TANSCHE CURRICULUM AND SYLLABUS FOR

B.Sc. NUTRITION AND DIETETICS

CHOICE BASED CREDIT SYSTEM

OUTCOME BASED EDUCATION

(For Candidates admitted from 2023 - 2024 onwards)

(Updated based on TANSCHE Syllabus circulated on 01.07.2023 by Common State Integrated Board for Food Science and Nutrition Disciplines)

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)	• Analyzing the question is one that asks the students to breakdown something into its component parts. • Analyzing requires students to identify reasons causes or motives and reach conclusions or generalizations.
Evaluate (K5)	• Evaluation requires an individual to make judgment on something. • Questions to be asked to judge the value of an idea, a character, a work of art, or a solution to a problem. • Students are engaged in decision-making and problem–solving. • Evaluation questions do not have single right answers.
Create (K6)	• The questions of this category challenge students to get engaged in creative and original thinking. • Developing original ideas and problem solving skills

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

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

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 Extension Activity	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	1	22
Part V	-	-	-	-	-	2	2
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)

Sem I	Course Name	Credit	Hours	CIA	ESE	Total
1.1. Part 1 - Language	Tamil/Hindi	3	6	25	75	100
1.2 Part 2	English	3	6	25	75	100
1.3 Core Course – CC I	Food Science	5	5	25	75	100
1.4 Core Course – CC II	Food Science Practical	4	4	40	60	100
1.5 Elective I Generic/~~Discipline Specific~~	A: Chemistry I/ Food Chemistry I (Theory)	3	3	25	75	100
	B: Chemistry / Food Chemistry Practical	1	2	40	60	100
1.6 Skill Enhancement Course - SEC-1 (NME)	Nutrition and Fitness	2	2	25	75	100
1.7 Skill Enhancement - (Foundation Course)	Dimensions of Health	2	2	25	75	100
		23	**30**	**230**	**570**	**800**

Sem II	Course Name	Credit	Hours	CIA	ESE	Total
2.1. Part 1 - Language	Tamil/Hindi	3	6	25	75	100
2.2 Part 2	English	3	4	25	75	100
Part-II	Language Proficiency for employability- Overview of English Communication	2	2	-	-	-
2.3 Core Course – CC III	Human Physiology	5	5	25	75	100
2.4 Core Course – CC IV	Human Physiology Practical	4	4	40	60	100
2.5 Elective II Generic/ ~~Discipline Specific~~	A: Chemistry II / Food Chemistry II (Theory)	3	3	25	75	100
	B: Chemistry / Food Chemistry Practical	1	2	40	60	100
2.6 Skill Enhancement Course-SEC-2 (NME)	Basics of Functional Foods	2	2	25	75	100
2.7 Skill Enhancement Course –SEC-3	Fundamentals of Bakery (Training)	2	2	40	60	100
		23	**30**	**245**	**555**	**800**

Sem III	Course Name	Credit	Hours	CIA	ESE	Total
3.1. Part 1 - Language	Tamil/Hindi	3	6	25	75	100
3.2 Part 2	English	3	6	25	75	100
3.3 Core Course – CC V	Principles of Nutrition	5	5	25	75	100
3.4 Core Course – CC VI	Principles of Nutrition Practical	4	4	40	60	100

3.5 Elective III Generic/ ~~Discipline Specific~~	Nutritional Biochemistry	3	3	25	75	100
	Nutritional Biochemistry Practical	1	2	40	60	100
3.6 Skill Enhancement Course SEC-4 (Entrepreneurial Skill)	Entrepreneurship Development (Training)	1	1	40	60	100
3.7 Skill Enhancement Course SEC-5	Convenience Foods	2	2	25	75	100
3.8 E.V.S		-	1	-	-	-
		22	**30**	**245**	**555**	**800**

Sem IV		**Credit**	**Hours**	**CIA**	**ESE**	**Total**
4.1. Part 1 - Language	Tamil/Hindi	3	6	25	75	100
4.2 Part 2	English	3	6	25	75	100
4.3 Core Course – CC VII-Core Industry Module	Nutrition through Life Cycle	5	5	25	75	100
4.4 Core Course – CC VIII	Nutrition through Life Cycle Practical	4	4	40	60	100
4.5 Elective IV Generic/ ~~Discipline Specific~~	Home Science	3	3	25	75	100
	Home Science Practical	1	1	40	60	100
4.6 Skill Enhancement Course-SEC-6	Food Business Management	2	2	25	75	100
4.7 Skill Enhancement Course SEC-7	Computer Applications in Nutrition Practical	2	2	40	60	100
4.8 E.V.S		2	1	25	75	100
		25	**30**	**270**	**630**	**900**

Sem V		**Credit**	**Hours**	**CIA**	**ESE**	**Total**
5.1 Core Course – CC IX	Dietetics	4	5	25	75	100
5.2 Core Course – CC X	Food Microbiology	4	5	25	75	100
5.3.Core Course CC -XI	Dietetics Practical	4	5	40	60	100
5.4.Core Course / Project with viva-voce -CC -XII	Mini Project	4	5	40	60	100
5.5 Elective V ~~Generic~~/ Discipline Specific	Quantity Food Service and Physical Facilities / Bakery Science	3	4	25	75	100
5.6 Elective VI ~~Generic~~/ Discipline Specific	Food Biotechnology / Nutrigenomics	3	4	25	75	100
5.7 Value Education	Yoga and Fitness Practical	2	2	40	60	100
5.8 Summer Internship /Industrial Training	Dietetics Internship (15 days)	2	-	40	60	100
		26	**30**	**260**	**540**	**800**

Sem VI		**Credit**	**Hours**	**CIA**	**ESE**	**Total**
6.1 Core Course – CC XIII	Food Processing and Preservation	4	6	25	75	100
6.2 Core Course – CC XIV	Food Standards and Quality Control	4	5	25	75	100
6.3 Core Course – CC XV	Food Processing and Preservation Practical	4	6	40	60	100
6.4 Elective -VII ~~Generic~~/ Discipline Specific	Functional Foods and Nutraceuticals / Food Product Development and Packaging	3	4	25	75	100
6.5 Elective VIII ~~Generic~~/ Discipline Specific	Basics in Research Methodology / Food Innovation Models	3	4	25	75	100
6.6 Extension Activity	Nutrition related activity in the society	1	3	40	60	100
6.7 Professional Competency Skill	Naan Mudhalvan	2	2	25	75	100
		21	**30**	**205**	**495**	**700**

Semester I Syllabus

Title of the Course		FOOD SCIENCE				
Category	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Sem.					
1.3 Core CC1	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

COURSE OUTCOMES

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

CO	Course Outcomes	Knowledge level	Units
CO1	Identify and classify foods based on the food grouping system and illustrate their use	K1, K2	I
CO2	Define the foods, describe its structure and distinguish their composition	K1, K2	II,III,IV,V
CO3	Demonstrate their ability in selecting quality food and appraise the varieties in a food	K3, K5	II,III,IV,V
CO4	Compare the nutrients present in different types of food and choose foods rich in specific nutrients	K4, K3	II,III,IV,V
CO5	Analyse the effect of cooking on the quality of food and discriminate the desirable and undesirable changes	K4, K5	II,III,IV,V

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.

Pulses and legumes -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 – Composition and nutritive value, 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, McMillan McGraw Company, New York.
6. Thangam E.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), Essentials of Food Science 2nded., Springer Publication, 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, 6thedition, Macmillan Publishing Co. 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/

Title of the Course		FOOD SCIENCE PRACTICAL				
Category	Year / Sem	Credits	Hours	Marks		
				CIA	External	Total
1.4 Core CC II	I	3	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

On completion of this course, students will be able to

COs	Course Outcomes	Knowledge Levels
CO1	Examine the physicochemical changes of food	K4
CO2	Demonstrate the methods of nutrient retention while cooking	K5
CO3	Illustrate the factors that affect cooking quality of different food	K5
CO4	Prepare variety of foods by adopting different cooking methods	K6

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

Cereals and 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. Chomplay Pranshu 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 MP and AdaMarie C,(2012),Experimental Food Science, Academic Pres., 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

Title of the Course		NUTRITION AND FITNESS				
Category	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Sem.					
1.6 Skill Enhancement SEC 1 (NME)	I	2	2	25	75	100

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 centers

On completion of this course, students will be able to

COs	Course Outcomes	Knowledge Level	Units
CO1	Understand the concept of nutrition in relation to fitness	K1,K2	I, II, III
CO2	Determine the nutritional requirement for fitness and physical performance	K3, K2	I,II,IV
CO3	Illustrate the relationship between body composition and fitness	K2, K3	I, III
CO4	Interpret and explain the role of physical activity in preventing lifestyle disorders	K2, K4	II, III, IV
CO5	Relate and speculate the role of nutrition in preventing lifestyle related diseases	K2, K3, K6	IV
CO6	Assess and validate the role of stress management	K5, K6	V

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

Title of the Course		DIMENSIONS OF HEALTH				
Category	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Sem.					
1.8 Skill Enhancement (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

On completion of this course, students will be able to

COs	Course Outcomes	Knowledge Level	Units
CO1	Enumerate the determinants and dimensions of health	K1	I
CO2	Discuss the physical aspects of health	K2	II
CO3	Illustrate the determinants and factors affecting social health	K2	III
CO4	Examine the importance of emotional and social health	K3	IV
CO5	Cite the interaction between health dimensions and health promotion	K2	V

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, Bhanot Banarsidas 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

Semester II Syllabus

Title of the Course		HUMAN PHYSIOLOGY				
Category	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Sem.					
2.3 Core CCIII	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.

On completion of this course, students will be able to

COs	Course Outcomes	Knowledge Level	Units
CO1	Examine the role of cells, tissues and immune system	K1	I
CO2	Describe the anatomy of the various organ systems in the human body	K1,K2	I, II, III, IV, V
CO3	Differentiate the major organs and the accessory organs	K2,K4	I, II, III, IV, V
CO4	Relate the functions of each organ in the human system	K3	I, II, III, IV, V
CO5	Compare the hypo and hyper function of the endocrine glands	K5	IV

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 and smell (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, blood pressure - 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 in the 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 urine formation.

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. Sarada Subrahmanyam 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. and Sembulingam, P., (2012), Essentials of Medical Physiology, 6th edition, Jaypee Brothers Medical Publishers, New Delhi.

REFERENCE BOOKS

1. Waugh A and Grant A., (2012), Ross and Wilson Anatomy and Physiology in Health 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 Madhavan Kutty, K., (1996), The Text Book 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 Walterand Boulpaep 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

Title of the Course		HUMAN PHYSIOLOGY PRACTICAL				
Category	Year / Sem.	Credits	Hours	Marks		
				CIA	External	Total
2.4 Core CCIV	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

On completion of this course, students will be able to

COs	Course Outcomes	Knowledge Level
CO1	Identify and differentiate the different types of cells and organs	K4
CO2	Describe the histology of muscles	K3
CO3	Distinguish the different blood groups and recognize the Rh factor	K4
CO4	Determine the bleeding and clotting time	K3
CO5	Measure blood pressure and record the respiratory and pulse rate.	K5

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.

Title of the Course		BASICS OF FUNCTIONAL FOODS				
Category	Year	Credits	Hours	Marks		
	I			CIA	External	Total
	Sem.					
2.6 Skill Enhancement Course – SEC 2 (NME II)	II	2	2	25	75	100

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

On completion of this course, students will be able to

COs	Course Outcomes	Knowledge Level	Units
CO1	Describe and classify the functional foods	K1, K2	I, II, III, IV
CO2	Explain the sources and enumerate the health benefits of prebiotics	K3, K1	II
CO3	Differentiate the probiotics and synbiotics and associate their health benefits	K4, K2	III
CO4	Justify the effects of bioactive compounds and cite the role of functional components and antioxidants	K5,K2	IV
CO5	Summarize the preventive role of functional foods in diseases	K5	V

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

UNIT IV: 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

UNIT V: Specific Functional Foods for Cancer and Diabetic

a. Anti-cancer foods: Turmeric, honey, garlic, onion, ginger, saffron, cumin seeds, 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, Daya Publishing House, Astral International Pvt Ltd, 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,Dhiraj A.and Vatsala Maitin, (2016),Functional Foods,Nutraceuticals and Natural Products, Concepts and Applications, DEStech Publications,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.

REFERENCE BOOKS

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, 5thedition, 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

Title of the Course		FUNDAMENTALS OF BAKERY				
Category	Year / Sem.	Credits	Hours	Marks		
				CIA	External	Total
2.7 Skill Enhancement SEC 3	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.

On completion of this course, students will be able to

COs	Course Outcomes	Knowledge Level	Units
CO1	Enumerate the principles of baking and classification of baked products	K1	I
CO2	Cite the role of ingredients in baked products	K2	III
CO3	Differentiate the major and minor equipment	K2	II
CO4	Prepare different types of baked products	K3	IV, V
CO5	Appraise the faults in baked products	K5	IV, V

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. Yogambal Ashokkumar, (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.

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1. Dubey. S.C., (2002), Basic Baking, 4th Edition, Published by the Society of Indian Bakers, New Delhi.
2. John Kingslee, (2006), A Professional Text book to Bakery and Confectionary. New Age International Pvt Ltd, New Delhi.
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 Education Ltd, USA.
5. The Culinary Institute of America, Baking & Pastry: Mastering the Art and Craft, (2009), John Wiley & Sons, Inc New Jersey.
6. Uttam K Singh, (2011), Theory of Bakery and Confectionary- An Operational Approach, Kanishka Publishers and Distributors, New Delhi.

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