	Acquire knowledge about copyright and copyright law	K2
CO5	Identify Geographical Indications	K2

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓			
CO2		✓	✓	✓	
CO3			✓		✓
CO4	✓	✓			✓
CO5	✓		✓	✓	✓

<input checked="" type="checkbox"/> Skill Development	<input checked="" type="checkbox"/> Entrepreneurial Development
<input checked="" type="checkbox"/> Employability	<input checked="" type="checkbox"/> Innovations
<input checked="" type="checkbox"/> Intellectual Property Rights	<input type="checkbox"/> Gender Sensitization
<input checked="" type="checkbox"/> Social Awareness/ Environment	<input checked="" type="checkbox"/> Constitutional Rights/ Human Values/ Ethics



223BC1A6AA	AECC: INNOVATION, IPR AND ENTREPRENEURSHIP	SEMESTER VI
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**Total Credits: 2**

**Total Instruction Hours: 24 h**

### Syllabus

**Unit I** Introduction to Innovation and Entrepreneurship 05 h

Meaning of Creativity, Invention and innovation - Types of Innovation - Introduction and the need for Intellectual Property Right (IPR) - Kinds of IPR - National and International IPR Policy. Entrepreneurs-Concept, characteristics, Functions, need and types, Entrepreneurial decision process. Role of Entrepreneurship in Economic Development.

Case Study: Jayabharati Viswanath: A case of Ladel to Leather.

**Unit II** Patents 05 h

Introduction and origin of Patent System in India- Conceptual Principles of Patent Law in India - Process for obtaining patent - Rights granted to a Patentee -Validity of patent- Infringement of Patent.

Case Study: Apple Inc. v. Samsung Electronics Co. Ltd. (2020)

**Unit III** Trademarks 05 h

Origin of Trade Marks System - Types - Functions - Distinctiveness and Trademarks - Meaning of Good Trademark - Rights granted by Registration of Trademarks - Infringement of trademark.

Case Study: Merck v. Mylan Pharmaceuticals (2016)

**Unit IV** Copyright 05 h

Introduction and Evolution of Copyright - Objectives and fundamentals of Copyright Law - Requirements for Copyrights - Works protectable under Copyrights - Authorship and Ownership - Rights of Authors and Copyright owners - Infringement of Copyright.

Case Study: J.K. Rowling and Warner Bros. v. Steve Vander Ark (2007)

**Unit V** Geographical Indications 04 h

Introduction and Concept of Geographical Indications - History - Administrative Mechanism - Benefits of Geographical Indications - Infringement of registered Geographical Indication





### Case Study: Darjeeling Tea v. Tea Board of India (2012)

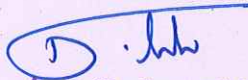
Note: Case studies related to the above topics to be discussed (Examined internal only)


### Text Books

- 1 Nityananda, K V. 2019, "Intellectual Property Rights" Protection and Management. Cengage Learning India Private Limited, New Delhi, India.
- 2 Dr.S.S.Khanka, 2020,"Entrepreneurial Development", S Chand and Company Limited, New Delhi, India.

### References

- 1 Ahuja, V K. 2017, "Law relating to Intellectual Property Rights", 3rd Edition, Lexis Nexis, Gurgaon, India.
- 2 Neeraj, P., & Khusdeep, D. 2014, "Intellectual Property Rights", 1st Edition, PHI learning Private Limited, New Delhi, India.
- 3 <http://www.bdu.ac.in/cells/ipr/docs/ipr-eng-ebook.pdf>.
- 4 <https://knowledgentia.com/knowledgeate>

  
 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- 18 <sup>th</sup> 8/11/24	AC- 18 <sup>th</sup> 26/11/24	GB -

