PERIYAR UNIVERSITY
SALEM-636011.

DEGREE OF BACHELOR OF SCIENCE

CHOICE BASED CREDIT SYSTEM

Syllabus for

B.Sc. NUTRITION AND DIETETICS

(SEMESTER PATTERN)

(For Candidates admitted in the Colleges affiliated to Periyar University from 2023-2024 onwards)

REGULATIONS

1. Preamble:

Nutrition and Dietetics curriculum has been structured to prepare the undergraduates to achieve skills to move forward with the development of the society/community/nation and entrepreneurship. Nutrition has been recognized and given a special role in national development. This programme is following on the same lines laid out in National Policy of Nutrition. This curriculum aims at training students to take up leadership roles in extension and community outreach programs. The students are encouraged to develop a scientific temper. Familiarizing them with the use of newer technologies, methods in family and community linkages, and sustainable use of resources for human development are the hall mark of this course. This course aims at enriching the minds of the students who have interest in learning finer points of nutrition. Nutrition is the key to facilitate the study and enhance the quality of human life. Its approach is therefore inherently interdisciplinary. Its curriculum that engages the student through teaching, research and extension.

2. Eligibility for Admission:

Candidates for admission to the first year of the Degree of Nutrition and Dietetics programme shall be required to have passed the Higher Secondary Examinations conducted by the Government of Tamil Nadu or any other equivalent examination.

As per Government Order (2020-2021) G.O.(1D)N0.110, Higher Education (G1) Department, dated 18.07.2020.

ELIGIBILITY: 1. General Stream: Chemistry with Biology or Home Science

2. Vocational Stream: Biology or Home Science.

Eligibility will be updated as per the Tamil Nadu G.O. thereafter.

3. Eligibility for the Award of the Degree:

A candidate shall be eligible for the award of the Degree only if she has undergone the prescribed courses of study for a period of not less than three academic years, passed the examinations of all the six semesters prescribed.

4. Courses of Study:

The main parts of the study for Bachelor Degree shall consist of the following:

PART-I:Tamil / Other languages

PART-II:English

PART -III: Core Courses, Elective Courses and Allied Courses

PART-IV: SBEC*/ NMEC**/Add-on course / EVS/ Value Education

PART-V: **Extension Activities:** NSS / NCC / Sports / YRC and other Extracurricular activities offered under part V of the programmes.

*Skilled Based Elective Course

** Non Major Elective Course

5. Examinations

There shall be six examinations by adhering semester pattern - two in the first year, two in the second year and two in the third year. Candidates failing in any subject / subjects will be permitted to appear for such failed courses at subsequent examinations. The Syllabus has

been divided into six semesters. Examinations for I, III and V semesters will be held in November/ December and for II, IV and VI semesters will be held in April / May.

Requirement to appear for the examination: A candidate shall be permitted to appear for the university examinations for any semester (practical/theory) if he / she secure not less than 75% of attendance in the number of working days during the semester.

6. Passing Minimum

A candidate who secures not less than 40% in the university (external) Examination and 40% marks in the external examination and continuous internal assessment put together in any course of Part I, II, III & IV shall be declared to have passed the examination in the subject (Theory or Practical).

7. Classification of Successful Candidates

Candidates who secure not less than 60% of the aggregate marks in the whole examination shall be declared to have passed the examination in First Class. All other successful candidates shall be declared to have passed in the Second Class. Candidates who obtain 75% of the marks in the aggregate shall be declared to have passed the examination in First Class with Distinction provided they pass all the examinations prescribed for the course at the first appearance. Candidates who pass all the examinations (Part I, II, III & IV and Part V activity) prescribed for the course in the **FIRST APPEARANCE ITSELF ALONE** is eligible for ranking.

8. Maximum Duration for the Completion of the Programme:

The maximum duration for completion of the UG Programme shall not exceed twelve semesters.

9. Commencement of this Regulation:

These regulations shall take effect from the academic year 2023-24, i.e. for students who are to be admitted to the first year of the course during the academic year 2023-24 and thereafter.

10. Pattern of Question Paper (All Courses)

The following is the model question paper pattern for B.Sc. Nutrition and Dietetics

Time: 3 Hours Maximum:75 Marks

Part A : 15 x1 =15 (Multiple Choice) (Three questions from each unit) (K1 to K5 Level)

Part B : 2 x 5 = 10 (Any Two questions) (One question from each unit) (K3 to K6 Level)

Part C : 5 x 10 = 50 (One question from each unit with internal choice) (K1 to K2 level)

The pattern of question paper will be based on the respective University Examination guidelines.

Methods of Assessment	
Remembering (K1)	• The lowest level of questions require students to recall information from the course content • Knowledge questions usually require students to identify information in the textbook
Understanding (K2)	• Understanding of acts and ideas by comprehending organizing, comparing, translating, interpolating and interpreting in their own words. • The questions go beyond simple recall and require students to combine data together
Application (K3)	• Students have to solve problems by using / applying a concept learned in the classroom • Students must use their knowledge to determine exact response.
Analyze (K4)	• Analyzingthequestionisonethatasksthestudentstobreakdownsomethingintoitscomponentparts. • Analyzingrequiresstudentstoidentifyreasonscausesormotivesandreachconclusionsorgeneralizations.
Evaluate (K5)	• Evaluationrequiresanindividualtomakejudgmentonsomething. • Questionstobeaskedtojudgethevalueofanidea,acharacter,aworkofart,orasolutiontoaproblem. • Studentsareengagedindecision-makingandproblem–solving. • Evaluationquestionsdonothavesinglerightanswers.
Create (K6)	• Thequestionsofthiscategorychallenge studentstogetengagedincreativeandoriginalthinking. • Developingoriginalideasandproblemsolvingskills

11. Evaluation Pattern for Internal Assessment

11A. THEORY PAPERS

External Assessment (EA)	Internal Assessment (IA)
75 Marks	25 Marks

Component	Time	Total Marks	IA marks
Test I	2 hours	50	10
Test II	2 hours	50	10
Assignment (minimum 2)/Seminar/Problem based Activity		10	05
		Total	**25**

PASS PERCENTAGE

Passing minimum (Internal Assessment) 40%	**10 marks**
Passing minimum (External Assessment) 40%	**30 marks**
Total	**40 marks**

11B. PRACTICALS

External Assessment (EA)	Internal Assessment (IA)
60 Marks	40 Marks

Component	Time	Total Marks	IA marks
Practical Test I	3 hours	50	15
Practical Test II	3 hours	50	15
Record / Filled in Manual			05
Attendance / Performance Evaluation of the Experiments during the Conduct of the Course			05
Total			40

PROJECT EVALUATION

External Assessment (EA)	Internal Assessment (IA)
60 Marks	40 Marks

PASS PERCENTAGE

Passing minimum (Internal Assessment) 40%	**16 marks**
Passing minimum (External Assessment) 40%	**24 marks**
Total	**40 marks**

PROGRAMME OUTCOMES

PO1. KNOWLEDGE

Students:

- Follow the developments in the field of nutrition and dietetics
- Have knowledge and skill of the information and communication technologies essential to follow today's technological developments and improve themselves in this field
- Acquire the skill of understanding the basic values and culture of the society they live in, adapting to these and changing themselves positively
- Have knowledge of the concepts of physiology, nutritional biochemistry, nutrition, dietetics and other terminologies related to human health.

PO2. SKILLS

Students:

- Apply the knowledge and skills they obtain to the situations encountered in both national and international level, as well as the ability of lifelong learning
- Aware of professional ethics in the nutrition and dietetics field
- Apply the scientific methods and techniques, as well as quality management processes related to food, nutrition and dietetics service sector

- Apply the skills of designing experiments/projects to solve issues related to nutrition and dietetics in the society

PO3. COMPETENCES

Students:

- Use the knowledge to increase the level of health and quality of life in the society they live.
- Apply the professional competency acquired during the process of learning towards their career growth with the collaborative and cooperative attitude.

Program Specific Objectives (PSO)

Nutrition & Dietetics students will acquire

1. Understanding, critically assessing and knowing how to use and apply information sources related to nutrition, food, lifestyle and health.

2. Being familiar with nutrients, their function in an organism, bioavailability, requirements and recommended quantities, as well as the bases of energetic and nutritional balance.

3. Interpreting a nutritional diagnosis, evaluating nutritional aspects of a clinical record and implementing a dietary treatment plan.

4. Understanding the structure of food services, nutrition departments and hospital nutritionists, identifying and developing the functions of a nutritionist-dietician in a multidisciplinary team.

5. Perform food system management and leadership functions that consider sustainability in business, healthcare, community, and institutional areas

In order to avoid pull the score down of each PO, it is suggested that the usage L-Low (1) to the minimum. The S, M, L is based on the Course outcomes. The mapping is based on the revised Bloom's Taxonomy Verbs used to describe your Course outcomes.

- Remember and Understanding – Lower level
- Apply and Analyze – Medium Level
- Evaluate and Create – Strong Level

Credit Distribution for UG Programmes

Sem I	Credit	H	Sem II	Credit	H	Sem III	Credit	H	Sem IV	Credit	H	Sem V	Credit	H	Sem VI	Credit	H
Part 1. Language – Tamil	3	6	Part..1. Language – Tamil	3	6	Part..1. Language – Tamil	3	6	Part..1. Language – Tamil	3	6	5.1 Core Course – \CC IX	4	5	6.1 Core Course – CC XIII	4	6
Part.2 English	3	6	Part..2 English	3	6	Part..2 English	3	6	Part..2 English	3	6	5.2 Core Course – CC X	4	5	6.2 Core Course – CC XIV	4	6
1.3 Core Course – CC I	5	5	2..3 Core Course – CC III	5	5	3.3 Core Course – CC V	5	5	4.3 Core Course – CC VII Core Industry Module	5	5	5. 3.Core Course CC -XI	4	5	6.3 Core Course – CC XV	4	6
1.4 Core Course – CC II	5	5	2.4 Core Course – CC IV	5	5	3.4 Core Course – CC VI	5	5	4.4 Core Course – CC VIII	5	5	5. 4.Core Course –/ Project with viva- voce CC -XII	4	5	6.4 Elective - VII Generic/ Discipline Specific	3	5
1.5 Elective I Generic/ Discipline Specific	3	4	2.5 Elective II Generic/ Discipline Specific	3	4	3.5 Elective III Generic/ Discipline Specific	3	4	4.5 Elective IV Generic/ Discipline Specific	3	3	5.5 Elective V Generic/ Discipline Specific	3	4	6.5 Elective VIII Generic/ Discipline Specific	3	5
1.6 Skill Enhancement Course SEC-1	2	2	2.6 Skill Enhancement Course SEC-2	2	2	3.6 Skill Enhancement Course SEC-4, (Entrepreneurial Skill)	1	1	4.6 Skill Enhancement Course SEC-6	2	2	5.6 Elective VI Generic/ Discipline Specific	3	4	6.6 ExtensionActivity	1	-
1.7 Skill Enhancement - (Foundation Course)	2	2	2.7 Skill Enhancement Course – SEC-3	2	2	3.7 Skill Enhancement Course SEC-5	2	2	4.7 Skill Enhancement Course SEC-7	2	2	5.7 Value Education	2	2	6.7 Professional Competency Skill	2	2
						3.8 E.V.S.	-	1	4.8 E.V.S	2	1	5.8 Summer Internship /Industrial Training	2				
	23	**30**		**23**	**30**		**22**	**30**		**25**	**30**		**26**	**30**		**21**	**30**
Total – 140 Credits																	

Choice Based Credit System (CBCS), Learning Outcomes Based Curriculum Framework (LOCF) Guideline Based Credit and Hours Distribution System for all UG courses including Lab Hours

First Year – Semester-I

Part	List of Courses	Credit	No. of Hours
Part-1	Language – Tamil	3	6
Part-2	English	3	6
Part-3	Core Courses & Elective Courses [in Total]	13	14
Part-4	Skill Enhancement Course SEC-1	2	2
	Foundation Course	2	2
		23	**30**

Semester-II

Part	List of Courses	Credit	No. of Hours
Part-1	Language – Tamil	3	6
Part-2	English	3	6
Part-3	Core Courses & Elective Courses including laboratory [in Total]	13	14
Part-4	Skill Enhancement Course -SEC-2	2	2
	Skill Enhancement Course -SEC-3 (Discipline / Subject Specific)	2	2
		23	**30**

Second Year – Semester-III

Part	List of Courses	Credit	No. of Hours
Part-1	Language - Tamil	3	6
Part-2	English	3	6
Part-3	Core Courses & Elective Courses including laboratory [in Total]	13	14
Part-4	Skill Enhancement Course -SEC-4 (Entrepreneurial Based)	1	1
	Skill Enhancement Course -SEC-5 (Discipline / Subject Specific)	2	2
	E.V.S	-	1
		22	**30**

Semester-IV

Part	List of Courses	Credit	No. of Hours
Part-1	Language - Tamil	3	6
Part-2	English	3	6
Part-3	Core Courses & Elective Courses including laboratory [in Total]	13	13
Part-4	Skill Enhancement Course -SEC-6 (Discipline / Subject Specific)	2	2
	Skill Enhancement Course -SEC-7 (Discipline / Subject Specific)	2	2
	E.V.S	2	1
		25	**30**

Third Year
Semester-V

Part	List of Courses	Credit	No. of Hours
Part-3	Core Courses including Project / Elective Based	22	26
Part-4	Value Education	2	2
	Internship / Industrial Visit / Field Visit	2	2
		26	**30**

Semester-VI

Part	List of Courses	Credit	No. of Hours
Part-3	Core Courses including Project / Elective Based & LAB	18	28
Part-4	Extension Activity	1	-
	Professional Competency Skill	2	2
		21	**30**

Consolidated Semester wise and Component wise Credit distribution

Parts	Sem I	Sem II	Sem III	Sem IV	Sem V	Sem VI	Total Credits
Part I	3	3	3	3	-	-	12
Part II	3	3	3	3	-	-	12
Part III	13	13	13	13	22	18	92
Part IV	4	4	3	6	4	2	23
Part V	-	-	-	-	-	1	01
Total	23	23	22	25	26	21	**140**

***Part I. II, and Part III components will be separately taken into account for CGPA calculation and classification for the under graduate programme and the other components. IV, V have to be completed during the duration of the programme as per the norms, to be eligible for obtaining the UG degree.**

B.Sc. Nutrition and Dietetics (Semester Wise Structure)

FIRST YEAR

Part	Semester I	Course Name	Credit	Hours	Internal	External	Total
I	Language	Tamil/ /Other Languages	3	6	25	75	100
II	Language	English	3	6	25	75	100
III	Core Course1	Food Science	5	5	25	75	100
III	Core Course 2	Food Science Practical	4	3	40	60	100
III	Allied1	Chemistry for Biological Sciences I	3	4	25	75	100
III	Allied 2	Chemistry Practical I	1	2	40	60	100
IV	NMEC	Nutrition and Fitness(other departments)	2	2	25	75	100
IV	FC	Dimensions of Health	2	2	25	75	100
			23	**30**	**230**	**570**	**800**

Part	Semester II	Course Name	Credit	Hours	Internal	External	Total
I	Language	Tamil/ Other Languages	3	6	25	75	100
II	Language	English	3	4	25	75	100
Part-II	NMSDC	Language Proficiency for employability- Overview of English Communication	2	2	-	-	
III	Core Course 3	Human Physiology	5	5	25	75	100
III	Core Course 4	Human Physiology Practical	4	3	40	60	100
III	Allied 3	Chemistry for Biological Sciences II	3	4	25	75	100
III	Allied 4	Chemistry Practical II	1	2	40	60	100
IV	NMEC	Basics of Functional Foods(other departments)	2	2	25	75	100
IV	SEC1	Fundamentals of Bakery	2	2	25	75	100
			25	**30**	**230**	**570**	**800**

SECOND YEAR

Part	Semester III	Course Name	Credit	Hours	Internal	External	Total
I	Language	Tamil/ Other Languages	3	6	25	75	100
II	Language	English	3	6	25	75	100
III	Core Course 5	Principles of Nutrition	4	4	25	75	100
III	Core Course 6	Nutrient Analysis Practical	4	3	40	60	100
III	Allied 5	Nutritional Biochemistry	3	3	25	75	100
III	Allied 6	Nutritional Biochemistry Practical	2	3	40	60	100
IV	**NMSDC**	**Digital Skills for Employability-Digital Skills**	**2**	**2**	**-**	**-**	**-**
IV	E.V.S	Environmental Studies	-	1	-	-	-
			22	**30**	**245**	**555**	**800**

Part	Semester IV		Credit	Hours	Internal	External	Total
I	Language	Tamil/ Other Languages	3	6	25	75	100
II	Language	English	3	6	25	75	100
III	Core Course 7	Nutrition through Life Cycle	4	4	25	75	100
III	Core Course 8	Nutrition through Life Cycle Practical	4	3	40	60	100
III	Allied 7	Home Science	3	3	25	75	100
III	Allied 8	Home Science Practical	2	3	40	60	100
IV	SEC 4	Food Product Development	2	2	25	75	100
IV	SEC 5	Design and formulations of food Practical	2	2	40	60	100
IV	E.V.S	Environmental Studies	2	1	25	75	100
			25	**30**	**270**	**630**	**900**

*Internship -15 days (summer vacation)

THIRD YEAR

Part	Semester V		Credit	Hours	Internal	External	Total
III	Core Course 9	Dietetics	4	6	25	75	100
III	Core Course 10	Nutritional Assessment and Diet counselling in Clinical Setting	4	5	25	75	100
III	Core Course 11	Dietetics Practical	3	3	40	60	100
III	Core Course 12	Public Heath Nutrition	4	5	25	75	100
III	Project	Project Viva-Voce	4	4	40	60	100
III	Elective Course1	1. Food Service Management (or) 2. Principles for Resource Management	3	5	25	75	100
IV	Internship	Summer vacation at the end of IV semester activity	2	-	40	60	100
IV	VE	Value Education	2	2	25	75	100
			26	**30**	**245**	**555**	**800**

Part	Semester VI		Credit	Hours	Internal	External	Total
III	Core Course 13	Food Preservation	4	5	25	75	100
III	Core Course 14	Nutrition for Health and Physical Fitness	4	6	25	75	100
III	Core Course 15	Food Preservation Practical	1	3	40	60	100
III	Core Course 16	Sports Nutrition	3	5	25	75	100
III	Elective Course2	1. Food Microbiology(or) 2. Early Childhood care and Education	3	4	25	75	100
III	Elective Course3	1. Food Safety and Quality Control(or) 2. Community Development	3	4	25	75	100
IV	SEC 6	Basics in Research Methodology	2	3	25	75	100
V	EA	Extension activity	1	-	-	-	-
			21	**30**	**190**	**510**	**700**

Semester I Syllabus

Title of the Course		FOOD SCIENCE				
PART III	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Semester					
Core course1	I	5	5	25	75	100

Learning Objectives

To enable the students to:

- Understand the classification of foods according to their functions
- Gain knowledge on the composition and nutritive value of foods
- Know the basic methods of cooking and its influence on food

UNIT I

INTRODUCTION TO FOOD AND COOKING METHODS

Definition - Food, Food Science, Nutrients, Nutrition, Balanced Diet.Food Groups - Need for grouping foods, Basic IV and V food groups, food pyramid and my plate. Functional classification of foods- Energy yielding, body building, protective and regulatory foods.

Cooking – Objectives, cooking methods- Moist and Dry heat methods of cooking, merits and demerits. Microwave cooking, ohmic cooking, induction cooking and solar cooking.

UNIT II

CEREALS,**MILLETS**, **PULSES, LEGUMES AND NUTS**

Cereal and Millets – Structure, composition and nutritive value of rice, wheat and millets. Selection, parboiling of rice and millets. Effect of cooking on the nutritive value of cereals. Dextrinization, gelatinization, retrogradation and gluten formation.

Millets- Types, nutritive value.

Pulsesandlegumes-Types, nutritive value, selection, methods of cooking, factors affecting cooking quality of pulses, effect of germination on the nutritive value of pulses, cereal and pulse combination and its significance. Toxic constituents of pulses and methods of inactivation. Protein fractionation – Textured vegetable protein.

Nuts-Types, composition, selection, role of nuts in cookery

Oilseeds-Types, selection, uses and shelf life.

UNIT III

VEGETABLES, FRUITS AND MILK:

Vegetables - Classification, nutritive value, types of pigments, selection of vegetables, effect of cooking on colour, texture, flavour, appearance and nutritive value.

Fruits - Classification, nutritive value, changes that occur during ripening, enzymatic browning and its prevention.

Milk –Compositionandnutritivevalue, types of milk, selection, pasteurization homogenization and coagulation of milk, Effect of cooking and processing on milk.

UNIT IV
FLESH FOODS AND EGG
Meats – structure, nutritive value, cuts of meat, selection of meat, postmortem changes in meat, ageing, factors affecting tenderness of meat, changes during cooking.
Poultry-types, nutritive value, selection, changes during cooking.
Fish-classification, nutritive value, selection, changes during cooking.
Eggs- Structure, nutritive value, selection, uses in cookery; foam formation and factors affecting foam formation, changes during cooking.

UNIT V
FATS, SUGARS,SPICES AND BEVERAGES
Fats and Oils– Types of fats, composition - saturated, MUFA, PUFA, hydrogenation, uses of fat in cookery, factors affecting absorption of fats, smoking point, rancidity. Vegetable oils – types, selection and nutritive value.
Sugar - Types of sugars, stages of sugar cookery, crystallization, factors affecting crystallization.
Spices and Condiments–Classification, uses in Indian cookery, medicinal value.
Beverages – Classification - fruit based beverages,milk-based beverages, alcoholic beverages, coffee, tea and cocoa, malted beverages, nutritive value and uses.

TEXT BOOKS

1. Srilakshmi, B., (2010), Food Science, 6th edition New Age International (P) Limited, New Delhi.
2. Sunetra, R.,(2007), Food Science and Nutrition, Oxford University Press, India.
3. Chandrasekhar, U.,(2002),Food Science and Application in Indian Cookery, Phoenix Publishing House P. Ltd., New Delhi.
4. Shakuntala, M. and Shadaksharaswamy. M., (2000), 2nd Edition, Foods, Facts and Principles, New Age International Pvt. Ltd., Publishers, New Delhi.
5. Mehas, K.Y. and Rodgers, S.L. (2000), Food Science and You, McMillanMcGraw Company, New York.
6. ThangamE.Philip, (2010), Modern Cookery for Teaching and the Trade Volume - 1&2 (6th RevisedEdition),Orient Black, India.

REFERENCE BOOKS

1. Vaclavik,V.A.and ElizabethW.C., (2013),Essentialsof FoodScience 2nded., SpringerPublication,NewDelhi, India.
2. Brown.T Amy, (2014), Understanding Food, 5th Edition, Wadsworth Publishing Co Inc., USA.
3. Parker, R., (2003), Introduction to Food Science. Thomson Learning Inc., New York.

4. Peckham, G.C. and Freeland-Graves, J.H, (1979), Foundations of Food Preparation, 6th edition,Macmillan PublishingCo.Inc., New York.
5. Shewfelt, R.L, (2015), Introducing Food Science, CRC Press, Taylor and Francis Group, BocaRaton.
6. Potter, N.and Hotchkiss, J.H., (1995), Food Science, 5th edition, Chapman &Hall, New York.

E – Learning Resources

- https://www.pdfdrive.com/food-science-books.html
- https://archive.org/details/textbookoffoodsc0000khad
- https://himitepa.lk.ipb.ac.id/e-book/
- https://lib.rudn.ru/file/Food_Science_Nutrition_Catalogue_ebook.pdf
- https://www.vet-ebooks.com/food-science-and-technology/
- https://epgp.inflibnet.ac.in/

COURSEOUTCOMES

After successful completion of the course the students will be able to:

CO	Course Outcomes
CO1	Identify and classify foods based on the food grouping system and illustrate their use
CO2	Define the foods, describe its structure and distinguish their composition
CO3	Demonstrate their ability in selecting quality food and appraise the varieties in a food
CO4	Compare the nutrients present in different types of food and choose foods rich in specific nutrients
CO5	Analyse the effect of cooking on the quality of food and discriminate the desirable and undesirable changes

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		FOOD SCIENCE PRACTICAL				
PART III	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Semester					
Core course 2	I	4	3	40	60	100

Learning Objectives:

Enable students to

- Understand the basic measurements and its equivalent units
- Study the various physiochemical properties of foods
- Assess the stages of sugar cookery

UNIT I: INTRODUCTION TO BASIC COOKING SKILLS

a. Introduction to different cooking methods, equipment and techniques used for pre-preparation and preparation of foods.
b. Measuring and weighing liquids and dry ingredients. Use of simple kitchen equipments.
c. Introduction to food safety, sanitation and hygiene in the kitchen, Safe practices in handling knives, sharp instruments, fuels and materials at high temperature.
d. Calculate the edible portions of a few foods.

UNIT II: CEREALS, MILLETS AND PULSES

Cerealsand Millets

a. Methods of combining fine and coarse cereal with liquid (eg. porridge, upma)
b. Method of cooking cereals- cooking rice by boiling, absorption method, pressure cooking, microwave cooking
c. Microscopic examination of starch -raw and gelatinized.
d. Preparation of recipes using rice –idli, idiappam, fried rice
e. Gluten formation in different cereal flours- Wheat, Refined wheat flour; preparation of phulka and poori
f. Millet preparations –kesari, pongal, variety rice.

Pulses

a. Factors influencing cooking quality of pulses -soaking, addition of sodium bicarbonate, addition of salt, water quality- hard and softwater, pressure cooking, boiling andstraining of one pulse.
b. Effect of time, temperature and water required for sprouting whole pulses and legumes- green gram, Bengal gram, cow pea and horse gram
c. Pulse preparations- Sundal, sprout salad and payasam

UNIT III: VEGETABLES AND FRUITS

Vegetables

a. Basic cuts of vegetables-Slice and mince (onions) Shred (cabbage, spinach),dice (carrot), chop (tomato), grating (beetroot), and their uses in dishes.
b. Changes in colour, texture and nutritive value of vegetables due to different methods of cooking, cooking medium and addition of acid/alkali.
c. Browning reaction in fruits and vegetables and prevention methods
d. Vegetable preparations – poriyal, cutlet, salad and halwa
e. Fruit preparations- saladand smoothie

UNIT IV: EGGS, MILK &MILK PRODUCTS,MEAT AND FISH

Egg Cookery:

a. Boiling of eggs-hard- and soft-boiled eggs.
b. Poaching and frying, coagulation of egg protein- custard.
c. Effect of cooking time on the colour, texture and acceptability of whole egg; Formation of ferrous sulphide in boiling egg and its preventive measures.
d. Egg preparations - Omelette, French toast, scrambled eggs/
e. Stages of foam formation in whipped egg whites.

Milk and milk products

a. Curdling of milk using lime juice, butter milk, tomato juice.
b. Milk preparations: payasam, lassi, spiced buttermilk

Meat and Fish

a. Methods of tenderizing meat-Pounding, mincing, addition of acids like curd/lime juice in marinade, addition of proteolytic enzymes-raw papaya
b. Effect of different methods of cooking on flavour, texture and appearanceof meat and fish; soup, fry

UNIT V: SUGARS, FATS & OILS AND BEVERAGES

a. Sugar Cookery - Stages of sugar cookery and uses. Preparations of sweets using different stages of sugar cookery
b. Fats and oils - Effect of temperature of oil on texture and palatability of foods-Frying pooris at different temperatures
c. Smoking point of any 4 oils - bread cube test.
d. Emulsions- definition, Preparation of mayonnaise
e. Beverages- Preparation of Coffee and Tea using different methods

TEXT BOOKS

1. Brown, Amy, (2013), Understanding Food: Principles And Preparation, Cengage Learning, USA.
2. Vaclavik , A. Vickie, Christian, W. Elizabeth, (2014), Essentials of Food Science, 5th edition, Springer Publications, UK.
3. ChomplayPranshu and Singh K Shailendra, (2012), Theory of Cookery: A Textbook, Aman Publications, India.

REFERENCE BOOKS

1. Krishna Arora, (2008), Theory of cookery, Frank Brothers & Co, India.
2. Martland, R.E. and Welsby, D.A, (1980), Basic Cookery, Fundamental Recipes and Variations, William Heinemann Ltd., London.
3. Negi J, (2013), Fundamentals of Culinary Art, S.Chand and Co. India.
4. Peckham,G .C and Freeland- Graves,J.H, (1987) Foundation of food preparation, 4th edition, Macmillan Publishing co, New York.
5. Penfield MPandAdaMarieC,(2012),ExperimentalFoodScience, AcademicPres., SanDiego.
6. Bharadwaj, Monisha, (2016), The Indian Cookery Course, Kyle Books, India.
7. Potter, Norman, (2007), Food science, 5th edition, CBS Publishers & Distributors Pvt Ltd, India.

E- RESOURCES

- https://www.academia.edu/33958572/Browning_Reactions
- https://www.acsedu.co.uk/uploads/Food/Lesson_1_and_Assignment_1_Sample_Human_Nutrition_II.pdf
- https://egyankosh.ac.in/bitstream/123456789/10636/1/Unit-7.pdf
- https://institut-agro-dijon.fr/fileadmin/user_upload/Masters-Internationaux/Plaquette_PULSES_AND_CEREALS_WHY_NOT.pdf
- https://sfmicrosociety.org/features/starch-gelatinization-under-the-microscope

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Examine the physicochemical changes of food
CO2	Demonstrate the methods of nutrient retention while cooking
CO3	Illustrate the factors that affect cooking quality of different food
CO4	Prepare variety of foods by adopting different cooking methods
CO5	Justify the best preparation and cooking methods for acceptability and retention of nutrients in different dishes

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		NUTRITION AND FITNESS				
PART IV	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Semester					
* NMEC1	I	2	2	25	75	100

* **NMEC to be offered to other department students**

Learning Objectives:

Enable students to

- Understand the concepts of fitness
- Relate importance of nutrition in fitness
- Comprehend the role nutrition and fitness in maintaining body composition
- Explore career opportunities in fitness centres

UNIT I: BASICS OF NUTRITION

a. Definition - food, nutrients, nutrition, health, general guidelines for healthy eating - balanced diet, food pyramid, concept of my plate.
b. Classification of nutrients – macro and micronutrients; non-essential nutrients in fitness.

UNIT II: FITNESS AND COMPETITION MEALS

a. Fitness – Definition, health related fitness; physical activity – unstructured, structured.
b. Pre and post competition meal, – definition and role.

UNIT III EXERCISE AND ERGOGENIC AIDS

a. Exercise-definition, basic principles of exercise – overload, progression, recuperation, individuality, reversibility, overuse; moderate intensity and vigorous intensity exercise; role of exercise in health.
b. Ergogenic aids – definition; types – mechanical, psychological, physiological, pharmacological and nutritional; Role of nutritional ergogenic aids – water, carbohydrates, proteins, vitamins, antioxidants and minerals.

UNIT IV: BODY WEIGHT AND COMPOSITION

a. Ideal body weight, Body Mass Index, Introduction to body composition, importance of body composition analysis, factors affecting body composition.
b. Role of physical activity in improving body composition, role of nutrition in improving body composition.

UNIT V: FITNESS IN STRESS MANAGEMENT

a. Meaning of stress, general adaptation syndrome - alarm stage, resistance stage, exhaustion stage, types of stress – eustress and distress.
b. Stress management techniques - role of yoga and meditation; importance of nutrition and exercise in stress management.

TEXT BOOKS

1. Mahan, L.K. &Ecott-Stump, S., (2000), Krause's Food, Nutrition and Diet therapy, 10th edition,W.B. Sunders ltd, London.
2. Sizer, F. &Whitney, E., (2000), Nutrition- Concepts & Controversies, 8th edition, Wadsworth Thomson learning, New York.
3. Shills, M.E., Olson, J.A., Shike, N. and Ross, A.C, (1999), Modern Nutrition in Health & disease, 9th edition, Williams & Wilkins, UK.

REFERENCE BOOKS

1. Parizkova. J., Ed.Wolinsky.I., (2001), Nutrition, Physical Activity and Health in Early Life, CRC press, New York.
2. Whitney, E.N. &Rolfes. S.R., (2002), Understanding Nutrition, 8th edition, West/Wadsworth, an International Thomson publishing Co. London.

E - RESOURCES

- https://ssb.gov.in/WriteReadData/LINKS/Guide%20to%20Fitness890910af-6685-4812-9b63-fc205a8080a7.pdf
- https://mdpi-res.com/bookfiles/book/3237/Nutrition_and_Fitness.pdf?v=1687521516
- https://www.bizmove.com/books/how-to-improve-your-health-and-fitness.pdf

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Understand the concept of nutrition in relation to fitness
CO2	Determine the nutritional requirement for fitness and physical performance
CO3	Illustrate the relationship between body composition and fitness
CO4	Interpret and explain the role of physical activity in preventing lifestyle disorders
CO5	Relate and speculate the role of nutrition in preventing lifestyle related diseases
CO6	Assess and validate the role of stress management

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		DIMENSIONS OF HEALTH				
PART IV	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Semester					
Foundation Course	I	2	2	25	75	100

Learning Objectives:

Enable students to

- Understand the importance of health and its determinants
- Know the dimensions of health and concepts of well-being
- Study the role of institutions in health promotion

UNIT I: HEALTH AND WELLNESS

a. Definition of Health –determinants of health, dimensions of health – physical, social, mental, emotional.
b. Efforts for achieving health goals- sustainable development goals (SDGs).
c. Wellness- definition, concepts of well-being - standard of well-being – level of living- quality of living. Principles of health in day-to-day life.

UNIT II: PHYSICAL DIMENSION OF HEALTH

a. Introduction, components of physical health, types of physical health – external and internal health and its evaluation (list).
b. Physical quality of life index (PQLI) and Human Development index, Health Continuum Model, factors affecting physical health.

UNIT III: SOCIAL DIMENSION OF HEALTH

a. Introduction, definition, need for developing social health, social determinants of health.
b. Factors affecting social dimensions of health, role of various institutions in promoting social health – schools and college.

UNIT IV: MENTAL AND EMOTIONAL DIMENSIONS OF HEALTH

a. Mental and Emotional Health- Introduction, definition, need and emergence of mental and emotional health.
b. Risk factors of mental health conditions- biological, psychological, environmental, steps to achieve mental and emotional wellbeing.

UNIT V: OTHER DIMENSIONS OF HEALTH AND HEALTH PROMOTION

a. Spiritual, philosophical, cultural, socioeconomic, environmental, educational, nutritional, curative and preventive aspects.
b. Interaction between the dimensions of health.
c. Health Promotion- Definition, needs and Goals.

TEXT BOOKS:

1. Gunn, A. William, Mansourian P.B, (2010), Understanding the Global Dimensions of Health, Springer ltd., New York.

2. Nettleton Sarah, (2021), Sociology of Health and Illness, Polity Press, UK.
3. Barry, M. Anne, Yuill Chris, (2016), Understanding the Sociology of Health: An Introduction, SAGE Publications, California.

REFERENCE BOOKS:

1. Park's (2021), Textbook of Preventive and Social Medicine, 26th edition, BhanotBanarsidas publisher private limited, India.
4. Dew Kevin, Scott Anne, Kirkman Allison, (2016), Social, Political and Cultural Dimensions of Health, Springer ltd., New York.

E-RESOURCES

- https://www.jaypeedigital.com/eReader/chapter/9789352500215/ch1
- https://www.who.int/data/gho/data/major-themes/health-and-well-being
- https://www.studocu.com/in/document/jamia-millia-islamia/sociology-ii/the-four-dimensions-of-health/23023888
- https://sdgs.un.org/goals
- https://www.who.int/westernpacific/activities/improving-school-based-health-programmes

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Enumerate the determinants and dimensions of health
CO2	Discuss the physical aspects of health
CO3	Illustrate the determinants and factors affecting social health
CO4	Examine the importance of emotional and social health
CO5	Cite the interaction between health dimensions and health promotion

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Semester II

Title of the Course		HUMAN PHYSIOLOGY				
PART III	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Semester					
Core course 3	II	5	5	25	75	100

Learning Objectives:

To enable students to understand the

1. Structure of various tissues and organs of the body and their functions.
2. Different systems of the human body and their functions.
3. Importance of hormonal and nervous regulation of the body.

UNIT I: CELLS, TISSUES, BLOOD AND IMMUNE SYSTEM

a. Cell and tissues

Structure and function of cell and its organelles,classification, structure and functions of tissues.

b. Blood

Constituents of blood- RBC, WBC and platelets and its functions,erythropoiesis, blood clotting, blood groups and histocompatibility.

c. Immune system

Antigen, antibody, cellular and humoral immunity (in brief).

UNIT II: NERVOUS SYSTEM AND SENSE ORGANS

a. Nervous system

Structure and functions of brain (cerebrum, brain stem, cerebellum), spinal cord structure and function; functions of autonomic nerves and cranial nerves.

b. Sense Organs

Structure and functions of eye, ear, skin. physiology of taste andsmell(in brief)

UNIT III: CIRCULATORY SYSTEM AND RESPIRATORY SYSTEM

a. Heart and circulation

Anatomy of the heart and blood vessels, origin and conduction of heartbeat, cardiac cycle, bloodpressure - definition and physical factors affecting blood pressure and description of normal ECG.

b. Respiratory system

Anatomy and physiology of respiratory organs,mechanism of respiration; gaseous exchange inthe lungs and tissues.

UNIT IV: DIGESTIVE SYSTEM AND EXCRETORY SYSTEM

a. Digestive system

Anatomy of gastro-intestinal tract, structure and functions of liver and pancreas;digestion and absorption of carbohydrates, proteins and fats.

b. Excretory system

Structure of kidney, structure of nephron, physiology of urineformation.

UNIT V: ENDOCRINE SYSTEM AND REPRODUCTIVE SYSTEM

a. Endocrine system

Functions, hypo and hyper secretions of hormones secreted by pancreas, pituitary gland, thyroid,parathyroid and adrenal glands.

b. Reproductive system

Anatomy of male and female reproductive organs, menstrual cycle, conception, parturition.

TEXT BOOKS

1. SaradaSubrahmanyam et al, (2007), Textbook of Human Physiology, S.Chand and Company Ltd. New Delhi.
2. Murugesh. N, (2012), Basic Anatomy and Physiology, Sathya Publishers, Madurai.
3. Sembulingam,K.andSembulingam,P.,(2012),EssentialsofMedicalPhysiology, 6th edition,Jaypee BrothersMedicalPublishers,New Delhi.

REFERENCE BOOKS

1. Waugh A and Grant A., (2012), Ross and Wilson Anatomy and Physiology inHealth and Illness, 11th edition, Churchill and Livingston, Elsevier, UK.
2. BestandTaylor, (2011), ThePhysiologicalBasisofMedicalPractice,13thEdition,Saunders Company, New York.
3. Chaudhri, K, (2016), Concise Medical Physiology,7thEdition, New Central BookAgency(Parentral)Ltd.,Calcutta.
4. Beck, W.S., (1971), Human Design, Harcourt Brace Jovanovich Inc., New York.
5. Guyton, A.C., (1979), Physiology of the Human Body, 5th edition, Saunders College of Publishing, Philadelphia.
6. Subramaniam, S. and MadhavanKutty, K., (1996), The TextBook of Physiology, Orient Longman Ltd., Madras.
7. Chatterjee C.C, (2016), Human Physiology - Volume I, Medical Allied Agency, Kolkata.
8. West, J.B., (2007), Best and Taylor's Physiological Basis of Medical Practice, 13th Edition. Wolters Kluwer Pvt Ltd., India.
9. Boron F WalterandBoulpaep E Emile,(2016), Medical Physiology, 3rd edition, Elsevier, UK.
10. Barret et al., (2019),Ganong'sReveiwof Medical Physiology, 26th edition, McGraw Hill, India.
11. Venkatesh D and Sudhakar HH, (2018), Basics of Medical Physiology, 4th edition, Wolters Kluwer Ltd., India.

E - LEARNING RESOURCES

1. http://epgp.inflibnet.ac.in/Home/Download
2. https://www.freebookcentre.net/medical_books_download/Introductory-Human-Physiology.html
3. https://www.freebookcentre.net/medical_books_download/Applied-physiology.html
4. https://www.topfreebooks.org/human-physiology/
5. https://youtu.be/uFf0zxQ3rBU

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Examinetheroleofcells, tissues and immune system
CO2	Describe the anatomy of the various organ systems in the human body
CO3	Differentiatethemajororgansandthe accessoryorgans
CO4	Relate the functionsofeachorganinthehumansystem
CO5	Comparethehypoandhyperfunctionoftheendocrineglands

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		HUMAN PHYSIOLOGY PRACTICAL				
PART III	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Sem.					
Core Course 4	II	4	4	40	60	100

Learning Objectives:

To enable students to

- Understand the histology of tissues
- Make aware of the structure of various organs
- Learn the procedure for estimation of vital components of blood

1. Histology of Tissues–columnar, cubical, ciliated, squamous, stratified squamous
2. Structure of organs – lungs, artery, vein, stomach, ovary, testis, uterus, pancreas
3. Histology of muscles –cardiac, striated, non– striated
4. Estimation of Haemoglobin
5. Measurement of blood pressure–before and after exercise
6. Determination of respiratory rate and pulse rate–before and after exercise
7. Determination of blood group
8. Identification of Rh factor
9. Determination of bleeding time and clotting time
11. Enumeration of red blood cells –Demonstration
12. Enumeration of white blood cells–Demonstration
13. Differential leucocyte count–Demonstration
14. Visit to a clinical laboratory

REFERENCES

1. Bestand Taylor, (2011), The Physiological Basis of Medical Practice, 13th Edition, Saunders Company.
2. Chaudhri, K., (2016), Concise Medical Physiology, 7th Edition, New Central Book Agency (Parentral) Ltd., Calcutta.
3. Nageswari K Sri, (2018), Practical Workbook of Human Physiology, Jaypee Brothers Medical Publishers, Coimbatore.

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Identify and differentiate the different types of cells and organs
CO2	Describe the histology of muscles
CO3	Distinguish the different blood groups and recognize the Rh factor
CO4	Determine the bleeding and clotting time
CO5	Measure blood pressure and record the respiratory and pulse rate.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		BASICS OF FUNCTIONAL FOODS				
PART IV	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Semester					
*NMEC II	II	2	2	25	75	100

* **NMEC to be offered to other department students**

Learning Objectives:

To enable the students to

- understand the concept of functional foods
- gain knowledge on role of functional food in health promotion
- know about the inclusion of functional foods in daily diet

UNIT I: Classification of Functional Foods

a. Definition, meaning, history, health benefits of functional foods.
b. Types of functional foods-whole foods, fortified foods, enhanced foods.

UNIT II: Prebiotics

a. Definition of prebiotics, recommended intake, sources of prebiotics – inulin, FOS
b. Health benefits of prebiotics.

UNIT III: Probiotics &Synbiotics

a. Definition of probiotics, criteria, sources of probiotics-yoghurt, kefir
b. Health benefits of probiotics; definition of synbiotics

UNITIV:Free Radicals and Antioxidants

a. Free radicals – definition list, formation – exogeneonus and endogenous, ill effects caused by free radicals
b. Antioxidant – definition, types, antioxidant defense mechanism, role of antioxidants in human health

UNITV:Specific Functional Foods for Cancer and Diabetic

a. Anti-cancer foods: Turmeric, honey, garlic, onion, ginger, saffron, cuminseeds, black pepper, tea,cinnamon, cloves.
b. Anti-diabetic foods: Fenugreek, bittergourd, jamun, onion, barley, curry leaves, garlic, soya, cranberry.

TEXTBOOKS

1. Srilakshmi.B, (2008), Nutrition Science, New Age International (P) Limited, India.
2. Subbulakshmi.G, Subhadra.M, (2014), Functional Foods and Nutrition, DayaPublishing House, Astral International PvtLtd, New Delhi, India.
3. Krause, Hunseher, M. A, (2020), Food and Nutrition Therapy, 12th edition, SaundersElseviercompany,London, UK.
4. Swaminathan. M, (2014), Essentials of Food and Nutrition (An Advanced Text Book),Vol I, Bappco, India.
5. Vattem,DhirajA.andVatsalaMaitin, (2016),Functional Foods,Nutraceuticalsand

Natural Products, Concepts and Applications, DEStechPublications,Inc., USA.
6. Boye, Joyce I, (2015), Nutraceutical and Functional Food Processing Technology, Wiley-Blackwell Publishing, NewJersey, USA.
7. Iwu, Maurice M, (2017), Food as Medicine: Functional Food Plants of Africa, CRC Press, US.

REFERENCEBOOKS

1. Michael.Z, (2010), Hand book of Nutrition, Thime Medical and Scientific Publishers Pvt. Ltd, India.
2. Carroll Lutz and Przytulski (2010), Nutrition and Diet Therapy, 5th edition, Jaypee Brothers Medical publishers, New Delhi, India.

E RESOURCES

- https://www.mdpi.com/books/book/3439-functional-foods-and-food-supplements
- https://www.intechopen.com/books/7183
- https://www.researchgate.net/publication/343961783_Functional_Foods_and_Nutraceuticals
- https://www.researchgate.net/publication/284602100_Handbook_of_Nutraceuticals_and_Functional_Foods

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Describe and classify the functional foods
CO2	Explain the sources and enumerate the health benefits of prebiotics
CO3	Differentiate the probiotics and synbiotics and associate their health benefits
CO4	Justify the effects of bioactive compounds and cite the role of functional components and antioxidants
CO5	Summarize the preventive role of functional foods in diseases

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		FUNDAMENTALS OF BAKERY				
PART IV	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Semester					
SEC 1	II	2	2	25	75	100

Learning Objectives:

To enable student to

1. Understand the technique of baking.
2. Know the equipments and ingredients used in baking.
3. Understand the production of baked products.

UNIT I: BAKING

a. History of baking, definition, principle, changes that take place during baking, advantages and disadvantages, classification of baked foods.
b. Factors to be considered for setting up a bakery unit.

UNIT II: EQUIPMENTS

a. Major equipment's – description, types, materials and usage.
b. Minor equipment's - description, types, materials and usage.

UNIT III: INGREDIENTS

a. Major ingredients – types, role and usage.
b. Minor ingredients - types, role and usage.
c. Batter and Dough – definition, types, methods of making batter and dough.

UNIT IV: CAKES

a. Cake preparation – ingredients, methods, types.
b. Faults and remedies.
c. Icing – Definition, types.

UNIT V: BISCUITS

a. Biscuit preparation – ingredients, methods, types.
b. Faults and remedies.

TEXT BOOKS

1. YogambalAshokkumar, (2012), Textbook of Bakery and Confectionery, 2nd edition, PHI, New Delhi.
2. Sivasankar, D., (2007), Food Processing and Preservation, Prentice Hall of India, New Delhi.
3. Dubey, S.C., (2012), Basic Baking, 4th Edition, The Society of Indian Bakers, New Delhi.
4. Bakers, (2008), Handbook on Practical Baking, US Wheat Associates, New Delhi.

REFERENCE BOOKS

1. Dubey.S.C.,(2002), BasicBaking, 4thEdition, Publishedbythe SocietyofIndianBakers, NewDelhi.
2. JohnKingslee,(2006),A ProfessionalText booktoBakeryandConfectionary. NewAge InternationalPvtLtd,NewDelhi.
3. Nicolello, I. and Foote, R., (2000), Complete Confectionary Techniques, Hodder and Solution,London.
4. Sarah R. Lebensky, Pricilla et al., (2004), Textbook of Baking and Pastry, Fundamentals,3rd edition, Pearson EducationLtd, USA.
5. The Culinary Institute of America, Baking & Pastry: Mastering the Art and Craft, (2009), JohnWiley& Sons,IncNew Jersey.
6. UttamKSingh,(2011), TheoryofBakeryandConfectionary-AnOperational Approach, KanishkaPublishers andDistributors, NewDelhi.

E Resources

- https://www.youtube.com/watch?v=dfvkplBBO2g
- https://www.lifestyleasia.com/ind/food-drink/dining/bookmark-the-best-baking-youtube-channels-to-bake-like-a-pro/
- https://www.ihmnotes.in/assets/Docs/Sem-6/FOOD%20PRODUCTION%20OPERATIONS/Ch-2%20BAKERY%20AND%20CONFECTIONERY.pdf
- https://www.sciencedirect.com/topics/food-science/fondant
- https://www.thespruceeats.com/breads-4162750
- https://www.thespruceeats.com/cakes-4162783

On completion of this course, students will be able to

COs	Course Outcomes
CO1	Enumerate the principles of baking and classification of baked products
CO2	Cite theroleofingredientsinbakedproducts
CO3	Differentiate the major and minor equipment
CO4	Prepare different types of baked products
CO5	Appraise the faultsin baked products

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

SECOND YEAR-SEMESTER III

Title of the Course		PRINCIPLES OF NUTRITION				
PART III	Year	Credits	Hours	Marks		
	II			CIA	External	Total
	Semester					
Core course 5	III	4	4	25	75	100

Learning Objectives

To enable the students to:

- Understand the significance of nutrients in health.
- Gain knowledge in the functions, requirement and deficiency conditions pertaining to various nutrients.
- Know the significance of energy expenditure and water homeostasis.

UNIT-I

Science of Nutrition, Concept of Nutrition- Definition of nutrition, health, nutritional status and malnutrition. RDA- Definition, factors affecting RDA and methods used for deriving RDA.

Carbohydrates- Definition ,composition, functions, maintenance of blood sugar levels, requirement, sources, digestion and absorption; Dietary fiber- Definition, classification, physiological effects and sources.

UNIT-II

Proteins- Definition, composition, nutritional classification of proteins and amino acids, functions, sources, requirements, digestion and absorption. Evaluation of protein quality:PER, BV, NPU and Chemical score.

Lipids- Definition, composition, functions, sources, requirements, digestion and absorption. Essential fatty acids – Definition, functions, sources and effects of deficiency.

UNIT -III

Energy- Definition, units of measurement, direct and indirect calorimetry; Determination of energy value of food, Total Energy requirement, Factors affecting physical activity, Factors affecting basal metabolic rate, factors affecting thermic effect of food, Recommended Dietary Allowances and Sources

UNIT-IV

Macro Minerals- Calcium and Phosphorous: Functions, requirements, sources and effects of deficiency. Micro minerals- Iron, Iodine, Copper, Fluorine and Zinc: Functions, sources, requirements and effects of deficiency. Sodium and Potassium : Functions, sources, requirements and effects of imbalances.

UNIT-V

Fat soluble Vitamins – Vitamin A, D, E and K: Functions, requirements, sources and effects of deficiency. Water Soluble Vitamins –Thiamine, riboflavin, niacin, ascorbic acid, folic acid, vitamin B6 and vitamin B12: Functions, requirements, sources and effects of deficiency.

TEXT BOOKS

1. Sumathi R. Mudambi, Rajagopal, M.V., Fundametals of Foods and Nutrition,NewAgeInternational(P)Ltd,Publishers,Thirdedition, 1997.
2. Srilakshmi B.,Nutrition Science, New Age International (P) Ltd,Publishers,Fifth,multicolouredition,2016.
3. Mangala Kango, Normal Nutrition, Curing diseases through diet, CBS Publications, First edition, 2005.
4. Sue Rodwell Williams, Nutrition and Diet Therapy, C.V. Melskey Co.,6th edition, 2000.
5. Mahtab. S.Bamji, Kamala Krishnaswamy and G.N.V Brahmam, Text Book of Human Nutrition, Oxford and IBH Publishing Company, Third Edition.2009.

REFERENCES:

1. Eastwood M (2013), Principles of Human Nutrition, Wiley Publishing, USA.
2. Raheena Begum M (2009), Textbook of Foods, Nutrition and Dietetics, Sterling Publishers, NewDelhi.
3. William, S.R. (1985), Nutrition and Diet Therapy (5thed), Mosbey Co., St. Louis.
4. Maurice E. Shils, James A. Olson, Moshe Shike (1994), Modern Nutrition in health anddisease.Vol. I & II (8thed) , Febiger Philadelphia. A Waverly Company.
5. Anderson J. J. B., Root M. M., Garner S. C. (2015), Human Nutrition: Healthy Optionsfor Life,Jones & Bartlett Learning, Massachusetts, USA.
6. Mahan K and Sylvia E. Stump (2000), Krause‟s Food

Nutrition and Diet Therapy,W.B.Saunders, U.S.A.

7. Medeiros D. M., and Wildman R. E. C. (2019), Advanced Human Nutrition, 4th Ed., Jones & Bartlett Learning, Massachusetts, USA.
8. Swaminathan M (1993), Principles of Nutrition and Dietetics, Bappco, Bangalore.
9. Ross A. C., Caballero B., Cousins R. J., Tucker K. L., Ziegler T. R. (2014), Modern Nutrition in Health and Disease, 11th Ed., Wolters Kluwer, Lippincott Williams & Wilkins, Philadelphia, U.S.A.

e-learning resources:

- http://www.merck.com/mmhe/seciz/ch155/ch155a.html
- http://www.whereincity/medical/vitamins
- https://www.anme.com.mx/libros/Principles%20of%20Human%20Nutrition.pdf
- https://egyankosh.ac.in/bitstream/123456789/333
- https://open.umn.edu/opentextbooks/textbooks/622
- https://www.hairscientists.org/wp content/uploads/2013/06/1405168072%2BNutritionA.pdf

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Illustrate the types, sources and requirements of macro and micro nutrients
CO2	Assessing the nutritional status of individuals and groups and ascertain their wellbeing
CO3	Explain the functions and utilisation of macro and micro nutrients in human physiology
CO4	Analyze the nutrients present in food, deficiency in human health
CO5	Enumerate the significance of energy expenditure and water balance in health

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		NUTRIENT ANALYSIS PRACTICAL				
PART III	Year	Credits	Hours	Marks		
	II			CIA	External	Total
	Semester					
Core course 6	III	4	3	40	60	100

Learning Objectives

To enable the students to:

- Understand the fundamental laboratory skills for performing food analytical experiments
- Examine and interpret the observations of the experimental results pertaining to food analysis

1. Determination of moisture.
2. Determination of fibre.
3. Determination of ash.
4. Estimation of Iron.
5. Estimation of phosphorus.
6. Estimation of calcium.
7. Estimation of Vitamin C.
8. Estimation of Iodine value.
9. Estimation of protein by Lowry's method.
10. Estimation of Specific gravity of milk using lactometer
11. Determination of pectin content of food.
12. Determination of gluten of food.
13. Demonstration of kjeldahl and soxhlet method
14. Visit to food analytical lab.

REFERENCES

1. Sadasivam and Manickyam, *Biochemical Methods*, New Age International Publications, New Delhi, 1996.
2. Hawk PB, Oser BL and Summerson WH (1954). Practical Physiological

Chemistry, Mcgraw Hill, New York.
3. Sundararaj P and Siddhu A (2006). Qualitative Tests and Quantitative Procedures in Biochemistry. Elite Publishing House Pvt. Ltd., New Delhi.
4. Geetha Swaminathan and Mary George S. (2010) Laboratory Chemical Methods in Food Analysis, Margham Publications, 3rd edition.

. ***On completion of this course, students will be able to***

CO	Course Outcomes
CO1	Fundamental knowledge and practical skills in handling laboratory equipment related to nutrient analysis.
CO2	Explain the principles related to the analysis of nutrient .
CO3	Examine and analyze the different components present in the food samples
CO4	Apply the acquired laboratory skills in assessing food components present in different processing .
CO5	To compile the obtained results and apply the outcome in a food industrial sector

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		NUTRITIONAL BIOCHEMISTRY				
PART III	Year	Credits	Hours	Marks		
	II			CIA	External	Total
	Semester					
Allied 5	III	3	3	25	75	100

Learning Objectives

To enable the students to:

- Understand the basic concepts of metabolism of proximate principles
- Learn the metabolic pathways of nutritional significance
- Get acquainted with the role of enzymes and coenzymes in metabolism
- Gain familiarity with current concepts such as xenobiotics, nutrigenomics.

UNIT-I

Biological oxidation and Enzymes

Definition of Biochemistry and its relation to nutrition. Biological oxidation, Electron transport chain and OxidativePhosphorylation.

Enzymes – Definition, Types, Mechanism ofaction, Factors affecting enzyme activity, Coenzyme, Role of B vitamin ascoenzymes.

Free radicals – Definition, Formation in biological systems.Antioxidants – definition, Role of antioxidants in the prevention of degenerative disorders

UNIT-II

Metabolism of Carbohydrates

Classification, General reactions of mono, di, tri and oligosaccharides.

Glycolysis, The Citric Acid Cycle,

Gluconeogenesis, The Hexose MonophosphateShunt and bioenergetics.

UNIT-III

Metabolism of Protein

Classification of amino acids, Chemical properties due to amino and carboxyl groups, Oxidative Deamination, decarboxylation,transamination and transmethylation of amino acids, urea cycle. Classification of proteins. Protein biosynthesis.

UNIT-IV

Metabolism of Lipids

Classification of fatty acid, Biosynthesis of fatty acids, beta-oxidation of saturated fatty acids, ketone bodies. Essential fattyacids – types and functions. Lipoproteins – classification and function.

UNIT-V

Integration of Metabolism of Macronutrients, Nucleic Acid &Recent Concepts

Integration of metabolism of carbohydrates, protein and lipid.
Hormonal regulation of carbohydrate, protein and fat metabolism.Structural components and functions of nucleic acid, Structure of DNA,RNA types and functions.
Recombinant DNAtechnology, Xenobiotics, Nutrigenomics (Concept in brief)

TEXT BOOKS

1. Pattabiraman.T.N.ConciseTextBookofBio-chemistry,2ndedition, All India Publishers and Distributors , 1998.
2. Deb.A.C.,FundamentalofBiochemistry,NewCentruyBookAgency (P)Ltd,Reprint2004.
3. AmbikaShanmugam,FundamentalsofbiochemistryforMedicalstudents,Karthik printers,7thedition,1992.
4. U.SathyanarayanaandU.Chakrabani,Biochemistry,ThirdEdition, Uppala- Author Publishers, 2007.

REFERENCES

1. Albanese, A. (Ed.). (2012). Newer methods of nutritional biochemistryV3: Withapplications and interpretations. Elsevier.
2. Bettelheim, F. A., Brown, W. H., Campbell, M. K., & Farrell, S. O. (2009). General,Organic & Biochemistry. Brooks/Cole Cengage Learning.
3. Champe, P. C., Harvey, R. A., & Ferrier, D. R. (2005). Biochemistry. LippincottWilliams & Wilkins, 6th Edition, Wolters Kluwer, London.
4. Chatterjea M.N. and Shinde R.,2016 -Textbook of Medical Biochemistry, 8th edition –Jaypee Brothers Medical Publishers (P) Ltd. New Delhi.
5. David L.N. and Cox M.M., 2017 – Lehninger Principles of Biochemistry, 7th edition - W. H.Freeman & Co Ltd.
6. Harbans Lal, 2017 - Essentials of Biochemistry for BSc Nursing Students – CBS Publishers& Distributors Pvt. Ltd., New Delhi.
7. Harvey, R. and Ferrier, D., Lippincott‟s Illustrated Reviews: Biochemistry, 6th edition,Lippincott Williams and Wilkins, Philadelphia.

8. Lieberman, M., & Ricer, R. E. (2009). Lippincott's Illustrated Q&AReview ofBiochemistry. Lippincott Williams & Wilkins.
9. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2000): 25th Ed. HarpersBiochemistry.Macmillan worth publishers.
10. Sathyanarayana U and Chakrapani U, 2016 – Biochemistry, 4th Revised Edition – Elsevier(New Delhi) and Books and Allied (p) Ltd., Kolkata.
11. Shanmugham Ambika (1985) Fundamentals of bio-chemistry to medicalstudents. NVABharat Printers, and traders 56, Peters Road, Madras-86.

E-LEARNING RESOURCES:

- https://www.udemy.com/share/1027yA/
- https://www.classcentral.com/course/swayam-biochemistry-5229
- https://www.classcentral.com/course/edx-biochemistry-biomolecules-methods-and-mechanisms-12585
- https://www.classcentral.com/course/swayam-experimental-biochemistry-12909
- https://youtu.be/y6YGZfcAegw

. ***On completion of this course, students will be able to***

CO	Course Outcomes
CO1	Describe the role of enzymes and co-enzymes in metabolic pathways.
CO2	Explain the metabolism and regulation of carbohydrates, lipids and proteins
CO3	Analyze the integration of carbohydrate, lipid and protein metabolism
CO4	Comprehend the significance of recent biochemical concepts namely xenobiotics, recombinant DNA technology and Nutrigenomics.
CO5	Discuss the structure and functions of nucleic acids.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		NUTRITIONAL BIOCHEMISTRY PRACTICAL				
PART III	Year	Credits	Hours	Marks		
	II			CIA	External	Total
	Semester					
Allied 6	III	2	3	40	60	100

Learning Objectives

To enable the students to:

- Understand the principle in the estimation of nutrients and metabolites using various analyticaltechniques
- Acquire analytical skills required for nutrition and clinical biochemistry research.

1. Qualitative analysis of carbohydrate-glucose, fructose, lactose and maltose.
2. Qualitative analysis of amino acids- methionine, tryptophan and tyrosine.
3. Determination of pH
4. Preparation of buffer
5. Estimation of urinary phosphorus
6. Estimation of urinary urea
7. Estimation of serum protein
8. Estimation of blood iron
9. Estimation of blood glucose
10. Visit to a clinical biochemistry lab.

REFERENCES:

1. Oser,D.l.(1979) Hawk‟s Physiological Chemistry. Tata- McGraw Hill PublishingCo.,NewDelhi
2. Plummer, D.T. (1987) Introduction to Practical Biochemistry. Tata- McGraw Hill Publishing Co.,New Delhi
3. Raghuramulu,N., Nair,K.M. and Kalyanasundaram,S.(1983) A Manual of Laboratory
4. Sharma, B.K. (1999). 8thEd. Instrumental Methods of Chemical Analysis.GelPublishing House.
5. Srivastava, A.K and Jain, P.C. (1986). 2nd, Ed.Chemical Analysis: An InstrumentalApproach. S Chand and Company Ltd.Techniques. NIN, Hyderabad
6. Varley, H.; Gowenlock, A.H. and Bell, M. (1980). 5thed. PracticalClinicalBiochemistry. Heinemann Medical Books Ltd.
7. Winton, A.L. and Winton, K.B. (1999). Techniques of Food Analysis. AlliedScientific

e-learning resources:

- http://www.merck.com/mmhe/seciz/ch155/ch155a.html
- http://www.whereincity/medical/vitamins

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Describe the principle and procedures for analysis of specific nutrients and metabolites
CO2	Identify appropriate laboratory procedures suited for estimation of select nutrients infood and body fluids
CO3	Estimate select nutrients in food and metabolites in serum
CO4	Compare the results with standard values and interpret the findings
CO5	Acquire clinical biochemistry laboratory skills

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		ENTREPRENEURSHIP MANAGEMENT				
PART IV	Year	Credits	Hours	Marks		
	II			CIA	External	Total
	Semester					
SEC 2	III	1	2	25	75	100

Learning Objectives

To enable the students to:

- Initiate entrepreneurial motive and impart skills and capabilities for entrepreneurship
- Comprehend nuances of entrepreneurship
- Gain knowledge on Governmental plans and programs

UNIT-I.

Concept of Entrepreneurship

Conceptual - meaning, definition and scope of entrepreneurship Entrepreneur-meaning ,qualities, functions and types of entrepreneur Enterprise – Definition, nature and classification. Forms of Organization–Sole proprietorship, partnership, Joint Stock Company Role of entrepreneur in economic development

Visit to enterprises to observe the qualities of entrepreneurs

UNIT-II

Establishing a Small Scale Enterprise

ConceptandClassification–Productidentificationandproductselection Infrastructure – Plant Location, Land, building, water and power

6MS–Manpower, method, machine, material, marketing, mother nature Preparation of case studies of successful entrepreneur

UNIT-III

Institutional Support

Commercial Bank, Central level SSIB–

Small scale Industries Board

NSIC – National Small Industries Corporation, SIDO–Small Industries Development Organization, KVIC – Khadi and Village Industries Commission NIESBUD– National Institute for Entrepreneurship and Small Business DevelopmentNABARD – National Bank for Agricultural and Rural Development State Level

DIC – District Industrial Center, SFC–State Finance Corporations

SSIDC – State Industrial Development Corporation, SIDBI–Small Scale Industrial Development of India SISI – Small Industries Service Institutes
ICICI–Industrial Credit Investment Corporation of India

Visit to financial and supportive Institution to understand or observe the inaction modalities

UNIT-IV

Project Formulation

Meaning and definition of project
Project formulation techniques– Quantifiable and Non quantifiable projects, Sect oral project, Techno economic project, Project report and preparation of project report Project appraisal–market feasibility, technical feasibility, financial and economic feasibility

Carryout market survey

UNIT-V

Accounting for Small Enterprises

Meaning, need and objectives of accounting
Process of Accounting, Book Keeping, Journal, Ledger and Balance Sheet, Final Accounts
Auditing–nature and types
Preparation of model project, proposal and report

TEXT BOOKS

1. Anilkumar,S. PoornimaS.C MiniK.Abraham and Jayashree,K.(2012). Entrepreneurship Development. NewDelhi: NewAgeInternationalPvt.Ltd.,
2. Badi,R.V.andBadiN.V.(2011),Entrepreneurship.NewDelhi:VrindaPublications Pvt. Limited

REFERENCES

1. B. Jankiraman, P.V. Raveendra, V.K. Srirama (2010). Role and Challenges ofEntrepreneurship Development, Excel Books Publishers
2. Dr.Jayshree Suresh (2012) Entrepreneurial Development, Margham Publications
3. S S Khanka (2011) Entrepreneurial development, S Chand, and company

4. Sunil Gupta, (2018), Small-Scale Industries and Entrepreneurship, ABD Publishers
5. T N Chhabra (2019), Entrepreneurship Development, Sun India Publications
6. Taneja, S. and Gupta, S.L. (1992). Entrepreneurship Development, New VentureCreation, Galgotia Publishing Company, New Delhi.

E-LEARNING RESOURCES

- http://www.simplynotes.in/e-notes/mbabba/entrepreneurship-development/
- https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_Entrepreneurial_Development_NOTES.pdf
- https://ncert.nic.in/ncerts/l/lebs213.pdf
- https://www.researchgate.net/publication/344413560_Small_Scale_Industries_in_Entrepren eurship_Development_of_India_References

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Understand the concept of entrepreneurship, entrepreneur and enterprise
CO2	Identify ways to approach supportive Institutions and Banks for starting an enterprise
CO3	Analyze the steps in product selection and form of ownership
CO4	Focus on the formation of project proposal
CO5	Practice effective accounting processes

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		BAKERY AND CONFECTIONERY PRACTICAL				
PART IV	Year	Credits	Hours	Marks		
	II			CIA	External	Total
	Semester					
SEC 3	III	2	2	40	60	100

Learning Objectives

To enable the students to:

- Introduce the students to the basic concepts and principles of baking and confectionery products and hone the practical skills
- Students to appreciate and evolve new formulations with novel ingredients in baking and confectionery sectors.

1. Determination of dough raising capacity of the dough
2. Preparation of gluten-free baked product
3. Preparation of cakes(any three methods)
4. Preparation of cookies cakes(any three)
5. Preparation of biscuits(any types)
6. Preparation of icing(any three design)
7. Preparation of puff (veg.and non veg.)
8. Preparation of toffees
9. Preparation of fudge
10. Preparation of fondant
11. Preparation of chocolate.
12. Visit or baking and confectionery unit.

TEXT BOOKS

1. Lees and Jackson **(1994)** Sugar Confectionery and Chocolate Manufacture by, 1st Ed. London: Chapman & Hall,1973, Reprinted
2. Justin J. Alikonis. Candy Technology **(1979)** AVI publishing company, Inc., Westport, Connecticut
3. Dubey SC **(2002)** Basic Baking. The Society of Indian Bakers, New Delhi.
4. Manley D **(2000)** Technology of Biscuits, Crackers & Cookies, 2nd Ed.CRC Press.

REFERENCES

1. John Kingslee **(2006)—**A professional Text to bakery and confectionary‖, New Age International
2. Jefffrey Hamelman **(2004) —**Bread: A baker's book of techniques and recipes‖ , John Wiley and Sons
3. Samuel.A. Matz **(1997) —**Bakery Technology and Engineering‖, Chapman & Hall, 3rd Edition,CBS Publishers
4. Francis FJ **(2000) —**Wiley Encyclopaedia of Food Science & Technology‖, John Wiley & Sons.

Web resources:

1. https://guides.baker.edu/
2. https://www.joyofbaking.com/
3. https://www.candyindustry.com/

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Understand the concept of baking and confectionery products
CO2	Develop skill in handling baking equipment
CO3	Analyze the steps in product selection and form of new product
CO4	Enhance entrepneurial skill confectionery
CO5	Develop skills for setting up bakery unit

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		NUTRITION THROUGH LIFE CYCLE				
PART III	Year	Credits	Hours	Marks		
	II			CIA	External	Total
	Semester					
Core Course 7	IV	4	4	25	75	100

Learning Objectives

To enable the students to:

- Understand the role of nutrition in the growth and development of individuals
- Comprehend the basic aspects and importance of meal planning
- Obtain knowledge on the nutritional needs pertaining to different stages of life
- Acquire skills to plan meals for various groups, activities and socio-economic levels.

UNIT-I

Introduction to meal planning - Balanced diet, RDA, factors influencing nutritional requirements for all age groups, food allowance for different age groups, principles of meal planning – steps involvedin planning a diet.

Nutrition for Adult – Nutrition and food requirements, planning balanced diets for adult men and women, nutrition related problems.

UNIT-II

Nutrition during pregnancy - stages of pregnancy, physiological changes, weight gain in pregnancy, complications, factors influencing the outcome of pregnancy, nutrition and food requirements and meal planning for pregnant women.

Nutrition during lactation- Physiology of lactation, hormonal control, colostrum - composition, composition of breast milk, factors affecting the volume and composition of breast milk, nutrition and food requirements of a nursing mother, meal planning, factors responsiblefor lactation failure. World Alliance for Breast feeding Action (WABA), Expressed Breast Milk (EBM), breast milk pump, human breastmilk bank.

UNIT-III

Nutrition during infancy- Growth and Development, immunization schedule, nutritional requirements, process of breast feeding, superiority of breast milk, advantages of breast feeding, comparison ofhuman milk with cow‟s milk, artificial feeding, weaning, supplementary foods- types, weaning problems and complications. Characteristics of low-birth weight infant, small for date babies, pre-term babies-Feeding of preterm infants and the challenges.

UNIT-IV

Nutrition for preschool children- Growth and development, food and nutritional requirements, low cost supplementary foods, factors affecting nutritional status,

nutrition related problems- Protein Energy Malnutriton, Vitamin A Deficiency and their dietary interventions.

Nutrition for school children- Growth pattern, nutritional and food requirement, importance of healthy snacks, factors affecting eating habits, packed lunch - factors to be considered, nutritional problems, meal plan for the school children.

UNIT-V

Nutrition during adolescence- Growth and development, nutritional requirements, nutritional problems - obesity, underweight, anaemia, food habits and meal plan. Eating disorders-Binge eating, anorexianervosa, bulimia nervosa.

Nutrition for old age- Definition of geriatrics, changes in body composition, physiological changes, psychological and socio- economic factors in relation to food intake, nutritional requirement, food modification in old age. Nutrition related problems.

TEXT BOOKS

1. Robinson, Normal and therapeutic nutrition.: Macmillan Pub. Company New York , 2006.
2. SumatiR.Mudambi,M.V.Rajagopal.,Fundamentaloffood,nutrition and diet therapy. New age international publishers, New Delhi, 2015.
3. Srilakshmi B., Dietetics, New age international publishers, New Delhi, 2014.

REFERENCES

1. Abraham S, (2016), Nutrition through Life Cycle1st edition, New Age International publishers,New Delhi.
2. Antia, F.P. (2005), Clinical Nutrition and Dietetics, Oxford University Press, Delhi.
3. Chadha, R. and Mathur, P., (2015), Nutrition: A Lifecycle Approach, Orient Blackswan, NewDelhi.
4. Gopalan, C. Rama Sastri, B.V. and Balasubramanian, (2014), Nutritive Value of Indian Foods,NIN, ICMR, Hyderabad.
5. Krause, M.V. and Hunscher, M.A., (2000), Food, Nutrition and Diet Therapy, 14 th Edition,W.B. Saunders, London.
6. Krishnasamy, K. and Sesikeran, B., (2013), Dietary Guidelines for Indians, National Institute ofNutrition, ICMR, Hyderabad.
7. Longvah, T., Ananthan, R., Baskarachary, K. and Venkaiah, K., (2017), Indian Food Composition Table, NIN, ICMR, Hyderabad.
8. Mahtab, S., Bamji, Krishnasamy, K., Brahmam, G.N.V., (2012), Text Book of Human Nutrition,Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.
9. Shubhangini, A., Joshi (2002), Nutrition and Dietetics, 2nd edition, Tata McGraw- Hill Publishing Company Limited, New Delhi.
10. Srilakshmi, B., (2013), Dietetics, New Age International (P) Ltd., New Delhi.

11. Stacy N, William‟s Basic Nutrition and Diet Therapy (2005), 12th edition, Elseivierpublications, United Kingdom.
12. Swaminathan, M., (2012), Advanced Textbook on Food and Nutrition, Vol. 1, SecondEdition,Bangalore Printing and Publishing Co. Ltd., Bangalore.
13. Wardlaw, G.M., Hampi, J.S., Di Silvestro, R.A., (2004), Perspectives in Nutrition, 6thedition,McGraw Hill, New York.
14. Whitney E N and Rolfes S R, (2002), Understanding Nutrition 9th edition,West/Wordsworth,London.

E-LEARNING RESOURCES

- https://ujlink.uj.ac.za/
- www.worldcat.org
- www.nal.usda.gov/legacy/fnic/life-stage-nutrition
- https://motherchildnutrition.org/india/complementary-feeding-guidelines.html
- https://open.umn.edu/opentextbooks/textbooks/622

https://pressbooks.bccampus.ca/nutr1100/front-matter/acknowledgements-2

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Relate the different stages of growth and the corresponding nutritional requirements inthe human life cycle.
CO2	Compare the Recommended Dietary Allowance for different age groups based on genderand activity and contemplate the variations.
CO3	Illustrate the food and nutritional requirements for specific groups of people based ontheir age and food habits.
CO4	Explain the nutrition related problems common in different stages of life cycle and itsimpact on health.
CO5	Plan appropriate meals based on scientific parameters and balance them quantitativelyand qualitatively.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		NUTRITION THROUGH LIFE CYCLE PRACTICAL				
PART III	Year	Credits	Hours	Marks		
	II			CIA	External	Total
	Semester					
Core Course 8	IV	4	3	40	60	100

Learning Objectives

To enable the students to:

- Nutrition in life cycle focuses on food management through proper planning, preparation, monitoring, implementation and supervision of different age groups and to develop basic counseling skills as dietitian.

1. Display raw and cooked food materials according to exchange lists given below. Record their nutritive value. Milk exchange list, Meat exchange list, Pulse exchange list, Cereal exchange list, Vegetable-A exchange list, Vegetable-B exchange list, Fruit exchange list and Fat exchange list.
2. Planning, preparing and serving a meal for low income family, middle income family and high income family.
3. Planning, preparing and serving a meal for a pregnant woman in first second and third trimesters.
4. Planning, preparing and serving a meal for a lactating woman (0-6 months and 6-12 months).
5. Planning, preparing and serving a meal for an infant.
6. Planning and preparing an indigenous weaning mixes.
7. Planning, preparing and serving a meal for a preschooler.
8. Planning, preparing and serving a meal for a school going child (a boy and a girl).
9. Planning, preparing and serving a meal for an adolescent.

10. Planning and preparation of any five packed lunches.
11. Planning, preparing and serving a meal for an adult (sedentary, moderate and heavy worker).
12. Planning, preparing and serving a meal for an old age person.

REFERENCES

1. Srilakshmi, B. Dietetics ,New Age International P. Ltd., New Delhi, 2018.
2. Dietary Guidelines of Indians - A Manual, National Institute of Nutrition, Hyderabad, 2015.
3. Dietary Guidelines of Indians - A Manual, National Institute of Nutrition, Hyderabad, 2011

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Relate the different stages of growth and the corresponding nutritional requirements inthe human life cycle.
CO2	Compare the Recommended Dietary Allowance for different age groups based on genderand activity and contemplate the variations.
CO3	Illustrate the food and nutritional requirements for specific groups of people based ontheir age and food habits.
CO4	Explain the nutrition related problems common in different stages of life cycle and itsimpact on health.
CO5	Plan appropriate meals based on scientific parameters and balance them quantitativelyand qualitatively.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		HOME SCIENCE				
PART III	Year	Credits	Hours	Marks		
	II			CIA	External	Total
	Semester					
Allied 7	IV	3	3	25	75	100

Learning Objectives

To enable the students to:

- Demonstrate systematic, extensive and coherent knowledge as well as skills, attitude and values in the core areas of Home Science
- Acquaint learners with the basics of human development with specific reference to self and child.
- Understand the principles of family resource management.

UNIT-I

Textile – Definition, Terminology and Classification of textile fibers. Basic unit and Polymer bonds in textile fiber, Physical and Chemical Properties of fibers.
Processing of Manufacture of all Natural and Man-Made Fibers – Plant, Protein, Man-Made, Cellulosic, Synthetic, Metallic, Mineral and Elastomeric Fibers.

UNIT II

Clothing : Origin of Clothing , Principles of Clothing, Clothing Construction – Drafting flat pattern and Dapping.
Textile Designing, Fashion Designing – Influence Factors, Fashion Cycle, Broken fashion cycles, Fashion adoption theories and Business and Merchandizing.

UNIT III

Home Management : Definition, Characteristic of Management , Importance of Home Management, Motivation Factors of Management (Values, Goals, Standards) , Home Management Process

UNIT IV

Family Resource Management: Types and Characteristics of Family Resource. Family Decision Making – Definition and Types of Decision Making. Housing – Definition, Importance and Functions of a House , Principles of Planning, Space Allocation and Organization in Independent Houses, Apartments and Flats. Symbols used in Drafting Plans, Reading Plans and Blueprint.

UNIT V

Interior Design: Definition, Principles and Classification. Household Equipments Colors – Definition , Classification, Factors Influencing Choice of Colors Furniture and Lighting – Definition and Types.

TEXT BOOKS

1. Sunita Mishra (2018), Selective and Scientific Books,New Delhi.

2. Bhargava, B. (2001).Family Resource Management and Interior Decoration, Delhi: University Book House. Bhargava, B. (2001).

3. Housing and Space Management. Jaipur: University Book House Ltd.

4. Seetharaman, P., Batra, S., &Mehra, P. (2005). An Introduction to Family Resource Management. New Delhi: CBS Publishers &Distributors (ISBN 13: 9788123911861)

5. Shukul, M., and Gandotra,V . (2006). Home Management and Family Finance. New Delhi: Dominant Publishers and Distributors.(ISBN No. 81-7888-403-8

REFERENCES

1. Premalatha Mullick, A textbook of Home Science, Ludhiana, Kalyani Publishers, 2004.
2. Shubangini Joshi, Nutrition ϖ & Dietetics, New Delhi, Tata Mc Graw Hill Publishing Company Ltd, 2004.
3. Stella Soundarajan, A textbook of Household Arts, Madras, Orient Longman, ϖ 1989.
4. Varghese, Home Management, New Delhi, Wiley Eastern Limited, 1992.
5. Booth, J.E. (1996). *Principles of Textile Testing.* New Delhi: CBS Publishers & Distributors Pvt. Ltd.
6. Corbman, P.B. (1983). *Textiles: Fibre to Fabric*. McGraw-Hill Publishers.
7. Collier, B.J., & Epps, H.H. (1998). *Textile testing and analysis.* Prentice Hall Publishers.
8. Dantyagi, S. (1996).*Fundamentals of Textiles and their Care*. India: Orient

Black swan Private Limited.
9. D'Souza, N. (2014).*Fabric Care*. New Delhi: New Age International Publishers.
10. Greaves,P.H., Saville, B. P. (1995).*Microscopy of textile fibres.*bios Scientific Publishers Gohl,
11. Kallal, Mary Jo, (1985), Clothing Construction, Mc Millan Publishing Company, New York.
12. Norma Hollen, Jane Saddler, Anna L. Langford & Sara, J.,(1988) Textiles 6th ed., Macmillan Publication, New York

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Develop an understanding of concepts and basics of textiles.
CO2	Understands and define the key textile terms.
CO3	Understand basic principles of clothing construction
CO4	Concept, definition, universality and scope of family resource management.
CO5	Practicing knowledge gained on selection of site and building principles in real life situations.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		HOME SCIENCE PRACTICAL				
PART III	Year	Credits	Hours	Marks		
	II			CIA	External	Total
	Semester					
Allied 8	IV	2	3	40	60	100

Learning Objectives

To enable the students to:

- Orientated them with the educational and vocational scope of Home Science and the need to practice/develop entrepreneurship;

1. To prepare first aid kit.
2. Preparation budget for low, middle and high income group family
3. Learning to fill different bank forms- Fill form to withdraw and deposit money, Open account in bank, Recurring deposit.
4. Drawing house plans for low, middle and high income groups.
5. Drawing kitchen layout for different families with plumbing and wiring.
6. Preparation of an album on development milestones of children.
7. Market study on –Cost of different types of furniture's
8. Designing greeting cards for different occasion (any five occasions).
9. Table setting-Fruit and vegetable carving.
10. 10.To identify various types of fibres using- burning test and visual inspection.
11. .Basic stitches.
12. Use of waste material for making decorative and utility materials.
13. Paper cutting for decorating a house for special occasions.
14. Prepare one poster/chart on environmental/personal hygiene and sanitation.
15. Preparation and evaluation of label- Evaluation of label on different type of food products, Prepare label.
16. Methods of strain removal.
17. Methods of soap and detergent preparation.

18. Kitchen gardens-use the waste container(any four greens).
19. To prepare simple dishes using different germination methods (any five food).

REFERENCS

1. Seema Sekhri, (2011). Textbook of Fabric Science, Fundamentals to finishing, PHI Learning Private limited, New Delhi.
2. Cream, Penelope.,(1996), The Complete Book of Sewing - A Practical Step by Step Guide to Sewing Techniques, DK Publishing Book, New York ,
3. Premalatha Mullick, A textbook of Home Science, Ludhiana, Kalyani Publishers, 2004.

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Develop an understanding of concepts and basics of house
CO2	Understands and define the key carving terms.
CO3	Understand basic principles of clothing construction
CO4	Acquire conceptual knowledge of elements and principles of design
CO5	Practicing knowledge of germination process

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		FOOD PRODUCT DEVELOPMENT				
PART IV	Year	Credits	Hours	Marks		
	II			CIA	External	Total
	Semester					
SEC 4	IV	2	2	25	75	100

Learning Objectives

To enable the students to:

- Understand the concept of development of a new product
- Discuss the preparation of new products based on special dietary requirements, functionality, convenience
- Employ novel methods to enhance traditional Indian foods.

UNIT-I

Introduction to New food products & food product development

Concepts, definitions & characteristics. Factors to consider for food product development (external and internal factors)

Types of new food products- Line extensions, new-to-world products, innovative/creative products, existing products- repositioned, reformulated, new form, new size, and new package.

UNIT-II

Stages in food product development Idea generation

Internal & external sources; Screening - Course Objectives and criterion; Development of product prototype- market research, concept testing approaches, product formulation and specification, product optimization, process development & optimization, product attributes, scale up requirements; Product prototype testing - consumer testing, packaging testing, shelf life testing, product integrity and conformance to standards; Marketing plans - price structure, place & distribution system, promotional program, market positioning, test marketing,results evaluation

UNIT-III

Concepts in sensory evaluation of foods

Sensory attributes of foods: Chemical senses (olfactory and gustatory);physical, kinesthetic and tactile senses (appearance, color, texture, & overall taste).

Score card development. Role of sensory analysis in product development& quality control.

UNIT-IV

Subjective evaluation methods

Definition, advantages, and disadvantages. Subjective tests: Analytical tests (sensitivity tests, difference tests, ranking tests), descriptive tests, and consumer/ preference tests.

UNIT-V

Objective and instrumental evaluation methods

Objective methods for appearance, size, shape, volume, specific gravity,refractive index, moisture, fat, and others. Instrumental methods for evaluation of color, viscosity, texture & aroma.

TEXT BOOKS

1. Carpenter Lyon & Hasdell, ―Guidelines for Sensory Analysis in Food Product Development and Quality Control‖, Springer, 2000
2. Earle, M. D., Earle, R. L., & Anderson, A. M. (2001). Food product development. Boca Raton, Fla: CRC Press.
3. Gordon L Robertson. 2006. Food Packaging: Principles and Practice. 2nd Ed. CRC Press
4. Harper J.M. Extrusion of Foods. Vol. 1 & 2 (1991) CRC Press, Inc.) Boca Raton, Aorida
5. Naik, H.R., & Amin, T. (2021). Food Processing and Preservation (1st ed.). CRC Press. https://doi.org/10.1201/9781003243250
6. V.K. Joshi (2006) Sensory science- Principles and Applications in Food Evaluation,Agrotech Publishing Academy, Udaipur.

REFERENCES

1. Awasthi D, Jaggi R and Padmanand V. A Manual for Entrepreneurs: Food ProcessingIndustry. Tata McGraw-Hill Publishing Limited. 2006.
2. Bedekar SJ. Marketing Concepts and Strategies, Oxford University Press. 1991.
3. Connie M. Weaver and James R. Daniel. The Food Chemistry Laboratory – A manual forExperimental Foods, Dietetics and Food Scientists, CRC Press, New York. (Practical). 2003.
4. Fuller GW. New Food Product Development- From concept to marketplace. CRC Press,Taylor & Francis Inc., USA. 2005.
5. Lyon DH, Francombe MA, Hasdell TA and Lawson K (eds). Guidelines for Sensory Analysis in Food Product Development and Quality Control. Chapman and Hall, London.1992.
6. Moskowitz HR. New Directions for Product Testing and Sensory

Analysis of Foods.Food and Nutrition Press, Connecticut. 1985.
7. Moskowitz, HR, Saguy I, Sam and Straus T. An Integrated Approach to New FoodProduct Development. CRC Press, Taylor & Francis Inc., USA. 2009.
8. Paine FA and Paine HY (eds). A Handbook of Food Packaging, 2nd Edn. BlackieAcademic and Professional. 1992.

E-LEARNING RESOURCES

- http://epgp.inflibnet.ac.in/Home/Download

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Recall, categorize, and analyze major trends in product development .
CO2	Identify the processes & stages for new product development from conception to commercialization.
CO3	Understand the role of sensory and objective evaluation in product development, quality control, and research in the food and otherconsumer industries.
CO4	Explain the theoretical background and practical understanding of sensory evaluation of food.
CO5	Develop a new food product from concept to prototype or pilot-scale production with the inclusion of a critical analysis of the quality,safety, shelf-life, packaging, labeling, and cost of the product.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		DESIGN AND FORMULATIONS OF FOOD PRACTICAL				
PART IV	Year	Credits	Hours	Marks		
	II			CIA	External	Total
	Semester					
SEC 5	IV	2	2	40	60	100

Learning Objectives

To enable the students to:

- To utilize raw materials in combination with other novel ingredients to produce value added food products
- To formulate processing techniques and develop product evaluations with novel food ingredients required for entrepreneurial skills.

1. Evaluate food products by sensory perceptions using sensory evaluation - Difference test, Attribute difference test ,Analytical descriptive test , Preference test
2. Tests with sweetness, saltiness, sourness, bitterness and astringency using different concentration series.
3. Formulation of different Ready To Cook (RTC) and Ready To Service (RTS) foods – Precooked Cereal, legume based, dairy based, fat based products.
4. Formulation of different Ready To Eat (RTE) foods – Instant snacks,
5. Preparation of different premixes – Rice mix, soup mix, fortified weaning foods using malts.
6. Formulation of foods with probiotics – Spirulina, fermented products
7. Formulation of value-added extruded products – Incorporation of fiber/sprouts/vegetable extract.

8. Formulation of traditional recipes with novel and functional food ingredients – Soy protein, flax and, flower infusions, palm sugar

TEXT BOOKS

1. Carpenter Lyon & Hasdell, ―Guidelines for Sensory Analysis in Food Product Development and Quality Control‖, Springer, 2000
2. Earle, M. D., Earle, R. L., & Anderson, A. M. (2001). Food product development. Boca Raton, Fla: CRC Press.
3. Gordon L Robertson. 2006. Food Packaging: Principles and Practice. 2nd Ed. CRC Press
4. Harper J.M. Extrusion of Foods. Vol. 1 & 2 (1991) CRC Press, Inc.) Boca Raton, Aorida
5. Naik, H.R., & Amin, T. (2021). Food Processing and Preservation (1st ed.). CRC Press. https://doi.org/10.1201/9781003243250
6. V.K. Joshi (2006) Sensory science- Principles and Applications in Food Evaluation,Agrotech Publishing Academy, Udaipur.

E Resources

https://iastate.pressbooks.pub/foodproductdevelopment

On completion of this course, students will be able to

CO	Course Outcomes
CO1	To identify and recall the basic principles of new product development and its evaluation.
CO2	To calculate the amount of ingredients required to develop a standardized novel food product.
CO3	To develop new products with suitable food processing and preservation technique.
CO4	To evaluate the role of ingredients in product formulation.
CO5	To propose and formulate a novel product with added functional and nutritional value

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

THIRD YEAR

Title of the Course		DIETETICS				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Core Course 9	V	4	6	25	75	100

Learning Objectives

To enable the students to:

- Understand the role of dietitian in using the principles of therapeutic diet in special nutrition support
- Identify the crucial points of disease management through nutrition support
- Recommend appropriate nutrition therapy for various disease conditions.

UNIT-I

Concept of diet therapy and role of dietitian

Dietitian- Definition, role and code of ethics, classification of dieticians in nutritional care

Principles of therapeutic diets, modification of normal diet,routine hospital diets

Different feeding techniques -enteral and parenteral feeding. –Indications, contraindications and complications.

UNIT-II

Diseases of Gastrointestinal tract

Etiology, symptoms, dietary management of: diarrhoea, dysentery, and constipation

Peptic ulcer, irritable bowel syndrome & inflammatory bowel disease(ulcerative colitis), Crohn's disease and celiac disease.

UNIT-III

Diseases of liver, gall bladder and febrile conditions

Etiology, symptoms, dietary management of: Disease of liver and Gall bladder- Hepatitis, cirrhosis, gall stones

Febrile conditions - Acute & Chronic fevers (Typhoid,influenza, malaria, tuberculosis, COVID).

UNIT-IV

Metabolic disorders

Etiology, symptoms, and dietary management of:Obesity and PCOS

Diabetes mellitus- types, symptoms and metabolic changes, treatmentwith diet and insulin, GI, GL, carbohydrate counting,artificial sweeteners and complications. Cardiovascular diseases – hypertension, atherosclerosis.

UNIT-V

Diseases of excretory system and cancer

Etiology, symptoms, dietary management of: Glomerular nephritis, nephrotic syndrome, urinary calculi, renalfailure.

Cancer – Risk factors, modification of diet in cancer, nutritionalproblems of cancer therapy. Role of antioxidants in prevention of degenerative diseases.

Food Allergy - Definition, Causes, Science and Symptoms, Types of Allergy, Diagnosis, Dietary Modifications

Gluten sensitivity and Lactose intolerance

TEXT BOOKS

1. Srilakshmi, B. Dietetics ,New Age International P. Ltd.,New Delhi, 2018.
2. Dietary Guidelines of Indians – A Manual, National Institute of Nutrition, Hyderabad, 2015
3. Garg, M. Diet, Nutrition and Health, ABD Publishers, 2006. Krause,M.V.andMahan,L.K.Food,NutritionandDiet Therapy,9thEd.,W.B.SaundersCompany,Philadelphia,2019.
4. Maimun Nisha, Diet Planning for Diseases, Kalpaz Publishers,2016.
5. Dietary Guidelines of Indians – A Manual, National Institute of Nutrition, Hyderabad, 2011

REFERENCES

1. Antia F. P. (2002), Clinical Dietetics and Nutrition, 4th edition, Oxford UniversityPress,Chennai.
2. Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics, 10thEdition, Churchill Livingstone
3. Guthrie H. A, Picciano M. F (1995) Human Nutrition, Mosby, St. Louis Missorie.
4. Joshi. S.A. (2005), Nutrition and Dietetics, Tata Mc Graw-Hill PublishingCompanyLimited, New Delhi
5. Mahan, L.K. & Escott-Stump, S. (2008) Krause's Food & the Nutrition Care Therapy,International Edition, 12th Edition, Saunders Elsevier Publication.
6. Nutrition Update Series
7. Passmore R. and Davidson S. (1986) Human nutrition and Dietetics. Living stonepublishers
8. Sharma.A.(2017), Principles of Therapeutic Nutrition and Dietetics, CBS Publishers&Distributors Pvt Ltd, New Delhi.
9. Shils, M.E., Olson, J.A., Shike, M. and Ross, A.C. (1999): Modern

Nutrition in Health andDisease, 9th Edition, Williams and Wilkins
10. Srilakshmi B, Dietetics (2019),8th edition, New Age International Publishing Ltd,NewDelhi
11. Williams S.R, (2000) Basic Nutrition and Diet Therapy, Mosbypublication
12. World Review of Nutrition and Dietetics

JOURNALS

- American Journal of Clinical Nutrition
- European Journal of Clinical Nutrition
- Journal of the American Dietetic Association
- Nutrition Review

E-LEARNING RESOURCES

- https://www.cdss.ca.gov/agedblinddisabled/res/VPTC2/9%20Food%20Nutrition%20and%20Preparation/Types_of_Therapeutic_Diets.pdf
- http://www.differencebetween.net/science/health/difference-between-enteral-and-parenteral-nutrition/
- https://www.medicinenet.com/difference_between_diarrheaand_dysentery/article.html
- https://my.clevelandclinic.org/health/diseases/15587-inflammatory-bowel-disease- overview

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Recall the concepts of diet therapy and role of dietitian.
CO2	Describe the etiology symptoms and rinciples of dietary managementfor various diseases.
CO3	Identify the indications, contraindications of routes of feeding
CO4	Examine the physiological condition of the individual and explain the role of diet in treating that condition
CO5	Plan therapeutic diets for various disease conditions by applying the principles of dietetics

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		NUTRITIONAL ASSESSMENT AND DIET COUNSELLING IN CLINICAL SETTING				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Core Course 10	V	4	5	25	75	100

Learning Objectives

To enable the students to:

- Understand the various assessment tools
- Learn the basics in diet counseling
- Apply diet counselling skills in various disease conditions

UNIT-I

Introduction to Nutrition Screening and Assessment tools:

Introduction to Nutrition screening and assessment- Definition and itsrole in diagnosing various deficiencies and disease conditions. Bed-side assessment tools; where , when and how to use. Nutrition FocusedPhysical Examination (NFPE),Body Mass Index(BMI), otheranthropometric assessments, Bioelectrical Impedance Analysis (BIA),Hand-grip dynamometer, Skin-fold Thickness. Introduction to Screening tools- Malnutrition Universal Screening Tool (MUST), Nutrition Risk Screening (NRS-2002),Mini Nutritional Assessment (MNA), Subjective Global Assessment(SGA), Global Leadership Initiative for Malnutrition (GLIM) Criteria.

UNIT-II

Clinical and Biochemical assessment:

Use clinical examination schedule and conduct clinical examination under the guidance of medical supervisor to identify nutrient deficiencies (preferably preschool children)

Biochemical tests to be conducted to analyses nutritional deficiencies and various disease conditions; analyses available biochemical reports for nutritional adequacy.

UNIT-III

Dietary assessment:

Conduct Diet survey using 24-hour dietary recall: Food frequency method; Weighed food inventory; food diaries and food composition methods Rapid assessment methods for dietary intake, food frequency questionnaire and

estimate nutrient intake manually orusing appropriate software. Suggest alterations in food intake to improve nutrient adequacy. Dietary intakes methods and understanding their usage and limitations in different field situations.

Dietary Diversity Score for Household, Individual, women and children.

UNIT-IV

Dietitian

Classification, code of ethics, responsibilities. Computer application – Use of computers by dietitian, dietary computations, dietetic management, education/ training, information storage and administrations. Teaching aids used by dietitians - charts, leaflets, posters etc., preparation of teaching material for patients.

UNIT-V

Diet counselling:

Practical consideration in giving dietary advice and counselling – Factors affecting and individual food choice; Communication of dietary advice; Consideration of behaviour modification; Motivation. Counselling and educating the patient-Introduction to nutrition counselling. Teaching aids used by dietitians- charts, leaflets, posters etc., preparation of teaching material for patients suffering from different disease conditions (eg Digestive disorders, Hypertension, Diabetes, Obesity). Practice diet counselling techniques using different teaching aids prepared, among students.

TEXT BOOKS

1. Srilakshmi, B. Dietetics ,New Age International P. Ltd.,New Delhi, 2018.
2. Dietary Guidelines of Indians – A Manual, National Institute of Nutrition, Hyderabad, 2015
3. Garg, M. Diet, Nutrition and Health, ABD Publishers, 2006. Krause,M.V.andMahan,L.K.Food,NutritionandDiet Therapy,9thEd.,W.B.SaundersCompany,Philadelphia,2019.
4. Maimun Nisha, Diet Planning for Diseases, Kalpaz Publishers, 2016. Dietary Guidelines of Indians – A Manual, National Institute of Nutrition, Hyderabad, 2011.
5. Brown,J(2014).Nutrition now (7thed). Wadsworth, USA, ISBN- 13:978-1-133-93653-4,ISBN10:1-133-93653-9•NelmsM,

REFERENCES

1. Mahan, L.K. & Escott-Stump, S. (2008) Krause's Food & the Nutrition Care Therapy,International Edition, 12th Edition, Saunders Elsevier Publication.
2. Sylvia Escott-stump,(2010)Nutrition and diagnosis-related Care, Sixth edition

,Wolters Kluwerpublication
3. Nancy Munoz, Melissa Bernstein,(2018), Nutrition Assessment: Clinical andResearchApplication, First edition, Jones &Bartlett Publishers.
4. Kathleen Bauer, Doreen Liou, (2020), Nutrition Counselling and Education Skill Development ,4th Edition,Brooks/Cole Publishers.

JOURNALS

- Nutrition Update Series
- World Review of Nutrition and Dietetics
- Journal of the American Dietetic Association
- American Journal of Clinical Nutrition
- European Journal of Clinical Nutrition
- Nutrition Review

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Demonstrate familiarity in the use of various nutrition screening and assessment tools
CO2	Understand when and how to use the various nutrition assessment tools
CO3	Write a PESS statement as a part of nutrition diagnosis
CO4	Analyse practical considerations while prescribing dietary advice and counselling
CO5	Design and develop teaching aids for educating patients on evidence based dietary modifications for chronic disease prevention and management.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		DIETETICS PRACTICAL				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Core Course 11	V	3	3	40	60	100

Learning Objectives

To enable the students to:

- Apply principles of diet therapy in planning and preparation of foods for various disease conditions.
- Evaluate and understand nutrition labels to make informed food choices for self andeducate patients.
- Know the various nutritional supplements available and identify its appropriate usage.

1. Preparation of any 5 recipes for the following therapeutic hospital diets- clear liquid, full liquid, semi solid, bland, soft and regular diets.

2. Planning and preparation of diets for the following conditions using SOAP format for nutritional management. [Students have to analyze the given case history, prepare SOAP note, plan a day's menu and calculate the nutritional requirements. Record must include Food plan (total exchanges/ day), meal pattern and menu (distribution of exchange into meals and snacks)].

a. Obesity and under weight

b. Gastro intestinal disorders–Peptic ulcer, diarrhea and constipation

c. Febrile condition –typhoid and TB

d. Diseases of liver– Hepatitis and cirrhosis.

f. Diabetes mellitus

g. Diseases of cardio vascular system–Atherosclerosis and Hypertension

h. Diseases of kidney and urinary tract–Nephrolithiasis,Nephrotic syndrome and kidney stones

i. Cancer and AIDS.

TEXT BOOKS

V.Vimala,Advancesindiettherapy-Practicalmanual,NewAge International Publishers, 2010.

REFERENCES

1. Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics, 10th Edition, Churchill Livingstone
2. Mahan, L.K. & Escott-Stump, S. (2008) Krause's Food & the Nutrition Care Therapy,International Edition, 12th Edition, Saunders Elsevier Publication.
3. Nix S. (2013) Williams' Basic Nutrition & Diet Therapy. 14th Edition. Pub. Elsevier
4. Shils, M.E., Olson, J.A., Shike, M. and Ross, A.C. (1999): Modern Nutrition in Health andDisease, 9th Edition, Williams and Wilkins
5. Sue Rodwell Williams (2013) Nutrition, Diet Therapy (9th ed.). WB Saunders Company,London
6. Vinitha Krishnan (2013) Nutrition planning aid for practicing dietitians.

JOURNAL

- Nutrition Update Series
- World Review of Nutrition and Dietetics
- Journal of the American Dietetic Association

E-LEARNING RESOURCES

- https://www.espen.org
- https://www.nutritioncare.org/home
- https://www.idf.org
- https://ispad.org
- https://www.diabetes.org
- https://www.eatright.org

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Recall dietetic principles in planning, preparing and evaluating meals intended for various disease conditions.
CO2	Describe dietetic principles in planning, preparing and evaluating meals intended for patients requiring modification in consistency of food- stroke, gastro intestinal diseaseconditions.
CO3	Calculate the nutrient content of the diet for various conditions and compare it. With the recommended allowances
CO4	Justify choice of foods, preparation methods, content, and consistency for different disease conditions
CO5	Analyse and prepare tube feeding formulas.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		PUBLIC HEALTH NUTRITION				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Core Course 12	V	4	5	25	75	100

Learning Objectives

To enable the students to:

- Gain knowledge about nutritional policies, programs and agencies involved in combatingmalnutrition.
- Acquire knowledge and skills in assessment of nutritional status.
- Acquire ability to create awareness on improving the health and nutrition in the community.

UNIT-I

Concept and scope of public nutrition

Definition, concept, scope and multidisciplinary nature of public nutrition

Nutritional problems affecting the community.

Etiology, prevalence, clinical features and preventive strategies for malnutrition related problems and deficiency disorders - Under nutrition (Protein energy malnutrition, Wasting, Stunting)Nutritional anemia, Vitamin A deficiency, Iodine deficiency disorders, Over nutrition- obesity, Fluorosis.

Nutrition and Infection- relationship;immunisation and its importance.

UNIT-II

Social & behavior change communication (SBCC)

Concepts, components and process of communication for nutrition health promotion

Definitions of Formal – non-formal communication, Participatory communication

Various types of communication – interpersonal, mass media, visual, verbal/ non-verbal.

need of SBCC in India. Social ecological model and communication for development (C4D) approach.

Concepts and Theories of Social and Behavior change Communication

Definitions ,Three characteristics ,Ten overarching principles for developing SBCC program or campaign, Steps for developing a successful Social and Behavior change communication program,,Evaluating and replanning,

UNIT-III

National Programs to Combat Micronutrient Malnutrition

National nutritional policy**;** Integrated child development scheme (ICDS), Midday Meal Program-State and National (Poshan Abhyan),

Iron: National Nutritional Anemia Control Program, Nutritional Program for Control of Anemia among Adolescent Girls, Vitamin A: Vitamin A Prophylaxis Program (VAPP), Iodine: National Iodine Deficiency Disorders Control Program (NIDDCP), Universal Salt Iodization (USI), Diarrhea Control Program: Role of Zinc, ORS and National Deworming Campaign, Fluorosis Control Program

UNIT-IV

Nutrition education

Objectives, principles and scope of nutrition education.

Methods of imparting nutrition education, their advantages and disadvantages. Training workers in nutrition education programmes.Use of computers to impart nutrition education, Organization of Nutrition education programmes.

UNIT-V

Organizations Working towards Meeting Global Nutrition Targets

National organization – ICAR, ICMR, CSWB, SSWB, NNMB, NIN, CFTRI, DFRL, NIPCCD and NFI, Save the Children, Tata Trusts.

International Organizations - World Bank, WHO, UNICEF, CARE, WABA.

TEXT BOOKS

1. Park A. (2007), Park's *Textbook of Preventive and Social Medicine* XIX Edition M/S Banarasidas, Bharat Publishers, 1167, Prem Nagar, Jabalpur, 428 001(India)
2. Bamji M.S, Prahlad Rao N, Reddy V (2004*). Textbook of Human Nutrition* II Edition, Oxford and PBH Publishing Co. Pvt. Ltd , New Delhi
3. Bhatt D.P (2008), *Health Education*, Khel Sahitya Kendra, New Delhi
4. Gibney MJ, Margetts BM, Kearney JM, Arab L (2004*) Public Health Nutrition* Blackwell Publishing Co. UK

REFERENCES:

1. Gupta,MC. And Mahajan BK. (2003) Textbook of Preventive and Social Medicine 3rd Ed Jaypee brothers,Medical Publishers (p) Ltd.
2. Jellife DB, Jellife ERP, Zerfas A and Neumann CG (1989). Community nutritional

assessment with special reference to less technically developed countries. Oxford University Press. Oxford.
3. Judith Beto and Betsy Holli (2017), Nutrition counseling and educational skills: A guide for professionals, Wolters Kluwer company.
4. Mathur. J.S, Preventive and Social Medicine: A Comprehensive Textbook With Special Focus on Nepal, CBS; 1st edition (2008)
5. Natalie Stein,(2014), Public Health Nutrition: Principles And Practice In Community And Global Health, Jones & Bartlett Learning publisher.
6. Nweze Eunice Nnkawe, (2019) Community Nutrition, Planning, Health Promotion and disease Prevention, Jones and Bartlett Publishers.
7. Wadhwa A and Sharma S (2003). Nutrition in the Community- A textbook. ElitePublishing House Pvt. Ltd. New Delhi.
8. WHO (2006). Child Growth Standards: Methods and development: height- for- age, weight-for-age, weight-for-length, weight-for-height and body mass index- for-age (http://www.who.int/childgrowth/standards/en/).

e-learning resources:

- Mohfw.nic.in/NRHM/NIDD
- www.nrhmorissa.gov.in/NIDDCP.html,http://www.who.int/nutrition/nlis/en/
- (www.who.int),www.nin.res.in,www.motherchildnutrition.org,www.nnmbindia.org
- www.ijmr.org.in.www.ncbi.nlm.nih.org,www.nutritionvalue.org

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Define terms related to Public Health nutrition.
CO2	Describe the nutritional problems prevalent in the community.
CO3	Explain the significance of assessment of nutritional status.
CO4	Assess the role of various organizations, policies and programs in combating nutritional problems.
CO5	Conduct nutrition education programs to create awareness on improving the health and nutrition of the community at large.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		PROJECT VIVA-VOCE				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Project	V	4	4	40	60	100

Learning Objectives

To enable the students to:

- To empower the learners on assessing their nutritional status, planning balanced meal and conservation of nutrients 2
- To give an insight into the various low cost ingredients available in market and develop low cost nutritious recipes for vulnerable segments of the community

Outcome

1. Understand the common health problems of the community
2. Acquire skills to overcome nutritional deficiency diseases
3. Understand the reasons for mal nutrition and under nutrition
4. Develop the skills in educating healthy dietary practices for pregnancy and lactation

Course outline Module: Community survey

(for group project-5-10 students may be included)

A. Assessment of nutritional status: General information, Anthropometry, Identification of clinical signs of common nutritional disorders, Dietary assessment – FFQ and 24 hour diet recall

B. Planning of low cost nutritious recipes for infants, preschoolers, pregnant/nursing mothers for nutrition education

C. Teaching aids for nutrition education.

D. Development of low cost nutritious recipe, Standardization of Recipe, Calculation of cost and Nutritive Value

Field visit;

Observe the working of Nutrition Programs
Hospitals/PHC to observe Nutritional deficiencies

Title of the Course		INTERNSHIP VIVA-VOCE		
PART III	Year	Credits	Hours	EVALUATION
	III			As per university norms
	Semester			
Internship	V	2	-	

DIETETICS INTERNSHIP

The students are expected to undergo a dietetic internship for 15 days at any reputed hospital that has a Dietary Department and a Dietitian.
Internship will be carried out during the summer vacation after the fourth semester

Learning Objectives

To enable the students to:

- Prepare graduates, to be competent, entry-level dietitians with a strong foundation intheory and application of medical nutrition therapy.
- Provide learning experiences that will promote the development of professional attitude,skills, self-confidence and enhance professional competence.

EXPECTED OUTCOME OF THE INTERNSHIP
On successful completion of the internship, the student:

- Learns how a dietary department functions and the specific roles and responsibilities of adietitian.
- Develops skills in nutrition screening and assessment.
- Acquires training in nutrition diagnoses of each patient assessed
- Acquires a brief introduction to enteral and parenteral nutrition.
- Demonstrates the ability to implement nutrition care plans; document nutrition care provided,maintain internship logbook and monitor outcomes of the nutrition plan
- Displays familiarity with the use of standardized terminology in documentation.
- Demonstrates competency in professional presentation, communication and writing skills.
- Acquires exposure to diet counselling, online counselling and group counselling.
- Is trained in the preparation and presentation of case studies/short communications for publication

Title of the Course		FOOD SERVICE MANAGEMENT				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Elective Course1(1)	V	3	5	25	75	100

Learning Objectives

To enable the students to:

- Understand the basic concepts of managing a food service institution.
- Differentiate the different types of catering establishments and food service systems
- Learn the components of an efficient layout for different foodservice outlets.

UNIT-I

Food Service Industry

History and Learn the components of an efficient layout for different foodservice outlets. growth of food service industry in India.

Types of food service establishments – Commercial – general and restricted market - types of restaurant, classification of hotels and transport catering- railways, ship, airline and space catering. Non-commercial / welfare establishments - hospitals, industries, schools, colleges, religious places and care houses. Miscellaneous - outdoor catering, contract catering and franchising. Food delivery apps - essential features, advantages and drawbacks

Food Service systems-conventional, ready–prepared, commissary, assembly-serve.

UNIT-II

Introduction to Management

Management - Definition, principles, functions and tools ofmanagement.

Leadership – Styles and qualities of leader. Basics of employeesupervision.

Motivation – Types and theories – Maslow‟s hierarchy of needs,Herzberg‟s two factor theory and theory „X‟ & Theory „Y‟.

Communication – Definition, process, methods and barriers.

UNIT-III

Introduction to Management

Management - Definition, principles, functions and tools ofmanagement.

Leadership – Styles and qualities of leader. Basics of employeesupervision.

Motivation – Types and theories – Maslow‟s hierarchy of needs,Herzberg‟s two factor theory and theory „X‟ & Theory „Y‟.

Communication – Definition, process, methods and barriers.

UNIT-IV

Management of physical facilities and Equipment

Factors to be considered for selection of a site/area.

Layout –Definition, features of a good layout –Space allocation andarrangement of the work areas for different types of establishments. Workers area of reach and standard heights for work tables.

Sample layout plans for coffee shop, school/ college canteen,industrial unit, hospital, restaurant and hotel.

Kitchen – shapes and factors affecting layout of kitchen spaces Layout of kitchen space for coffee shop, multi cuisine restaurant andstar hotel.

Lighting and ventilation –importance, types and requirements for various work areas. Need for optimum drainage facilities, maintenance of temperature and acoustics.

Safety in foodservice institution-Accidents - causes and prevention. 3E‟s of safety procedure- Engineering, Education and Enforcement.

Catering Equipment

Definition of catering equipment – Classification – Factors affecting the selection of equipment- Electrical and non - electrical equipment used in the various work areas of food service establishments – Production / kitchen – Cooking equipment – Processing equipment

– Cookware – Hand tools. Food Service equipment – Furniture – Linen – Crockery – Tableware – Glassware – Miscellaneous and Disposables.

Dishwashing – Waste disposal. Base materials and

Insulating materials used in the manufacture of equipment

UNIT-V

Financial Management

Book-keeping –definition, advantages of double entry system,books of accounts.

Costing and Cost control: Basic cost concepts–elements ofcost- material, labour, overheads.

Behavior of cost - fixed, variable, semi-fixed/semi-variable. Methods of costing-Dish, meal, menu costing& costing for events, cost control, concept of break-even, break-even point.**Pricing**-factors affecting pricing, pricing methods- cost plus, factor, rate of return, subsidy, discount.

REFERENCES:

1. Andrews andSudhir.(2000).IntroductiontoHospitalityIndustry,Tata-McGrawHillPub.Co.,New Delhi.

2. DhawanandVijay.(2001).FoodandBeverageService,FrankBossandCo,New Delhi
3. FoskettDavid.(2011).TheTheoryofHospitalityandCatering,HodderEducation,London.
4. Lillicarp,D.R.andCousins,J.(2010).FoodandbeverageService,8th edition,HodderEducation,London.
5. Sethi,Mohini,Malhan,Surjeet.(2015).CateringManagement–AnIntegratedApproach,3rd ed,NewAgeInternationalPublishers,NewDelhi.
6. Suganthi,VandPremakumari,C.(2017).FoodServiceManagement,DiptiPress(OPC)Pvt .Ltd,Chennai.
7. Verghese and Brian. (2000). Professional Food and Beverage Service Management,MacmillanIndiaLtd.,India.

E - LEARNING RESOURCES

- http://open.lib.umn.edu/principlesmanagement/chapter/1-5-planning-organizing-leading-and-controlling-2/
- https://www.managementstudyguide.com/management_functions.htm
- http://www.bngkolkata.com/web/food-and-beverage-service-equipment/
- http://www.fcijammu.org/food/food/orders/F&B%20Service-Unit-2.pdf
- https://www.scribd.com/doc/29362905/Equipments-in-Food-amp-Beverage

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Apply the basic concepts of management to ensure the smooth functioning of an organization.
CO2	Develop managerial skills for effective human resource management
CO3	Identify suitable purchase and storage methods for optimum profit.
CO4	Analyze the requirements for a good layout and efficient workflow.
CO5	Assess the techniques of financial management for lucrative growth of an enterprise.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		PRINCIPLES FOR RESOURCE MANAGEMENT				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Elective Course1(2)	V	3	5	25	75	100

Learning Objectives

To enable the students to:

- Define the concept of management and identify the importance of values, goals and standards.
- Develop skills in utilizing the available resources for maximum output.
- Gain knowledge about work simplification and effective management of family income and expenditure.

UNIT-I

Introduction to Management - Management Concepts - Definition, Concept, Micro and Macro environment. Principles and Process of Management - Planning, Organizing, Controlling, Evaluating. Qualitiesof a Good Manager. Motivational factors-Values, Goals and Standards.

Activity: Identification of personal and family values and goals–their Interrelationship

UNIT-II

Resources in Management and Decision Making

Definition, characteristics classification, optimizing the use of familyresources, Factors affecting the use of resources.

Decision making-Meaning and its importance, Types of decisions, Decision making process, Methods of resolving conflicts.

Activity : List out the resources required to obtain a specific goal.

UNIT-III

Time Management - Tools in time management - Time norms, Peakloads, WorkCurves and rest periods, Time management process- Planning-Steps in making time plans-Controlling the planning action- Evaluation.

Energy Management-The efforts required in home-making activities; Energy required for household activities.

Activity: Preparation of a time schedule and Evaluate time scheduleUsing antt chart.

UNIT-IV

Work Simplification - Definition, Importance, Techniques – Formal and Informal Techniques-Mundel's Classes of change – Planning efficient work areas in kitchen.

Body Mechanics - Posture, Gravity, Rhythmic movement, Proper use of Muscle and to take advantage of Momentum.

Fatigue-Concepts, Types-Physiological and Psychological fatigue And Managerial process applied to energy

Activity: Study on work heights based on anthropometric measurement Of vertical and horizontal planes.

UNIT-V

Money Management-Family Income-Types, sources and methods of augmenting family income.

Family Expenditure-Budget-Definition-Types of budgets, Planning a budget for a family with fixed income, advantages of budgeting. Factors affecting family budget, Engel's law of consumption, methods of handling money-Family financial records, Savings-Importance and types.

Activity: Preparation of family budget. Study of a savings institution and its scheme.

REFERENCES:

1. BelaBhargava(2005),—FamilyresourceManagement&InteriorDecoration‖,universitybookhousepvtltd,ISBN-13:978-8187339229
2. Marion Giordan (2016), —ConsumerEducation: A handbook for Teachers‖,Routledge;1stedition,ISBN-13:978-1138839151
3. Nickell&Dorsey(2002),—ManagementinFamilyLiving‖,CBS;4thedition ,ISBN-13:978-8123908519
4. PushpaChakravorty(2007),HomeManagement,NewDelhi:PointerPublishers.
5. Rao(2020),—Taxmann‟sHumanResourceManagement‖,TaxmannPublicationsPvt. Ltd.;2ndedition,ISBN-13:978-9390128396
6. Ready GB (2021), —EBCconsumerProtectionAct‖,Law Books,Asin:
7. Steven, D.S, (2016). Consumer Economics: APracticalOverview‖,NewYork:RoutledgeTaylorandFrancis group.
8. SudhirDixit(2018),—TimeManagement‖,Manjul PublishingHouse,ISBN-13:978-9388241106

E. learning resources:

- http://www.yourarticlelibrary.com/decision-making/decision-making-in-management-
- definition-and-features-explained/25657/
- http://www.familyresourcemanagement.org/services/goals/
- http://www.familyresourcemanagement.org/services/standards/
- http://www.nios.ac.in/media/documents/sechmscicour/english/home%20sci ence%20(eng)%20ch-15.pdf
- https://books.google.co.in/books?id=NJkrzK3CgisC&pg=PA149&lpg=PA149&d q=ti

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Recall the principles of management and motivational factors to achieve goals.
CO2	Describe the use of resources and process of decision making
CO3	Identify the tools of time and energy management.
CO4	Analyze the work simplification techniques to handle fatigue.
CO5	Develop an effective budget by assessing the family income and expenditure.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		FOOD PRESERVATION				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Core Course13	VI	4	5	25	75	100

Learning Objectives

To enable the students to:

- Gain knowledge on principles of food preservation
- Understand the techniques used in processing foods to increase their shelf life
- Apply skills learnt to develop preserved food products

UNIT-I

Introduction to Food Preservation

Food Spoilage - Definition, causes, microorganisms involved in spoilage of bread, fruits and vegetables, meat, fish, egg, milk, juices and pickles. Classification of foods based on shelf life

Food preservation - Definition, principles and importance,classification – bactericidal and bacteriostatic methods.

UNIT-II

Preservation by high temperature

Methods used- blanching, pasteurization, sterilization, UHT processing, canning, extraction cooking, dielectric heating, Dehydration.

Preservation by low temperature

Methods commonly used- refrigeration, freezing, dehydro-freezing-advantages and limitations

UNIT-III

Preservation by drying and dehydrated products

Methods of drying &dehydration , different types of driers and freeze drying.

Drying methods for the selected products -Rice, Sago, Wheat, Maida, Rice flakes, black gram dhal, green gram dhal, Horse gram dhal Roots and Tubers

General tips with drying foods

Preparation of salted, dehydrated, preserves (Traditional Indian varieties of chips, Papads, and Masala Powders, onion, garlic, ginger powder etc)

UNIT-IV

Preservation by Using Sugar and salt

Role of Pectin in Preserved foods

Sugar Concentrates – Principles of Gel Formation

Hands on Experience: Preparation of Jam, Jelly, Marmalades, Sauce and Squash
Evaluation of pH, Acidity and pectin quality
Preparation and Preservation of Fruit Juices, RTS
Pickling – Principles Involved and Types of Pickles

UNIT-V

Food additives and Food packaging

Food additives used in preservation: Definition, types and functions, and safety aspects; permissible limits of preservatives in fruit andvegetable products.
Food packaging- types, advantages and disadvantages;
Food labeling- types and nutritional information.

Visit to Food Industries

REFERENCES:

1. Arthey D and Ashurst, P.R (1996), Fruit processing, Blackie academic andprofessional. London.
2. Fellows, P.J (2016): Food Processing Technology: Principles and Practice,2nd edition, CRC Wood head publishing Ltd, Cambridge.
3. Gould. G.W (1995), New methods of food preservation. Blackie academic and professional. London.
4. Manay S and Shadaksharaswamy M (2008) Food Facts and Principles, New AgeInternational Publishers, New Delhi.
5. Rahman M S (2020) Handbook of Food Preservation CRC Press, USA
6. Srilakshmi B (2017) Food Science, New Age International Publications, New Delhi.
7. Suganthi.V and Subaratinam.R (2021) Textbook on Food preservation, Dipti Press(OPC) Pvt. Ltd, Chennai.
8.

E.learning resources

- https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/food-spoilage.
- http://ecoursesonline.iasri.res.in/mod/page/view.php?id=111436
- http://ecoursesonline.iasri.res.in/mod/page/view.php?id=111435
- http://www.homepreservingbible.com/2247-an-introduction-to-the-drying-food-preservation-method/
- https://egyankosh.ac.in/bitstream/123456789/12397/1/Unit-15.pdf

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Describe the role of microorganisms in food spoilage, principles and importance of food preservation.
CO2	Classify the different food preservation methods and foods based on shelf life
CO3	Apply the various techniques of food preservation to preserve different foods and increase the shelf life
CO4	Evaluate the uses of various food preservation methods and explain the role of packaging in food processing
CO5	Justify the use of various preservation techniques, natural and chemical food additives used for preservation ,food labeling and food packaging materials

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		NUTRITION FOR HEALTH AND PHYSICAL FITNESS				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Core Course14	VI	4	6	25	75	100

Learning Objectives

To enable the students to:

- Understand the Importance of Nutrition, Fitness and Health
- Gain Knowledge on Exercise Physiology and Nutrition for Physical Activity
- Comprehend the Technique and Gadgets for Physical Activity Training

UNIT-I.

Health and Fitness

Definition, Components and Relationship among Physical Fitness, Wellness and Health

Personalized approach

Benefits of fitness training

UNIT-II.

Exercise Physiology and Nutrition for Physical Activity

Pulmonary ,Cardiovascular Regulation and integration,

Skeletal and neural control,

Endocrines and exercise

Nutrition & Physical performance

Physical fitness: cardio respiratory fitness, muscular strength, muscular endurance, body composition and flexibility

Energy systems, muscles and physical performance-ATP-CP energy systems, Lactic Acid energy systems, Oxygen energy systems, Glycogen depletion

Endurance Training-Muscle and Muscle fibers

Optimal Nutrition and Energy needs for optimum performance e.g. athletes

Exercise and fluid loss

Hydration

Nutrition supplements, Ergo genic Aids

UNIT-III.

Physical Activity Training

Aerobic and anaerobic training -To enhance Cardio Vascular Endurance,

Flexibility and Body Composition,
Measurement of PAL,
Benefits of Fitness training and Gadgets for measuring PA –
Motorized Treadmill, (aerobic Fitness),
Functional Trainer,
Fluid Rower (Upper body),
Elliptical Bicycle and
Bicycle Ergometer (Lower body),
3.10Stretch Trainer (Whole body),
3.11Multi Gym (9, 12, 16 station) for different muscle groups

UNIT-IV.

Diseases due to Faulty/Poor Food Habits and Physical Inactivity

Life Style related diseases/disorders (Non communicable Disease conditions) - Meaning Causative Factors and Diet Modification/evidence based guidelines for
Underweight,
Obesity,
Diabetes mellitus,
Hypertension,
Cancer
Cardiovascular Disease,
Anemia

UNIT-V.

Exercise, Stress and Health Management

Stress Assessment and Management
Techniques-Exercise at medium and high altitudes, Underweight, Overweight and Obesity, Relaxation Techniques,
Yoga and Meditation for Health,
Clinical Exercise
Physiology for Cancer,
CV and Pulmonary rehabilitation

REFERENCES

1. Werner W. K Hoejer (1989), *Life time Physical Fitness and Wellness*, Morton Publishing Company, Colorado.
2. Mishra, S. C (2005) *Physiology in Sports*. Sports Publication, New Delhi

3. Greenberg, S. J and Pargman, D (1989) *Physical Fitness – A Wellness Approach Prentice* Hall International (UK) Limited, London
4. Swaminathan M. (2008) *Essentials of Food and Nutrition* Bangalore Printing Publishing Co.New Delhi □
5. McArdle, W. D, Frank I. Katch, F. I and Victor L. Katch (1996) *Exercise Nutrition: Energy Nutrition and Human Performance*. William & Wilkin Publishing USA.
6. Mahan, K and Stump, E. S (1996) Krause *Food and Nutrition and Diet Therapy* W.B Saunders Company, USA.

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Explain the principles of physical fitness and nutrition complement each other in helping to develop physiological well-being and overall health.
CO2	Explain the principles of fitness and nutrition complement each other in helping to develop psychological well-being and overall health.
CO3	Identify some of the social and cultural influences on food habits and exercise/activity patterns
CO4	Evaluate current nutritional information with regard to its contribution to Health and physical fitness
CO5	Evaluate current nutritional information with regard to diseases

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		FOOD PRESERVATION PRACTICAL				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Core Course15	VI	1	3	40	60	100

Learning Objectives

To enable the students to:

- To appreciate and understand preservation
- To know about various methods of preservation
- To understand the need for preservation

Learning Outcomes

1. The students would be able to know the origin of preservation, with its need and purpose.
2. The students would be able to enlist the methods of preservation.

1. Preservation of jam—fruit jam, pineapple jam, apple jam.
2. Preservation of jelly—fruit jelly, synthetic jelly
3. Preservation of Squash—mango squashy, orange squash
4. Preservation of jelly—fruit jelly, synthetic jelly
5. Preparation of mango bar, papaya bar, banana bar
6. Preservation by drying vegetables and fruits— any five
7. Preparation of sauce —tomato, green chilli
8. Preparation of pickles—mango, mixed vegetables, tomato
9. Preparation of vathal,and vadagam—any four
10. Food adulteration tests for common food.

Title of the Course		SPORTS NUTRITION				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Core Course16	VI	3	5	25	75	100

Learning Objectives

To enable the students to:

- Gain knowledge on the role of nutrition in physical fitness and sports.
- Understand the relationship between physical training and dietary habits in order to produce optimal performance
- Gain familiarity with the claims and types of ergogenic aids and supplements available inthe market

UNIT-I

Introduction to Physical Fitness

Physical Fitness- Definition, factors affecting physical fitness, componentsof fitness, fitness testing methods

Physical activity- types of physical activity, determinants of physicalactivity, benefits of physical activity

Exercise- Classification of exercise, specific exercise for strengthening;health benefits of exercise- yoga its benefits

Body weight and composition for health and sport, Strategies for weight Management

UNIT-II

Muscle physiology and Energy systems for exercise

Skeletal muscle structure, Types of muscle contraction, Types of muscle fiber, Factors determining muscular strength, Muscular fatigue, adaptationof skeletal muscles to exercise training. Sources of energy for muscle force generation-energy pathways- metabolic response to exercise-factors influencing choice of fuels.

UNIT-III

Role of Macronutrients in Physical Fitness

Carbohydrates – Utilization of carbohydrate before, during and afterexercise, importance of glycogen loading.

Proteins – role of proteins for exercise, requirements before, during andafter

exercise. Fats – role of fat as a fuel during exercise, Fat loading- effects on exercise performance.
Macronutrients Requirements for Power, endurance sports and strength training activities.

UNIT-IV

Role of Micronutrients and Water for Exercise
Role of vitamins and minerals for exercise, Role of Antioxidant nutrientsfor exercise,Female athletic triad, eating disorders- effect on sports performance, treatment and prevention. Water, electrolyte and temperature regulation. Effect of dehydration and hyperhydration on performance. Fluid guidelines, before,during and after exercise.

UNIT-V

Nutrition and Ergogenic aids for Athletes Importance of pre-event, during and post-event mealsElectrolyte balance-sports drinks.
Eating for anaerobic power- aerobic power- timing of meals and snacks- Recovery food. Food for power sports, endurance sports, combined power Overview of supplements and sports foods- Use of performance enhancing substances among athletes- Anabolic steroids-Sports foods (cereal bar, sports drinks, carbohydrate gels, Liquid meal replacements, Vitamins),Different types of protein supplements.

REFERENCES

1. B Srilakshmi, V Suganthi, C Kalaivani Ashok, Exercise Physiology and Sports Nutrition,New Age International publishers, 2017.
2. Bean Anita, The Complete Guide to Sports Nutrition, A7C Black Publishers Limited, London,2009.
3. Crossley.J., Personal Training and Practice, Hodder Arnold, London, 2009. Glendhill.A.Mulligan, C.Saffer#y,
4. Fink H.H., Burgoon L.A., Mikesky A.E.(2018) Practical applications in Sports Nutrition.Jones and Bartlett Publishers. Sudbery, Massachusetts.
5. Jordan P (Ed), Fitness Theory and Practice- The comprehensive Resource for fitnessInstructors, Sherman Oahs, California, 1997.
6. Lal Priti Rishi, Nutritional recommendations for sports persons- A Review, J.Indian Dieteticassociation,, 31, 2006.
7. McArdle .W.D., Frank. I. Katch, Victor L Katch (2005) Sports and ExerciseNutrition.Lippincott, Williams and Wilkins, Philadelphia
8. Macedinio. MA, Dunford M, The Athlete's Guide to making weight-Optimal weight forOptimal performance, Human kinetics, 2009.

9. Position of the American Dietetic association, Dietitians of Canada and the Americal Collegeof Sports medicine: Nutrition and Athletic Performance, J Am diet Assc., 109, 2009.
10. Sutton.J & Taylor.R., Sports and Exercise Sciences, McLanie Gray & Felicity Kendall,Heinemann, Oxford, 2007.
11. Singh V & Bhadana OP, Physical Fitness and Training, Sports Publication, New Delhi, 2010.Wadsworth A., Cardiovascular Training for Fitness, Anness publishing limited, 2010.

E-LEARNING RESOURCES:

- American College of Sports Medicine- www.acsm.org
- Centre for disease control and prevention- www. cdc.gov/ncdphp/ndpa
- Sports, cardiovascular and wellness Nutrition Dietetics Practice group- www.scandpg.org
- Exercise Physiology www.ncbi.nim.nih.gov/PubMed/
- sportsmedicine.about.com
- http://sportsmedicine.about.com/od/sportsnutrition/a/carbohydrates.html

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Define terms related to physical fitness, nutrients and supplements for exercise
CO2	Describe the benefits of different exercise, significance of body weight and composition parameters, fuel systems engaged in exercise.
CO3	Identify the intertwining relationship between physical training and dietary requirements
CO4	Analyse and select nutrients for optimal performance on the basis of energy pathwaysinvolved in a given sporting activity
CO5	Assess the functions of nutrients before, during and after exercise, andrecommend meal plans for athletes involved in different sports.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		FOOD MICROBIOLOGY				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Elective Course 2(1)	VI	3	4	25	75	100

Learning Objectives

To enable the students to:

- Understand the interaction between micro-organisms and food
- Discuss the factors that favor or inhibit the growth of microbes
- Understand the role of microbes in fermentation, spoilage and food borne diseases.

UNIT-I

Introduction to Food Microbiology

History and Development of Food Microbiology. Definition and Scope of food microbiology. Inter-relationship of microbiology with othersciences.

Characteristics of Microorganisms in Food

Types of microorganisms (Bacteria, Molds and yeasts) associated with food, their morphology and structure Significance of spores in food microbiology

UNIT-II

Microbial Growth in Food

Bacterial growth curve and microbial growth in food, Factors affecting the growth of micro organisms in food. Methods for the destruction of bacteria- application of dry heat, moist heat, filtration, radiation

Cultivation of Micro-organisms

Pure culture technique, .Methods of isolation and cultivation. Enumeration of Microorganisms- qualitative and quantitative

UNIT-III

Microbial Food Spoilage

Sources of Microorganisms in foods .Some important food spoilage microorganisms. Spoilage of specific food groups- Milk and dairy products, Meat, poultry and sea foods, Cereal and cereal products, Fruits and vegetables and Canned products

UNIT-IV

Food Fermentations

Fermentation –definition and types, Microorganisms used in food fermentations, Dairy Fermentations-starter cultures and their types, concept of probiotics, Fermented Foods-types, methods of manufacture of vinegar, sauerkraut, tempeh, miso , soya sauce ,beer, wine and traditional Indian foods

UNIT-V

Foodborne Illnesses

Types – foodborne infections(Salmonellosis, Shigellosis, Vibrio para haemoliticus gastroenteritis, Entero pathogenic Escherichia coli diarrhea,,HepatitisA, food borne bacterial intoxications(Staphylococcal, Bacillus cereus, Botulism) and toxin infection(Clostridium perfringens gastroenteritis, Enterotoxigenic E.coli gastroenteritis, Cholera, Listeriosis).

Trends in Food Microbiology

Rapid methods for detection of microorganisms in food- Nucleicacid-based, biosensor-based, and immunological-based approaches.

REFERENCES

1. Adams, M.R. and M.O. Moss.‖ Food Microbiology‖. New Age International, 2002
2. Bamforph,C.W. 2005. Food, Fermentation and Microorganisms. Blackwell Pubs
3. Banwart, G.J. ―Basic Food Microbiology‖ 2nd Edition. CBS Publishers, 1998.
4. Frazier William C and Westhoff, Dennis C. Food Microbiology, TMH, New Delhi, 2004
5. Harrigan,W.P. 1988. Laboratory Methods in Food Microorganism. 3rd. Ed. Academic Press. San Diego.
6. Jay, J.M. ―Modern Food Microbiology‖. 4th Edition. CBS Publishers, 2003.
7. Khetarpaul, Neelam. ―Food Microbiology‖ Daya Publishing House, 2006.
8. Vijaya Ramesh. ― Food Microbiology‖. MJP Publishers, Chennai, 2007

E- LEARNING RESOURCES

- http://ecoursesonline.iasri.res.in/course/view.php?id=107
- http://epgp.inflibnet.ac.in/Home/Download

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Understand the interaction between micro-organisms and food
CO2	Obtain a basic understanding of the microbial phenomena occurring in food products and factors affecting the growth of microbes
CO3	Recognize the microbes causing food spoilage and food borne illnesses.
CO4	Explain sources of contamination, principles of preservation and types of spoilage of different foods
CO5	Evaluate the role of microorganisms in food safety

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		EARLY CHILDHOOD CARE AND EDUCATION				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Elective Course 2(2)	VI	3	4	25	75	100

Learning Objectives

To enable the students to:

- Know the importance of early childhood years and significance of intervention programs for early childhood development.
- Develop insight into the historical developments – global and Indian including the current programs and policies in ECCE.
- Impart knowledge on programme planning for young children.

UNIT-I

Introduction to Early Childhood Care and Education

Concept, meaning, scope and significance of ECCE

Developmental perspective , Neuroscience perspective , Human rights perspective

Expansion from ECE to ECCE to ECD. Aims and objectives of ECCE– General and specific Types of ECCE service delivery – Formal and informal; Government funded, Philosophy oriented, Laboratory nursery school, Franchise oriented

UNIT-II

ECCE in India

History of Early Childhood Care and Education in India.

Overview of ECCE in pre and post-independence period. Preschool education in the pre and post-independence era (very brief). How the international trends have influenced the national trends.

Contributions of educational philosophers: global and Indian perspective-views of educationists and philosophers: Comenius, Rousseau, Pestalozzi, Froebel, Robert Owen, McMillan Sisters, John Dewey and Montessori, Sri Aurobindo, Tagore, Gijubhai Badheka, TarabaiModak, Mahatma Gandhi

Present status of young children in India, Policy perspectives in ECCE, Recent Policies in ECCE-Various Education commissions of India : National Policy on Education (1986) Programmes / schemes and innovations in ECCE –

ICDS, Balwadis, mobile crèches , National Curriculum Framework 2005 , National Policy on Early Childhood Care and Education 2013, Curriculum Framework for Early Childhood Care and Education 2012/2013.New Education Policy, 2020

UNIT-III

Early Childhood Curriculum

Definition and concept of curriculum ,Curriculum approaches – subject centered, learner centered, community centered Developmentally Appropriate Practice (DAP) – definition and core considerations, myths and consequences of developmentally inappropriate ECE practices.Components and essential features of developmentally appropriate ECCE curriculum Planning a developmentally appropriate curriculum- approaches, key principles and types of plans

UNIT-IV

Play and its importance

Play and its characteristics, Theories of play- surplus energy theory, recreational theory, recapitulation theory. Stages and types of play, Role of play in overall development of children

Teacher's role in creating environment and promoting play. Use of play way approach in the curriculum for young children.

UNIT-V

Innovative ECCE Models

Nutan Bal Shikshan Sangh, India ,Daxinamurti Bal Mandir, India,Gram Bal Shikshan Kendra, India.Lok Jumbish Program, India .Mirambika, India..Rishi Valley, India.High/Scope Model, USA.

Reggio Emilia Approach, Italy. *TeWhãriki*Model, New Zealand .The ECEC Model, Sweden .Seto Gurans National Child Development Services, Nepal

REFERENCES

1. Agarwal, J. C. (2007). *Early childhood care and education: principles and practice*s. New Delhi: Shipra

2. Agarwal, S.P. and Usmani, M. (2000).*Children'seducation in India: from vedic*

a. *times to twenty first century* New Delhi: Shipra.

3. Canning, N. (2010) *Play and practice in the early years: Foundation stage*. New Delhi: Sage.

4. Durlak, J.A. (1995). School based prevention programmesforchildren and adolescents. N.Y.:
5. Fleer, M. (2010). *Early learning and development: Cultural–historical concepts in play*. Cambridge: Cambridge University Press.
6. Kaul, V. (2009). *Early childhood education programme.* National Council of Educational Research and Training, New Delhi.
7. OECD. (2004). Curricula and pedagogies in early childhood education and care. Retrieved from http://www.oecd.org/education/school/31672150.pdf
8. Purkait, B.R. (2005). *Milestones in modern Indian education*. Kolkata: New Central Book Agency.
9. Swaminathan, M.(ed.) (1998).*Thefirstfive years: A critical perspectives on* a. *early childhood care and education in India*. New Delhi: Sage.
10. Sarangapani, P.M. (2009). Quality, feasibility and desirability of low cost private schooling: what is the evidence? *Economic & Political Weekly, 44*(43), 67–69.
11. Sarangapani, P.M. (2010). Comparative education in India: Why it is missing and why we need it. *Journal of Education Planning and Administration 24*(4): 363-378.
12. Saraswathi, T.H., Menon, S. & Madan, A. (eds.) (2018) *Childhoods in India traditions, trends and transformations.* New Delhi. Routledge.
13. Sharma, K.K., & Miglani, P. (2016). *Gender, school and society*. Patiala: Twenty First Century Publications.
14. Early Childhood Care and Education (n.d.) Retrieved from http://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/home_science/10._early_childhood _care,_education_and_development/14._aurobindo,_gijubhai_badheka,_tarabai_modak/et/671 6_et_et.pdf
15. Singh, A. (1995). *Playing to learn: A training manual for early childhood education*. Chennai: M. S. Swaminathan Research Foundation.
16. Venkataraman, B. (2009). Education for sustainable development. *Environment: Science and Policy for Sustainable Development, 51*(2), 8-10.

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Explain the importance of early childhood years and significance of intervention programs for early childhood development.
CO2	Describe the historical developments – global and Indian including the current programs and policies in ECCE.
CO3	Identify various indigenous (Indian) models of Early Childhood Education and apply it to understand the current early childhood research, theoretical trends and issues.
CO4	Analyze curriculum models and pedagogical approaches in early childhood education.
CO5	Create developmentally appropriate programs for young children

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		FOOD SAFELY AND QUALITY CONTROL				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Elective Course 3(1)	VI	3	4	25	75	100

Learning Objectives

To enable the students to:

- Learn the importance of food safety, quality control, food laws and regulations in food industry.
- Get acquainted with the existing food safety management system.
- Acquire basic understanding of quality concepts and practice in food companies.
- Gain familiarity with the standards and specifications.

UNIT-I

Food safety - Introduction to concepts of food quality, food safety, General food laws and food safety regulations. Importance of Food safety and quality control concepts applied in the food processing industry. Evaluation of Food safety – Applications of HACCP in the food industry.

Activity - Assignment on the preparation of food safety related risk analysis in food processing industry. Prepare a HACCP Plan for a food processing industry.

UNIT-II

Food Quality assurance - Introduction**,** Importance and functions of quality control. Theoretical and practical considerations, description of different systems: GAP, GMP, TQM, ISO. Indian food standards - Voluntary and Obligatory standards (PFA, FPO, MMPO, AGMARK etc) Codex Alimentarius.

Activity - Training on the preparation of manual for GMP

UNIT-III

Food sanitation and safety - Factors contributing to physical, chemical and biological contamination in food chain, prevention and control of food borne hazards. Personal hygiene of food handlers, cleaning compounds, sanitation methods, waste disposal strategy (solid and liquid waste) and pest control

Activity - Preparing work instructions for the staff in charge of sanitation and the cleaning staff in food industry/food outlets.

Food adulteration - Food adulteration, Common adulterants, Simple tests for detection of adulteration and toxic constituents. Recent trends and challenges in food adulteration.

Activity - Practical analysis of the detection of adulteration in different types of foods.

UNIT-IV

Food safety regulation in India - An overview of Food Regulation in India; Structure, organization and dutiesof regulatory system; Duties and responsibilities of food business operator; Registration and Licensing process and requirements; Labeling of Food Products; Traceability; Import and Export of Foods; Liability for Defective Products; Food safety management systems and certifications.

Activity - Assignment to prepare a PPT to educate the food business operator about FSSAI licensing of their outlet.

UNIT-V

Standard operating procedure and checklist - Preparing scope, quality policy and quality objectives of food processing company, Defining Standard operating procedure. SOP for purchasing raw materials, receiving raw materials, storage, cleaning, holding, cooling, freezing, thawing, reheating,facility and equipments. Preparation of HACCP based SOP checklist - food preparation, hot holding, cold holding, refrigerator, freezer and milk cooler, food storage and dry storage, cleaning and sanitizing, utensils and equipments, large equipments, waste disposal and pest control.

Activity - Prepare Audit Checklist for various food industries.

REFERENCES

1. AOAC International. (2005) Official methods of analysis of AOAC International. 17thEd., current through 1st revision. Gaithersburg, MD, USA, Association of Analytical Communities.
2. Bhatia,R. and Ichhpujan,R.L (2004), Quality assurance in Microbiology, CBS Publishers and Distributors, New Delhi. 2004.
3. Bryan, F.L. (2007) Hazard Analysis Critical Control Point Evaluations A Guide to Identifying Hazards and Assessing Risks Associated with Food Preparation and Storage. World Health Organization, Geneva.

4. Early, R. (2006) Guide to Quality Management Systems for the Food Industry, Blackie,Academic and professional, London.
5. FAO (2006) Manuals of Food Quality Control. 2-Additives Contaminants Techniques,Rome.
6. Food and Agricultural Organization (1980): Manuals of Food Quality Control. 2 Additives Contaminants Techniques, Rome
7. Food safety and standards act 2006, Rules 2011, Regulations 2011, 10th Edition, ILBCOIndia, Indian Law Book Company,

E-LEARNING RESOURCES

- http://www.fssai.gov.in/
- http://www.medindia.net
- http://www.foodsafety.unl.edu/

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Describe the areas in food systems that come under the purview of Food Safety& Quality Assurance
CO2	Cite Indian and international food laws and food safety programs
CO3	Demonstrate familiarity with FSSAI regulations and licensing
CO4	Acquire skills to prepare manual and SOP for food industry
CO5	Demonstrate the ability to detect common adulterants in food

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		COMMUNITY DEVELOPMENT				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
Elective Course 3(2)	VI	3	4	25	75	100

Learning Objectives

To enable the students to:

- Understand the concept and process of development
- Gain knowledge on development communication
- Learn the importance media in development communication
- Acquire skills on Information Education and Communication (IEC) technologies and media

Unit-I.

Development Communication

Definition, basic concept, nature, significance and functions and dysfunctions, dynamics of development.

Models of Development- Dominant paradigm, Basic Needs model, new paradigm of development.

Philosophy of and principles of development communication.

Methods of Communication

Unit-II.

Approaches to Development Communication

Meaning, nature, role and characteristics of development communication

Interrelationship between development and development communication

Diffusion / extension approach, Mass media approach, development support communication approach, institution approach, integrated approach and localized approach. Paradigm of development communication

Unit-III.

Media and Development Communication

Traditional media – types, characteristic role in development communication

Development reporting – roles and responsibilities of development reporter, ethics in reporting, required skills and issues in development reporting

News reporting – definition of news, ingredients and qualities of news, news value, types of news reports, structure of news reports

Radio news, features and commentaries, radio and development communication
Television and cinema – role in development communication
ICTS – scope in development communication

Unit-IV.

Skills for Development Communication

Photography - basic principles, preplanning, scripting, shooting, developing, mounting, recording of commentary or dialogue, synchronization of frame with recording
Video films – essential preliminaries, preplanning – procedure, classification of video programmes, shooting script
Editing procedure – optical effects, music titles and other accessories to be added
Recording process, Home videos, radio recording

Unit-V.

Social marketing and advertising

Social marketing – concept of social marketing
Innovative strategies in Social marketing
Advertising – definition, types, origin and role
Types of advertisement and their impacts
Media for advertising
Media planning and advertising

REFERENCES

1. Capila.A. (2001). Images of Women in the Folk Songs of Garhwal Himalayass. New Delhi: Concept Publishers
2. Communication for Development in the Third World Theory and Practices (1991). New Delhi: Sage Publications
3. Dhanraj patil. (2010). Communication for rural development in India. New Delhi: Serials Publications
4. Gupta.D. (2007). Development Communication in Rural Sector. New Delhi: Mukhopadhyay,Abijeet publication
5. Joshi Uma. (1997). Textbook of Mass Communication and Media. New Delhi: Anmol Publications
6. Joshi Uma. (2001). Understanding Development Communication. New Delhi: Domincent Publishers
7. Karun Shetty. (2011). Communication for Social Change. New Delhi: Pacific publication

8. Nisha,M. (2006). Understanding Extension Education. New Delhi: Kalpay Publications
9. Reddy, A.A. (2001). Extension Education. Bapatla: Sri Lakshmi Press
10. Singh, U.K., and Nayak A.K. (2007). Extension Education. New Delhi: Common Wealth Publishers

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Understand the concept related to communication for development
CO2	Comprehend the significant development communication
CO3	Focus on different types of media and its uses in the implementation of programme
CO4	Analyze the ICT in development communication
CO5	Understand the steps in message design

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**

Title of the Course		BASICS IN RESEARCH METHODOLOGY				
PART III	Year	Credits	Hours	Marks		
	III			CIA	External	Total
	Semester					
SEC 6	VI	2	3	25	75	100

Learning Objectives

To enable the students to:

- Gain a clear understanding of basic concepts, approaches and methods in conducting research.
- Apply appropriate statistical techniques for data collection, analysis and interpretation in any given study in the field of nutrition and dietetics
- Develop skills to carry out a project and present a report. Acquire skills required in preparing a research proposal.

UNIT-I

Introduction to research

Research- Meaning, objectives, significance.

Research problem- Definition and selection of research problem.Research design –Types of research design

Method of sampling - probability and non-probability sampling – Merits and Demerits, Determining sample size, Deciding Variables

UNIT-II

Data Collection

Primary and secondary data, selection of appropriate method fordata collection. Tools used for data collection- Questionnaire and Interview schedule.

UNIT-III

Coding and tabulation of data

Data entry and computation, Tabulation of data – parts of the table Presentation of data- use of bar graph and pie chart

UNIT-IV

Basic statistical tools for analysis and interpretation Measures of central tendency – Mean, Median, Mode definition, merits, demerits and basic application Measures of dispersion - range and standard deviation- definition, merits, demerits and basic application

Correlation –Karl Pearson's coefficient of correlation merits, demerits and basic application. Test of significance- Student's t test basic application.

UNIT-V

Report writing

Steps in report writing, Layout of a report.Bibliography-citing references-APA style.

REFERENCES

1. Anderson, David R and et.al. (2013): Statistics for Business and Economics. Delhi, CengageLearning India Pvt Ltd. 11th Ed.
2. Bandarkar, P.L. and Wilkinson T.S. (2000): Methodology and Techniques of Social Research.Himalaya Publishing House, Mumbai.
3. Bell, Judith (2005): Doing your Research Project – A guide for first time researchers in education,health and social science. England, Open University Press. 4th Ed.
4. Danial, Wayne W and Chad L Cross (2017): Biostatistics – Basic Concepts and Methodology forthe Health Sciences – International Student Version. New Delhi, ArEmm International, 10th Ed.
5. Ranjit Kumar (2011). Research Methodology: a step-by-step guide for beginners, SAGEPublications. 3rd edition.

E.learning resources

- https://mfs.mkcl.org/images/ebook/Fundamental%20of%20Research%20Methodology%20and%20Statistic
- s%20by%20Yogesh%20Kumar%20Singh.pdf
- https://www.statisticssolutions.com/research-methodology/

On completion of this course, students will be able to

CO	Course Outcomes
CO1	Demonstrate knowledge of the scientific method, purpose and approaches toresearch.
CO2	Identify and select appropriate techniques to select samples and tools of measurement for the chosen research problem at hand
CO3	Acquire skills in preparing a research proposal
CO4	Conduct statistical analysis for the given data, interpret the results and depict findings with suitable use of tables and pictorial representations
CO5	Present research data in a scientific manner and discuss the findings obtained.

MAPPING(CO/PSO):

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	**3**	**3**	**3**	**3**	**3**