REGULATIONS 2019-20 for Under Graduate Programme
(Outcome Based Education model with Choice Based Credit System)

B.Sc. Degree

(For the students admitted during the academic year 2019-20 and onwards)

Dr. N.G.P.ARTS AND SCIENCE COLLEGE (Autonomous)

Programme: B.Sc. FOOD SCIENCE AND NUTRITION

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 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 though 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 pre professional 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 entrepreneurism.
PO5	1. Develop professional attributes and portfolio in Food Science and Nutrition that are adopted to serve in diverse professional and community organizations.

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
First Semester										
Part – I										
191TL1A1TA 191TL1A1HA 191TL1A1MA 191TL1A1FA	Language - I	Tamil-I/ Hindi-I/ Malayalam-I/ French – I	4	1	-	3	25	75	100	3
Part – II										
191EL1A1EA	Language - II	English – I	4	-	1	3	25	75	100	3
Part – III										
193FN1A1CA	Core-I	Basic Food Science	4	1	-	3	25	75	100	4
193FN1A1CP	Core practical-I	Food Science	-	-	4	3	40	60	100	2
193FN1A1CB	Core-II	Chemistry of Foods	4	1	-	3	25	75	100	4
192CE1A1IA	IDC-I	Chemistry-I	4	-	-	3	25	75	100	3
Part – IV										
193MB1A1AA	AECC-I	Environmental studies	2	-	-	3	-	50	50	2
Total			**22**	**3**	**5**				**650**	**21**

Second Semester										
Part – I										
191TL1A2TA 191TL1A2HA 191TL1A2MA 191TL1A2FA	Language -I	Tamil-II/ Hindi-II/ Malayalam-II/ French – II	4	1	-	3	25	75	100	3
Part – II										
191EL1A2EA	Language- II	English – II	4	-	1	3	25	75	100	3
Part – III										
193FN1A2CA	Core -III	Principles of Nutrition	5	1	-	3	25	75	100	4
193FN1A2CP	Core Practical-II	Nutrition Practical	-	-	4	3	40	60	100	2
192CE1A2IA	IDC-II	Chemistry-II	4	-	-	3	25	75	100	3
192CE1A2IP	IDC Practical-I	Chemistry	-	-	4	3	40	60	100	2
Part – IV										
196BM1A2AA	AECC-II	Human Rights	2	-	-	3		50	50	2
		Total	**19**	**2**	**9**				**650**	**19**

Second Semester										
Part – I										
191TL1A2TA 191TL1A2HA 191TL1A2MA 191TL1A2FA	Language -I	Tamil-II/ Hindi-II/ Malayalam-II/ French – II	4	1	-	3	25	75	100	3
Part – II										
191EL1A2EA	Language- II	English – II	4	-	1	3	25	75	100	3
Part – III										
193FN1A2CA	Core -III	Principles of Nutrition	5	1	-	3	25	75	100	4
193FN1A2CP	Core Practical-II	Nutrition Practical	-	-	4	3	40	60	100	2
192CE1A2IA	IDC-II	Chemistry-II	4	-	-	3	25	75	100	3
192CE1A2IP	IDC Practical-I	Chemistry	-	-	4	3	40	60	100	2
Part – IV										
196BM1A2AA	AECC-II	Human Rights	2	-	-	3		50	50	2
		Total	**19**	**1**	**10**				**650**	**19**

Third Semester										
Part – I										
191TL1A3TA 191TL1A3HA 191TL1A3MA 191TL1A3FA	Language - I	Tamil-III/ Hindi-III/ Malayalam-III/French – III	3	1	-	3	25	75	100	3
Part – II										
191EL1A3EA	Language - II	Eco English - III	4	1	-	3	25	75	100	3
Part – III										
193FN1A3CA	Core-IV	Nutrition in Health	4	-	-	3	25	75	100	4
193FN1A3CP	Core Practical-III	Nutrition in Health	-	-	4	3	40	60	100	2
193FN1A3CB	Core-V	Human Physiology	3	-	-	3	25	75	100	2
193BC1A3IA	IDC-III	Biochemistry	3	-	-	3	25	75	100	3
193FN1A3SP	SEC-I	Human Physiology	-	-	2	3	40	60	100	3
	GE-I		2	-	-	3	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	-	-
Part – IV										
191TL1A3AA	AECC-III	Basic Tamil	2	-	-	3	-	50	50	2
191TL1A3AB		AdvanceTamil								
195CR1A3AA		Women's Rights								
		Total	**22**	**2**	**6**				**800**	**24**

Fourth Semester										
Part – I										
191TL1A4TA 191TL1A4HA 191TL1A4MA 191TL1A4FA	Language -I	Tamil-IV/ Hindi-IV/ Malayalam-IV/ French – IV	3	1	-	3	25	75	100	3
Part – II										
191EL1A4EA	Language - II	Eco English - IV	4	-	-	3	25	75	100	3
Part – III										
193FN1A4CA	Core –VI	Dietetics	4	1	-	3	25	75	100	4
193FN1A4CP	Core Practical-IV	Dietetic	-	-	4	3	40	60	100	2
193BC1A4IA	IDC –IV	Biochemistry –II	3	-	-	3	25	75	100	3
193BC1A4IP	IDC-II	Biochemistry Practical	-	-	4	3	40	60	100	2
193FN1A4SA	SEC-II	Perspective Psychology	2			3	25	75	100	3
	GE-II		2	-	-	3	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	-	-
Part – IV										
191TL1A4AA 191TL1A4AB 192PY1A4AA	AECC -IV	Basic Tamil / Advance Tamil/ General Awareness	2	-	-	3	-	50	50	2
		Total	**21**	**1**	**8**				**800**	**24**

Fifth Semester										
Part – III										
193FN1A5CA	Core-VII	Food Preservation	4	1	-	3	25	75	100	4
193FN1A5CB	Core-VIII	Food Microbiology	4	-	-	3	25	75	100	4
193FN1A5CC	Core-IX	Food Processing	4	1	-	3	25	75	100	4
193FN1A5CP	Core Practical-V	Food Preservation and quality control	-	-	4	3	40	60	100	2
193FN1A5SA	SEC-III	Food hygiene and Sanitation	3	-	-	3	25	75	100	3
193FN1A5DA /B/C	DSE-I	Elective-I	4	1	-	3	25	75	100	4
193FN1A5TA	IT	Industrial Training	**Grade A to C**							
193FN1A5LA	LoP	Lab on Project	2	-	-	-	-	-	50	1
Part – IV										
192MT1A5AA	**AECC-V**	Research Methodology	2	-	-	3	-	-	50	2
		Total	**23**	**3**	**4**				**700**	**24**

Sixth Semester										
Part – III										
193FN1A6CA	Core-X	Public health nutrition	4	1	-	3	25	75	100	4
193FN1A6CB	Core-XI	Food service management	3	1	-	3	25	75	100	4
193FN1A6CC	Core-XII	Food safety and quality control	4	-	-	3	25	75	100	4
193FN1A6CP	Core Practical-VI	Food service management	-	-	4	3	40	60	100	2
193FN1A6SA	SEC-IV	Health and fitness	3	-	-	3	25	75	100	3
193FN1A6DA /B/C	DSE-II	Elective-II	3	1	-	3	25	75	100	4
193FN1A6DD /E/F	DSE-III	Elective-III	4	-	-	3	25	75	100	4
Part – IV										
193BC1A6AA	**AECC-VI**	Innovation, IPR and Entrepreneurship	2	-	-	3	-	-	50	2
Part-V										
193FN1A6XA		Extension Activity	-	-	-	-	-	-	50	1
		Total	**23**	**3**	**4**				**800**	**28**
Grand Total									**4400**	**140**

DISPLINE SPECIFIC ELECTIVE

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

Semester V (Elective
I) List of Elective
Courses

S. No.	Course Code	Name of the Course
1.	193FN1A5DA	Post Harvest Technology
2.	193FN1A5DB	Clinical Nutrition
3.	193FN1A5DC	Food Commodities And Preparation

Semester VI (Elective
II)List of Elective
Courses

S. No.	Course Code	Name of the Course
1.	193FN1A6DA	Food Product Development And Marketing
2.	193FN1A6DB	Nutrition Care Process
3.	193FN1A6DC	Equipments In Food Service Institution

Semester VI (Elective
III)List of Elective
Courses

S. No.	Course Code	Name of the Course
1.	193FN1A6DD	Fundamentals of Food Packaging
2.	193FN1A6DE	Diet Counseling
3.	193FN1A6DF	Entrepreneurship In Food Industry

Generic Elective Courses (GE)

The following are the courses offered under Generic Elective Course

Semester III (GE-I)

S. No.	Course Code	Course Name
1	193FN1A3GA	Fundamentals of Foods

Semester IV (GE-II)

S. No.	Course Code	Course Name
1	193FN1A4GA	Food Preservation

EXTRA CREDIT COURSES

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

S. No.	Course Code	Course Name
1	193FN1ASSA	Food Fortification
2	193FN1ASSB	Nutrition education

DIPLOMA / CERTIFICATE PROGRAMMES

The following are the programme offered to earn extra credits:

S. No.	ProgrammeCode and Name	Course code	Course Name
1	3FN5A Certificate Course in Sports Nutrition	193FN5A1CA	Exercise physiology and essentials of sports nutrition
2	3FN5B Certificate Course in Health and Fitness Management	193FN5B1CP	Fitness, nutrition and training exercises

REGULATION 2019-20

Effective from the academic year 2019-20 and applicable to the students admitted to the Degree of Bachelor of Science / Commerce/Arts.

1. NOMENCLATURE

1.1 Faculty: Refers to a group of programmes concerned with a major division of knowledge are. Eg. Faculty of Computer Science consists of disciplines like Departments of Computer Science, Information Technology, Computer Technology and Computer Applications.

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 2015–2018 refers to students belonging to a 3 year Degree programme admitted in 2015 and completing in 2018.

1.4 Course: Refers to a component (a paper) 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 and learning needs and the credits may be assigned suitably.

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

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**: DSE courses are the courses offered by the respective disciplinary/ interdisciplinary programme.

d) **Skill Enhancement Courses (SEC):** SEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

e) **Ability Enhancement Courses (AEC):** AECC courses are the courses based upon the content that leads to Knowledge enhancement. These are mandatory for all disciplines. Environmental Science, Human Rights, Women's Rights, General Awareness, IPR and Innovation, Entrepreneurship Development and Research Methodology.

All these courses should be taught according to Outcome based Education.

1.5 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.

1.6 Project work

Itis considered as a special 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.

Extra credits

Extra credits will be awarded to a student for achievements in co-curricular activities carried out outside the regular class hours. The guidelines for the

award of extra credits are given in section- these credits are not mandatory for completing the programme.

Advanced Learner Course (ALC):

ALCis doing work of a higher standard than usual for students at that stage in their education. Research work carried out in University/ Research Institutions/ Industries of repute in India or abroad for a period of 15 to 30 days will be considered as Advanced Learners Course.

STRUCTURE OF PROGRAMME

2.1 PART – I: LANGUAGE

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

2.2 PART – II : ENGLISH

English will be offered during the first two / four semester.

2.3 PART – III :

- Core course
- Inter Departmental Course (IDC)
- Discipline Specific Elective (DSE)
- Skill Enhancement Course (SEC)
- Generic Elective (GE)
- Lab on Project (LoP)
- Industrial Training (IT)

2.4 PART IV

2.4.1 Ability Enhancement Compulsory Course

The ability enhancement courses such as i)Environmental Studies, ii) Human Rights, iii) Womens' Rights, iv) General Awareness, v) Research Methodology, vi) Intellectual Property Rights(IPR), Innovation and Entrepreneurship or IPR and Innovation from I to VI Semester.

a) Those who have not studied Tamil up to XII Std and taken a non-Tamil language under Part-I shall take Tamil comprising of two courses.

(OR)

b) Those who have studied Tamil up to XII std and taken a non-Tamil language under Part-I shall takeAdvanced Tamil comprising of two courses in the third and fourth semesters.

(OR)

c) Studentswho come under the above a+b categories are exempted from Women's Rights and General awareness during III and IV semester respectively.

2.5PART V: EXTENSION ACTIVITIES

The following co-curricular and extra curricular activities are offered under institutional / department Association/ club/ extension programmes for the students under extension activities from I to IV semester.

a) Institutional

- National Service Scheme (NSS)
  Participation in any one of the camps organized by NSS unit.
- Friends of Police(FoP)
  Active participation in traffic regulation and other extension activities
- Sports
  Active participation in any one of the sports activities
- Youth Red Cross (YRC)
  Active participation in YRC programmes

b) Department Association

Membership and active participation in the department association activities.

c) Clubs

Membership and active participation in any one club activities.

1. CREDIT ALLOTTMENT

The following is the credit allotment:

- **Lecture Hours (Theory)** **:** Max.1 credit per lecture hour per week, 1 credit per tutorial 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

2. DURATION OF THE PROGRAMME

- A student is normally expected to complete the B.Sc. /B.com. /BA Programme in 6 semesters. However, in any case not more than 7 consecutive semesters. Failing which the concern BoS will identify suitable / equivalent course.

3. REQUIREMENTS FOR COMPLETION OF A SEMESTER

Candidate shall be permitted to appear for the End Semester examinations for any semester(practical/theory) if

i) He/she secures **not less than 75%** of attendance in the number of working days during the semester.

ii) He/she earns a progress certificate from the Head of the institution, of having satisfactorily completed the course of study prescribed in the scheme of examinations for that semester as required by these regulations, and

iii) His/her conduct / character is satisfactory.

- Provided that it shall be open to the Academic council, or any authority delegated with such powers by the Academic council, to grant exemption to a candidate who has failed to earn 75% of the attendance prescribed, for valid reasons, subject to usual conditions. (Refer the **Ordinance No.1 of 1990 of the Bharathiar University)**
- A candidate who earned 75% of attendance and more in the current semester are eligible to write the examination in current semester subjects.
- A candidate who has secured **less than 65% but 55%** and above attendance in any semester has to compensate the shortage in attendance in the subsequent semester besides earning the required percentage of attendance in that semester and appear for both semester papers together at the end of the later semester.
- A candidate who has secured **less than 55%** of attendance in any semester shall not be permitted to appear for the regular examinations and to continue the study in the subsequent semester. He/she has to rejoin the semester in which the attendance is less than 55%.
- A candidate who has secured **less than 65%** of attendance in the final semester has to compensate his/her attendance shortage in a manner as decided by the concerned Head of the department after rejoining the same course.

4. 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 (including the project work and Viva-Voce examination in the final Semester) shall be 100 with the following breakup.

(i) Theory Courses

Continuous Internal Assessment (CIA) : **25** Marks

End Semester Exams (ESE) : **75** Marks

(ii) For Practical/ Courses

Continuous Internal Assessment (CIA) : **40** Marks

End Semester Exams (ESE) : **60** Marks

a. The following are the distribution of marks for the **Continuous Internal Assessment** in **Practical, Project / Industrial Training Courses**.

Continuous Internal Assessment for Practical Courses:

S.No	For - UG practical courses	Distribution of Marks					
1	Minimum 10 experiments to be conducted/practical paper/semester	20	15	10	8	5	4
2	Tests : Two tests out of which one shall be during the mid semester and the other to be conducted as model test at the end of the semester.)	16	10	10	8	6	6
3	Observation Note Book	4	5	5	4	4	-
	TOTAL MARKS	**40**	**30**	**25**	**20**	**15**	**10**

Project viva-voce / Industrial Training

The following are the distribution of marks for the continuous internal assessment in UG Project/Industrial Training courses.

S. No	For - UG Project courses//Industrial Training	Distribution of Marks	
1	Review-I	5	10
2	Review-II	5	10
3	Review-III	5	10
4	Document, Preparation and Implementation	10	10
	TOTAL MARKS	**25**	**40**

b. Following are the distribution of marks for the **External Examination** in UG Project /Industrial Training courses

S. No	For - UG Project //Industrial Training courses	Distribution of Marks	
1	Record Work and Presentation	35	40
2	Viva-Voce	15	20
	TOTAL MARKS	**50**	**60**

Part – IV

The courses offered under Part – IV shall have only End Semester Examinations (ESE) for a maximum of 50 Marks. However, Students who select "Tamil" under Part IV, will be assessed only by Continuous Internal Assessment (CIA). The marks shall be furnished to the COE by the concerned Course teacher through the Head of the Department.

6.1CONTINUOUS ASSESSMENT EXAMS

6.1 Theory courses

a)Continuous Internal Assessment test (CIA)

There will be a Minimum of two Continuous Assessment Exams, for each Theory course. The first and Second Assessment Exams will be conducted for a Maximum of 50 Marksand 75 marks respectively. The total marks secured in the Two Assessment Exams will be converted to 15 Marks.

b) Utilization of Library

Marks will be awarded to the student based on the hours spent in the library after the working hours and submission of report by the student.

Hours spent in Library	Marks	Type of Document submitted
2	1	Report/ Assignment/ Class presentation
4	2	
6	3	
8	4	
10	5	
12	6	

- During the Library hour, the student must spend time in reading the articles, books, journals of their subject of interest
- Each student should borrow minimum three books during the semester
- **Student is expected to submit one Report / Assignment/ Class Presentation per Course.**

c) Class Participation

Active participation in classroom discussion by the student will be evaluated based on Integration of knowledge, Interaction and Participation and demonstration of knowledge.

d)PAPERS / REPORTS/ ASSIGNMENTS/ CLASS PRESENTATION

The student will be evaluated based on his ability to do analysis of application of theory to real world problems or creative extension of class room learning and his/her ability to communicate the given topic effectively and clearly.

Continuous Assessment OBE Rubrics Score Sheet

Degree: _____ Branch: _____ Semester: _____

Course Code: _____ Course: _____

Total: _____

Max. Marks: Internal:_____ External: _____

S.No.	REG.NO	THEORY / PRACTICAL & LIBRARY CLASS PARTICIPATION (15) (Compulsory)				RUBRICS ASSESSMENT (SELECT ANY ONE)									Total Marks out of : 30	Total Marks out of : 16 /10 /08 /04
						PAPERS / REPORTS (15)			ASSIGNMENTS (15)			CLASS PRESENTATION (15)				
		Library	Integration of Knowledge	Interaction & Participation	Demonstration of Knowledge	Organization & Knowledge	Format & Spelling	Reference / Experiments	Demonstration of Knowledge	Format & Spelling	Reference	Content & Coherence	Creativity and Speaking Skills	Duration of Presentation		
		6	3	3	3	5	5	5	5	5	5	5	5	5		
1																

The following are the distribution of marks for the continuous internal assessment in UG practical courses

S.No	For - UG Practical Courses	Distribution of Marks					
1	Minimum 10 experiments to be conducted/practical paper/semester	20	15	10	8	5	4
2	Tests : Two tests out of which one shall be during the mid semester and the other to be conducted as model test at the end of the semester.)	16	10	10	8	6	6
3	Observation Note Book	4	5	5	4	4	-
	TOTAL MARKS	**40**	**30**	**25**	**20**	**15**	**10**

7. FOR PROGRAMME COMPLETION

Programme Completion (for students admitted in the A.Y.2019-20 and Onwards)

Student has to complete the following:

i) Part I, II,III,IV,V as mentioned in the scheme

ii) **Industrial/ Institutional training**

Students must undertake industrial / institutional training for a minimum of 15 days and not exceeding 30 days during the IV semester summer vacation. The students will submit the report for evaluation during V semester.
Based on the performance Grade will be awarded as follows:

Marks Scored	Grade to be awarded
75 and above	A
60-74	B
40-59	C
< 40	Re-Appearance

iii) Skill Enhancement Training

Student must undergo Skill Enhancement training on Communication skills (I and II Semester) and Quantitative aptitude (III and IV Semester) respectively each for 40h.

8.EXTRA CREDITS

- Earning extra credit is mandatory. However, it is not essential for programme completion
- Extra Credits will be awarded to a student for achievement in co-curricular/ extracurricular activities carried other than the regular class-hours.
- The detailed guidelines for the award of extra credits are as follows:
- A student is permitted to earn a maximum of **five** extra Credits during the programme duration of UG from I to V Semester.
- Candidate can claim a maximum of 1 credit under each category listed.

The following are the guidelines for the award of Extra credits:

8.1 Proficiency in foreign language

Qualification	Credit
A pass in any foreign language in the examination conducted by an authorized agency	1

8.2 Proficiency in Hindi

Qualification	Credit
A pass in the Hindi examination conducted by Dakshin Bharat Hindi Prachar Sabha	1

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

8.3 Self study Course

Qualification	Credit
A pass in the self study courses offered by the department	1

- The candidate shouldregister the self study course offered by the department only in the III semester

8.4 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.

Qualification	Credit
A pass in the type writing / short hand examination offered by TNDTE	1

8.5 Diploma/Certificate

Courses offered by any recognized University / NCVRT

Qualification	Credit
A pass in any Certificate course/ Diploma / PG Diploma	1

8.6 CA/ICSI/CMA

Qualification	Credit
Qualifying foundation / Inter level / Final in CA/ICSI/CMA / etc.,	1

8.7 Sports and Games

The Student can earn extra credit based on their Achievement in sports as given below:

Qualification	Credits
Achievement in University/ State / National/ International	1

8.8 Online Courses

Pass in any one of the online courses

Qualification	Credit
SWAYAM/NPTEL/Spoken Tutorial etc.,	1

8.9Publications /Conference Presentations (Oral/Poster)/Awards

Qualification	Credit
Research Publications in Journals/ oral/poster presentation in Conference	1

8.10Innovation / Incubation / Patent / Sponsored Projects / Consultancy

Qualification	Credit
Development of model/ Products /Prototype /Process/App/Registration of Patents/ Copyrights/Trademarks/Sponsored Projects /Consultancy	1

8.11Representation

Qualification	Credit
State / National level celebrations such as Independence day, Republic day Parade,National Integration camp etc.,	1

193FN1A1CA	BASIC FOOD SCIENCE	Category	L	T	P	SEMESTER-I
		Core	4	1	-	

PREAMBLE

- To enable students to obtain knowledge of different food groups, their composition, nutritive value and role in daily diet, gain knowledge on principles and various methods of cooking foods.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO 1	List the basic food groups Define various cooking methods	K_1
CO 2	Interpret the nutritive value of food groups Outline the sources, structure, composition, methods and effects of cooking cereals, pulses, fruits and vegetables	K_2
CO 3	Demonstrate the methods of beverage preparation Explain the types and functions of fats and oils Outline medicinal uses of Spices and Condiments	K_2
CO 4	Illustrate milk processing and demonstrate preparation of milk products Identify uses, methods and experiment with effects of cooking egg	K_2
CO 5	Choose the cooking methods appropriate for meat, poultry and fish Solve the effects of cooking on meat, poultry and fish by applying the principles of cooking	K_3

Mapping with Program Outcomes

CO s/POs	PO 1	PO 2	PO 3	PO 4	PO 5
CO_1	S	S	S	S	S
CO_2	S	S	S	S	S
CO_3	S	S	S	S	S
CO_4	S	S	S	S	S
CO_5	S	S	S	S	S

S- Strong; M-Medium; L-Low

193FN1A1CA	BASIC FOOD SCIENCE	SEMESTER-I

Total Credits: 4
Instructional Hours: 60

Syllabus

UNIT –I 12Hrs

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. Boiling, steaming, stewing, frying, baking, roasting, broiling, cooking under pressure and microwave cooking.
Cereals: Structure and composition of rice and wheat, effects of cooking on parboiled and raw rice, **Cereal cookery**- Gluten and gelatinization, factors effecting gluten formation and gelatinization. **Millets:** Nutritive value of Ragi, Jowar and Maize.

UNIT –II 12Hrs

Pulses and legumes: Varieties of pulses, legumes and grams, composition, nutritive value, anti nutritional factors (Trypsin and Tannins), cooking quality of pulses, germination and its effects.
Fruits: Composition, nutritive value, changes during ripening, methods and effects of cooking, enzymatic browning.
Vegetables: Classification, composition, nutritive value, selection and preparation for cooking, methods and principles involved in cooking.

UNIT –III 13Hrs

Beverages - Classification, nutritive value, milk based beverages- methods of preparing tea and coffee, fruit based beverages and preparation of carbonated non – alcoholic beverages. **Sugar:** Stages of sugar cookery.
Fats and Oils: Types of oils, function of fats and oils, shortening effects of oil, smoking point of oil, effect of heat on oil absorption and factors affecting absorption of oil
Spices and Condiments: Functions of spices, medicinal values of Cardamom, Cinnamon, Cloves, Fenugreek, Pepper, Onion, Turmeric, Ginger and Garlic.

UNIT –IV **13Hrs**

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

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

UNIT -V **10Hrs**

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 Delhi: New Age International.
2. *ShakunthalaManay and Shadakhraswamy M., 2008.***Food Facts and Principles**, Third Edition, New Age International Publishers, New Delhi

REFERENCES :

1. *Mudambi .R. Sumathiand Rajagopal 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

193FN1A1CP	FOOD SCIENCE	SEMESTER I

Total Credits: 2
Hours/week: 4

EXPERIMENTS

1. Food group- Grouping of foods, discussion on nutritive value
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 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, common preparation with milk, cheese and curd.
11. Fleshy foods Fish, meat and poultry- preparations
12. Experimental cookery of Egg - boiled egg, poached egg. Common preparations with egg
13. Beverages Preparation of hot beverages- coffee, tea, Preparation of cold beverages-fruit drinks and milk shake

EXPERIMENTS UNDER DBT

14. Development of value added foods from cereals and pulses
15. Development of value added foods from vegetables and fruits
16. Evaluation of score card

193FN1A1CB	CHEMISTRY OF FOODS	Category	L	T	P	SEMESTER-I
		Core	4	1	-	

PREAMBLE

- To understand the physico-chemical properties of foods
- To analyze 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 physico-chemical properties of foods-Moisture in Foods, Hydrogen Bonding, Bound Water, Water Activity.Demonstrate Moisture Content in Foods, True Solutions, Dispersions, Sols, Gels, Foams, Colloids and Emulsions	K_1, K_2
CO2	List out the Components of Starch and treatment effects on starch.Explain the Stages of Sugar Cookery, Crystal Formation.Classify the types of Candies, Action of Acid, Alkali and Enzymes.	K_1, K_2
CO3	Explain Structure of wheat proteins, pulse proteins, egg proteins, vegetable proteins.Interpret the effect of treatments on various proteins.	K_2
CO4	Identify the Physical and Chemical Properties of fats and oils.Explain the techniques of processing fats and oils Summarize the factors affecting Fat Absorption in Foods	K_2,K_3
CO5	Identify the properties, importance of enzymes, enzymes involved in food reactions Choose the plant pigments and its abundant sources	K_3

Mapping with Program Outcomes

CO s/POs	PO 1	PO 2	PO 3	PO 4	PO 5
CO_1	M	M	M	S	S
CO_2	S	S	S	S	S
CO_3	S	S	S	S	S
CO_4	S	S	S	S	S
CO_5	S	S	S	S	S

S- Strong; M-Medium; L-Low

193FN1A1CB	CHEMISTRY OF FOODS	SEMESTER-I

Total Credits: 4
Instructional Hours: 60

Syllabus

UNIT-I 10 HrsPhysico-chemical properties of foods

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

UNIT- II 13Hrs

Chemistry of Starch and Sugars

Components of Starch, Swelling of Starch Granules, Gel Formation, Retro gradation, 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.

UNIT- III 13Hrs

Chemistry of Proteins

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

UNIT- IV 13 Hrs

Chemistry of Fats and Oils

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 , Factors Affecting Fat Absorption in Food

UNIT -V 11Hrs

Chemistry of Pectic Substances, Plant Pigments

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 Delhi: New Age International.
2. *Shakunthalamanay and Shadakhraswamy, 2008*, **Food Facts and Principles,** Third Edition, New Age International Publishers, New Delhi.
3. *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. *SunetraRoday (2000),***Food Science and Nutrition,** Edition I, Mangal Deep Publications, New Delhi.
3. *Swaminathan*, M. (1974). Essentials of food and nutrition. Vol. II. Applied aspects. *Essentials of food and nutrition. Vol. II. Applied aspects.*

192CE1A1IA	CHEMISTRY I	Category	L	T	P	SEMESTER-I
		IDC	4	-	-	

PREAMBLE

This course has been designed for students to learn and understand

- The basic concepts of chemical bonding in molecules.
- The essentials of organic chemistry and coordination chemistry. Enable to differentiate the organic molecule configurations.
- The fundamentals of solution concepts and to know the basic phenomenon of surface chemistry

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Outline the basics of chemistry which helps students to understand bonding in molecules, crystals structures and evaluate their bonding characteristics.	K2
CO2	Demonstrate to prepare laboratory solutions.	K2
CO3	Understand the concepts of bonding in organic molecules, and relate their displacement reactions with mechanism.	K2
CO4	Infer the concepts of adsorption and chromatography	K2
CO5	Extend their knowledge in absorption spectra, classification and few application of dyes	K2

MAPPING WITH PROGRAMME OUTCOMES

CO s/POs	PO 1	PO 2	PO 3	PO 4	PO 5
CO_1	M	M	M	S	S
CO_2	S	S	S	S	S
CO_3	S	S	S	S	S
CO_4	S	S	S	S	S
CO_5	S	S	S	S	S

S- Strong; M-Medium; L-Low

192CE1A1IA	CHEMISTRY I	SEMESTER I

Total Credits: 3
Total Instructions Hours: 36

Syllabus

Unit I 8**Hrs**

Chemical bonding

Molecular Orbital Theory - bonding, antibonding and nonbonding orbitals. MO configuration of H_2, N_2, O_2, F_2- bond order – diamagnetism and paramagnetism.
Ionic Bond: Nature of ionic bond, structure of NaCl and CsCl, factors influencing the formation of ionic bond.
Covalent Bond: Nature of covalent bond, structure of CH_4, NH_3, H_2O, shapes of $BeCl_2$, BF_3, based on VSEPR theory and hybridization.

Unit II Solutions 7**Hrs**

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- Acid base and quinonoid.
Strong and weak acids and bases - Ionic product of water- pH, pKa, pKb, Buffer solution, pH and pOH simple calculations.

Unit III Basic Organic Chemistry 7**Hrs**

Electron displacement effect in organic compounds - Inductive effect – Electromeric effect - Resonance effect, Hyperconjugation and Steric effect.
Isomerism, Symmetry of elements (Plane, Centre and Axis of symmetry), Molecules with one chiral carbon and two adjacent chiral carbons –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 IV Surface Chemistry and Chromatography 7Hrs

Surface Chemistry-Adsorption – adsorbent and adsorbate, adsorption and absorption - chemisorption - physisorption - Difference between chemisorption and physisorption - applications of adsorption - Factors influencing adsorption, adsorption isobar, adsorption isostere.
Chromatography - principles and applications of column, paper and thin layer chromatography.

Unit V Dyes 7Hrs

Chromophore, auxochrome, bathochromic shift, hypsochromic shift, hyperchromic shift and hypochromic shift absorption spectra of dyes. Classification of dyes based on chemical structure and application-Preparation of azo (Methyl orange) and methane triphenyl (Malachite green) dyes.

TEXT BOOKS

1 R.D. Madan. 2014. Modern Inorganic Chemistry, Revised Edition, S. Chand & Company.

2 Puri, Sharma and Pathania. 2017. Principles of Physical Chemistry, 47th Edition, Vishal Publishing Company.

REFERENCES:

1 Bahl Arun andB.S. Bahl. 2016. Organic Chemistry, 22nd Edition, S. Chand & Company.

2 M. K. Jain and S.C. Sharma. 2007. Organic Chemistry, Shoban Lal Nayin Chand.

3 R. Gopalan. 2004. Elements of Analytical Chemistry, Sultan Chand & Sons.

Course Code	Course Name	Category	L	T	P	Credit
191TL1A2TA	**தமிழ்த்தாள் - II**	Theory	4	**1**	**-**	3

PREAMBLE

This course has been designed for students to learn and understand

- **மொழிப் பாடங்களின் வாயிலாக தமிழரின் பண்பாடு, பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்**
- **கலை மற்றும் மரபுகளை அறியச் செய்தல்**
- **மாணவர்களின் படைப்பாக்கத் திறன்களை 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)- **மாணவனின் செயலாக்கத்திறனை ஊக்குவித்தல்**	K1,K2,K3
CO2	**மதிப்புக்கல்வி** (Attitude and Value education)	K2,K4
CO3	**பாட இணைச் செயல்பாடுகள்** (Co-curricular activities)	K2,K3,K4
CO4	**சூழலியல் ஆக்கம்** (Ecology)	K4
CO5	**மொழி அறிவு** (Tamil knowledge)	K5, K6

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

191TL1A2TA	தமிழ்த்தாள் - II	SEMESTER II

Total Credits: 3
Total Instruction Hours: 60 h

Syllabus

Unit I அற இலக்கியம் **12 h**

1. திருக்குறள்

அ.அறன் வலியுறுத்தல் (அ. எண்: 04)

ஆ.நட்பாராய்தல் (அ. எண்: 80)

இ.சான்றாண்மை (அ. எண்: 99)

ஈ.குறிப்பறிதல் (அ. எண்: 110)

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

Unit II அற இலக்கியம் **10 h**

1. நாலடியார் - அறிவுடைமை

2.பழமொழி நானூறு - வீட்டு நெறி

3. கார்நாற்பது - தோழி பருவங்காட்டி தலைமகளை வற்புறுத்திய பாடல்கள் (1முதல் - 18பாடல்கள்)

Unit III உரைநடை **10 h**

1. பெற்றோர்ப் பேணல் - திரு.வி.க.

2. உள்ளம் குளிர்ந்தது - மு.வரதராசனார்

3. சங்கநெறிகள் - வ.சுப.மாணிக்கம்

Unit IV உரைநடை **13 h**

1.பெரியார் உணர்த்தும் சுயமரியாதையும் சமதர்மமும் - வே. ஆனைமுத்து

2. வீரவணக்கம் - கைலாசபதி

3.மொழியும்நிலமும் - எஸ். ராமகிருஷ்ணண்

Unit V இலக்கிய வரலாறு, இலக்கணம் மற்றும் பயிற்சிப்பகுதி **15 h**

அ.இலக்கிய வரலாறு

1. பதினெண் கீழ்க்கணக்கு நூல்கள்

2. தமிழ் உரைநடையின் தோற்றமும் வளர்ச்சியும்

ஆ. இலக்கணம்

1. வழு, வழுவமைதி, வழாநிலை

இ. பயிற்சிப்பகுதி

1. நூல் மதிப்பீடு மற்றும் திரைக்கதை திறனாய்வு

2. தன்விவரக் குறிப்பு எழுதுதல்

Text Books

1 தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை மற்றும் அறிவியல் கல்லூரி (தன்னாட்சி) செய்யுள் மற்றும் உரைநடைத் திரட்டு. (முதல்பதிப்பு.) சென்னை: நியூ செஞ்சுரி புக்ஹவுஸ் (பி) லிட்.

References

1 பேராசிரியர் புலவர் இளவரசு, சோம. (ஜூலை2012). தமிழ் இலக்கிய வரலாறு. (எட்டாம் பதிப்பு) சென்னை: மணிவாசகர் பதிப்பகம்.

2 பேராசிரியர் முனைவர் பாக்கியமேரி (2013). இலக்கணம் இலக்கிய வரலாறு மொழித்திறன். (முதல் பதிப்பு) சென்னை பூவேந்தன் பதிப்பகம்.

3 தமிழ் இணையக் கல்விக்கழகம் <http://www.tamilvu.org/>

Course Code	Course Name	Category	L	T	P	Credit
191TL1A2HA	HINDI-II	Theory	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature
- To learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	M	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S Strong M Medium L Low

191TL1A2HA	HINDI-II	**SEMESTER II**

Total Credits: 3
Total Instruction Hours: 60 h

Syllabus

Unit I — 15 h

आधुनिकपद्य – शबरी(श्रीनरेशमेहता)

प्रकाशक: लोकभारतीप्रकाशन

पहलीमंजिल, दरबारीबिल्डिंग,

महात्मागाँधीमार्ग, इलाहाबाद-**211001**

Unit II — 15 h

उपन्यास: सेवासदन-प्रेमचन्द

प्रकाशक: सु मत्रप्रकाशन

204 लीलाअपार्ट्मेंट्स, **15** हेस्टिंग्सरोड'

अशोकनगरइलाहाबाद-**211001**

Unit III — 15 h

अनुवादअभ्यास-**III (**केवलहिन्दीसेअंग्रेजीमें**)**

(पाठ**1 to 10)**

प्रकाशक: द क्षणभारतप्रचारसभाचेनैई-**17**

Unit IV — 15 h

पत्रलेखन: (औपचारिकयाअनौपचारिक)

Course Code	Course Name	Category	L	T	P	Credit
191TL1A2FA	FRENCH- II	Theory	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- To Acquire Competence in General Communication Skills – Oral + Written – Comprehension & Expression
- To Introduce the Culture, life style and the civilization aspects of the French people as well as of France
- To help 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	To learn the adjectives and the classroom environment in France	K2
CO3	Learn the Plural, Articles and the Hobbies	K3
CO4	To learn the Cultural Activity in France	K3
CO5	To learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S Strong M Medium L Low

191TL1A2FA	FRENCH- II	**SEMESTER II**

Total Credits: 3
Total Instruction Hours: 60 h

Syllabus

Unit I – Super! 13 h

•Compétenc e Culturelle

L'égalitéhomme/femme

Compétence De communication

INTERACTION:

Exprimer des sentiments, exprimer la joie, le plaisir, le bonheur

- RÉCEPTION ORALE:

Comprendre un jeuradiophonique

- RÉCEPTION ÉCRITE:

Comprendre des announces

- PRODUCTION ÉCRITE:

Écrire des cartespostales •

Compétencegrammaticale

Les noms de professions masculine/feminine

- Le verb finir et less

Verbes du groupe

en-ir

- Le present de l'impératif
- Savoir(present)
- Le participle passé:

Fini, aimé, arrive, dit,écrit

- Quel(s), quelle(s)..:

InterrogatifetExclamatif

- À + infinitive
- Les articles: n,une,des

Unit II Quoi? 13 h

Compétenc e Culturelle

•Le 20 siécle:

Petitsprogrés Grand progrés

Compétence De communication

- INTERACTION:

Decrirequelque chose, unepersonne

- RECEPTION ORALE:

Comprendre un message publicitaire

- RÉCEPTION ÉCRITE:

Comprendre un déplianttouristique

- PRODUCTION

ÉCRITE: Écrire des petites announces

Compétence grammatical

- On
- Plus, moins
- Le verbealler:
- Present, impératif
- Aller + infinitife
- Le pluriel en –x

Unit III – Et aprés 12 h

Compétenc e Culturelle

Nouvelles du jour

Compétence De communication

INTERACTION:

Raconteur,situer un récitdans le temps

RÉCEPTION ORALE:

Comprendreune description

RÉCEPTION ÉCRITE:

Comprendre un test

PRODUCTION ÉCRITE:

écrire des cartespostales

Compétencegrammaticale

L'imparfait:: quel-Ques forms pour introduire le récit:Ilfaisait, il y avait, ilÉtait

Un peu, beaucoup, trop,Assez

Trés

Le verbevenir:

Présent, impératif

En Suisse, auMaroc, aux Etats-Unis

Unit IV Maisoui! 12 h

Compétenc e Culturelle

La génération des20-30 ans

Compétence De communication

INTERACTION:

Donner son opinion,

Expliquerpourquoi

RÉCEPTION ORALE:

Comprendre des informations à la radio

RÉCEPTION ÉCRITE:

Comprendre un texteinformatif

PRODUCTION ÉCRITE:

éncrire un mél de protestation

Compétencegrammaticale

Répondre, prendre:

Présent, impératif, part Passé

Parcequepourquoi

Tout/tous, toute/s

Tous/toutes les…

(répétition action)

Unit V Maisnon! 10 h

•Compétenc e Culturelle

De la ville à la campagne

Compétence De communication

INTERACTION:

Débat:: exprimerl'accord, exprimer le Désaccord

RECEPTION ORALE:

Comprendre un message sur un répondeurtéléphonique

RÉCEPTION ÉCRITE:

Comprendre un témoignage

PRODUCTION ECRITE: Rediger des petites Announces immobilieres

Compétencegrammaticale

Le verbedevoir:Present et participe passé

Le verbe vivre, present

Aller + infinitive

Venir+ infinitive

Etre pour/contre

Text Books

1 Marcella Di Giura Jean-Claude Beacco, AlorsINew Delhi – 110007:Goyal Publishers Pvt Ltd86, University Block Jawahar Nagar (Kamla Nagar).

Course Code	Course Name	Category	L	T	P	Credit
191TL1A2MA	MALAYALAM-II PROSE: NON-FICTION	Theory	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature.
- To learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S Strong M Medium L Low

191TL1A2MA	MALAYALAM-II PROSE: NON-FICTION	**SEMESTER II**

Total Credits: 3
Total Instruction Hours: 60 h

Syllabus

Unit I 12 h

Biography

Unit II 12 h

Biography

Unit III 12 h

Travelogue

Unit IV 12 h

Travelogue

Unit V 12 h

Travelogue

Text Books

1. Unit III, IV &V:Pottakkadu,S.K. KappirikaludeNattil. Kottayam: D.C. Books.
2. Bhatathirippadu,V.T.KannerumKinavum. Kottayam: D.C. Books.

References

1. Dr. George,K.M.(). Jeevacharitrasahithyam. (Edn.) Kottayam: N.B.S.
2. Dr. NaduvattomGopalakrishnan.JeevacharitrasahithyamMalayalathil. Trivandrum:Kerala BhashaInstitute.
3. Dr. VijayalamJayakumar. AthmakathasahithyamMalayalathil. (Kottayam:N.B.S.
4. Prof. Ramesh Chandran.SancharasahithyamMalayalathil. (10 Edn.) Trivandrum: Kerala Bhasha Institute.

Course Code	Course Name	Category	L	T	P	Credit
191EL1A2EA	ENGLISH - II	Language - II	4	-	1	3

PREAMBLE

This course has been designed for students to learn and understand

- To experience the effect of dialogue, the brilliance of imagery and the magnificence of varied genres
- To strengthen the student's English vocabulary and understanding of English sentence structure
- To communicate effectively and acquire knowledge on 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	Interpret skills in communication and to shape their attitude	K2
CO2	Develop oral and written language skills in a business context	K3
CO3	Analyze to gain key strategies and expressions for communicating with professionals	K4
CO4	Inspect the knowledge to the corporate needs	K4
CO5	Formulate Inter and Intrapersonal skills	K6

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

191EL1A2EA	ENGLISH - II	SEMESTER II

Total Credits: 3
Total Instructions Hours: 60

Syllabus

Unit I Technical English 10

Communication: Process- Methods- Channels- Barriers of Communications

Phonetics: Basics of phonetics - Consonants and Vowel sounds - Pronunciation Guidelines- Problem Sounds and Differences in Pronunciation

Reading Skills: Skimming and Scanning- Reading Different Kinds of Texts- Types- Developing a Good Reading Speed

Writing Skills: Note- Making and note taking, Summarizing and Paraphrasing- Paragraph Writing: Structure and principles

Unit II Business English 11

Structure and Planning of Letters: Elements of Structure- Forms of Layout- Style- Importance and Steps for Planning- Writing Business Letters

Quotation, Order and Tender: Inviting - Sending Quotation letter - Placing Orders- Inviting Tenders

E-mail Correspondence: Structure- Procedure- Style- Guidelines- Jargon and Acronyms- Security Precaution

Seminar and Meetings: Introduction- Organizing a Seminar- Sample Brochure- Conducting and Participating in a Meeting

Unit III Professional English 14

Report Writing: Importance- Process- Types- Structure

Memo: Importance- Structure

Notice, Agenda and Minutes: Meeting- Notice- Agenda- Minutes: Preparation- Structure- Delivery

Brochures: Purpose- Audience- Qualities

Unit IV Employment Communication 11

Resume Writing : Elements of Resume - difference between CV and Resume - Writing Job Application Art of Conversation: Small Talk- Body Language- Principles of Good Conversation Interview: Organizational role- Goals- Types- Interview Process

Group Discussion: Importance- Features- Strategies- Barriers

Unit V Soft Skills 14

Self - Discovery and Goal Setting: Self - Discovery - What Comprises It?- Goals and Types- Benefits, Areas and Clarity of Goal Setting - Critical thinking

Positive Thinking (PT) and Attitude: Benefits of PT and Attitude- Develop Positive Attitude and Thinking- Drive out Negative Thinking and Attitude

Etiquettes and Manners: Home, Table and Business- Time Management: Nature and Characteristics- Objectives and Significance

Developing Emotional Intelligence (EI): Salient Features- Components of EI- Intrapersonal Development

Text Books

1 Prabha, Dr. R. Vithya & S. Nithya Devi. 2019. Sparkle. (1st Edn.) McGraw - Hill Education. Chennai.

2 Rizvi, Ashraf. M. 2018. Effective Technical Communication. McGraw - Hill Education, Chennai.

References

1 Ghosh, B.N. Editor. 2017. Managing Soft Skills for Personality Development. McGraw - Hill Education, Chennai.

2 Adams, Katherine L. and Gloria I. Galanes. 2018. Communicating in Groups- Applications and Skills. McGraw - Hill Education, Chennai.

3 Koneru, Aruna. 2017. Professional Communication. McGraw - Hill Education, Chennai.

4 Koneru, Aruna. 2011. English Language Skills. McGraw - Hill Education, Chennai.

5 Sharma, R.C. and Krishna Mohan. 2016. Business Correspondence and Report Writing. 5th Edn. McGraw - Hill Education, Chennai.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A2CA	PRINCIPLES OF NUTRITION	CORE	5	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- To enable students to understand the vital link between nutrition and health.
- To gain knowledge on functions, metabolism of nutrients.
- To understand effects of deficiency and toxicity of 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 history of nutrition, basic values to determine energy. Analyze the calorific value of food.	K2
CO2	Editorialize the role of carbohydrate, dietary fiber and the significance of fats in human nutrition.	K5
CO3	Analyze the metabolism of protein and digestibility coefficient. Construct the vital role of amino acids and mutual supplementation of dietary proteins in human nutrition.	K3,K4
CO4	Speculate the role of vitamins and its implication in human nutrition.	K6
CO5	Infer the general functions of minerals. Execute the role and its implication of micro-macro minerals in human nutrition. Elucidate the distribution and maintenance of water and acid base and electrolyte balance in the body	K2, K4

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A2CA	PRINCIPLES OF NUTRITION	**SEMESTER II**

Total Credits: 4
Total Instruction Hours: 72 h

Syllabus

Unit I Energy 14 h

Introduction to Nutrition – History of Nutrition. Definition of Energy, Units of Energy- Calorie and Joule.

Measurement of calorific value of foods using Bomb Calorimeter. Physiological fuel values of foods and SDA of foods.

Determination of energy requirements- Bomb calorimeter- Direct calorimeter and Indirect calorimeter. Relation between respiratory quotient and energy output.

Basal Metabolism- Definition, determination of basal metabolism, factors affecting BMR. Recommended Dietary Allowances for energy.

Unit II Carbohydrates, Fats and Lipids 14 h

Carbohydrates - Classification, functions, digestion, absorption, utilization, sources and requirements of carbohydrates. Glycemic index of foods.

Dietary fiber – Definition, sources, Role of fiber in human health.

Fats and Lipids - Classification, functions, sources and requirements, importance, types and sources of fatty acids.

Unit III Proteins 14 h

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

Evaluation of protein quality-PER, BV and NPU, Digestibility Coefficient, Reference protein, Quality difference between animal and vegetable proteins.

Amino acids - Essential amino acids and Non-Essential amino acids, mutual supplementation of dietary protein.

Unit IV Vitamins 15 h

Vitamins – General functions in the body and Classification of vitamins.

Fat soluble vitamins - Functions, sources, requirements and deficiency and toxicity ofVitamin A, D, E and K.

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

Unit V Minerals and Water 15 h

Minerals – General functions in the body, Classification –Macro and Micro minerals.

Micro minerals - Iron, Zinc, Iodine, Copper, Fluorine, - Functions, sources, requirements, deficiency and toxicity.

Macro minerals - Calcium, Phosphorus, Sodium, Potassium and Chlorine - Functions, sources, requirements, deficiency and toxicity.

Water – Importance, distribution in the body, functions of water and sources, maintenance of water and regulation of acid- base balance in the body and Electrolyte balance.

Text Books

1 Srilakshmi, B (2018). Nutrition Science. (6th Edn.) Delhi: New Age International Publishers.

2 Shubhangini Joshi, A. (2014). Nutrition and Dietetics. (3 Edn.) New Delhi: Tata Mc Graw Hill Publishing Company Ltd.

References

1 Swaminathan.M. (1996). Handbook of Food and Nutrition. (2 Edn.) Bangalore: Bangalore Printing Publishing Company.

2 Vijay Kaushik. (2000). Food Science and Nutrition. (4 Edn.) New Delhi : Mangal Deep Publications.

193FN1A2CP	NUTRITION PRACTICAL	SEMESTER II

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Demonstration and handling techniques of the following a) Bomb calorimeter b) Photometer c) Centrifuge d) Weighing balance e) Incubator f) Muffle Furnace g) pH meter h) Soxhlet apparatus
2	Determination of moisture content and mode of operation technique of Hot air Oven and microwave oven
3	Determination of gluten content in wheat
4	Estimation of fibre content of the foods
5	Estimation of protein by Lowry's method
6	Determination of ash content in food
7	Qualitative tests for iron
8	Qualitative tests for phosphorus
9	Estimation of calcium in milk
10	Qualitative test for Vitamin A
11	Quantitative estimation of ascorbic acid in citrus fruits
12	Estimation of titrable acidity
13	Detection of hydrogen peroxide and phosphates in milk
14	EXPERIMENTS UNDER DBT Determination Methylene Blue Reduction Test
15	Detection of adulteration in milk by using Lactometer

Notes: Eight experiments out of fifteen

Course Code	Course Name	Category	L	T	P	Credit
192CE1A2IA	CHEMISTRY II	IDC	4	-	-	3

PREAMBLE

This course has been designed for students to learn and understand

- The basic properties of -periodic table and their periodicity.
- The structure, preparation and properties of carbohydrates and heterocyclic compounds. And also about source, classification and deficiency of vitamins.
- The basic concepts of chemical kinetics and water treatment methods.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Summarize basics about coordination chemistry and fertilizers.	K2
CO2	Outline the preparation and chemical properties of carbohydrates and sources, classification of vitamins and their deficiency.	K2
CO3	Interpret the nomenclature of organic compounds and summarize the preparation and properties of basic heterocyclic compounds.	K3
CO4	Identify the types of rate of reactions and their catalytic reactions.	K3
CO5	Select the various techniques to find the hardness of water.	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

192CE1A2IA	CHEMISTRY II	SEMESTER II

Total Credits: 3
Total Instruction Hours: 36 h

Syllabus

Unit I Coordination Chemistry and Fertilizers 7 h

Coordination Chemistry

Nomenclature, Theories of Werner, Sidge-Wick, Pauling, Chelation examples, Haemoglobin, Chlorophyll.

Fertilizers

Manufacture of Urea, Potassium Nitrate, Superphosphate, Triple Superphosphate.

Unit II Carbohydrates and Vitamins 7 h

Carbohydrates - Classification, preparation, properties and structure of glucose, fructose, inter conversion of glucose to fructose and fructose to glucose, mutarotation.

Vitamins - Sources of vitamins, diseases caused by the deficiency of vitamins.

Unit III Heterocyclic Chemistry 7 h

IUPAC Nomenclature of organic compounds – alkanes, alkenes, alcohols, aldehydes, ketones, carboxylic acids (mono and dicarboxylic), benzene and naphthalene derivatives.

Heterocyclic Compounds – Preparation and properties (physical, chemical and electrophilic substitution reactions) of furan, pyrrole, pyridine and thiophene.

Unit IV Chemical Kinetics 8 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. Derivation of rate expression for I and II order kinetics.

Catalysis – homogenous, heterogeneous and enzyme catalysis (definition only), enzymes used in industry, characteristics of catalytic reactions.

Unit V Water Technology 7 h

Introduction- dissolved impurities in water – hard water – disadvantages of hard water, hardness, estimation of hardness by EDTA titration.

Softening methods – zeolite,demineralization process, reverse osmosis – purification of drinking water, biological oxygen demand (BOD) and chemical oxygen demand (COD).

Text Books

1. Madan, R D (2019). Modern Inorganic Chemistry. (Revised Edn.) Delhi: S. Chand & Company.
2. Puri, Sharma, Pathania, P R, L R, M S. (2017). Principles of Physical Chemistry. (47Edn.) ShobanLalNagin Chand and Co: New Delhi.

References

1. Jain.M.K, Sharma, S. C. (2019). Modern Organic Chemistry. (Latest Edn.) Location: Vishal Publishing Co.
2. Gopalan.R, Subramanian P.S, Rengarajan.K (2004). Elements of Analytical Chemistry. (10 Edn.) New Delhi: Sultan Chand & Sons...
3. Gurdeep Raj, (2014). Advanced Inorganic Chemistry. (Volume II Edn.) Uttar Pradesh: Krishna's Educational Publishers.
4. Sharma B. K. (2012). Water pollution. (6 Edn.) Meerut: Krishna Prakashan Media P. Ltd.

192CE1A2IP	CHEMISTRY	SEMESTER II

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Volumetric analysis (i) Estimation of Sodium Hydroxide using standard Sodium Carbonate (ii) Estimation of Hydrochloric acid using standard Oxalic acid (iii) Estimation of Oxalic acid using standard Sulphuric acid (iv) Estimation of Ferrous sulphate using standard Mohr salt solution (v) Estimation of Oxalic acid using standard Ferrous sulphate solution
2	Organic Analysis Systemic analysis of organic compounds containing diamides, carbohydrates, phenol, carboxylic acids (mono & di), amines and amides.

Notes: Any 4 volumetric analysis

References

1. V. Venkateswaran. R. Veeraswamy. A. R. Kulandaivelu. 2004. Basic Principles of practical chemistry. Sultan Chand & Co.
2. R. Gopalan. 2000. Elements of analytical chemistry. S. Chand. New Delhi.
3. N. S. Gnanapragasam. G. Ramamurthy.1998. Organic Chemistry lab manual. S. Viswanathan and Co. Pvt. Ltd. Chennai.

Course Code	Course Name	Category	L	T	P	Credit
196BM1A2AA	HUMAN RIGHTS	AECC	2	-	-	2

PREAMBLE

This course has been designed for students to learn and understand

- To study how human values and personality traits help to develop the characteristics of each individual
- Understanding the moral values towards the enrichment of the society
- Identify the impact of ethics and values on the global development of the current scenario

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 human values, personality traits and character formation.	K2
CO2	Acquire the knowledge through value education towards national and global development.	K1
CO3	Introduce the basic concepts of conflict, emotions and adolescent emotions.	K1
CO4	Illustrate the techniques in therapeutic measures like yoga and meditation.	K2
CO5	Learn the concepts of human rights, rights for women and children and domestic violence.	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

196BM1A2AA	HUMAN RIGHTS	SEMESTER II

Total Credits: 2
Total Instruction Hours: 24 h

Syllabus

Unit I Introduction to human values 05 h

Concept of Human Values - Value Education Towards Personal Development - Aim of education and value education - Evolution of value oriented education - Concept of Human values - Types of values - Components of value education - Personal Development: Self analysis and introspection - Sensitization towards gender equality - Physically challenged - Intellectually challenged - Respect to age - Experience - Maturity - Family members - Neighbours - Co-workers - Character Formation towards Positive Personality: Truthfulness - Constructivity - Sacrifice - Sincerity - Self Control - Altruism - Tolerance - Scientific Vision.

Unit II Value education and Social values 05 h

Value Education Towards National and Global Development National and International Values: Constitutional or national values - Democracy - Socialism - Secularism - Equality - Justice - Liberty - Freedom and fraternity -Social Values - Pity and probity - Self control - Universal brotherhood - Professional Values - Knowledge thirst - Sincerity in profession - Regularity - Punctuality and faith - Religious Values - Tolerance - Wisdom - Character - Aesthetic values - Love and appreciation of literature and fine arts and respect for the same - National Integration and international understanding.

Unit III Global Development on Ethics and Values 04 h

Impact of Global Development on Ethics and Values: Conflict of cross-cultural influences - Mass media - Cross-border education - Materialistic values - Professional challenges and compromise - Modern Challenges of Adolescent Emotions and behave or Sex and spirituality: Comparison and competition - Positive and negative thoughts - Adolescent Emotions - Arrogance - Anger - Sexual instability - Selfishness - defiance.

Unit IV Yoga and Meditation 05 h

Therapeutic Measures: Control of the mind through - Simplified physical exercise - Meditation – Objectives - Types - Effect on body - Mind - Soul - Yoga – Objectives - Types - Asanas - Activities: Moralisation of Desires -Neutralisation of Anger - Eradication of Worries - Benefits of Blessings.

Unit V Human Rights and Rights of Women and Children 05 h

Human Rights - Concept of Human Rights – Indian and International Perspectives - Evolution of Human Rights - Definitions under Indian and International

documents - Broad classification of Human Rights and Relevant Constitutional Provisions - Right to Life - Liberty and Dignity - Right to Equality - Right against Exploitation - Cultural and Educational Rights - Economic Rights - Political Rights - Social Rights - Human Rights of Women and Children - Social Practice and Constitutional Safeguards - Female Foeticide and Infanticide - Physical assault and harassment - Domestic violence - Conditions of Working Women - Institutions for Implementation - Human Rights Commission - Judiciary - Violations and Redressel Violation by State - Violation by Individuals - Nuclear Weapons and Terrorism Safeguards.

References

1. Brain Trust Aliyar, 2008, Value Education for health, happiness and harmony. Vethathiri publications, Erode.
2. Grose. D. N, 2005, A text book of Value Education. Dominant Publishers and Distributors, New Delhi.
3. Yogesh Kumar Singh & Ruchika Nath, 2005, Value Education, P. H Publishing Corporation, New Delhi.
4. Venkataram & Sandhiya. N, 2001, Research in Value Education, APH Publishing Corporation, New Delhi.
5. Seetharam. R. (Ed), 1998, Becoming a better Teacher Madras Academic Staff College.
6. Brain Trust Aliyar, 2004, Value Education for Health, Happiness and Harmony. Vethathiri publications, Erode.
7. Swami Vivekananda, 2008, Personality Development. Advaita Ashrama, Kolkata.
8. Dey A. K, 2002, Environmental Chemistry. New Delhi – Vile Dasaus Ltd

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Third Semester										
Part – I										
191TL1A3TA	Language - I	Tamil-III	3	1	-	3	25	75	100	3
191TL1A3HA		Hindi-III								
191TL1A3MA		Malayalam- III								
191TL1A3FA		French –III								
Part – II										
191EL1A3EA	Language-II	English – III	4	-		3	25	75	100	3
Part – III										
193FN1A3CA	Core-IV	Nutrition in Health	4	-	-	3	25	75	100	4
193FN1A3CB	Core-V	Human Physiology	3	-	-	3	25	75	100	2
193FN1A3CP	Core Practical-III	Nutrition in Health	-	-	4	3	40	60	100	2
193BC1A3IA	IDC-III	Biochemistry-I	3	-	-	3	25	75	100	3
193FN1A3SP	SEC-I	Human Physiology	-	-	4	3	40	60	100	3
	GE-I		2	-	-	3	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	-	-
Part – IV										
191TL1A3AA	AECC-III	Basic Tamil	2	-	-	3	-	50	50	2
191TL1A3AB		Advance Tamil								
195CR1A3AA		Women's Rights								
Total			**21**	**1**	**8**				**800**	**24**

EXTRA CREDIT COURSES

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

S. No.	Course Code	Course Name
1	193FN1ASSA	Food Fortification
2	193FN1ASSB	Nutrition education

ourse Code	Course Name	Category	L	T	P	Credit
191TL1A3TA	தமிழ்த் தாள்– III	மொழி-I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு , 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) – மாணவனின் செயலாக்கத்திறனை ஊக்குவித்தல்	K1,K2,K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K2,K4
CO3	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K2,K3,K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு(Tamil knowledge)	K5

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

191TL1A3TA	பகுதி – 1 : தமிழ் தாள் : 3	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I 10 h

1. காப்பியங்களின் தோற்றமும் வளர்ச்சியும்
2. சிலப்பதிகாரம் – மனையறம் படுத்த காதை
3. மணிமேகலை – வஞ்சிமாநகர் புக்க காதை

Unit II 10 h

1. கம்பராமாயணம் – கும்பகர்ணன் வதைப்படலம் (பா. எண் : 60 – 100)
2. பெரிய புராணம் – அதிபத்தநாயனார் புராணம்

Unit III 10 h

1.சிற்றிலக்கியங்களின் தோற்றமும் வளர்ச்சியும்

2.தமிழ்விடு தூது – தூதுப்பொருள்கள் மட்டும் 101 முதல் 112 வரை(12 கண்ணிகள்)

3.திருக்குற்றாலக்குறவஞ்சி – வசந்தவல்லி பந்தாடிய சிறப்பு (6: 4கண்ணிகள்)

4.கலிங்கத்துப்பரணி – களம் பாடியது (போர்க்களக் காட்சி –பா.எண்: 472–502)

Unit IV 10 h

1. நாடகங்களின் தோற்றமும் வளர்ச்சியும்
2. நாடகம் - ஔவை–ஆசிரியர் இன்குலாப்

Unit V 08 h

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

3. பயிற்சிப்பகுதி

அ) அலுவலகம் சார்ந்த கடிதம்: விண்ணப்பங்கள், வேண்டுகோள், முறையீடு,

ஆ) வாசகர் கடிதம்: நாளிதழ், வானொலி, செய்தி ஊடகங்களுக்கு விமர்சனம் எழுதுதல்.

Text Books

1. மொழிப்பாடம் - 2020, தொகுப்பு : தமிழ்த்துறை , டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி.
2. இன்குலாப் – 2017. ஔவை (நாடகம்), அன்னம் வெளியீடு, சென்னை.

References

1. புலவர் சோம. இளவரசு - 2014. இலக்கிய வரலாறு , மணிவாசகர் பதிப்பகம் , சென்னை – 108,
2. பேராசிரியர் முனைவர் பாக்யமேரி – முதற் பதிப்பு 2013 , இலக்கணம் இலக்கிய வரலாறு மொழித்திறன், பூவேந்தன் பதிப்பகம், சென்னை.
3. இணையதள முகவரி : www.tamilvirtual.com

Course Code	Course Name	Category	L	T	P	Credit
191TL1A3HA	HINDI-III	Language - I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S Strong M Medium L Low

191TL1A3HA	HINDI-III	SEMESTER III

Total Credits: 03

Total Instruction Hours: 48 h

Syllabus

Unit I — 10 h

पद्य – काव्य पराशर (भोलानाथ)

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

प्रकाशक: जवाहर पुस्तकालय

सदर बाजार, मथुरा

उत्तर प्रदेश - 281001

Unit II — 10 h

हिन्दी साहित्य का इतिहास: (साधारण ज्ञान)

आचार्य रामचन्द्र शुक्ल

लोकभारती प्रकाशन इलाहाबाद

Unit III — 10 h

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

प्रकाशक: विनोद पुस्तक मंदिर

आगरा - 282002

Unit IV — 10 h

संवाद लेखन

पुस्तक: व्याकरण प्रदिप - रामदेव

प्रकाशक: हिन्दी भवन 36 इलाहाबाद - 211024

Unit V — 08 h

अनुवाद अभ्यास-III (केवल हिन्दी से अंग्रेजी में)

(पाठ 10 to 20)

प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई -17

Course Code	Course Name	Category	L	T	P	Credit
191TL1A3MA	MALAYALAM - III	Language - I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S Strong M Medium L Low

191TL1A3MA	MALAYALAM - III	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I 10 h

Kumaranasan

Unit II 10 h

Kumaranasan

Unit III 10 h

Kumaranasan

Unit IV 10 h

Kavyanchali Collection of Poems.

Unit V 08 h

Kavyanchali Collection of Poems.

Text Books

1 Chinthavishtayaya Sitha By Kumaranasan DC.Books Kottayam

2 Kavyanchali -Group of Authors DC.Books Kottayam

References

1 Kavitha Sahithya Charithram –Dr.M.Leelavathy Sahithya academy Thrissur.

Course Code	Course Name	Category	L	T	P	Credit
191TL1A3FA	FRENCH-III	Language - I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- To Acquire Competence in General Communication Skills – Oral + Written – Comprehension & Expression.
- To Introduce the Culture, life style and the civilization aspects of the French people as well as of France.
- To help 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	To learn the adjectives and the classroom environment in France.	K2
CO3	Learn the Plural, Articles and the Hobbies.	K3
CO4	To learn the Cultural Activity in France.	K4
CO5	To learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S Strong M Medium L Low

191TL1A3FA	FRENCH-III	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I **Excuses et vœux** 10 h

Compétence Culturelle : Convivialité - (lieux et société, - l'apéritif)

Compétence de Communication

- **INTERACTION ORALE:** Accueillir quelqu'un, s'excuser,remercier
- **RÉCEPTION ORALE**: Comprendre des announces enregistrées
- **RÉCEPTION ÉCRITE:** Compremdre une affiche
- **PRODUCTION ÉCRITE:** Écrire des cartes de vœux

Compétence Grammatical

Pronoms personnels toniques moi,je…;toi…tu - Pronoms personnels objets Me,te,le… - Lesverbsen-ercomme appeler,acheter - Lesadjectives possessives nos,vos,leurs

Unit II **Bravo et merci** 8 h

Communication et technologies (leportable, internet)

- **INTERACTION ORALE:** Interagir au téléphone , féliciter
- **RÉCEPTION ORALE:** Comperendre une emission à la radio
- **RÉCEPTION ORALE:** Comprendre une définition
- **PRODUCTION ECRITE:** Écrire des plaques commemoratives

Oui,que - Le passé composé - Le participe passé - J'ai eu,ella a été -

Longtemps,pendant …, de… à

Unit III **Faire et dire** 10 h

Jeunes : enquête

- **INTERACTION ORACE:** Demander de l'aide, donner des instructions
- **RÉCEPTION ORALE:** Comprendre un message enregistré
- **RÉCEPTION ÉCRITE :** Comprendre un article d'un magazine de consommateurs
- **PRODUCTION ÉCRITE :** Écrire un règlement

- du,de la (de l)',des,de

Unit IV **Faire ci ou faire ça** 10 h

Les vacances des Français

- **INTERACTION ORALE :** Proposer quelque chose,accepter,refuser
- **RÉCEPTION ORALE :** Comprendre une émission de cuisine
- **RECEPTION ÉCRITE :** Comprendre une brochure d'informations
- **PRODUCTION ÉCRITE :** Ecrire un'texte de promotion touristique

S'il y a du soleil : L'hypothèse (supposition, Condition) la préposition S i + indicatif Sinon… ou + indicatif - Sortir,partir - Quelques, plusieurs - Le long de - Au milieu de… - Au sommet de…

Unit V Dialogue writing 10 h

1. Au Restaurant
2. A la poste
3. A L' Aeroport
4. A La Gare
5. Chez Le Medecin

Text Books

1 Marcella Di Giura Jean-Claude Beacco, Alors II. Goyal Publishers Pvt Ltd 86, University Block ,Jawahar Nagar (Kamla Nagar), New Delhi – 110007

Course Code	Course Name	Category	L	T	P	Credit
191EL1A3EA	ENGLISH - III	Language II	4	-	-	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	Learn English grammar and its specific usage	K2
CO2	Know the methods of improving reading skills	K3
CO3	Understand the importance of speaking skills and developing it through various practices	K3
CO4	Comprehend the basic steps of reading and its necessity	K3
CO5	Acquire the writing skills and mandatory similar practices	K4

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

191EL1A3EA	ENGLISH - III	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I Basics of English 10 h

Phrasal verb - Notions and Conventional Idiomatic Expressions - One-Word Substitution - Word Formation - Homophones - Spelling - Sentence Completion – Sentence Pattern

Unit II Listening 08 h

Listening and Hearing - Principles of listening - Types of listening - incidental listening - active and effective listening - discriminative listening - critical listening - listening vs practice - Barrier to Listening - Guidelines for Improving Listening

Unit III Speaking 10 h

Monologues - Dialogue - Role Play - JAM (Just A Minute talk) - Debate - Public Speaking - Group Discussion - Interview - Showing Directions - Accent and Neutralization

Unit IV Reading 10 h

Mechanics of Reading - Types of Reading - Summarization - Paraphrasing - Analysis and Interpretation - Reading Comprehension – Reading with purpose and making predictions - Cloze Passage

Unit V Writing 10 h

Paraphrase Writing - Techniques and Methods of Paraphrasing - Precis Writing - Difference between Paraphrase and Precis - review writing - Hints Developing - Editorial Writing - Tabloid - Column Writing

Text Books

1. Bhatnagar R. P. 2013. English for Competitive Examinations. Macmillan Publishers, Chennai.
2. KoneruAruna. 2011. English Language Skills. McGraw Hill Education, Chennai.

References

1. Radhakrishna Pillai G. 2000. English for Success. Emerald Publishers, Chennai.
2. Gauri Mishra, Ranjana Kaul. 2016. Language Through Literature. Primus Books, New Delhi.
3. Miles Craven. 2008. Cambridge English Skills Real Listening and Speaking. First Edition, Cambridge University Press, India.
4. Teaching Adult: A Literary Resource Book. 2012. New Readers Press, New York, United States.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A3CA	NUTRITION IN HEALTH	CORE	4	-	-	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 form 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	Illustrate the RDA for Indians. Evaluate the nutritional needs of adults.	K4
CO2	Explain the physiological, nutritional changes, hormonal control and relaxation during pregnancy.	K5
CO3	Assess the growth and development of infants. Explain the importance breast milk. And preparation of Weaning foods and compare commercially and other organization.	K4
CO4	Assess the nutritional requirement of preschool and school going children. Importance of packed lunch.	K4
CO5	Infer the nutritional problem and nutritional requirement in adolescent and old age people.	K6

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A3CA	NUTRITION IN HEALTH	SEMESTER III

Total Credits: 4
Total Instruction Hours: 48 h

Syllabus

Unit I Introduction to RDA and Balanced Diet 10 h

Basics for Recommending the Dietary Allowances, Acceptable Dietary Intake, Purposes of RDA, Factors Affecting Recommended Dietary Allowances, Requirements and Recommended Dietary Allowances, Uses of ICMR RDA in planning balanced diet, Consumption Units. Reference Man and Woman, Basic Principles of Meal Planning.
Nutritional needs of adults (men and women) – Nutrition and work efficiency. Menopausal and post menopausal women, nutritional requirement of the adult in relation to occupation.

Unit II Nutritional Needs during Pregnancy and Lactation 8 h

Normal growth and weight change. Physiological changes, complications, dietary problems and stages of pregnancy. Physiological changes during lactation, hormonal control and relaxation, nutritional components of colostrums and mature milk. Nutritional requirements of pregnant and lactating women.

Unit III Nutrition during Infancy 8 h

Growth and development (growth chart), factors influencing growth, breast feeding and bottle feeding, factors to be considered in bottle feeding. Different types of commercial milk formulae. Problems of feeding in normal, premature and LBW infants. Nutritional requirements of infants' up to one year Weaning Foods - Weaning foods, types of supplementary food and problems in weaning.

Unit IV Nutritional needs of pre-school children 10 h

Growth and development and factors inhibiting growth. Nutritional and food requirements of preschool children. Factors to be considered while planning meals for pre-school children. Eating problems of children and their management, preparation of supplementary foods using available low cost foods. Nutrition for School children - Growth pattern, Nutritional requirement, meal planning and feeding problem for school children, Importance of Packed lunches

Unit V Nutrition during adolescence 12 h

Physical Growth- changes and factors affecting height and weight, increments during menarche, changes in food habits, Nutritional problems in adolescence- Iron deficiency anemia, obesity , anorexia nervosa and bulimia nervosa, predisposition to osteoporosis, under nutrition, premenstrual syndrome, malnutrition due to early marriage. Nutritional requirement
Nutrition During Old Age - Physiological changes in ageing, psycho-social and economic factors affecting eating behavior. Nutritional problems of aged 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. Brahmam, 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 Krause, M.V. and Hunscher, M.A., "Food, Nutrition and Diet Therapy", 14th Edition, W.B. Saunders

3 Swaminathan, M, 2012, "Advanced Textbook on Food and Nutrition", Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore.

4 Simon Langley-Evans, 2015, "Nutrition, Health and Disease: A Lifespan Approach" wiley publications.

193FN1A3CP	NUTRITION IN HEALTH	SEMESTER III

Total Credits: 2
Total Instructions Hours: 48 h

S.No	List of Experiments
1	Classification of food groups
2	Planning and preparing diet for sedentary ,moderate and heavy workers (men and women)
3	Preparation of supplementary and weaning foods
4	Nutrition during pregnancy
5	Nutrition during lactation
6	Nutrition during infant
7	Nutrition during toddlers
8	Nutrition during preschool
9	Nutrition during school going
10	Nutrition during for adolescence
11	Nutrition during for adult
12	Planning and preparing a menu during old age

Note: Out of 12 - 10 Mandatory

References

Srilakshmi, B., 2013, "Dietetics", New Age International (P) Ltd., New Delhi.

ICMR, National Institute of Nutrition, 2013, "Dietary Guidelines for Indians", Hyderabad.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A3CB	HUMAN PHYSIOLOGY	CORE	3	-	-	2

PREAMBLE

This course has been designed for students to learn and understand

- structure of various organs human systems 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,K3
CO2	Demonstrate understanding of the circulatory system Describe the heartbeat, and relate it to the cardiac cycle Analyze factors leading to hypertension	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. Illustrate the structure and function of the major endocrine organ	K3
CO5	Explain the processes of filtration, reabsorption, and secretion in the nephron. Examine how the nervous system controls the body mechanism	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S – Strong M – Medium L – Low

193FN1A3CB	HUMAN PHYSIOLOGY	SEMESTER III

Total Credits: 2

Total Instruction Hours: 36 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 07 h

Blood: Composition and functions of blood and plasma, Red Blood cells: Formation and functions, White Blood cells: Types and functions, Platelets-function. Blood group, blood coagulation and Rhesus factor,Blood transfusion. 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 Respiratory diseases 07 h

Sense Organs -Eye – Structure and functions. of vision, Ear and Skin. Diseases-vision – Conjunctivitis, trachoma, glaucoma, cataract. Ear –. Deafness, vertigo

Lungs – Structure and functions, Exchange and Transportation of oxygen and carbon dioxide in the body. Disturbances in respiration – Apnea, Dyspnea, Hypoxia

Unit IV Reproductive system& Endocrinology 07 h

Reproductive system- Male reproductive system – Structure and functions. Spermatogenesis. Female reproductive system – Structure and functions. Oogenesis. Menstrual cycle and Puberty,

Endocrinology - Endocrine glands- Pituitary, Thyroid, , Pancreas (endocrine function), Adrenal – Their structure and functions

Unit V Excretory, Muscular and Central nervous system 07 h

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

Muscular system – Functions of the muscles. Muscular action.

Central nervous system - Brain and spinal cord – structure , Physiology of the nerve cell and function.

Text Books

1 Guyton and Hall, 2011, Text Book of Medical Physiology, 12th Edition, Elsevier Inc.

2 Pal G. K, 2015, Textbook of Medical Physiology, Ahuja Publishing House

References

1 Dee Unglaub Silverthorn, 2016, Human Physiology: An Integrated Approach, 7th Edition, Pearson

2 Chatterjee C. C, 2017, Human Physiology - Vol I and II, 11th Edition, CBS Publishers.

3 Barrett, Barman, Boitano and Brooks, 2016, Ganong's Review of Medical Physiology, 25th Edition, McGraw Hill.

4 Eric Widmaier, Hershel Raff and Kevin Strang, 2016, Vander's Human Physiology: The Mechanisms of Body Function, 14th Edition, McGraw Hill

193FN1A3SP	HUMAN PHYSIOLOGY	SEMESTER III

Total Credits: 3
Total Instructions Hours: 48 h

S.No	Contents
1	Identification of tissue
2	Preparation of buffers
3	Detection of Blood group (Slide method).
4	Measurement of Haemoglobin level (Sahli`s or Drabkinmethod).
5	Measurement of Erythrocyte sedimentation rate
6	Determination of blood pressure by Sphygmomanometer
7	Determination of Clotting Time (CT).
8	Determination of Bleeding Time (BT).
9	Enumeration of WBC
10	Enumeration of RBC
11	osmotic fragility test
12	Demonstration in preparation of plasma and serum

Note: Out of 12 - 10 Mandatory

References

1. Gupta, S 1998, A Short Text Book of Medical Laboratory for Technicians. Jaypee Brothers Medical Publishers (P) Ltd., New Delhi
2. Bain B J, Bates I, Laffan M A and Lewis M 2011, Dacie and Lewis Practical Hematology, 11th edition, Churchill Livingstone, China
3. Talib V H., 2000, Handbook of Medical Laboratory Technology 2nd Edition, CBS Publishers and Distributors, New Delhi

Course Code	Course Name	Category	L	T	P	Credit
193BC1A3IA	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 chemical characteristics, types and importance of carbohydrates.	K1 & K2
CO2	List and compare saturated and unsaturated fatty acids. Summarize the physiochemical properties of lipids.	K1 & K2
CO3	Compare the different saturated level & organization of proteins. List the non-protein amino acids.	K1, K2 & K3
CO4	Identify the structures of purines, pyrimidines, nucleoside and nucleotides. Classification of DNA and RNA	K1, K2 & K3
CO5	Explain the functions of minerals in biological system. Illustrate the role of hormones in metabolic regulation.	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	S	M	S	S	S
CO4	S	M	S	S	S
CO5	S	M	S	S	S

S Strong M Medium L Low

193BC1A3IA	BIOCHEMISTRY-I	SEMESTER III

Total Credits: 3

Total Instruction Hours: 36 h

Syllabus

Unit I Carbohydrate 08 h

Carbohydrate – Classification, structure, properties and chemical reaction of monosaccharide - Glucose, Fructose, Galactose, Mannose, Arabinose, Disaccharides - Maltose, Lactose and sucrose. Polysaccharides – Homo polysaccharides – Starch, Glycogen and Cellulose & Hetero polysaccharides – Hyaluronic acid, Heparin, Chondroitin sulphate. Biological importance of sugar derivates - glycosaminoglycan, proteoglycan & glycoprotein – blood group & Bacterial cell wall polysaccharides

Unit II Lipid 07 h

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

Unit III Amino acid 07 h

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

Unit IV Nucleic Acid 07 h

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

Unit V Minerals 07 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) – Sources, Functions and deficiencies. Role of Vitamins as antioxidants and cofactors. Hormones involved in regulatory metabolism: Insulin, Glucagon and thyroid.

Text Books

1 J. L. Jain. 2016. Fundamentals of Biochemistry, 7th edition, S. Chand and company Ltd.

2 Sathyanarayan U. 2017, Biochemistry, 5th edition, Books and Allied (P) Ltd.

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..

193FN1A3GA	FUNDAMENTALS OF FOOD	SEMESTER III

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Food groups &Cereals 5 h

Classification of food groups, Functions of foods-Energy yielding, Body building and Protective foods, Food pyramid, Classification of nutrients –Macro and Micro nutrients.

Cereals – Composition and Nutritive value of Rice ,Wheat.

Millets – Composition and Nutritive value of Ragi,Jower

Unit II Pulses & fruit and vegetables 5 h

Varities of pulses and legumes, Composition and Nutritive value of pulses, Germination and its benefits.

Vegetables and Fruits

Classification of Fruits and Vegetables, Selection , Enzymatic browning

Unit III Beverage&Spices 4 h

Beverages

Classification, Carbonated and Non Alcoholic beverages.

Spices and condiments

Classification, Medicinal benefits of Ginger, Garlic. Pepper, Turmeric, Fenugreek and Cloves

Unit IV Milk ,Egg&Fat 5 h

Fats and oils - Types and Functions of oil

Milk - Nutritive value, Kinds of milk

Egg – Structure and Selection and quality of Egg

Unit V Non-Vegetarian Foods 5 h

Meat – Nutritive value and Composition of meat

Poultry –Classification

Fish –Classification and Selection of fish

Text Books

1 Srilakshmi,B (2015), "Food Science". (8th Edn.), New Age International Private Ltd, New Delhi.

2 Manay & Shadaksharaswamy ,S.N. & M (2008), "Food facts and Principles". (Edn.) New Age International Private Ltd, NewDelhi.

References

1 Potter.N.N and Hotchkiss ,. (1996), "Food Science". (Edn.) CBS Publisher. NewDelhi.

2 SunetraRoday ,I.N. (2015). "Food Science and Nutrition". (Edn.),Oxford Publishers. New Delhi.

3 Mudambi .R. Sumathiand Rajagopal M.V (2008),"Food Science". (Edn.),New Age International Publishers, New Delhi.

4 Thangam E. Philip (1998)."Modern Cookery Volume II, II Edition"., Orient Longman, Hyderabad

193FN1ASSA	SELF STUDY: FOOD FORTIFICATION	SEMESTER III

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, 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 Modern Technology of Food Processing and Agro Based Industry, 2nd Edition, NIIR Board, Asia Pacific Business Press, 2002.

193FN1ASSB	SELF STUDY: NUTRITION EDUCATION	SEMESTER III

Total Credits: 1

Syllabus

Unit I Nutrition Education

Nutrition education: definition, rational, 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., 1993., "Nutrition Trends in India", N1N, Hyderabad, India.

2 Park and Park, 1995., "Text Book of Preventive and Social Medicine", Banarsidas Publication, Jahalpur.

References

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

2 Wadhwa.A, 2003, "Nutrition in the Community", 1st Edition, Elite Publications, New Delhi.

191TL1A3AA	பகுதி – 4 : அடிப்படைத்தமிழ்தாள் : 1(Basic Tamil)	SEMESTER III

Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2019–20ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது (10 மற்றும் 12 – ஆம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு) (பருவத் தேர்வு உண்டு)

அலகு : 1 தமிழ் மொழியின் அடிப்படைக் கூறுகள் 12 h

அ) எழுத்துகள் அறிமுகம் :

1. உயிர் எழுத்துக்கள் - குறில் , நெடில் எழுத்துகள்
2. மெய் எழுத்துக்கள் - வல்லினம், மெல்லினம், இடையினம்
3. உயிர்மெய் எழுத்துக்கள்

ஆ) சொற்களின் அறிமுகம்: பெயர்ச்சொல், வினைச்சொல் – விளக்கம் (எ.கா.)

அலகு : 2 குறிப்பு எழுதுதல் 12 h

1. பெயர், முகவரி, பாடப்பிரிவு , கல்லூரியின் முகவரி
2. தமிழ் மாதங்கள்(12), வாரநாட்கள்(7),
3. எண்கள் (ஒன்று முதல் பத்து வரை), வடிவங்கள், வண்ணங்கள்
4. ஊர்வன, பறப்பன, விலங்குகள், மனிதர்களின் உறவுப்பெயர்கள்
5. ஊர்களின்பெயர்கள் (எண்ணிக்கை 10)
6. பயிற்சிப் பகுதி (உரையாடும் இடங்கள்) : வகுப்பறை, பேருந்து நிலையம், சந்தை

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 50

பகுதி –அ

சரியான விடையைத் தேர்வு செய்தல் 10x2=20

பகுதி –ஆ

அரைப்பக்க அளவில் விடையளிக்க 03x5=15

பகுதி-இ

இரண்டு பக்க அளவில் விடையளிக்க 01x15=15

குறிப்பு:

- அனைத்து அலகுகளில் இருந்தும் வினாக்கள் அமைதல் வேண்டும்
- பகுதி ஆ மற்றும் இ –க்கான வினாக்கள் இது அல்லது அது என்ற அடிப்படையில் அந்தந்த அலகுகளில் அமைதல் வேண்டும்

Text Books

1 அடிப்படைத் தமிழ். 2019. தொகுப்பு : தமிழ்த் துறை, டாக்டர் என். ஜி.பி. கலை மற்றும் அறிவியல் கல்லூரி, நியூ செஞ்சுரி புக் ஹவுஸ்(பி)லிட். சென்னை

References

1 ஒன்றாம் வகுப்பு பாடநூல் - தமிழ்நாடு அரசு பாடநூல் கழகம்

2 வலைதள முகவரி : http://tamilvu.org

191TL1A3AB	பகுதி – 4 : சிறப்புத் தமிழ் தாள் : 1 **(Advanced Tamil)**	**SEMESTER - III**

Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2019– 2020 ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது (10 மற்றும் 12 – ஆம் வகுப்புகளில் தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு உரியது)(பருவத் தேர்வு உண்டு)

அலகு – 1 மரபுக் கவிதைகள் 05 h

அ) பாரதியார் கவிதைகள்

- தமிழ்நாடு
- மனதில் உறுதி வேண்டும்
- வருகின்ற பாரதம் (பா.எண்.5-8)

ஆ) பாரதிதாசன் கவிதைகள்

- இன்பத்தமிழ்
- நீங்களே சொல்லுங்கள்
- வாளினை எடடா!

இ) தாராபாரதி கவிதைகள்

- வேலைகளல்ல வேள்விகள்

அலகு – 2 புதுக்கவிதைகள் 05 h

- கம்பன் கவியரங்கக் கவிதை - மு.மேத்தா
- தமிழா! நீ பேசுவது தமிழா! - காசியானந்தன்
- நட்புக் காலம் (10 கவிதைகள்) - அறிவுமதி கவிதைகள்

அலகு – 3 இலக்கணம் 04 h

- வல்லினம் மிகும் மற்றும் மிகா இடங்கள்
- ர, ற,- ல, ழ, ள - ந, ண, ன - ஒலிப்பு நெறி, பொருள் வேறுபாடு அறிதல்

அலகு – 4 கடிதங்கள் எழுதுதல் 05 h

- பாராட்டுக் கடிதம்
- நன்றிக் கடிதம்
- அழைப்புக் கடிதம்
- அலுவலக விண்ணப்பங்கள்

அலகு – 5 பாடம் தழுவிய வரலாறு 05 h

- பாரதியாரின் இலக்கியப் பணி
- பாரதிதாசனின் இலக்கியப்பணி
- மரபுக்கவிதை, புதுக்கவிதை - விளக்கம்

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 50

பகுதி –அ	
சரியான விடையைத் தேர்வு செய்தல்	10x1=10
பகுதி –ஆ	
அரைப்பக்க அளவில் விடையளிக்க	05x3=15
பகுதி-இ	
இரண்டு பக்க அளவில் விடையளிக்க	05x5=25

குறிப்பு:

- பகுதி –அ அனைத்து அலகுகளில் இருந்தும் இரண்டு வினாக்கள் அமைதல் வேண்டும்
- பகுதி ஆ மற்றும் இ –க்கான வினாக்கள் இது அல்லது அது என்ற அடிப்படையில் அந்தந்த அலகுகளில் அமைதல் வேண்டும்

Text Books

1 சிறப்புத் தமிழ் . 2019. தொகுப்பு : தமிழ்த் துறை, டாக்டர் என். ஜி.பி. கலை மற்றும் அறிவியல் கல்லூரி, நியூ செஞ்சுரி புக் ஹவுஸ்(பி)லிட். சென்னை

References

1 புலவர் சோம. இளவரசு - 2014. இலக்கிய வரலாறு, மணிவாசகர் பதிப்பகம், சென்னை – 108

2 வலைதள முகவரி : http://tamilvu.org

195CR1A3AA	WOMEN'S RIGHTS	SEMESTER III

Total Credits: 2

Total Instruction Hours: 24h

Syllabus

Unit I Rights to Infant & Child 4 h

Issues for women in India- Law relating to Female infanticide-Rights to the survival of a child-Child Labour- Child trafficking –Child Marriage- Protection of Children against Sexual Offences Act 2012 (POCSO)

Unit II Rights to women 5 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

Unit III Laws for Senior Citizen women 5 h

Constitutional Rights –Personal Laws- The Tamil Nadu Maintenance and Welfare of Parents and Senior Citizens Rules in 2009- The National Council for Older person- Government Provisions for elderly persons

Unit IV Civil and Political Rights of Women 5 h

Right of inheritance-Right to live with decency and dignity-The Married women's Property Act 1874-Personl law 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

Unit V International convention on Womens' Right 5 h

Convention on the Elimination of All Forms of Discrimination against Women(CEDAW)-United Nations population Fund(UNFPA)-Protocol to the African Charter on the rights of women in Africa-Convention on the Nationality of Married women-Convention on the political rights of women- Inter-American convention on granting of civil and political rights for women-Universal declaration of Human rights

Text Books

1 Women & Law(2009)-Krishna Pal Malik-Allahabad Law University, Delhi

References

1 Women's Human Rights in India(2019)-Christian Foster and Jaya Sagade- Routledge India

2 Justice for Women: Concerns and Expressions (2008)-Anand AS –Universal Law Publishing Co.

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fourth Semester										
Part – I										
191TL1A4TA	Language - I	Tamil-IV	3	1	-	3	25	75	100	3
191TL1A4HA		Hindi-IV								
191TL1A4MA		Malayalam- IV								
191TL1A4FA		French –IV								
Part – II										
191EL1A4EA	Language-II	English – IV	4	-		3	25	75	100	3
Part – III										
193FN1A4CA	Core-VI	Dietetics	4	-	-	3	25	75	100	4
193FN1A4CP	Core Practical	Dietetics	-	-	4	3	40	60	100	2
193BC1A4IA	IDC	Biochemistry – II	3	-	-	3	25	75	100	3
193BC1A4IP	IDC Practical II	Biochemistry	-	-	4	3	40	60	100	2
193FN1A4SA	SEC-II	Perspective Psychology	3			3	25	75	100	3
	GE-II		2	-	-	3	-	50	50	2
	LoP	Lab on Project	-		-	-	-	-	-	-
Part – IV										
191TL1A4AA	AECC-IV	Basic Tamil	2	-	-	3	-	50	50	2
191TL1A4AB		Advanced Tamil								
192PY1A4AA		General Awareness								
Total			**21**	**1**	**8**				**800**	**24**

Course Code	Course Name	Category	L	T	P	Credit
191TL1A4TA	பகுதி-1: தமிழ் - தாள்- IV	மொழி	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாகத் தமிழரின் பண்பாடு , 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) – மாணவனின் செயலாக்கத்திறனை ஊக்குவித்தல்	K1,K2 & K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K2,K4
CO3	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K2,K3 & K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு (Tamil knowledge)	K5

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

191TL1A4TA	பகுதி-1: தமிழ் - தாள்- IV	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I **எட்டுத்தொகை** 10 h

1. இலக்கிய வரலாறு - எட்டுத்தொகை நூல்கள்
2. 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 – கோவூர்கிழார்

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 :9 – பெருங்கடுங்கோ

2. அகநானூறு – மருதத்திணை

I.பா.எண் : 86 – நல்லாவூர்கிழார்

குறிஞ்சித் திணை

I.பா.எண் :198 – பரணர்

2. 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. இலக்கிய வரலாறு - பத்துப்பாட்டு நூல்கள்

2. பட்டினப் பாலை – கடியலூர் உருத்திரங் கண்ணனார்

Unit IV **புதினம்** 10 h

1. புதினத்தின் தோற்றமும் வளர்ச்சியும்
2. புதினம்

1.புத்துமண் –- சுப்ரபாரதிமணியன்

Unit V **இலக்கணம் மற்றும் திறனாய்வுப் பகுதி** 10 h

I.இலக்கணம்

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

II.பயிற்சிப் பகுதி

புதினத் திறனாய்வு – கொங்கு வட்டாரப் புதினங்கள்

1. நாகம்மாள் – ஆர். சண்முகசுந்தரம்
2. மானாவாரி மனிதர்கள் – சூர்யகாந்தன்
3. ஈரம் கசிந்த நிலம் – சி. ஆர். ரவீந்திரன்
4. ஒண்டிக்காரன் பண்ணையம் – மா. நடராசன்

Note: பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது

Text Books

செய்யுள் திரட்டு - மொழிப் பாடம் - 2020- 21

1 தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, வெளியீடு : நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை – 600 098.

2 சுப்ரபாரதிமணியன், முதற் பதிப்பு -2019, புத்துமண் புதினம் – நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை – 600 098. (Unit-IV)

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 தமிழ் இணையக் கல்விக்கழகம்.http://www.tamilvu.org/

Course Code	Course Name	Category	L	T	P	Credit
191TL1A4HA	Part- I : HINDI - Paper-IV	Language I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S Strong M Medium L Low

191TL1A4HA	Part- I : HINDI - Paper-IV	SEMESTER IV

Total Credits: 03

Total Instruction Hours: 48 h

Syllabus

Unit I — 10 h

नाटक – लडाई – सर्वेश्वरदयाल सक्सेना

प्रकाशक: वाणी प्रकाशन

21-A, दरियागंज

नई दिल्ली-110002

Unit II — 10 h

एकांकी: एकांकी पंचामृत – डॉ राम कुमार

(भोर और तारा छोड़कर)

प्रकाशक: जवाहर पुस्तकालय

सदर बाजार, मथुरा

उत्तर प्रदेश-281001

Unit III — 10 h

काव्य मंजरी- (डा मुन्ना तिवारी)

मैथिलीशरण गुप्त- मनुष्यता, जयशंकर प्रसाद- बीती विभावरी जागरी

सूर्यकान्त त्रिपाठी निराला- तोडती पत्थर और भिक्षुक

Unit IV — 10 h

सूचना लेखन

पुस्तक: व्याकरण प्रदिप – रामदेव

प्रकाशक: हिन्दी भवन 36 इलाहाबाद-211024

Unit V — 08 h

अनुवाद अभ्यास-III (केवल अंग्रेजी से हिन्दी में)

(पाठ 10 to 20)

प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई -17

Course Code	Course Name	Category	L	T	P	Credit
191TL1A4MA	Part- I : MALAYALAM - Paper-IV	Language I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S Strong M Medium L Low

191TL1A4MA	Part- I : MALAYALAM - Paper-IV	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I 10 h

Drama

Unit II 10 h

Drama

Unit III 10 h

Drama

Unit IV 10 h

Screen Play

Unit V 08 h

Screen Play

Text Books

1. Manju Poloru Penkutty, Screen Play By Kalavoor Ravikumar, Published by DC.Books, Kannur.
2. Lankalakshmi, Drama By C.N.Sreekandan Nair Published by D C.Books Kottayam

Course Code	Course Name	Category	L	T	P	Credit
191TL1A4FA	Part- I : **FRENCH-** Paper-IV	**Language I**	**3**	**1**	**-**	**3**

PREAMBLE

This course has been designed for students to learn and understand

- To Acquire Competence in General Communication Skills – Oral + Written – Comprehension & Expression.
- To Introduce the Culture, life style and the civilization aspects of the French people as well as of France.

  To help 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	To learn the adjectives and the classroom environment in France	K2
CO3	Learn the Plural, Articles and the Hobbies.	K3
CO4	To learn the Cultural Activity in France	K3
CO5	To learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S Strong M Medium L Low

191TL1A4FA	Part- I : FRENCH- Paper-IV	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I **Cœur et santé** 10 h

• Author du Couple	• INTERACTION ORALE: Exprimer son intérêt pour quelqu'un, exprimer l'affection • RECEPTION ORALE: Comprendre une chanson • RECEPTION ÉCRITE: Lire un horoscope • PRODUCTION ÉCRITE: Écrire une letter au courrier du cœur	• J'étais…L'imparfait(1) • Aussi brilliant que… • Le plus beau, le moins cher • Le verbe connaître

Unit II **Problémes problems** 10 h

• Le bénvolat	• INTERACTION ORALE: Interroger sur la tristesse, I'abattement, exprimer sa sympathie, rassurer • RÉCEPTION ORALE: Comprendre une interview à la radio • RECEPTION ÉCRITE: Comprendre un test de magazine • PRODUCTION ÉCRITE: Écrire une letter a un(e) amie	• Les pronoms indfinis rien, quelque chose • Le verbe crier • Du pluriel: eau, eu, al • Se soigner, s'excuser, se renseigner, s'appeler • La phrase ngative: ne… plus, ne… jamais, ne… rien, ne… personne

Unit III C'est qui? C'est comment? 10 h

• Les classes socials	INTERACTION ORALE: Décrire quelqu'un RECEPTION ORALE: Comprendre un bulletin météo RECEPTION ÉCRITE: Comprendre une courte interview PRODUCTION ÉCRITE: Écrire des notices biographiques	• Les adjectifs qualificatifs: Formes au masculin et au féminin • ll fait beau, il neige, il pleut… • Le verbe décrier • Les verbs en –indre • Les adjectifs possessifs féminins mon, ton, son devant voyelle ou h

Unit IV Et après? Et après 10 h

• La mémoire et l'histoire	• INTERACTION ORALE: Raconter une anecdote, une histoire, attire l'attention • RÉCEPTION ORALE: Comprendre une interview à la radio • RÉCEPTION ÉCRITE: Comprendre des faits divers • PRODUCTION ÉCRITE: Écrire une bréve	• L'imparfait(2) • Les verbs en – oir • Les pronoms démonstratifs ça et cela • Prés de… Loin de… • La forme passive

Unit V Dialogue writing 08 h

a) Les Courses
b) A La Banque
c) Ecole
d) Professions
e) Bijoux

Text Books

1. *Marcella Di Giura Jean-Claude Beacco,* **Alors II. Pages 88 – 162,** Goyal Publishers Pvt Ltd 86, University Block ,Jawahar Nagar (Kamla Nagar), New Delhi – 110007.
2. *French Made Easy by Rashmi Varma, Goodwill Publishing House, New Delhi* – 110 008.

Course Code	Course Name	Category	L	T	P	Credit
191EL1A4EA	ENGLISH- IV	LANGUAGE II	4	-	-	3

PREAMBLE

This course has been designed for students to learn and understand

- The basics of English grammar and specific usages
- 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	Learn English grammar and its specific usage	K2
CO2	Know the ways of improving English language vocabulary	K3
CO3	Understand the importance of English language in competitive exams	K3
CO4	Acquire the basic needs of communication skills and methods	K3
CO5	Comprehend the composition writing and similar skills	K4

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

191EL1A4EA	ENGLISH- IV	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I Grammar 10 h

The use of correlatives - The perfect tense - appended questions - the infinitive - negative verbs - redundant conjunctions - use of make and do - fairly and rather

Unit II Vocabulary 10 h

Words and contextual uses - Synonyms - Antonyms - Add one out - inflectional - infix- telescoping - loanwords - British and American words - Thesaurus

Unit III Language Use 08 h

Spotting Errors - Words often confused - Reconstructing a Passage - Clause - Idioms and colloquialism - Language aptitude - Clipping

Unit IV Communication 11 h

Different Types of Asking - Oral rehearsal - Describing person, Diagram, Data, Table - Vote of thanks - Small talk - Refusal and Apology

Unit V Composition 09 h

General Essay writing - Mind map - Reviews - Title expansion - Creative writing - Content writing - Translation - Abstracting - Flash Fiction

Text Books

1. Wood F.T. 2010. A Remedial Grammar for Foreign Students. Macmillan Publishers, India. [Unit I and II]
2. Bhatnagar R.P. 2013. English for Competitive Examinations. 3rd Edition. Trinity Press, New Delhi. [Unit III, IV and V]

References

1. Radhakrishna Pillai G. 2000. English for Success. Emerald Publishers, Chennai.
2. Krishnaswamy N. 2000. Modern English a Book of Grammar Usage and Composition. Macmillan Publishers, India.
3. Arulselvi Evangelin. 2012. Teaching of Special English. Saratha Pathippagam, Chennai.
4. Rawdon Wyatt. 2008. Check Your Vocabulary for TOFEL. Macmillan Publishers, India.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A4CA	DIETETICS	CORE	4	-		4

PREAMBLE

This course has been designed for students to learn and understand

- the objectives of medical nutrition therapy
- the role of a dietitian
- the importance of nutrition care process for various disease condition

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Explain the principles of diet therapy, Nutrition Care Process and different types of feeding the patients	K1, K2
CO2	Identify the signs, symptom, causes and dietary recommendations for, gastrointestinal diseases and nutrient deficiencies	K2, K3
CO3	Identify the signs, symptom, causes and nutritional recommendations for the diseases of the liver, and CVD	K2 ,K3
CO4	Identify the signs, symptom, causes and nutritional recommendations for Diabetes mellitus and renal diseases	K2, K3
CO5	Identify the signs, symptom, causes and nutritional recommendations for Cancer, Food Allergy and Fever	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A4CA	DIETETICS	SEMESTER IV

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Diet Therapy and The Dietitian 10 h

Objectives of diet therapy - Principles of diet preparation, Nutrition Care Process, Portion Control, Food Exchange list and counseling. Hospital Routine diet – liquid, semi liquid, light, soft diet, bland diet and regular diet. Nutrition Care process. Different types of feeding - Basic concepts of oral feeding, tube feeding, IV feeds, gastrostomy feeding.

Dietitian - Classification, Role and Responsibilities of Specific Dietitians.

Unit II Diet for febrile condition, Therapeutic diets for malnutrition 09 h

Diet in typhoid, malaria, tuberculosis, Influenza. Dietary Consideration.

Therapeutic diets for malnutrition: Obesity - Etiology, Types, Role of hormones, Assessment, Grades, Types, Treatment Complications, Weight management guidelines, Prevention. Underweight-Etiology, Nutritional and food requirement.

Unit III Gastro intestinal and liver disorders 09 h

Diseases of the gastro intestinal tract- ulcer, constipation, diarrhea and malabsorption syndrome,GERD,

Diseases of the liver and Pancreas (risk factors and diet therapy) - Jaundice, Hepatitis, Cirrhosis, Fatty liver, Cholecystisis, Cholelithiasis and Pancreatitis.

Unit IV Cardiovascular Diseases and Diabetes Mellitus 10 h

Diseases of the cardio vascular system (risk factors and diet therapy) Atherosclerosis, CVD, Hypertension and Hypercholesterolemia.
Diabetes mellitus – Types, causes, symptoms, diagnosis, bio-chemical changes, insulin and hypo- glycemic drugs (types only), food exchange list, dietary management

Unit V Renal Disease and Cancer 10 h

Diseases of the kidney and urinary tract - Acute and chronic nephritis, Nephrotic syndrome, Renal failure, Urinary calculi. Causes and dietary treatment of kidney diseases and dialysis
Nutrition and cancer - Risk factors, Symptoms, Nutritional Problems of Cancer Therapy, Nutritional Requirements, Dietary guidelines for management

Text Books

1. SrilakshmiB., "Dietetics", 2014, VII Edition. New Age International (P) Limited Publishers, New Delhi
2. Shubhangini. A. Joshi ,2002 "Nutrition and dietetics",, Tata Mc Graw- Hill publishing Company limited, New Delhi

References

1. Carolynn E .Town send and Ruth A. Roth ,2002, " Nutrition and Diet Therapy",, Delmar Publisher
2. Sue Rod Williams, "Nutrition and diet Therapy",, 2002,, Times Mirror Mosby College publishing, Boston.
3. L. Kathleen Mahan and Janice Raymond , 2017, "Krause's Food and the Nutrition Care Process" 14th Edition, Saunders

193FN1A4CP	DIETETICS	Semester IV

Total Credits: 2
Total Instructions Hours: 48 h

S.No	List of Experiments
1	Weights and measures of foods
2	Menu planning, prescription and preparation of Normal diet, regular diet, light diet, soft diet, full liquid diet, clear liquid diet and bland diet
3	Diet for obesity
4	Diet for under weight
5	Diet for anemia
6	Diet for diseases of the Gastro intestinal tract : pepticulcer, diarrhea, constipation
7	Diet for Cardio-vascular diseases- atherosclerosis, hypertension
8	Diet for diseases of the kidney – nephritic and nephrotic syndrome,
9	Diet before and after dialysis
10	Diet for diabetes – Type 1 and 2, Diabetes with Cardio-vascular diseases
11	Diet in febrile conditions- Short duration – typhoid; long duration – tuberculosis
12	Diet in liver diseases – Viral hepatitis and cirrhosis

Note: out of 12-10 mandatory

Course Code	Course Name	Category	L	T	P	Credit
193BC1A4IA	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

S Strong M Medium L Low

193BC1A4IA	BIOCHEMISTRY-II	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 36 h

Syllabus

Unit I Buffers and Chromatography: 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.

Unit II Electrophoresis: Paper and Gel electrophoresis. 7 h

Principles and applications of colorimetry and spectrophotometry.

Isotopes: Definition and units of radioactivity: examples of natural and heavy isotopes in biological investigations.

Unit III Bioenergetics: 8 h

Basic principles of thermodynamics – entropy, enthalpy and free energy; highenergy 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 phenylalamine metabolism (structures not required).

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

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.

193BC1A4IP	BIOCHEMISTRY	SEMESTER– IV

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
193FN1A4SA	PERSPECTIVE PSYCHOLOGY	SEC	3	-	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the basic concepts in Psychology and their applications.
- to develop sensitivity forwards 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. Illustrate the modern perspective in psychology	K2,K3
CO2	Classify the types of attitudes and various communication styles including the types and barriers	K4
CO3	Appraise the self management, self esteem and stress management techniques	K2, K4
CO4	Understand the nature, character, types, aspects and the importance of personality.	K3
CO5	Analyze the relationship between body and mind. Evaluate the barriers to modify poor health behaviours.	K4

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A4SA	PERSPECTIVE PSYCHOLOGY	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 36 h

Syllabus

Unit I Introduction to Psychology 8 h

Psychology as a Science. Methods in Psychology - Experimental Methods, Systematic Observation. Disciplines of Psychology. Early Schools of Psychology – Structuralism, Gestalt Psychology, Functionalism, Behaviourism, Psychoanalysis. Modern Perspectives – Behavioural, Biological, Cognitive, Social, Developmental, Psychoanalytic.

Unit II Attitudes 7 h

Attitude -Meaning, Types of Attitude, How Attitude Develop, Importance of Attitudes, Improving Attitude, Developing Positive Attitudes.
Communication Channels - Communication Barriers, Communication Openers, Communication Styles.

Unit III Self Motivation 7 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 7 h

Definition, Nature of Personality, Characteristics of Personality, Types of Personality, Aspects of 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 7 h

Definition, Mind-Body Relationship, Biopsychosocial Model, Health Behaviour – Meaning, Barriers to Modify Poor Health Behaviours. Health Promotion, Primary Prevention, Intervening with Children, Adolescents and at risk people, Transtheoretical Model of Behaviour Change, Need, Functions of Health Psychologists.

Text Books

1 Clifford T. Morgan, Richard A. King, John R. Weisz & John Schopler ,2012. "Introduction to Psychology". Seventh Edition. Tata McGraw Hill Publishing Company Limited, New Delhi.

2 Taylor, S. E. ,2003. "Health Psychology". Fifth Edition. McGraw Hill Inc. New York.

References

1 Wallace, H.R.& Masters, A,2006. "Personality Development", India Edition, Cengage Learning

2 Morgan,C.T, King,R.A., Weisz,J.R., and Schopler,J. , 2004. "Introduction to Psychology", 7th edition,24th reprint.New Delhi:TataMcGraw-Hill.

3 Neil R. Carlson ,1999. "Foundation of Physiological Psychology", WH Freeman and Company

4 Feldman R.S ,2011. "Understanding Psychology", 10th edition. Delhi : Tata-McGraw Hill.

193FN1A4GA	FOOD PRESERVATION	SEMESTER IV

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Introduction on Fruits and Vegetables 5 h

Fruits and Vegetables - General Principles of selection for processing, global production versus Indian production, SWOT in food industry

Unit II Preservation by Sugar 5 h

Food Preservation – Definition, General Principle and Methods of Preservation.

Preservation by Addition of Sugar – General Principle, Preparation of Jam and Squash

Unit III Preservation by Salt 5 h

Preservation by Addition of Salt - General Principle, Preparation of Pickles and fermented pickles -Sauerkraut and Dill Pickles. Preservatives –class I and II Preservatives.

Unit IV High Temperature Preservation Techniques 4 h

Preservation Using High Temperature: definition, application - Pasteurization, canning, bottling & dehydration

Unit V Low Temperature Preservation Techniques 5 h

Preservation Using Low Temperature: Refrigeration and Freezing Advantages and Disadvantages

Preservation by Radiation – Microwave heating, Application in Food Processing and Preservation

Text Books

1 Manoranjan Kalia, Sangita Sood, 2012 "Food Preservation and Processing", Edition II, Kalyani Publishers, Ludhiana, India

2 Vijaya Khader, 1999 "Preservation of Fruits and vegetables", Edition I, Kalyani Publishers, Ludhiana, India

References

1 Sivasankar B., 2002 "Food Processing and Preservation", Edition I, PHI, New Delhi

191TL1A4AA	பகுதி – 4 : அடிப்படைத்தமிழ் - தாள் : II (Basic Tamil)	SEMESTER IV

Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2019–20ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது

(10 மற்றும் 12 – ஆம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு)

(பருவத் தேர்வு உண்டு)

அலகு : 1 12 h

நீதி நூல்கள்

I.ஆத்திசூடி - "அறம் செய விரும்பு" முதல் "ஔவியம் பேசேல்"வரை -12 பாடல்கள்

II.கொன்றைவேந்தன் - "அன்னையும் பிதாவும் முன்னறி தெய்வம்" முதல்

"எண்ணும் எழுத்தும் கண் எனத் தகும்" வரை -7 பாடல்கள்

III.திருக்குறள் - 6 பாடல்கள்

1. அகர முதல 1
2. மனத்துக் கண்.....34
3. இனிய உளவாக 100
4. தீயவை தீய பயத்தலான்.....202
5. கற்க கசடற 391
6. கண்ணொடு கண்ணினை.....1100

அலகு : 2 12 h

I. எளிய நீதிக்கதைகளும் வாழ்க்கை முறைகளும்

1. நீதிகாத்த மன்னன்
2. சிங்கமும் முயலும்
3. புத்திசாலி உழவனும் போக்கிரிப் பூதமும்
4. தேனீயும் புறாவும்
5. முயல் கூறிய தீர்ப்பு

II. தமிழகப் பண்பாடுகள்

1. தமிழர் விழாக்கள் - பொங்கல், ஆடிப்பெருக்கு
2. தமிழர் கலைகள் - தெருக்கூத்து, ஓவியம், சிற்பம்
3. தமிழர் விளையாட்டுகள்- ஏறுதழுவுதல், சடுகுடு

III . பயிற்சிப் பகுதி

1. படத்திற்கு ஏற்ற சொற்களை எழுதுதல்.
2. சொற்களைத் தொடராக்குதல்.
3. பொருத்துதல்,
4. உரையாடல் பகுதி

Note: பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 100

பகுதி – அ

சரியான விடையைத் தேர்வு செய்தல் 10x2=20

பகுதி – ஆ

சரியா? தவறா? தேர்ந்தெடுத்து எழுதுக . 10x2=20

பகுதி - இ

ஒரு பக்க அளவில் விடையளிக்க 03x20=60

குறிப்பு:

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

Text Books

1 அடிப்படைத்தமிழ் - 20-21. தொகுப்பு : தமிழ்த்துறை , டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, நியூ செஞ்சுரி புக் ஹவுஸ்(பி)லிட். சென்னை-600 098

References

1 ஒன்றாம் வகுப்பு பாடநூல் - தமிழ்நாடு அரசு பாடநூல் கழகம்

2 வலைதள முகவரி : http://tamilvu.org

191TL1A4AB	பகுதி – 4 : சிறப்புத்தமிழ் - தாள் : II (Advanced Tamil)	SEMESTER - IV

Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2019– 2020 ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது

(10 மற்றும் 12 – ஆம் வகுப்புகளில் தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு உரியது

(பருவத் தேர்வு உண்டு)

அலகு – 1 05 h

திருக்குறள்

I அறத்துப்பால்

1. இனியவை கூறல் - அதிகார எண் : 10
2. அடக்கமுடைமை - அதிகார எண் : 13

II பொருட்பால்

1. கல்வி - அதிகார எண் : 40
2. உழவு - அதிகார எண் : 104

III இன்பத்துப்பால்

1. தகையணங்குறுத்தல் - அதிகார எண் :109
2. பிரிவாற்றாமை - அதிகார எண் : 116

அலகு – 2 05 h

கட்டுரைத் தொகுப்பு

I நல்வாழ்வு - டாக்டர் மு.வரதராசன்

1. நம்பிக்கை
2. புலனடக்கம்
3. பண்பாடு

II இளைஞர்களின் ஒளிமயமான எதிர்காலத்திற்கு - கு.வெ. பாலசுப்பிரமணியம்

1. காலக்கணக்கு
2. நற்பழக்கமே செல்வம்

அலகு – 3 05 h

I காப்பியங்கள் - குறிப்பு எழுதுதல்

1. சிலப்பதிகாரம்
2. மணிமேகலை
3. கம்பராமாயணம்
4. பெரியபுராணம்

II ஊடகம் - காட்சி ஊடகங்கள்

1. தொலைக்காட்சி
2. திரைப்படம்
3. இணையம்
4. முகநூல்
5. கீச்சகம்
6. கட்செவி அஞ்சல்

அலகு – 4 05 h

இலக்கணம் - வழக்கறிதல்

1. இயல்பு வழக்கு
2. தகுதி வழக்கு

அலகு – 5 04 h

I படைப்பாற்றல் பகுதி

கவிதை,கட்டுரை எழுதச்செய்தல் - பொதுத் தலைப்பு

II பயிற்சிப் பகுதி

தமிழில் தட்டச்சு செய்தல் - யூனிகோடு எழுத்துருவில்.

Note: பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 100

பகுதி –அ

சரியான விடையைத் தேர்வு செய்தல் 10x2=20

பகுதி –ஆ

கோடிட்ட இடங்களை நிரப்புக 10x2=20

பகுதி –இ

இரண்டு பக்க அளவில் விடையளிக்க 4x15=60

குறிப்பு :

- அனைத்து அலகுகளில் இருந்தும் இரண்டு வினாக்கள் அமைதல் வேண்டும்
- பகுதி இ –க்கான வினாக்கள் இது அல்லது அது என்ற வகையில் அந்தந்த அலகுகளிலிருந்து அமைதல் வேண்டும்.

Text Books

1 சிறப்புத்தமிழ் 20-21. தொகுப்பு : தமிழ்த் துறை , டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, நியூ செஞ்சுரி புக் ஹவுஸ்(பி) லிட். 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 வலைதள முகவரி : http://tamilvu.org

192PY1A4AA	AECC : GENERAL AWARENESS	SEMESTER IV

Total Credits: 2
Total Instructions Hours: 24 h

S.No	Contents
1	Current Events
2	General Science
3	Geography of India
4	Tamil and Other Literature
5	Inventions and Discoveries
6	Numerical and Mental Aptitude
7	Verbal and Non Verbal Reasoning
8	Socio- Culture and Heritage of India
9	Indian Economy and Political System
10	History of India and Freedom Struggle

References

1. Majid Hussain, Arrora N D, 2019, "General Studies -TNPSC Group -I ", G.K.Publications (P) Ltd. New Delhi
2. Aggarwal R S, 2014, "Verbal and Non Verbal Reasoning" S Chand & Company, New Delhi
3. Competition Success Review, Competitive Success Publisher, New Delhi
4. Pratiyogita Darpan, Pratiyogita Darpan Publishers, Agra.

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fifth Semester										
Part - III										
193FN1A5CA	Core-VII	Food Preservation	4	1	1	3	25	75	100	4
193FN1A5CB	Core -VIII	Fundamentals of Food Microbiology	4	1	-	3	25	75	100	4
193FN1A5CC	Core -IX	Food Processing	4	1	-	3	25	75	100	4
193FN1A5CP	Core Practical-V	Food Preservation and Quality Control	-	-	4	3	40	60	100	2
193FN1A5SA	SEC -III	Food hygiene and Sanitation	3	-	-	3	25	75	100	3
193FN1A5DA	DSE-I	Harvest Technology of Agricultural Produce	4	1	-	3	25	75	100	4
193FN1A5DB		Nutrition Assessment								
193FN1A5DC		Food Commodities and Preparation								
193FN1A5TA	IT	Industrial Training	**Grade A to C**							
193FN1A5LA	LoP	Lab on Project	-	-	-	-	-	-	50	1
Part - IV										
192MT1A5AA	AECC - V	Research Methodology	2	-	-	3	-	-	50	2
		Total	**21**	**4**	**5**	**-**	**-**	**-**	**700**	**24**

Course Code	Course Name	Category	L	T	P	Credit
193FN1A5CA	FOOD PRESERVATION	CORE	4	1	1	4

PREAMBLE

This course has been designed for students to learn and understand

- The principle and method of preservation
- The Preservation techniques by thermal Processing
- The role of chemical preservative to enhance the shelf life of product

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Describe the principles and demonstrate the application of the natural preservation process depending on the type of food	K2,K3
CO2	Determine the thermal processing conditions (time / temperature) for each type of food	K3
CO3	Explain the preservation method by using low temperature & its effect on food	K2
CO4	Analyze the role of chemical preservative technique in food	K4
CO5	Summarize the dose of irradiation of food and Importance of Intermediate moist foods	K5

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A5CA	FOOD PRESERVATION	SEMESTER V

Total Credits: 4

Total Instruction Hours: 72 h

Syllabus

Unit I Preservation by Natural Preservatives 15 h

Food preservation - Definition, General Principles and Methods of Food Preservation - Classification of foods for processing.

Preservation by addition of sugar- General principles and preparation of chemical preserves jams, jellies, Marmalades, squashes and syrups, Preparation of candies theories of gel formation.

Preservation by addition of salt – Pickling, Preparation of Indian Pickles, Sauerkraut

Unit II Preservation by High Temperature &Drying 15 h

Thermal Processing–sterilization, commercial sterilization, pasteurization and blanching. Canning - steps, types of cans, advantages, disadvantages, Bottling - steps, advantages, disadvantages.

Drying &Dehydration Definition, principles of drying types of drying, and dehydration-factors affecting dehydration, changes occurring during dehydration, heat and mass transfer, types of driers, effect on foods & Basic concepts in thermal destruction of microorganisms D, Z, F values.

Unit III Preservation by use of Low Temperature 14 h

Freezing - Principles and methods of freezing Slow and fast freezing of foods and its consequence, Freeze drying advantages and disadvantages and Thawing of food.

Refrigeration- Definition principles, Types of refrigeration and refrigeration during transport. Common cold storage, defects in cold storage.Preservation of Semi moist foods - Principles, Method involved in preservation of Intermediate moist foods.

Unit IV Preservation with chemicals& Bio preservative 14 h

Mechanism of microbial inhibition- Inorganic and Organic preservatives. - Antibiotics, Mold inhibitors, Biopreservative, Antioxidants and its role in preservation

Unit V Preservation by modern techniques 14 h

Food irradiation-Types, Sources and units of radiation, Applications and Effect of irradiation on food components. Concept of cold sterilization.

Microwave Heating ultrasound, nano technology , oscillating magnetic field Ohmic heating of foods, Hurdle Technology, Pulse Electric Field , High Pressure Processing&hydrostatic pressure technique

Text Books

1. Manoranjan Kalia and Sangita Sood, 2012, "Food Preservation and Processing", Edition II, Kalyani Publishers, Ludhiana, India.
2. Sivasankar B., 2002, "Food Processing and Preservation", Edition I, PHI, New Delhi.

References

1. VijayaKhader, 2001, " Food Science and Technology", New Delhi: ICMR
2. Subulakshmi.G and Shoba A Udipi V.K, 2017,"Food Processing and Preservation"(volume –I Edn.), New Age International Publishers, New Delhi.
3. Vijaya Khader,1999,"Preservation of Fruits and Vegetables", Edition I, Kalyani Publishers, Ludhiana, India.
4. Srivastava.R.P and Sanjeev kumar, 2002, "Fruit and Vegetable Preservation Principle and Practices" (volume –III Edn.), CBS publishers, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A5CB	FUNDAMENTALS OF FOOD MICROBIOLOGY	CORE	4	1	-	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 the consuming public.
- 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 of microorganisms in food. Explain the factors affecting the growth of microorganisms in food.	K2,K3
CO2	Explain the role of Microorganism in Food Safety Outline FSO, GMP and HACCP	K3, K4
CO3	Identify and outline the process involved in Fermented food products and beverages.	K2, K4
CO4	Criticize the principles involved in the Contamination, Preservation and Spoilage of different foods.	K5
CO5	Summarize Food poisoning - Food borne intoxications and Food borne infections.	K5

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A5CB	FUNDAMENTALS OF FOOD MICROBIOLOGY	SEMESTER V

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Food and Microorganisms 12 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 and Inhibitory substances and biological structure.

Unit II Microbiology and Food Sanitation 12 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).

Waste management – solid and liquid waste.

Unit III Microorganisms as a food 12 h

Single cell protein, algae as food and Mushroom cultivation. 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- Wine and beer. Fermented meat products – Sausages.

Unit IV Contamination, Preservation and Spoilage of different food 12 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 V Food Poisoning 12 h

Food borne intoxications – Staphylococcus, Clostridium, Bacillus cereus, Vibrio parahaemolyticus and Campylobacter jejuni.

Food borne infections – E.Coli, Salmonella, Shigella, and Listeria monocytogenes.

Algal toxins and Mycotoxins.

Text Books

1 Frazier. W.C and D.C Westhoff, 1978, "Food Microbiology", 3rd Edition, Tata Macgraw Hill publishing Co, New Delhi.

2 Adams M.R. and Moss M. O, 2000, "Food Microbiology", 2nd Edition, Panima Publishers.

References

1 Roger.Y.Stainer, 2003, "Basic Food Microbiology", 2nd Edition, CBS Publishers.

2 Jay,J.M, 1991, "Modern Food Microbiology", 4th Edition, Van Nostra and Rainhokdd Co.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A5CC	FOOD PROCESSING	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The basic processing methods of foods
- the equipments used in food processing
- the 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	Enumerate the processing techniques of cereals and millets and by- products.	K3,K4
CO2	Explain the pulse processing techniques Outline the processing steps for edible oil production.	K3, K4
CO3	Describe the processing of dairy products. Illustrate the processing of meat and poultry Demonstrate the methods of manufacturing of egg and fish products.	K4, K5
CO4	Discuss the fruit and vegetable processing techniques and the method of mushroom processing.	K4, K5
CO5	Identify and make use of the latest non - thermal technologies in food processing.	K5, K6

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A5CC	FOOD PROCESSING	SEMESTER V

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Milling technology of cereals 11 h

Paddy processing Technology - Processing, types and milling of rice, by products of rice milling and their utilization Wheat Technology - Processing, extruded products Millets – Processing and Types of minor and major millets.

Unit II Legumes and Pulses Processing 12 h

Legumes and Pulses – wet and dry processing, protein concentrates and isolates, snack foods, development of low cost protein foods. Technology of oil seeds - Processing of edible oil, Fats from non-traditional oil seeds, rice bran oil, processing of vegetable oils and hydrogenation of fats.

Unit III Processing of Milk, Meat, Poultry, Fish and Egg 13 h

Processing of milk and milk products Milk – Processing of different types of cheese, Probiotic milk products - yoghurt, and ice-cream, Indigenous milk products - khoa,paneer, ghee and lassi Meat - Processing .Poultry - preparing poultry for consumption, packaging. Fish and Egg - Whole egg powder, egg yolk powder, fish protein concentrate and fish oil. Packaging of fish and egg products.

Unit IV Vegetables and Fruits Processing 12 h

Vegetables - Drying techniques –drum drying, vacuum puffing, foam mat drying, freeze drying, accelerated freeze drying. Mushroom - processing, utilization. Fruits- Sun drying and mechanical dehydration – use of kiln drier and tunnel drier.

Unit V Latest technologies in food Processing 12 h

Latest technologies in food Processing – Coffee- Process flow sheet for the manufacture of coffee powder – Instant coffee, methods, process and equipment involved and tea- Manufacturing process and equipment involved – Green tea manufacture – Instant tea manufacture ,cocoa bean – changes taking place during fermentation of cocoa bean – Processing of cocoa bean – cocoa powder – cocoa liquor manufacture Chocolates.

Spices-spice oils and oleoresins. Cleaning and grading of spices – packaging and storage of spices – grading specifications - AGMARK, ASTA, ESA specifications – processes involved in the manufacture of oleoresins and essential oils – quality analysis of spices and their derivatives.

Text Books

1 Subbulakshmi and ShobhaUdipi, 2001, "Food Processing and Preservation Technology", Edition I, New Age International Publications, New Delhi.

2 Fellows P. J, 2002, "Food Processing Technology", Edition II, Wood Head Publishing Limited, England. .

References

1 Sivasankar.B, 2002 "Food Processing and Preservation", Edition I, PHI NewDelhi.

2 MridullaMirajkar,2002 "Food Science and Processing Technology", Volume I and II, Edition I, Kanishka Publishers, New Delhi..

193FN1A5CP	FOOD PRESERVATION AND QUALITY CONTROL	SEMESTER V

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Preparation and sensory quality evaluation
2	Sensory evaluation technique
3	Descriptive ,sensory &consumer profile
4	Methods of Food Preservation using sugar Sauce Ketchup Jams Jellies Marmalades Preserves Squashes and cordial
5	Methods of Food Preservation using salt Pickles Chutney
6	Drying and Dehydration Vadams and vathal Ready Mixes

7 Food Adulteration tests for some common foods

Milk

Honey

Turmeric powder

Chilli powder

Pepper

Coffee powder

Tea Powder

Butter and ghee

Edible oil

Green peas

Jaggery

Wheat flour

Under DBT star college scheme

1 Formulation and standardization of fermented beverages

2 Development of natural food colors

Note: Out of 12 - 10 Mandatory

Course Code	Course Name	Category	L	T	P	Credit
193FN1A5SA	FOOD HYGIENE AND SANITATION	SEC	3	-	-	3

PREAMBLE

This course has been designed for students to learn and understand

- The hygienic and sanitary practices of food commodities
- The prevention of health issues among the personnel
- The rules and regulations of different food products

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Analyze the food hygiene and sanitation practices and Identify the food waste management	K4
CO2	Infer the food safety regulations of milk and milk products	K4
CO3	Identify the safety regulations for fruits and vegetables and formulate the products based on fruit and vegetable	K4, K5
CO4	Examine the food safety regulations for fleshy foods and its products	K4
CO5	Distinguish the process of licensing and Registration of food business	K4

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A5SA	FOOD HYGIENE AND SANITATION	SEMESTER V

Total Credits: 3

Total Instruction Hours: 36 h

Syllabus

Unit I Food hygiene and sanitation 8 h

General principle of food hygiene and sanitation, personal hygiene and food handling habits, Definition and meaning, deteriorative effects of micro organisms- physical and chemical changes; methods of killing micro organism- heat, chemicals and radiation, pest control, waste management

Unit II Milk and milk products 7 h

Regulation for milk and milk products-types of milk. Milk products-curd, cream, paneer, cheese, dairy based desserts and confections, evaporated and condensed milk products, whey products, edible casein products.

Unit III Fruits and vegetables& its products 7 h

Regulations for Fruits and vegetables -thermally processed fruits and vegetables, RTE vegetables and fruit based products- juices, sauce, ketchup, fruit nectars, fruit beverages, vegetable soups ,puree, paste, concentrated syrups, soup powders, marmalade, pickles

Unit IV Fleshy foods 7 h

Regulations for meat and meat products- canned beef, Ham, Luncheon Meat, chopped meat, chicken, goat, meat and frozen meat

Regulations for fish and fish products-canned, frozen, salted and smoking fish.

Unit V Latest technologies in food Processing 7 h

Definition Central Licensing Authority, Regulations for petty manufacture, Registering Authority, State Licensing Authority. Registration and License for Food Business, Registration of petty food business, License for food business, Application for license to the Licensing Authority, Processing and Procedure of Application for license, Validity and Renewal of Registration and License, Suspension or cancellation of Registration Certificate or license

Text Books

1. Mario Stanga,2010 ”Sanitation: Cleaning and Disinfection in the Food Industry", Wiley.

2. Roday S. 2008 ”Food Hygiene and Sanitation", Tata Mc-Graw Hill Publishing Company Limited, New Delhi.

References

1. Asmita T,2011 ”Catering Science and Food Safety", Edition I, Apex Global Publishers, India.

2. Prescott, Harley and Klein,2002 ”Microbiology", Mc-Graw Hill Co, New Delhi.

3. Adams M.R and Moss M.O, 2015,”FoodMicrobiology",New Age International Publishers, New Delhi.

4. Frazier, W.C and Westhoff, D.C,2015, ”Food Microbiology", Tata Mc-Graw Hill publishing Company Ltd, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A5DA	HARVEST TECHNOLOGY OF AGRICULTURAL PRODUCE	DSE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the post harvest techniques
- the post harvest loss management
- the various government sectors involved in PHT.

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	K3
CO2	Categorize the agents causes food spoilage	K4
CO3	Examine the physical and chemical methods to control insects and rodents.	K4
CO4	Prioritize the Importance of storage structures for food grains. Explain the agencies that control food losses	K5
CO5	Improve the product-process efficiency of food grains. Discuss the role of new food products for the growing population.	K6

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A5DA	HARVEST TECHNOLOGY OF AGRICULTURAL PRODUCE	SEMESTER V

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Post Harvest Technology 11 h

Introduction to Post Harvest Technology - Definition, importance.

Governmental measures to augment food production- need for food conservation.

Food loss in the post harvest period, extent of losses, loss in the field, threshing yard, storage, marketing loss.

Unit II Agent causing food loss 12 h

Agents Causing Food Losses - Physical agents (moisture, temperature), Chemical losses, biological losses- insects- insects attacking food grains -

damage caused to food grains and detection of insect infestation, rats and rodents, birds, animals- Nature of damage, identification

Unit III Control of spoilage Agents 12 h

Control of Spoilage Agents - Importance and methods of sanitary handling, physical, chemical, biological and other means of control of insects,rats and rodents.

Nutrient losses in spoiled grains and its prevention by fumigation methods.

Unit IV Storage and grains 12 h

Storage of Grains - Importance of storage structures- requirements, traditional and modern and underground and above ground storage and their improvements, FCI godowns, PDS

Unit V Food Processing 13 h

Food Processing of Selected Food Items – wheat, rice, breakfast cereals, pulses, oilseeds. Agencies Controlling Food Losses - Role of SGC, FCI, CWC, SWC, IGSI in controlling food losses.

Text Books

1 Potter, N.W, 1973, "Food Science", 8th Edition, The AVI Publishing Co, the Westport.

2 Chakravarthy ,A, 1981 "Post Harvest Technology of Cereals, Pulses and Oilseeds"., 1st Edition, Oxford and IBH, NewDelhi.

References

1 Boumans,G,2012. " Grain Handling and Storage ", 4th Edition, Elsevier Science Publishing, Netherland..

Course Code	Course Name	Category	L	T	P	Credit
193FN1A5DB	NUTRITION ASSESSMENT	DSE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the importance of nutritional assessment
- the Anthropometric, Biochemical, Clinical and Dietary assessment methods
- the importance of exercise and health management

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Examine the Anthropometric Assessment for the all age groups.	K3
CO2	Interpret and identify the biochemical parameters to free from deficiency and diseases.	K3
CO3	Estimate the clinical parameters to identify the common symptoms of disease and deficiency.	K4
CO4	Evaluate the nutrients intake and recommended dietary allowance per day	K4
CO5	Infer the physical and mental well being for healthy living	K5

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A5DB	NUTRITION ASSESSMENT	SEMESTER V

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Anthropometric Assessment 12 h

Measurement of body size, Growth indices, Evaluation of anthropometric indices, Body mass index in adults, BMI in children and adolescents, advantages and limitations of anthropometric assessment, Anthropometric assessment of body composition-assessment of body fat, assessment of the fat free mass.

Unit II Biochemical Assessment 13 h

Physiological and biochemical parameters and their interpretation -Blood pressure, pulse rate, Urine and stools- routine, albumin, sugar and urine culture, Blood-sugar (fasting, post-prandial, random),HbA1C, urea, creatinine, lipid profile, protein, A:G ratio, bilirubin, SGPT, SGOT, uric acid, calcium phosphate, alkaline phosphatase, Hb, CBC, PCV, ESR, Peripheral smear, serum iron and ferritin, TIBC. Imaging and endoscopy tests –X ray, ultrasound scan, CT scan, endoscopy, MRI, colonoscopy, biopsy.

Unit III Clinical Assessment 11 h

Medical history, physical examination- limitations of the physical examination, classification and interpretation of physical signs, functional assessment.

Unit IV Dietary Assessment 12 h

Dietary Assessment- 24hours recall method, plate wastage, Fluid Intake.

Menu planning -Determinants of food choice, food group system and the food guide, factors Influencing meal planning, balanced diet, and steps involved in balanced diet.

Nutrient Calculation- Definition and objectives of exchange list, recommended dietary allowance, use of food consumption assessment, calculation of nutrients intake.

Unit V Exercise, Stress and Health Management 12 h

Stress Assessment and Management Techniques Exercise at Medium and High Altitudes, Exercise and Thermal Stress, Physique, Performance and Physical Activity. Obesity and Weight Control

Definition, Components and Relationship among Physical Fitness, Wellness and Health - Challenges and Personalized Approach, Benefits of Fitness Training

Text Books

1. Rosalind S. Gibson, 2005, "Principles of Nutritional Assessment", 2nd edition Oxford University Press, New york.

2. William D. McArdle, Frank I Katch and Victor L. Katch, 1996, "Exercise Physiology – Energy Nutrition and Human Performance", A Waverley Company, Baltimore.

References

1. Robert K. Cooper, 2013,"Health and Fitness Excellence", The Comprehensive Action Plan, Houghton Mifflin Company, London.

2. Jacqueline C, 2011, "Dietitians Guide Assessment and Documentation", 1st Edition Jones and Bartlett, London.

3. Joshi Y. K, 2003, "Basic Clinical Nutrition", 1st Edition, J. P. Brothers, New Delhi

4. Sunetra Roday, 2018, "Food Science and Nutrition", 3rd edition, Oxford University Press, India.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A5DC	FOOD COMMODITIES AND PREPARATION	DSE	4	1	-	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 the nutrient losses in the food grains.	K2
CO2	Paraphrase the different positions and function of kitchen production and Illustrate the properly operate equipment & common culinary hand tools.	K2
CO3	Infer the appropriate cooking skills. Analyze various cooking techniques and safety hazards, employ preventative safety measures.	K4
CO4	Illustrate the processing of foods and utilization of stock exchange.	K2
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	S	M	M	S	S
CO2	S	S	M	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S Strong M Medium L Low

193FN1A5DC	FOOD COMMODITIES AND PREPARATION	SEMESTER V

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Introduction to Food Commodities 12 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, 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 13 h

Kitchen – Definition, parts, Different Positions, Designing a kitchen, Functions of kitchen

Kitchen equipments – Modernized kitchen equipments, Culinary hand tools – Importance, Functions and safety measures

Unit III Cooking Skills, Techniques and Safety 11 h

Cooking Skills – Equipment operating knowledge and handling skills

Cooking Techniques – Classification of Cooking techniques, Importance

Safety – Safety hazards, employ preventive safety measures, safe work habits.

Unit IV Preparation and processing of foods 12 h

Preparation of foods – selection of raw ingredients, cleaning, grading, Processing of foods, utilization of basic stocks and storage

Unit V Portion control and personal hygiene 12 h

Portion control – workflow, plating and garnishing principals

Personal hygiene – 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 Longmam 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.

Course Code	Course Name	Category	L	T	P	Credit
192MT1A5AA	RESEARCH METHODOLOGY	AECC	2	-	-	2

PREAMBLE

This course has been designed for students to learn and understand

- The art of using different research methods and techniques
- Planning and writing of research proposals and dissertations, as well as a thesis
- The necessity for research ethics and guidelines to pursue research

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the basics of the research methods and techniques	K1
CO2	Remember the hypothesis, laws related to research problem	K1
CO3	Understand the limitations of experimentation in research	K2
CO4	Illustrate the concept of interdisciplinary and multidisciplinary research	K3
CO5	Analyze the ethics and responsibilities of research	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

192MT1A5AA	RESEARCH METHODOLOGY	SEMESTER V

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Introductionto Research 4 h

Research: Introduction- Basic, Applied and Evaluation research – multidisciplinary and interdisciplinary Research – value of research skills – formulating a research problem – Research in relation to Teaching and Publishing

Unit II Hypotheses, Theories and Laws 6 h

Hypotheses – Theories – Laws. Scientific statements: their justification and acceptance: verification – Falsification – Acceptance – Peer review

Unit III Experimentationand research 5 h

The roles and limitations of experimentation – Experimentation and research – conducting experiments - validity and reliability in experimentation – Design of experiments

Unit IV Scientific method and Research Design 4 h

Introduction to Scientific method – Research Design - Components - research design and proposal -checklist in the preparation of proposals

Unit V Ethics and Responsibility in Scientific Research 5 h

Ethics – guidelines for Ethical practices in research - unethics to ethics in research - responsibility of Scientists and of Science as an Institution

Text Books

1 Perter Pruzan, (2016), Research Methodology: The Aims, Practices and Ethics of Science. Springer, Switzerland

References

1 Thomas, C.G. (2015) Research Methodology and Scientific Writing. Ane Books Pvt. Ltd.: New Delhi.

2 Locharoenrat, K. (2017) Research Methodologies for Beginners.Pan Stanford Publishing: Singapore.

3 Ranjit Kumar, (2014) Research Methodology: A Step-by-Step Guide for Beginners. SAGE Publications Ltd.: Singapore.

4 Kothari, C.R. Garg, G. (2009) Research Methodology Methods and Techniques. New Age International Publishers, New Delhi..

193FN1A5LA	LAB ON PROJECT	SEMESTER V

Total Credits: 1

S.No	Contents
1	Project can be done in any specialized area Food Processing Food Analysis Clinical nutrition Community nutrition The students could work with NGOs / Government agencies / International agencies/ Hospitals / Food Industries etc.
2	RULES
3	The students should submit the research work in soft and hard copy with 50- 75 pages, Individual project, Times new roman, font size 12, 1.15 line spacing.
4	The students will be guided and supervised by a member of the teaching faculty of the concerned Department. The dissertation in which the research culminates should reflect the student's own work.
5	Research work should be presented during External Viva voce.

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Sixth Semester										
Part-III										
193FN1A6CA	Core - X	Public Health Nutrition	4	1	-	3	25	75	100	4
193FN1A6CB	Core - XI	Food Service Management	3	1	-	3	25	75	100	4
193FN1A6CC	Core- XII	Food Safety and Quality Control	4	-	-	3	25	75	100	4
193FN1A6CP	Core Practical-VI	Food Product Development	-	-	4	3	40	60	100	2
193FN1A6SA	SEC-IV	Health and Fitness	3	-	-	3	25	75	100	3
193FN1A6DA	DSE-II	Food Product Development and Marketing	3	1	-	3	25	75	100	4
193FN1A6DB		Nutrition Care Process								
193FN1A6DC		Equipments in Food Service Institution								
193FN1A6DD	DSE-III	Fundamentals of Food Packaging	4	-	-	3	25	75	100	4
193FN1A6DE		Diet Counseling								
193FN1A6DF		Entrepreneurship in Food Industry								
Part – IV										
195BI1A6AA	AECC-VI	Innovation and IPR	2	-	-	3	-	-	50	2
Part-V										
193FN1A6XA		Extension Activity	-	-	-	-	-	-	50	1
		Total	**23**	**3**	**4**				**800**	**28**
Grand Total									**4400**	**140**

Course Code	Course Name	Category	L	T	P	Credit
193FN1A6CA	PUBLIC HEALTH NUTRITION	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The applications of basics of Nutrition in the community.
- About the community nutrition programs of national and international organizations.
- To use the different tools to educate the community.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Illustrate the concept of Community Health & Nutrition.	K3
CO2	Summarize on different methods to assess the nutritional status of community	K2
CO3	Explain and educate the Nutritional problems confronting our country.	K2
CO4	Demonstrate different tools used to educate the importance of Nutrition.	K2,K3
CO5	Classify and explain the role of Nutrition intervention programme	K2,K4

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A6CA	PUBLIC HEALTH NUTRITION	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Concept of Community Health & Nutrition 12 h

Definition - Community, family, village and block. Meaning of optimum Nutrition, Malnutrition- Under nutrition and over nutrition, Characteristics of community, IMR, MMR, morbidity. Causes of malnutrition - Factors contributing to malnutrition in the community – availability of food, vicious cycle of malnutrition and poverty and Socio-economic factors. Measures to overcome malnutrition- nutrition gardens, food technology, food fortification and enrichment, nutrition education.

Unit II Nutritional Assessment 12 h

Assessment of the nutritional status of the community – functional assessment. Direct methods - Anthropometry, Clinical and Biochemical, Diet Surveys. Indirect methods- ecological parameters and vital statistics.

Unit III Nutritional problems confronting our country 12 h

PEM - Prevalence, classification - Kwashiorkor and Marasmus - etiology, symptoms, pathological changes and biochemical changes. Anaemia, IDD, Vitamin A deficiency and Fluorosis - Prevalence, etiology, symptoms and prophylaxis programmes.

Unit IV Nutrition Education 12 h

Meaning and importance of Nutrition education to the community. Methods of education, Use of computers to impart nutrition education – power point presentation, E-learning. Organization of Nutrition education programmes: Principles of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.

Unit V Nutrition Intervention programmes 12 h

Nutrition intervention programmes - ICDS: Objectives and services, Noon meal programme, SNP. National Organization- Role of ICMR, NIN. International organization- WHO, FAO, UNICEF. Health Care - PHC, ESI. National immunization schedule. Role of nutrition in health care delivery and rural development.

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 Arvind Wadhwa, 2003, "Nutrition in the Community", Edition 1, Elite Publications, New Delhi.

3 Park and Park, 1995, "Text book of Preventive and Social Medicine", Banarsidas Published by Jahalpu.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A6CB	FOOD SERVICE MANAGEMNET	CORE	3	1	-	4

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
- The methods of processing foods and to plan a menu

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Classify the types of Food service Institution	K2
CO2	Infer on principles of organization and tools used in Food Service institution	K2
CO3	Illustrate the activities on personnel management of employees and employers	K3
CO4	Apply the cost control techniques and financial management strategies.	K3
CO5	Explain the principles of art and color in food service institutions	K2,K4

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A6CB	FOOD SERVICE MANAGEMENT	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Food Service Institution 10 h

Different types of catering institutions and services, classifications of food service institutions according to Function: Profit oriented, service oriented and public health facility oriented. Method of processing: Conventional systems, Commissary system, fast food service system. Types of menu. Service of food: Self-service, tray service, waiter-waitress services, Single point service, Buffet service English service, American service, French service, Guerdon service, Silver service, Russian service

Unit II Organization 9 h

Types and principles, organizational structure for catering institutions. Management - Definition, principles and techniques of effective management, leadership and managerial abilities. Tools of management-organizational chart, work study and work improvement

Unit III Personnel Management 10 h

Methods of selection, orientation, training, supervision and motivation of employees, importance of good human relations, legal aspects of catering, Professional ethics for employees and employers. Facilities and benefits needed for employees. Employee's welfare scheme. Procedures followed for recruiting employee.

Unit IV Financial management 9 h

Budget: Types of budget, Cost concept, Factors affecting budget, Book keeping, Cost control - Principles and methods of food cost control. Factors affecting food, labor, operating and overhead cost, budget, inventories. Sanitation and Safety- significance of hygienic management in food preparation and service, sterilization, pest control, garbage disposal. Health care of food service personnel, safety measures to be adopted in food service

Unit V Art in food service 10 h

Design selection-structural and decorative, Elements of design, principles of design, and their application in food service institutions. Factors to be considered in selection of furniture and accessories in food service industry. Color - Qualities of color, color schemes, flower arrangement-application of art, principles in arranging flowers, styles and types. Table service - Application of art in table service

Text Books

1 Sushma Gupta, 2013, "Textbook of Family Resource Management", Edition 9, Kalyani Publishers– New Delhi.

2 Sethi and Mahan, "S.-Catering Management and integrated approach", John Wiley and Sons, New York.

References

1 Joan C. Branson, 2004, "Hotel, Hostel and Hospital House Keeping", Edition 5, Book Power – London.

2 Sudhir Andrews, 2008, "Textbook of Hotel, House Keeping Management and Operations", Edition I, TMH, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A6CC	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 common food adulterants	K1
CO3	Illustrate the food laws and standards followed by government.	K3
CO4	Explain the methods for determining the quality and Sensory attributes of foods	K2,K4
CO5	Apply HACCP principles to maintain the standard of industrial sector.	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A6CC	FOOD SAFETY AND QUALITY CONTROL	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Food safety and Quality control 9 h

Food Safety - definition of food safety and food spoilage, factors affecting food safety and food spoilage: GMP, GAP, SOP, and GHP.
Principles of Quality control of food –Raw material control, processed control and finished product inspection.

Unit II National and International standards 10 h

Standardized systems for quality control of foods- National and International standards, Food grades and Food laws-compulsory and voluntary standards. FSSAI.
Food adulteration - Common adulterants in foods and tests to detect common adulterants

Unit III Standards of Food products 9 h

Standards for foods – Cereals and pulses, sago and starch, milk and milk products, Coffee, tea, sugar and sugar products

Unit IV Quality evaluation of foods 10 h

Methods for determining quality - Subjective and objective methods Sensory analysis of food quality-appearance, color, flavor, texture and taste, different methods of sensory analysis, preparation of score card, panel criteria, sensory evaluation room

Unit V Food safety and Hazards 10 h

Food safety, Risks and hazards: Food related hazards, Microbial consideration in food safety, HACCP-principles and structured approach. Chemical hazards associated with foods.

Text Books

1 Mahindru.S.N, 2000, "Food Safety", Edition I, TMH, New Delhi.

2 Philip.R.A, 1999, "Food Flavorings", Edition I, An Aspen Publication, Mary Land.

References

1 Sriramakanna, 2003, "Food Standards and Safety in Globalised World", Edition I, New Central Book Agencies Private Limited, New Delhi.

2 Mahindru.S.N, (2000), Food Additives, Edition I, TMH, New Delhi.

3 Pulkit Mathur , (2018), Food safety and quality control, Edition I, Orient Blackswan Pvt Ltd, Hydrebad

193FN1A6CP	FOOD PRODUCT DEVELOPMENT	SEMESTER VI

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Product Development and Standardization)
2	Cereal and Millets based foods
3	Pulse based foods
4	Vegetable and Fruit based foods.
5	Milk and milk products
6	Nuts and seeds based products
7	Weaning and supplementary foods
8	Convenience foods, RTS and RTE foods
9	Utilization of fruit based extruded products (DBT Star scheme)
10	Bio fortification in baked products (DBT Star scheme)
11	Selection, Preparation and Standardization of a Product.
12	Selection of Packaging Material, Labeling, Cost Calculation and Marketing of Food products.

Note: Out of 12- 10 mandatory

Course Code	Course Name	Category	L	T	P	Credit
193FN1A6SA	HEALTH AND FITNESS	SEC	3	-	-	3

PREAMBLE

This course has been designed for students to learn and understand

- The importance of health for quality living of foods
- The significance of food and exercise for good health
- The importance of health education and nutrition education

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the Principles of Sports, exercise and fitness	K1, K2
CO2	Explain the nutrition aspects in exercise	K2
CO3	Summarize Oxidative stress and antioxidant requirements in athletes	K3
CO4	Interpret Nutrition and regulation of body weight.	K2, K3
CO5	Enumerate Physical fitness and life style management	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A6SA	HEALTH AND FITNESS	SEMESTER VI

Total Credits: 3

Total Instruction Hours: 36 h

Syllabus

Unit I Nutrition and exercise – Health related fitness 8 h

Physical fitness - Principles, component (Speed, Strength, Endurance, Flexibility and Coordinative Abilities), Types of Physical fitness (Health related Physical Fitness - Performance Related Physical Fitness, Cosmetic fitness), Fitness Balance. Exercise and health related fitness- Principles and types of exercise, Role of exercise in health promotion, guidelines for healthy eating, benefits of diet

Unit II Fitness equipment handling techniques 7 h

Tread mill, hammer strength, steppers, cycles, body sculpting, kick boxing, Reebok ridge rocker, hanging, hand grips, swing, climbing and lifting weight.

Unit III Nutrition in Exercise 7 h

Pre games meal, post-game meal, carbohydrate loading, pre exercise hydration. Nutritional factors causing fatigue. Nutrition and fluid intake during exercise. Fluid replacement, dietary supplements and ergogenic aids in sports.

Unit IV Oxidative stress and antioxidant requirements in athletes 7 h

Oxidative stress, antioxidant defense, oxidative stress in exercise, importance of antioxidants in a diet, stress management techniques. High Altitude Nutrition - Acclimatization, hydration, nutritional problems, altitude sickness and dietary management.

Unit V Life style management in Physical fitness 7 h

Drug, Smoking and alcoholism – Consequences of use, abuse and addiction. Prevention - de-addiction and counseling. Regulation in Energy balance and Imbalance, Underweight, overweight and obesity, eating disorders (bulimia and anorexia nervosa). Weight management- Diet, counseling and physical exercise.

Text Books

1 Kathleen.M.L, and Krause's, 2004, "Food, Nutrition and Diet therapy", Edition 11, WB Saunders Company, Philadelphia.

2 Williams. M. H, 2002, "Nutrition for Health, Fitness and Sports", Edition 5, Mc Craw Hill Book Company, New Delhi.

References

1 Judy.A.D, 2002, "Nutritional assessment for Athletes", Edition I, CRC Press, New York.

2 Liane.M.S, 2001, "Nutrition, Exercise and Behaviour", Edition I, Wordsworth, Australia.

3 Krause Food, 2012, "Nutrition and Diet Therapy", Edition 12, W.B. Saunders Company.

4 Driskell.J.A and Wolinsky.I, 2011, "Nutritional Assessment of Athletes", Edition 2, ERC Press.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A6DA	FOOD PRODUCT DEVELOPMENT AND MARKETING	DSE	3	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- New marketable, nutritionally and economically viable food products.
- The Entrepreneurship skills for setting up small scale food industries.
- The Packaging materials used for different food products.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Infer the trends in food consumption pattern	K2
CO2	Discuss on the components of food processing industries in India	K2
CO3	Summarize the scope of various food product development methods	K2
CO4	Illustrate prototype development and Packaging of processed foods.	K2
CO5	Explain the financial management and marketing techniques in food product development	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A6DA	FOOD PRODUCT DEVELOPMENT AND MARKETING	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Food consumption pattern 9 h

Trends in Food Consumption pattern. Economical, Psychological and Sociological Dimensions of Food Consumption patterns. Trends in Social Change and Health concern as a Base for New Product Development.

Unit II Introduction to Food Processing and Product Development 10 h

Food Components, Types of Food Processing, Status of Food Processing Industry in India and Scope of Growth in Future. Principles and Purpose of New Product Development, Product Design and Specifications.

Unit III Scope for Food Product development 10 h

Traditional Foods, Weaning Foods, Convenience Foods, RTE, RTS, Extruded foods, IMF Foods, Specialty Products, Health foods, Nutritional Supplements, Functional Foods, Nutraceuticals and Designer Foods, Sports Foods, Foods for Defense Services, Space foods.

Unit IV Testing, Evaluation and Packaging of Products 10 h

Prototype development -Standardization, Portion size, Portion Control, Quantity Cooking, Shelf Life Evaluation- Sensory and Microbial Testing of Processed Foods, Nutrient Analysis. Suitable Packaging Materials for Different Foods, SWOT Analysis

Unit V Financial Management and Marketing of Food Products 9 h

Institutional Support (Training and Finance) for Entrepreneurship Development. Financial Institutions (Central and State Government) banks/Funding Agencies, Financial Accounting Procedures, Market Research, Marketing Strategies, Cost Calculation , GST, Advertising Methods, Product sales, Product License, Legal specifications, Consumer Behavior and Food Acceptance.

Text Books

1 Sudhir Gupta, 2007, "Handbook of Packaging Technology", Engineers India Research Institute, New Delhi.

2 Khanaka. S. S, 2006, "Entrepreneurial Development", S. Chandand Company Ltd, New Delhi.

References

1 Suja, R. Nair, 2004, "Consumer Behavior and Marketing Research", Edition I, Himalaya Publishers.

2 Hmacfie, 2007, "Consumer led Food Product Development", Weed head Publishing Ltd., UK

3 Fuller, Gordon.W, 2005, "New Food Product Development", Edition 2, CRC Press, Boca Raton, Florida.,

4 Schaffner. D.J and Schroder. W.R, 2000, "Food Marketing and International Perspectives", Web/McGraw Hill Publication.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A6DB	NUTRITION CARE PROCESS	DSE	3	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The importance of health for quality living of foods
- To appreciate the significance of food and exercise for good health.
- The process provides a framework to individualize care, taking into account the client's need to use the best evidence available to make decisions.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Define Nutrition Care Process. Explain the Introduction, Definition, Purpose and the steps in NCP.	K1, K2
CO2	Explain the Nutrition care process for Underweight, overweight and Obesity, Diabetes Mellitus a case study approach.	K2
CO3	Explain Nutrition care process for Cardiovascular Diseases, Hypertension and hyperlipidemia, Cancer	K2, K3
CO4	Contrast Nutrition care processes for Gastrointestinal Diseases, HIV/AIDS and Critically ill patients- a case study approach.	K2, K3
CO5	Identify Case report writing, case presentation and Medical record.	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A6DB	NUTRITION CARE PROCESS	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Nutrition Care Process and Model: 9 h

Introduction, Definition, Purpose and the steps in NCP (Assessment, Diagnosis, Intervention , Monitoring and Evaluation

Unit II Nutrition care process 10 h

Nutrition care process for Underweight, overweight and Obesity, Diabetes Mellitus (T1DM, T2DM and Gestational Diabetes) a case study approach

Unit III Nutrition care process 10 h

Nutrition care process for cardiovascular diseases (Hypertension and hyperlipidemia), Cancer a case study approach

Unit IV Nutrition care process 10 h

Nutrition care processes for Gastrointestinal Diseases, HIV/AIDS and Critically ill patients- a case study approach

Unit V Case report writing, presentation and medical record 9 h

Case report writing- ADIME Format, case presentation- PES statement, SGA(Subjective Global Assessment), Nutrition Intervention, Monitoring and evaluation and medical record- Biochemical values, Diet history and Past Medical history

Text Books

1 Shubhangini.A and Joshi, (2002), "Nutrition and Dietetics", Edition 2, Tata McGraw-Hill Publishing Company Ltd.

2 Jacqueline.C, (2011), "Dietitians Guide Assessment and Documentation", Edition I, Jones and Bartlett, London.

References

1 Kathleen Mahan.L and Janice L Raymond, (2000), "Krause Food, Nutrition and diet therapy", Edition 10, W.B.Sauders Company.

2 Joshi.Y.K, (2003), "Basic Clinical Nutrition", Edition I, J. P. Brothers, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A6DC	EQUIPMENTS IN FOOD SERVICE INSTITUTION	DSE	3	1	-	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	K3,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	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S Strong M Medium L Low

193FN1A6DC	EQUIPMENTS IN FOOD SERVICE INSTITUTION	SEMESTER VI

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
193FN1A6DD	FUNDAMENTALS 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
- Recent trends in packaging and labeling.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Illustrate the functions of packaging materials for different foods.	K1, K2
CO2	Summarize the purpose and requirements of packaging materials.	K1, K2
CO3	Demonstrate the importance ofbiodegradable packaging material	K2
CO4	Identify the techniques in packages of dehydrated products	K2,K3
CO5	Apply the labeling techniques for finished food products	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A6DD	FUNDAMENTALS OF FOOD PACKAGING	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Food packaging 10 h

Definition, functions of packaging materials for different foods, characteristics of packaging material. Food packages – bags, pouches, wrappers, tetra packs-applications.

Unit II Packaging materials 10 h

Introduction, rigid containers, flexible containers, general methods for establishing radiation stabilization, Radiation- measurement of radiations Biodegradable packaging material – biopolymer based edible firm.

Unit III Packaging of dehydrated products 10 h

Orientation, metallization, co-extrusion of multilayer films, stretch, package forms and techniques, Aseptic packaging, retortable containers, modified and controlled atmosphere packaging, skin, shrink and cling film packaging, micro-oven able containers, other package forms and components of plastics

Unit IV Packaging of finished goods 9 h

Weighing, filling, scaling, wrapping, cartooning, labeling, marking and Tracking

Unit V Labeling: Standards 9 h

Labeling: Standards, purpose, description types of labels, labeling regulation barcode, nutrition labeling, health claims, and mandatory labeling provision

Text Books

1 Vijaya Khader, 2001, "Text book of food science and technology," Indian council of Agricultural research, New Delhi.

2 Srilakshmi, 2007, "Food Science," Edition 4, New Age International Publishers, New Delhi.

References

1 NIIR Board, 2008, "Food Packaging Technology Handbook", NIIR, Delhi.

2 NIIR Board, 2008, "Food Packaging Technology Handbook", NIIR, Delhi.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A6DE	DIET COUNSELING	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The importance of diet counseling
- The practical consideration and way of communication with Client/Patient
- The routine follow-up and documentation

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Developing a knowledge about diet counseling, patient character and their expectation	K6
CO2	Interpret the goals, stages of changes, nutritional monitoring and evaluation of the patient.	K2, K3
CO3	Interpret the knowledge about diet counseling through the life span	K2, K3
CO4	Explain the dietary management of chronic disease conditions	K2, K4
CO5	Describe the uses of teaching aids in diet counseling.	K1, K2

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A6DE	DIET COUNSELING	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Counseling 10 h

Definition, Expectations, goals, scope and limits. Counselor – Characteristics of an effective counselor, Qualities of a diet counselor. Different approaches of counseling. The Client – Characteristics, expectations.

Unit II Practical consideration in giving dietary advice and counseling 10 h

Introduction, Trans-theoretical Model/Stages of Change, Process of change, Decisional Balance, Self -efficacy, Goal Setting, Nutrition Intervention, Nutrition Monitoring and Evaluation, Documentation, Electronic Communication.

Unit III Counseling Through the Life Span 8 h

Introduction, Prenatal and Pregnant women, Infants up to 2 years of age, Preschool children, School going children, Adolescents, Adults, Elderly. Need for Family counseling.

Unit IV Managing Chronic Diet -Related Disease. 10 h

Diet counseling for eating disorder, under and over nutrition, Thyroid, PCOD problems, Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis, cirrhosis and kidney disease.

Unit V Teaching aids used by dietitians and Motivating Patients 10 h

Types of Visual media. Delivering oral presentation-Introduction, Implementation of an effective presentation. Working with - Hospitalized patients (adults, pediatric, elderly, and handicapped), adjusting and adopting to individual needs. Outpatients (adults, pediatric, elderly, handicapped), patients, education, techniques and modes. Follow up, Monitoring and Evaluation of outcome, home visits

Text Books

1 Betsy B. Holli and Judith A. Beto, 2018, "Nutrition Counseling and Education Skills", Edition 7, Wolters Kluwer, China.

2 Premlata Mullick Joshi.Y.K, 2003, "Basic Clinical Nutrition", Jaypee Brothers, New Delhi.

References

1 Judy Gable, 2015, "Counseling skills for Dietitian", Edition 3, Blackwell Publishing.

2 Mahan. K and Escott. S, 2000, "Food Nutrition and Diet Therapy", Edition 11, W.S. Saunder's Company, Philadelphia, USA.

3 Gibney.M.J, 2004, "Public Health Nutrition", Edition I, Black Well Scientific Publications, Oxford.

Course Code	Course Name	Category	L	T	P	Credit
193FN1A6DF	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	K3,K4
CO2	Describe the Business idea generation techniques	K2
CO3	Establish the Business idea generation techniques in entrepreneurship Development	K3
CO4	Analyze the Entrepreneurship development programmes and establish the Small Scale Industries	K3,K4
CO5	Distinguish the Quality control and Sales Management in Food industry	K4

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193FN1A6DF	ENTREPRENUERSHIP IN FOOD INDUSTRY	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction to Entrepreneurship 8 h

Entrepreneurship Development-Introduction, Meaning, Need, scope and types of entrepreneurs, classification of entrepreneurs, functions of entrepreneurs, Qualities of successful Entrepreneurs and Factors influencing Entrepreneurship

Unit II Entrepreneurial Development 10 h

Agencies -Commercial banks- District Industries Centre – National Small Industries Corporation – Small Industries Development Organization – Small Industries Service Institute. All India Financial Institutions – IDBI-IFCI-ICICI- IRDBI.

Unit III Project Management 10 h

Business idea generation techniques- Identification of Business opportunities-Feasibility study Marketing, Finance Technology & Legal Formalities-Preparation of Project Report –Tools of Appraisal, SWOT analysis

Unit IV Entrepreneurial Development Programmes 10 h

Role Relevance and achievements – Role of Government in Organizing EDPS – Critical Evaluation. Management of Small Scale Industries Characteristics of small scale industries, social responsibilities and business ethics, sickness and remedial measures in small scale industries. Development of Women Entrepreneurship.

Unit V Quality Control and Sales Management 10 h

Quality Control and Sales Management- Meaning and importance of quality control, quality standards, market survey techniques, pricing, packaging, advertising, and sales promotion.

Text Books

1 Gupta.C.B and Srnivasan.P, 2007, "Entrepreneurship Development", Sultan Chand and Sons, New Delhi.

2 Gopal J Kalantri, 2010, "Text book of Entrepreneurship Development", Vision Publications.

References

1 Rathore.B.S and Saini.J.S, 2005, "A Handbook of Entrepreneurship", Aapga Publications, Panchkula (Haryana).

2 Jaya Shree Suresh, 2007, "Entrepreneurial Development", Margham Publications, Chennai.

3 Kavi Ramachandran, 2008, "Entrepreneurship Development", Mcgraw Hill Publisher.

4 S.S.Khanka, 2005, "Entrepreneurial Development", Sultan Chand & Co, Ltd, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
195BI1A6AA	INNOVATION AND IPR	AECC	2	-	-	2

PREAMBLE

This course has been designed for students to learn and understand

- basics of Intellectual Property Rights, Copy Right Laws Trade Marks 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 Creativity, Invention and innovation	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	S	M	M	M	M
CO2	S	M	M	M	M
CO3	S	M	M	M	M
CO4	S	M	M	M	M
CO5	S	M	M	M	M

S Strong M Medium L Low

195BI1A6AA	INNOVATION AND IPR	SEMESTER VI

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Introduction 05 h

Meaning of Creativity, Invention and innovation - Types of Innovation - Relevance of Technology for Innovation - Introduction and the need for Intellectual Property Right (IPR) - Kinds of IPR – National IPR Policy.

Unit II Patents 05 h

Introduction and origin of Patent System in India- Conceptual Principles of Patent Law in India - Process for obtaining patent - Procedure for obtaining a Patent in India - Rights granted to a Patentee - Infringement of Patent.
Case Study: When Google was sued for Patent Infringement.

Unit III Trademarks 05 h

Origin of Trade Marks System - Types - Functions - Distinctiveness and Trademarks - Meaning of Good Trademark - Registration and Renewal of a Trademark - Rights granted by Registration of Trademarks - Infringement of Trademark.
Case Study: Trademark mismanagement by Cadbury's.

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 - Registration ofCopyrights - Rights of Authors and Copyright owners - Infringement of Copyright.
Case Study: Copyright Case of Napster and Grokster.

Unit V Geographical Indications 04 h

Introduction and Concept of Geographical Indications - History - Administrative Mechanism - Registration for Geographical Indications and benefits of Geographical Indications - Geographical Indications and Trademarks - Infringementof registered Geographical Indication.
Case Study: The story of the Tirupati Laddu.

Note: Case studies related to the above topics to be discussed (Examined internal only)

Text Book

1 Nithyananda, K V. 2019, "Intellectual Property Rights" Protection and Management. India, IN: Cengage Learning India Private Limited.

References

1 Ahuja, V K. 2017, "Law relating to Intellectual Property Rights" India, IN: Lexis Nexis.

2 Neeraj, P., &Khusdeep, D. 2014, "Intellectual Property Rights" India, IN: PHI learning Private Limited.

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18/12/21
BoS Chairman/HoD
Department of Food Science & Nutrition
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Academic Council
Dr.V. Rajendran
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