

# B. Sc. NUTRITION AND DIETETICS

## Syllabus

Programme Code: 3USNUD

2022-2023



**SENGAMALA THAYAAR EDUCATIONAL TRUST  
WOMEN'S COLLEGE  
(AUTONOMOUS)**

(Affiliated to Bharathidasan University, Tiruchirappalli)  
(Accredited by NAAC) | (An ISO 9001:2015 Certified Institution)

**Sundarakkottai, Mannargudi-614 016,**

# SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

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(Affiliated to Bharathidasan University)

(Accredited by NAAC) (An ISO 9001:2015 Certified Institution)

SUNDARAKKOTTAI, MANNARGUDI- 614016.

TAMILNADU, INDIA.

(For the candidates admitted in the academic year 2022–2023)

## DEPARTMENT OF NUTRITION AND DIETETICS



### PROGRAMME OUTCOMES FOR B.Sc., DEGREE

PO No.	Program Outcomes
	<i>(Upon completion of the B.Sc. Degree Programme, the Undergraduate will be able to)</i>
PO-1*	<b>Disciplinary knowledge:</b> Demonstrate comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study in Bachelor of Science.
PO-2*	<b>Critical thinking and Problem Solving:</b> Think critically about the issues and identify, critically analyze and solve problems from the disciplines of concern using appropriate tools and techniques and the knowledge, skills and attitudes acquired and extrapolate the same to real life situations.
PO-3*	<b>Scientific reasoning:</b> Analyze, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.
PO-4*	<b>Digital literacy and Effective Communication:</b> Use ICT in a variety of learning situations and speak, read, write and listen clearly in person and through electronic media in English and in one or more Indian languages, and make meaning of the world by connecting people, ideas, books, media and technology.
PO-5*	<b>Individual and Team Work:</b> Effectively accomplish tasks individually as well as work effectively and respectfully as member or leader with diverse teams, facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.
PO-6*	<b>Environment and Sustainability:</b> Understand the impacts of technology and business practices in societal and environmental contexts, and sustainable development.
PO-7*	<b>Human values and Gender Issues:</b> Understand major ideas, values, beliefs, the nature of the individual and the relationship between self and the community and aware of the various issues concerning women and society
PO-8*	<b>Self-directed and Lifelong learning:</b> Acquire knowledge and skills, including learning "how to learn", that are necessary for participating in learning activities throughout life and to engage in independent and life-long learning in the broadest context of socio-technological changes.

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## DEPARTMENT OF NUTRITION AND DIETETICS

(For the candidates admitted in the academic year 2022–2023)



### PROGRAMME SPECIFIC OUTCOME

PSO No.	Program Specific Outcomes (B.Sc., Nutrition and Dietetics)
PSO-1	Understand the physiological, biochemical and microbiological parameters associated with human organ systems.
PSO-2	Understand the basic concepts of Food Science, Food chemistry, Nutrition, Dietetics, Biochemistry, Food Service management, Food Microbiology
PSO-3	Apply the theoretical and practical knowledge in Nutrition and Dietetics in various physiological, therapeutic and special conditions to assess the nutritional status and recommend nutritional support and care
PSO-4	Demonstrate Professional attributes required to manage the facet of Hospitality Industry, Hospital, Food Industry and Community welfare Organisations and Entrepreneurship.
PSO-5	Evaluate, adopt and apply the best practices relating to health, safety, quality and client satisfaction in the field of Nutrition and Dietetics.



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**TAMILNADU, INDIA.**

**B.Sc., NUTRITION AND DIETETICS COURSE STRUCTURE UNDER CBCS**

*(For the candidate admitted in the academic year 2022-2023)*

**ELIGIBILITY:** Those who have completed +2 examinations with Biology and Chemistry as two of the core subjects

Sem	Part	Course	Course Code	Title of the paper	Inst. Hours / Week	Credit	Exam Hours	Marks			
								CIA	ESE	Total	
<b>I</b>	<b>I</b>	Language Course (LC)-I Tamil*/Other Languages**#	22LC101	Ikkala Ilakkiyams	6	3	3	25	75	100	
	<b>II</b>	English Language Course (ELC) - I	21ELC101	Language through Literature I (Prose and Communication Skills)	6	3	3	25	75	100	
	<b>III</b>		Core Course (CC) - I	22ND101	Food Science	6	5	3	25	75	100
			Core Practical (CP) - I	22ND102P	Food Science Practical	3	2	3	40	60	100
			Allied Course (AC) - I	22AND101	Food Microbiology	4	3	3	25	75	100
			Allied Practical (AP) - I	22AND102P	Food Microbiology Practical	3	2	3	40	60	100
	<b>IV</b>	Value Education	22UGVED	Value Education	2	2	3	25	75	100	
<b>TOTAL</b>					<b>30</b>	<b>20</b>	-	-	-	<b>700</b>	
<b>II</b>	<b>I</b>	Language Course (LC) – II Tamil*/Other Languages ** #	22LC201	Idaikkala Ilakkiyamum Pudhinamum	6	3	3	25	75	100	
	<b>II</b>	English Language Course (ELC) - II	21ELC201	Language through Literature II (Poetry and Communication Skills)	6	3	3	25	75	100	
	<b>III</b>		Core Course (CC) - II	22ND203	Human Physiology	6	5	3	25	75	100
			Core Practical (CP) - II	22ND204P	Human Physiology Practical	3	2	3	40	60	100
			Allied Course (AC) - II	22AND203	Nutritional Biochemistry	4	3	3	25	75	100
			Allied Practical (AP)-II	22AND204P	Nutritional Biochemistry Practical	3	2	3	40	60	100
	<b>IV</b>	Environmental Studies	22UGCES	Environmental Studies	2	2	3	25	75	100	
<b>TOTAL</b>					<b>30</b>	<b>20</b>	-	-	-	<b>700</b>	
<b>III</b>	<b>I</b>	Language Course(LC) – III Tamil*/Other Languages**	22LC301	Kaapiyamum Naadakamum	6	3	3	25	75	100	
	<b>II</b>	English Language Course (ELC) - III	22ELC301	Language through Literature III (Drama and Communication Skills)	6	3	3	25	75	100	
	<b>III</b>		Core Course (CC) – III	23ND305	Principles of Nutrition	6	5	3	25	75	100
			Core Practical (CP) – III	23ND306P	Principles of Nutrition Practical	3	2	3	40	60	100
			Allied Course (AC) – III	23AND305	Family Resource Management and Interior Design	4	3	3	25	75	100
		Allied Practical (AP) – III	23AND306P	Interior Design Practical	3	2	3	40	60	100	

	IV	Non Major Elective (NME) – I for those who studied Tamil under Part-I i. Basic Tamil for other language students ii. Special Tamil for those who studied Tamil up to +2 but opt for other languages in degree programme		Non Major Elective I- for those who studied Tamil under Part-I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil up to +2 but opt for other languages in degree programme	2	2	3	25	75	100
		<b>TOTAL</b>				<b>30</b>	<b>20</b>	-	-	-
IV	I	Language Course (LC)–IV Tamil*/Other Languages **#	22LC401	Pandaiya Ilakkiyam	6	3	3	25	75	100
	II	English Language Course (ELC)-IV	22ELC401	Language through Literature IV (Short stories and Communication Skills)	6	3	3	25	75	100
	III	Core Course (CC)-IV	23ND407	Nutrition Through Life Cycle	5	4	3	25	75	100
		Core Practical (CP)-IV	23ND408P	Nutrition Through Life Cycle Practical	3	2	3	40	60	100
		Allied Course (AC)-IV	23AND407	Basic Food Processing and Preservation	3	3	3	25	75	100
		Allied Practical (AP)-IV	23AND408P	Basic Food Processing and Preservation Practical	3	2	3	40	60	100
	IV	Non Major Elective (NME)-II–for those who studied Tamil under Part I a). Basic Tamil for other language students b). Special Tamil for those who studied Tamil up to +2 but opt for other languages in degree programme		Non Major Elective II- for those who studied Tamil under Part-I a. Basic Tamil for other language students b. Special Tamil for those who studied Tamil up to +2 but opt for other languages in degree programme	2	2	3	25	75	100
	Skill Based Elective (SBE) –I			2	2	3	25	75	100	
<b>TOTAL</b>				<b>30</b>	<b>21</b>	-	-	-	<b>800</b>	
V	III	Core Course (CC) –V	R23ND509	Dietetics–I	6	6	3	25	75	100
		Core Course (CC) –VI	R23ND510	Food Service Management-I	6	6	3	25	75	100
		Core Course (CC) –VII	R23ND511	Family and Child Welfare	5	5	3	25	75	100
		Core Practical (CP) –V	R23ND512P	Dietetics–I Practical	3	3	3	40	60	100
		Major Based Elective (MBE) – I	R23MBEND1	Changing Trends in Extension Education	4	4	3	25	75	100
	IV	Skill Based Elective (SBE) –II		-	2	2	3	25	75	100
		Skill Based Elective (SBE) – III		-	2	2	3	25	75	100
		Soft Skills Development	23UGSDC	Soft Skills Development	2	2	3	25	75	100
<b>TOTAL</b>				<b>30</b>	<b>30</b>	-	-	-	<b>800</b>	
VI	III	Core Course (CC) –VIII	R23ND613	Dietetics–II	6	6	3	25	75	100
		Core Course (CC) –IX	R23ND614	Food Service Management-II	6	6	3	25	75	100
		Core Practical (CP) – VI	R23ND615P	Dietetics II Practical	6	5	3	40	60	100
		Major Based Elective (MBE) - II	R23MBEND2	Textile Science	5	5	3	25	75	100
		Major Based Elective (MBE) – III	R23MBEND3	Dietary Internship	6	5	-	40	60	100
	V	Extension Activities		**Extension Activities	-	1	-	-	-	-
	V	Gender Studies	23UGGS	Gender Studies	1	1	3	25	75	100
<b>4 TOTAL</b>				<b>30</b>	<b>29</b>	-	-	-	<b>600</b>	
<b>GRAND TOTAL</b>				<b>180</b>	<b>140</b>	-	-	-	<b>4300</b>	

## CURRICULUM DESIGN

Subject	No. of Courses	Total Credits
Language Part – I	4	12
English Part –II	4	12
Core Course	9	48
Core Practical	6	16
Allied Course	4	12
Allied Practical	4	08
Non–Major Elective	2	04
Skill Based Elective	3	06
Major Based Elective	3	14
Environmental Studies	1	02
Value Education	1	02
Soft Skill Development	1	02
Extension Activities	-	01
Gender Studies	1	01
<b>Total</b>	<b>43</b>	<b>140</b>

\* For those who studied Tamil up to 10<sup>th</sup> +2 (Regular Stream);

+ Syllabus for other Languages should be on par with Tamil at degree level;# those who studied Tamil up to 10<sup>th</sup> +2 but opt for other languages in degree level under Part I should study Tamil in Part IV;

\*\* Extension Activities shall be outside instruction hours.

**Note:**

	CIA	ESE
1. Theory	25	75
2. Practical	40	60

3. Separate passing minimum is prescribed for CIA and ESE

### FOR THEORY

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]

The passing minimum for ESE shall be 40% out of 75 marks [i.e. 30 marks]

### FOR PRACTICAL

The passing minimum for CIA shall be 40% out of 40 marks [i.e. 16 marks]

The passing minimum for ESE shall be 40% out of 60 marks [i.e. 24 marks]

### **NON MAJOR ELECTIVE (NME) OFFERED BY THE DEPARTMENT**

<b>Semester</b>	<b>Part</b>	<b>Course</b>	<b>Course Code</b>	<b>Title of the Paper</b>
III		NME-I	23NMEND31	Basics of Nutrition
IV		NME-II	23NMEND42	Women's Health and Nutrition

### **SKILL BASED ELECTIVE (SBE) OFFERED BY THE DEPARTMENT**

<b>Semester</b>	<b>Part</b>	<b>Course</b>	<b>Course Code</b>	<b>Title of the Paper</b>
IV		Skill Based Elective –I	23SBEND1	Bakery and Confectionary
V		Skill Based Elective –II	R23SBEND2	Food Standards and Quality Control
V		Skill Based Elective –III	R23SBEND3	Food Packaging

# SENGAMALATHAYAAREEDUCATIONALTRUSTWOMEN'SCOLLEGE

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TAMILNADU, INDIA.

## DEPARTMENT OF NUTRITION AND DIETETICS



### B.Sc., NUTRITION AND DIETETICS

(For the candidates admitted in the academic year 2022–2023)

### Question Paper Pattern- (Theory)

Max time: 3 Hours

Max Marks: 75

#### Section – A (10 x 2 = 20)

Answer all the questions

Answer in One or Two sentences each

1. }  
2. } Unit- I
3. }  
4. } Unit- II
5. }  
6. } Unit -III
7. }  
8. } Unit- IV
9. }  
10. } Unit -V

#### Section – B (5 x 5 = 25)

Answer all the questions

Each answer should not exceed 500 words

11. a(or) }  
b } Unit-I
12. a(or) }  
b } Unit-II
13. a(or) }  
b } Unit-III
14. a(or) }  
b } Unit-IV
15. a(or) }  
b } Unit-V

#### Section–C(3x10=30)

Answer any **THREE** questions in 1200 words

- 16 ....Unit-I
- 17 ...Unit -II
- 18 ...Unit-III
- 19 ...Unit-IV
- 20 ...Unit-V



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**DEPARTMENT OF NUTRITION AND DIETETICS  
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**Semester: I –CC-I: Food Science**

**Ins. Hrs./Week: 6**

**Course Credit : 5**

**Course Code:22ND101**

**OBJECTIVES:**

- To introduce different food groups, composition and their role in diet.
- To study the different methods of cooking foods.
- To make the students obtain knowledge about the nutrients present in the foods

**UNIT- I: Introduction to Food Science**

**(19 Hours)**

Definitions: Food Science, Food, Nutrients, Nutritional Status, Mal-nutrition- Under- nutrition, over-nutrition, Balanced diet, Hunger – Hollow Hunger, Hidden Hunger, Appetite, Satiety, Health, Meal, Menu. Food Groups: Basic five, Nutritional classification of foods – Energy yielding, Body building and protective foods. Cooking: Objectives, cooking methods- Moist and Dry heat methods of cooking, merits and demerits. Recent Methods of Cooking- microwave cooking and Induction Cooking.

**UNIT- II: Cereals, Pulses and Nuts**

**(19 Hours)**

Cereal and Cereal products: Rice and wheat -Structure, Nutritive Value, Changes during cooking- gelatinization, gel formation, retrogradation, syneresis, dextrinisation, gluten formation. Milling of rice, parboiling of rice, Enrichment and fortification of cereals and flours, Batters and doughs, Malting of cereals. Nutritional importance of millets– maize, jowar, ragi, bajra.

Pulses and Nuts: Nutritive value, factors affecting cooking quality of pulses, Processing – milling or decortications, soaking, germination, Fermentation, parching and their advantages. Role of pulses and nuts in Indian Cookery.

**UNIT- III: Vegetable and Fruit Science**

**(18 Hours)**

Vegetables: Classification, Selection of vegetables, Nutritive value, Pigments - water insoluble, water soluble, organic acids, enzymes, flavour and bitter compounds in vegetables, selection of vegetables, changes during cooking, nutrient loss, effect of cooking on the pigments.

Fruits: Classification, Nutritive value, Pigments- water insoluble, water soluble, flavour constituents, polyphenols and bitter compounds in fruits, effect of cooking on the pigments, flavours. Changes during ripening of fruits, enzymatic browning -prevention, storage.

**UNIT- IV: Milk and Meat Science**

**(18 Hours)**

Milk and Milk Products: Composition and Nutritive value, Processing of milk-clarification, pasteurization, homogenization. Milk products-Fermented and Non-fermented milk products, Maillard reaction.

Egg: Structure, Composition and Nutritive value, Quality of Egg -Evaluation of egg quality. Changes during cooking - Factors affecting coagulation of egg proteins and foam formation. Role of egg in cookery.

Meat- Structure, composition, different types of meat, cuts of meat, post mortem changes in meat, tenderness of meat, effect of cooking on meat. Poultry- Composition and classification. Fish- Structure, classification, composition, nutritive value, selection of fish.

**UNIT –V: Fats and Oils, Sugars, Spices and Beverage Science (16 Hours)**

Fats and oil- Composition of Common Fats and Oil, Refining and processing of oil-Plasticity, Hydrogenation, Winterization, Effect of heating-Smoking temperature, thermal breakdown. Rancidity-Definition, Types- oxidation, hydrolysis, prevention of rancidity and role of Fats and Oil in cookery.

Sugar- Stages of sugar cookery, crystallization, factors affecting crystallization. Nutritive value, sugar products. Spices and condiments- Types and uses in Indian cookery, medicinal value. Beverages-Classification and Nutritive value- Coffee and Tea.

**Total Lecture Hours -90**

**COURSE OUTCOME:**

The students will be able to,

1. Understand the basic principles of Food science, Food groups and Nutrients.
2. Acquire knowledge on different methods of cooking.
3. Identify the nutritive value and characteristics of Cereals, Pulses and Nuts
4. Understand the chemical reaction in fruits and vegetables.
5. Classify and explain the composition of milk and Fleshy food products.
6. Infer knowledge on the role of fats , oils,sugar,spices and condiments in cookery

**TEXT BOOKS**

1. Avantina Sharma. 2017. Textbook of Food Science and Technology. CBS Publishers and Distributors, New Delhi.
2. Shakuntala Manay ,N. 2001. Foods, Facts and Principles. New Age International Private Limited.Publishers, New Delhi.
3. Srilakshmi B. 2015. Food Science. New Age International Publishers, New Delhi.
4. Swaminathan M. 1992. Hand Book of Food Science and Experimental Foods. BAPPCO,Bangalore.
5. Usha Chandrasekhar. 2002. Food Science and Application in Indian Cookery. Phoenix Publishing House, Pvt. Ltd, New Delhi.

**REFERENCE BOOK(S)**

1. Brow A.2000. Understanding Food. Thomson Learning Publications, New Delhi.
2. Mehas KY and Rodgers SL.2000. Food Science and You, McMillan McGraw Company, New York.
3. Potter N.Hotchkiss, J H. 1998. Food Science.5<sup>th</sup> edition, CBS Publications and Distributors, Daryaganji, New Delhi.
4. Sunetra Roday.2012.Food Science and Nutrition. Oxford University Press, New Delhi.
5. Vickie A, Vaclavik, Elizabeth Wand Christian.2014. Essentials of Food Science Springer Science and Business Media, New York.

**E-RESOURCES**

1. <https://study.com/academy/lesson/what-is-food-science-definition-research.html>
2. <https://www.nia.nih.gov/health/important-nutrients-know-proteins-carbohydrates-and-fats>
3. <http://courseware.cutm.ac.in/wp-content/uploads/2020/06/Malting-of-Cereals.pdf>
4. <https://microbenotes.com/milk-pasteurization-methods-steps-significance/>
5. <https://www.selfstudys.com/uploads/pdf/pl7ZIMFciqH7WbRet7Qw.pdf>

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**Semester: ICP-I: Food Science Practical**

**Ins. Hrs./Week:3**

**Course Credit :2**

**Course Code: 22ND102P**

**OBJECTIVES:**

- To make the students understand the General Guidelines of laboratory.
- To introduce the methods of Measuring Ingredients and demonstration of Cooking Methods.
- To motivate the students for critical observation of different types of cereals, pulses, vegetables, fruits, nuts and oil seeds.

**PRACTICAL:**

1. Measurement of food materials using standard measures.
2. Cereals – Preparation of rice by steaming, absorption method, Straining and Pressure cooking, preparation of Fried and variety rice. Batters and dough- Preparation of Idli, Dosa, Upma, Chapathi, Pooi.
3. Pulses – Factors affecting the cooking quality of pulses. Preparation of Sambar, Sundal, Vada, Channa Masala, Green gram payasam, Sprouted salad and koottu.
4. Vegetables – Selecting, cleaning, coring, pitting and chopping of fruits and vegetables. Different techniques, Avial, stew, cutlet, chips, stuffed chapathi.
5. Fruits – Salad, Stuffed items, Jelly, Thokku, Sauce and Jams.
6. Milk – Cottage Cheese, Paneer, Ice cream, kova, Buttermilk, Basanthi.
7. Egg – Boiled, Scrambled, Poached, Omelette. Egg quality testing, egg as binding and coating agent.
8. Flesh Foods – Meat, Fish and Poultry. Changes in Cookery, different method of cooking.
9. Score card preparation and sensory evaluation.

**TEXT BOOKS**

1. Avantina Sharma. 2017. Textbook of Food Science and Technology. CBS Publishers and Distributors, New Delhi.
2. Shakuntala Manay N. 2001. Foods: facts and principles, New Age International Publishers, New Delhi
3. Srilakshmi B. 2015. Food Science. New Age International Publishers, New Delhi.
4. Swaminathan M . 1992. Hand Book of Food Science and Experimental Foods. BAPPCO, Bangalore.
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3. Potter Norman,N. 2007. Food Science. CBS Publications and distributors, New Delhi
4. Sumathi Mudambi R. Rajagopal MV. 2004. Fundamentals of Foods and Nutrition. New Age International Publishers, New Delhi.
5. ThangamE.Philip .2015. Modern Cookery for Teaching and the Trade Volume-I Orient Blackswan Private Limited, New Delhi.

## **E-RESOURCES**

1. <https://opentextbc.ca/basickitchenandfoodservicemanagement/chapter/units-of-measurement/>
2. <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=17057>
3. [https://old.fssai.gov.in/Portals/0/Pdf/GFLP\\_Document\\_06\\_09\\_2016.pdf](https://old.fssai.gov.in/Portals/0/Pdf/GFLP_Document_06_09_2016.pdf)
4. [https://www.researchgate.net/figure/Sample-Scorecard-that-Was-Used-for-Taste-Intensity-Training-Adapted-from-UTT-BAFT\\_fig2\\_259622487](https://www.researchgate.net/figure/Sample-Scorecard-that-Was-Used-for-Taste-Intensity-Training-Adapted-from-UTT-BAFT_fig2_259622487)
5. <https://www.indianhealthyrecipes.com/how-to-make-paneer-cubes-at-home/>
6. <https://www.slideshare.net/powerofknowledge3/egg-cookery>

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**Semester: I AC-I: Food Microbiology**

**Ins. Hrs./Week: 4**

**Course Credit :3**

**Course Code: 22AND101**

**OBJECTIVES:**

- To make the students to acquire fundamental knowledge and to make them to understand the relevance of microscopy.
- To make the students to learn and apply the basic of microbiology and its applications in everyday life.
- To make the students to understand the role of microorganisms in food industry and in the maintenance of health

**UNIT- I: Introduction to Microbiology (14 Hours)**

Definition and History: Microscopy, Light, Compound, Phase contrast, Fluorescence microscope and electron Microscope-Transmission Electron microscope, Scanning electron microscope. Micro Organisms – Bacteria- General characteristics, bacteria morphology, cell structure, motility, nutrition, reproduction and respiration. Viruses: General characteristics of viruses, Structure. Bacteriophage-multiplication. Yeasts: General characteristics of yeasts, Nutrition, Reproduction, Economic importance of yeasts. Molds: General characteristics of molds, Economic importance of molds.

**UNIT- II: Growth and Multiplication of microorganism (10 Hours)**

Growth phase, Factors Affecting Growth of microorganism: Intrinsic Factors- Nutrient Content, pH, Redox Potential, Antimicrobial Barrier and Water Activity. Extrinsic Factors- Relative Humidity, Temperature and Gaseous Atmosphere.

**UNIT -III: Microbiology of Perishable, Semi and Non-Perishable Foods (14 Hours)**

Outline of Contamination- Spoilage and Preservation of Cereals and Pulses, Vegetables and Fruits, Milk and Meat Products, Fish, Egg and Poultry.

**UNIT -IV: Beneficial Effects of Microorganisms (12 Hours)**

Fermentation- Definition, Types, Role of microorganisms in fermentation- Bacteria and Yeast. Fermented Foods – Probiotics, Curd, Cheese, Sauerkraut, Soy Based Foods, Alcoholic Beverages and Vinegar.

**Unit- V: Microbial Diseases, Causes, Symptoms, Treatment, Prevention (10 Hours)**

Food Borne Diseases – Botulism and Poliomyelitis, Amoebiasis. Water Borne Diseases- Diarrhea and cholera.

Air Borne Diseases – Corona, Influenza and Chicken pox.

**Total Lecture Hours -60**

### **COURSE OUTCOME:**

The students are able to

1. Understand the knowledge on history and scope of microbiology and deep insight in the application of microscopy
2. Acquaint with the basic concept of microbes, their taxonomy, differentiation and factors influencing their growth and survival.
3. Acquire knowledge of microbes and their importance, application in day to day life with special reference to food.
4. Explain the effects of fermentation in food production and also how it influences the microbial quality and status of the food product.
5. Identify the characteristics of food borne, water borne and air borne microbial diseases.

### **TEXT BOOK(S)**

1. Adams MR. 2014. Food Microbiology. New Age International Publishers, New Delhi.
2. Arumugam N, Mani A, Selvaraj AM and Narayanan LM. 2014. Microbiology. Saras publication, Nagercoil.
3. Pelczar Jr. Michael J. 2014. Microbiology. McGraw Hill Education (India), Private Ltd, New York.
4. Vijaya Ramesh, K. 2007. Food Microbiology. MJP Publishers, Chennai.
5. William C. Frazier. 2014. Food Microbiology. Tata McGraw Hills Publishing Company Limited, New York.

### **REFERENCE BOOK(S)**

1. Adams Tamine, 2005. Probiotic Dairy Products. Blackwell Publishing, USA.
2. Bohra and Parihar. 2012. Food Microbiology. Student edition.
3. James G. Cappuccino. Natalie Sherman. 2008. Microbiology – A Laboratory Manual. Pearson Education Publishers, USA.
4. James M. Jay. 2005. Modern Food Microbiology. Fourth Edition, CBS Publishers and Distributors, New Delhi.
5. Sugandhar Babu RP. 2008. Food Microbiology. Adhyayan Publishers and Distributors, New Delhi.

### **E-RESOURCES**

1. <http://airccse.org/journal/ijscail/papers/3214ijscail01.pdf>
2. <https://www.ncbi.nlm.nih.gov/>
3. <https://www.fda.gov/files/food/published/Evaluation-and-Definition-of-Potentially-Hazardous-Foods.pdf>
4. <https://nptel.ac.in/courses/102103015/pdf/mod5.pdf>
5. <http://egyankosh.ac.in/bitstream/123456789/12425/1/Unit-4.pdf>

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**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE  
(AUTONOMOUS)**



**SUNDARAKKOTTAI, MANNARGUDI -614016.**

*(For the candidate admitted in the academic year 2022-2023)*

**DEPARTMENT OF NUTRITION AND DIETETICS  
B.Sc., NUTRITION AND DIETETICS**

**Semester: I AP-I: Food Microbiology Practical**

**Ins. Hrs./Week:3**

**Course Credit :2**

**Course Code: 22AND102P**

**OBJECTIVES:**

- To make the students to acquire knowledge on cultivation of microorganisms.
- To make them understand the basics of microbiology and its applications in everyday life.

**Food Microbiology**

1. Instrumentation in Microbiology laboratory and their function (Microscope, Autoclave, Hot air oven)
2. Preparation of Culture media
3. Pure culture techniques (spread plate, streak plate and pour plate methods)
4. Staining techniques-simple and differential.
5. Morphological identification of important Yeast and Mold in Foods (Slide and Culture)-rhizopus, Mucor, Aspergillus.
6. Microbiological analysis of water and air.
7. Isolation of spoilage organisms from different food commodities.

**TEXT BOOK(S)**

1. Bharati Arora. 2007. Practical microbiology. CBS Publishers and Distributors, New Delhi.
2. Christina Amstalden and Margarete Midori, Neusely da Silva. 2012. Microbiological Examination Methods of Food and Water. CRS Press, London.
3. Deshpande HW, and Machewad. 2008 Practical Manual Food Microbiology. Department of Food Microbiology and Safety. College of Food Technology, Parbhani, Maharashtra. Microbiology. Dreamtech Press. New Delhi.
4. Neelima Garg KL and Mukerji. KG. 2010. laboratory Manual of Food
5. Shankar Prasad Sha and Kriti Ghatani. 2013. Fundamentals of Food Microbiology. Research India, Publications. New Delhi.

**REFERENCE BOOK(S)**

1. Adams Tamine. 2005. Probiotic Dairy Products. Blackwell Publishing, USA.
2. James G. Cappuccino and Natalie Sherman. 2008. Microbiology – A Laboratory Manual. Pearson Education Publishers, USA,
3. James M. Jay. 2005. Modern Food Microbiology. Fourth Edition, CBS Publishers and Distributors, New Delhi,
4. Rao AS. 2001. Introduction to Microbiology. Prentice Hall Of India Private Ltd, New Delhi.
5. Sugandhar Babu RP. 2008. Food Microbiology. Adhyaya Publishers and distributors, New Delhi.

**E-RESOURCES**

1. <https://microbenotes.com/instruments-used-in-microbiology-lab/>.
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3122495/>.
3. <https://youtu.be/Lhxy-mb2-Ls>.
4. <https://youtube.be/-ciKzM5SICK>.
5. <https://youtube.be/fzk -- O2SDos>.

# SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE



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**DEPARTMENT OF NUTRITION AND DIETETICS**

**B.Sc., NUTRITION AND DIETETICS**

## Part IV - VALUE EDUCATION-22UGVED

(Revised syllabus)

### Unit I Philosophy of Life and Social Values

Human Life on Earth (Kural 629) Purpose of Life (Kural 46) Meaning and Philosophy of Life (Kural 131, 226) Family (Kural 45), Peace in Family (Kural 1025) Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) Five responsibilities / duties of Man (a) to himself (b) to his family (c) to his environment (d) to his society, (e) to the Universe in his lives (Kural 43, 981).

### Unit II Human Rights and Organisations

Definitions, Nature of Human Rights. Universal Declaration of Human Rights, International covenant on Civil and Political Rights - International covenant of Economic, Social and Cultural Rights. Amnesty International Red Cross.

### Unit III Human Rights: Contemporary Challenges

Child labour - Womens Right - Bonded labour - Problems of refugees - Capital punishment. National and State Human Rights Commissions

### Unit IV Yoga and Health

Definition, Meaning, Scope of Yoga - Aims and objectives of Yoga - Yoga Education with modern context - Different traditions and schools of Yoga - Yoga practices: Asanas, Pranayama and Meditation.

### Unit V Role of State Public Service Commission

Constitutional provisions and formation - Powers and Functions - Methods of recruitment - Rules and notification, syllabi for different exams - written and oral- placement.

### BOOKS FOR REFERENCES:

1. Thirukkural with English Translation of Rev. Dr. G.U. Pope, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613 004
2. Leah Levin, Human Rights, NBT, 1998
3. V.R. Krishna Iyer, Dialectics and Dynamics of Human Rights in India, Tagore Law Lectures.
4. Yogic Therapy - Swami Kunalayananda and Dr.S.L.Vinekar, Government of India, Ministry of Health, New Delhi.
5. SOUND HEALTH THROUGH YOGA - Dr.K.Chandrasekaran, Prem Kalyan Publications, Sedapatti, 1999.

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**DEPARTMENT OF NUTRITION AND DIETETICS  
B.Sc., NUTRITION AND DIETETICS**

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**Semester: II- CC-II: Human Physiology**

**Ins. Hrs./Week:6**

**Course Credit :5**

**Course Code:22ND203**

**OBJECTIVES:**

- To provide knowledge on the structure of various organs of the body and their harmonious functions with other organs
- To make the students learn about the importance of hormonal and nervous systems and their significance in the regulation of the body.
- To make the Students to understand the circulatory, digestive and respiratory systems and their functions.

**UNIT-I: Blood and Circulatory System**

**(19 Hours)**

Blood: Composition, functions, Red Blood cells (RBCs) – Structure, functions, Erythropoiesis, Haemoglobin, White Blood cells (WBCs) –Structure, classification- granulocytes, lymphocytes, monocytes, and functions.

Blood Platelets: Structure, functions; Reticulo endothelial system; Blood groups –Rh factor. Blood coagulation, Spleen –Structure and functions, Lymph – Lymphatic system- Components and functions.

Heart and Circulation – Structure of heart and circulation. Structure of blood vessels, Properties of cardiac muscle, Cardiac cycle-Cardiac rhythm, Cardiac output, Origin and conduction of heart beat; Measurement of arterial blood pressure; Regulation of Heart's action.

**UNIT- II: Digestive System**

**(16 Hours)**

General Anatomy of the digestive system. Digestion in the Mouth, Stomach and Intestines; structure of Villi: Movements of the Gastro intestinal tract; Role of Liver, Gall bladder and Pancreas – Structure and Functions.

**UNIT- III: Respiratory and Excretory System**

**(18 Hours)**

Respiratory System –Anatomy and physiology of Respiratory organ, Mechanism of respiration, Subdivisions of Lung air; Control of respiration; chemistry of Respiration; Artificial Respiration. Excretory system –Structure and functions of kidney and nephron, Formation of urine; Micturition.

**UNIT- IV: Endocrine and Reproductive System**

**(19 Hours)**

Endocrine System – Role of hormones and functions of thyroid gland, pituitary gland, parathyroid gland, adrenal gland; Islets of langerhans of pancreas.

Reproductive System – General anatomy – Female and male reproductive system. Testis – Spermatogenesis, male sex hormones, ovaries – oogenesis, Female sex hormones, menstrual cycle. Phases and endocrine control. Fertilization, development of embryo, pregnancy and parturition. Mammary glands – Structure and process of lactation.

## **UNIT –V: Nervous System and Sense Organs**

**(18 Hours)**

Nervous System – Anatomy and physiology of Brain. Spinal cord and Neuron, Conduction of nerve impulse.

Sense Organs:

**Eye** - Structure, functions, Physiology of vision, dark and light adaptation, accommodation of the eye, visual fields, Abnormalities – presbyopia, cataract, Astigmatism, Blindness.

**Ear** - Structure and Physiology of hearing.

**Skin** – Structure and functions, Regulations of body temperature.

**Total Lecture Hours -90**

### **COURSE OUTCOME:**

The students will be able to,

1. Know the role and importance of circulatory system and its regulation in body function
2. Gain knowledge on mechanism of digestive system, respiratory and excretory function and their role in body regulation.
3. Understand the importance of endocrine system and its role in biological process.
4. Comprehend the reproductive system.
5. Gain knowledge about nervous system and sense organs.

### **TEXT BOOK(S)**

1. Arumugam, N.Mariakuttikan,A.2016. Animal Physiology. Saras Publication. ISBN: 9789382459873, 9382459871.Nagarcoil.
2. Chatterjee, CC .2004. Human Physiology. Volume I, Medical Allied Agency, Kolkata
3. Chatterjee ,CC. 2004. Human Physiology. Volume II, Medical Allied Agency, Kolkata.
4. Sembulingam, K. 2000. Essentials of Medical Physiology.Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.
5. Subramanyam, Sarada . 2018. Textbook of Human Physiology. S.Chand and company Ltd,New Delhi.

### **REFERENCE BOOK(S)**

1. Best and Taylor.1992. The Physiological Basis for Medical Practice, Saunders Company. Canada.
2. Chaudhri K. 1993. Concise Medical Physiology. New Central Book Agency Parentra ltd,Calcutta, Churchill Livingston, NewYork.
3. Dr.Goyal R, Dr.Natvar M, Patel M.2018.Practical Anatomy and Physiology.B.S.Shah Prakashan.Gujarat.
4. Muruges N.2014.Anatomy and Physiology.Sathya Publishers, Madurai
5. Waugh Anne Ross. 2003. Anatomyand Physiology in Health and Illness. Reed Elsevier IndiaPrivate Limited, New Delhi.

## **E - RESOURCES**

1. <https://nptel.ac.in/content/storage2/courses/122103039/pdf/mod3.pdf>
2. <https://lba.ku.edu/sites/lba.drupal.ku.edu/files/docs/Courses/chapter%204d.pdf>
3. <https://globex.coe.pku.edu.cn/file/upload/201807/05/092547601064.pdf>
4. <https://courses.lumenlearning.com/suny-ap2/chapter/anatomy-and-physiology-of-the-female-reproductive-system/>
5. <https://www.khanacademy.org/science/health-and-medicine/human-anatomy-and-physiology>

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**DEPARTMENT OF NUTRITION AND DIETETICS**

**B.Sc., NUTRITION AND DIETETICS**

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**Semester: II –CP-II: Human Physiology Practical**

**Ins.Hrs./Week:3**

**Course Credit: 2**

**Course Code: 22ND204P**

**OBJECTIVES**

- To make the students understand the General Guidelines of laboratory.
- To able to recognize and identify principles of tissue structure.
- To identify the count of Red Blood Cells, White Blood Cells, Blood Grouping, Blood bleeding and clotting time.
- To make the students to understand the determination of heart and pulse rate.

**PRACTICAL:**

1. Histology of Tissues – Columnar, cubical, ciliated, squamous, stratified squamous.
2. Microscopic structure of organs – lungs, artery, vein, stomach, ovary, testis, uterus, pancreas.
3. Histology of muscles – cardiac, striated, non – striated
4. Estimation of Haemoglobin, Bleeding time, Clotting time
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. Determination of Rh factor.
9. Enumeration of Red blood cells – Demonstration.
10. Enumeration of White blood cells – Demonstration.
11. Differential Leukocyte count – Demonstration
12. Visit to a Clinical laboratory.

**TEXT BOOK(S)**

1. Dr.Mrunal K.Shirsat.Dr.Jayesh Dwivedi.2002.A Practical Book on Human Anatomy And Physiology I. Everest Publishing House.Pune.
2. Guyton and Hal.2000. Textbook of Medical Physiology. Saunders, United States of America
3. Pal,G.K.and Parvati Pal.2016.Textbook of Practical Physiology. Universities Press(India)Private Limited.
4. Sembulingam, 2016. Essentials of Medical Physiology. Health Sciences Publisher, New Delhi.
5. Subramanyam, Sarada ,2018. Textbook of Human Physiology. S.Chand and company Limited, New Delhi.

## **REFERENCE BOOK(S)**

1. Best and Taylor.1992. The Physiological Basis for Medical Practice, Saunders Company. Canada.
2. Dr.Goyal R, Dr.Natvar M,Patel M.2018.Practical Anatomy and Physiology.B.S.Shah Prakashan.Gujarat.
3. Sri Nageswari K.Rajeev Sharma.2018.Practical Workbook of Human Physiology .Jaypee-The Health Sciences Publisher. Mumbai.
4. Waugh Anne Ross. 2003. Anatomy and Physiology in Health and Illness, Churchill Livingstone, New York.
5. Wilson, Ross. 2014. Anatomy and Physiology in Health and Illness, Reed Elsevier India Private Limited, New Delhi.

## **E - RESOURCES**

1. <http://nbtc.naco.gov.in/assets/resources/training/5.pdf>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4620538/>
3. <https://youtu.be/4PaEd6FAZn4>
4. [https://youtu.be/x\\_AihJIPF30](https://youtu.be/x_AihJIPF30)
5. <https://www.researchgate.net/publication/331326775>

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*(For the candidate admitted in the academic year 2022-2023)*

**DEPARTMENT OF NUTRITION AND DIETETICS  
B.Sc., NUTRITION AND DIETETICS**

**Semester: II CC – IV: Nutritional Biochemistry**

**Ins Hrs./Week:5**

**Course Credit: 5**

**Course Code:22AND203**

**OBJECTIVE:**

- Review the biological system of energy metabolism.
- Study the chemical/biochemical properties and metabolic pathways of carbohydrates, lipids, and proteins.
- Examine the regulatory mechanisms of macronutrient metabolism and associated signaling pathways.
- Understand the research techniques used in basic biochemistry and nutritional biochemistry research.

**UNIT- I: Carbohydrate**

**(15 Hours)**

Carbohydrate – Structure, General reactions of mono, di, tri and oligosaccharides, Metabolism of carbohydrate – glucose oxidation through Glycolysis, Krebs- TCA cycle, Pentose Phosphate Pathway, Gluconeogenesis. Inborn errors of metabolism – Fructosuria and galactosemia.

**UNIT II: Proteins**

**(15 Hours)**

Proteins-primary, secondary, tertiary structure of proteins, Hydrolysis of proteins-Denaturation, precipitation, coagulation. Nutritional classification of proteins, Amino Acids – Classification, chemical properties due to amino and carboxyl groups. General pathways of metabolism of amino acids- Deamination, Transamination, Decarboxylation – urea cycle, fate of carbon skeleton of amino acids. Inborn errors of metabolism-Phenyl ketonuria, Alcaptonuria, Maple Syrup Urine Disorder.

**UNIT- III: Lipid and Lipid Metabolism**

**(14 Hours)**

Lipids and Lipid Metabolism– Classification of fats, oxidation of fatty acids, Bio synthesis of fatty acids, ketogenesis. Nutritional importance of Saturated and Unsaturated fatty acids, Triacylglycerols, Phospholipids and Cholesterol.

**UNIT-IV: Nucleotides, Nucleic Acids And Enzyme**

**(15 Hours)**

Nucleotides and nucleic acids: Structure of purine and pyrimidines nucleotides, RNA – structure and types, double helical structure of DNA, biosynthesis and catabolism of purine and pyrimidine nucleotides.

Enzyme- Definition, Enzyme classification, Nomenclature, Factors affecting enzymatic activity, Mechanism of action. Co- enzyme and prosthetic group- role of B vitamins.

**UNIT- V: Vitamins and Minerals****(16 Hours)**

Vitamins: Fat Soluble Vitamins (A, D, E, K) – Sources, functions, Classification and its metabolism.

Water Soluble Vitamins (Vitamin B and Vitamin C) – Sources, functions, Classification and its metabolism.

Minerals: Macro Minerals (Calcium, Phosphorus, Sodium, Potassium, Magnesium)– Sources, functions, Classification and its metabolism.

Micro Minerals (Iron, Fluorine, Zinc, Iodine, Selenium) – Sources, functions, Classification and its metabolism.

**Total Lecture Hours- 75****COURSE OUTCOME**

The students should be able to

1. Understand the role of enzymes in metabolism and clinical conditions.
2. Interpret the significance of macronutrient metabolism, and thereby understand the implications of disorders resulting from these.
3. Acquire skills in qualitative tests and quantitative estimation of nutrients.
4. Understand and gain theory & practical knowledge on Biological cycles involved in metabolism.
5. Evaluate and criticize the experimental approaches and scientific information presented in the research articles related to nutritional biochemistry.

**TEXT BOOK(S)**

1. Ambika Shanmugam. 2008. Fundamentals of Biochemistry for Medical Students. Lippincott Williams & Wilkins.
2. Ambika Shanmugham. 1985. Fundamentals of bio-chemistry to medical students. NVA Bharat Printers, and traders, Madras.
3. Rafi MD. Dr. N.T.R. 2015. Textbook of Biochemistry for Medical Students. University of Health Sciences, Universities Press.
4. Ranganatha Rao. K. 2000. Text book of Biochemistry. Prentice Hall of India, New Delhi.
5. Sathyanarayanan U. Chakrapani U. 2010. Textbook of biochemistry. 3<sup>rd</sup> edition. books and allied (p)ltd, Kolkata.

**REFERENCE BOOK(S)**

1. Agarwal GR. Meerut. 2014. Text Book of Biochemistry .Krishna Prakashan Media(p)
2. Conn EE. Stumpf PK. 1981. Outlines of Biochemistry. 4<sup>th</sup>. Ed. Wiley Eastern Ltd, New Delhi.
3. Harvey R. Ferrier D. Lippincott's Illustrated Reviews Biochemistry. 6<sup>th</sup> edition, Lippincott Williams and Wilkins, Philadelphia.Ltd.
4. Murray, R.K., Granner, D.K. and Rodwell, V. W. 2006. Harper's Illustrated Biochemistry. 27<sup>th</sup> ed. The McGraw-Hill Companies, USA.
5. Satyanarayanan ,U .2014. Biochemistry. Elsevier India Private Limited, New Delhi.

**E- RESOURCES**

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2. <https://courses.lumenlearning.com/boundless-microbiology/chapter/the-citric-acid/>
3. <http://watcut.uwaterloo.ca/webnotes/Metabolism/Gluconeogenesis.html>
4. <https://www.nhs.uk/conditions/phenylketonuria/>
5. [https://dducollegedu.ac.in/Datafiles/cms/ecourse%20content/B.Sc.%20\(H\)%20Bot%20VI%20sem\\_Dr%20Sandeep%20Kumar%20Botay.pdf](https://dducollegedu.ac.in/Datafiles/cms/ecourse%20content/B.Sc.%20(H)%20Bot%20VI%20sem_Dr%20Sandeep%20Kumar%20Botay.pdf)

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**DEPARTMENT OF NUTRITION AND DIETETICS  
B.Sc., NUTRITION AND DIETETICS**

**Semester: II CP – IV: Nutritional Biochemistry Practical**

**Ins Hrs./Week:3 Course Credit: 2**

**Course Code:22AND204P**

**CONTENTS**

- Qualitative Tests for Carbohydrates – Glucose, Fructose, Lactose, Maltose, Starch
- Qualitative Test for Protein – Caesin, Egg albumin.
- Qualitative Tests for Lipids – Coconut oil, Gingelly oil.
- Qualitative Tests for Minerals – Copper Sulphate, Ammonium Phosphate.
- Quantitative Estimation of Glucose – BQR method
- Quantitative Estimation of Protein – Biuret Method
- Quantitative Estimation of Phosphorus – Fiske and Sub arrow Method
- Quantitative Estimation of Ascorbic Acid – 2,6 Dichloro Indophenol Dye Method
- Determination of Iodine Value.

**REFERENCE BOOK(S)**

1. Oser BL. 2001. Harke's Physiological Chemistry. XIV Edition. TataMcGraw Hill Publishing Company Ltd, Bombay.
2. Raghuramulu N. Madhavannair K. and Kalyana Sundaram. 2003. A Manual of Laboratory Techniques, National Institute of Nutrition, Hyderabad, 500007.
3. Sadasivam S and Manickam A. 2003. Biochemical Method. Second Edition. New Age International P. Ltd Publishers, New Delhi.
4. Varley H. Gowenlak AH. and Hill M. 2000. Practical Clinical Biochemistry. William Itinmaon Medical Books, London.

**E - RESOURCES**

1. <https://youtu.be/fQ1hSNGnXYY>
2. <https://youtu.be/ZN3bz3EftJ0>
3. <http://www.chem.boun.edu.tr/wp-content/uploads-415-Experiment-1.pdf/2014/04/Chem>
4. <https://www.pharmaguideline.com/2011/03/determination-of-iodine-value.html>
5. [https://www.webassign.net/labsgraceperiod/ucscgenchem11/lab\\_14/manual.pdf](https://www.webassign.net/labsgraceperiod/ucscgenchem11/lab_14/manual.pdf)

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**DEPARTMENT OF NUTRITION AND DIETETICS**

**B.Sc., NUTRITION AND DIETETICS**



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(Applicable to the candidates admitted from the Academic year 2019-20 onwards)  
ENVIRONMENTAL STUDIES-22UGCES

- Unit- 1:** The Multidisciplinary nature of environmental studies  
Definition, scope and importance. (2 lectures)  
Need for public awareness
- Unit- 2:** Natural Resources:  
Renewable and non-renewable resources:  
Natural resources and associated problems.
- Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
  - Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.
  - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
  - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
  - Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
  - Land resources: Land as a resources, land degradation, man induced Landslides, soil erosion and desertification.
- Role of an individual in conservation of natural resources.
  - Equitable use of resources for sustainable lifestyles. (8 lectures)
- Unit- 3: Ecosystems**
- Concept of an ecosystem.
  - Structure and function of an ecosystem.
  - Producers, consumers and decomposers
  - Energy flow in the ecosystem
  - Ecological succession.
  - Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem:-
- Forest ecosystem

- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)

(6 lectures)

**Unit- 4: Biodiversity and its conservation**

- Introduction – Definition : Genetic, species and ecosystem diversity
- Biogeographically classification of India
- Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, National and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Biological Diversity Act 2002/ BD Rules, 2004

(8 lectures)

**Unit-5:**

**Environmental Pollution**

Definition

Causes, effects and control measures of:

- a. Air Pollution
- b. Water Pollution
- c. Soil Pollution
- d. Marine Pollution
- e. Noise pollution
- f. Thermal Pollution
- g. Nuclear hazards

- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides.
- Ill-Effects of Fireworks: Firework and Celebrations, Health Hazards, Types of Fire, Firework and Safety

(8 lectures)

## **Unit- 6: Social Issues and the Environment**

- From Unsustainable to Sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and rehabilitation of people; its problems and concerns.

### Case studies

- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and Control of Pollution) Act.
- Wildlife Protection Act.
- Forest Conservation Act.
- Issues involved in enforcement of environmental legislation
- Public awareness.

(7 lectures)

## **Unit-7: Human Population and the Environment**

- Population growth, variation among nations.
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights - Value Education
- HIV/ AIDS - Women and Child Welfare
- Role of Information Technology in Environment and human health
- Case studies.

## **Unit- 8: Field Work**

- Visit to a local area to document environmental assets-river / forest/ grassland/ hill / mountain

## **References:**

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt Ltd, Ahmedabad – 380013, India, E-mail: [mapin@icenet.net](mailto:mapin@icenet.net)(R)
3. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480 p
4. Clark R.S. Marine Pollution, Clarendon Press Oxford (TB)
5. Cunningham, W.P. Cooper, T.H. Gorhani E & Hepworth, M.T. 2001.
6. De A.K. Environmental Chemistry, Wiley Eastern Ltd
7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford University, Press 473p.
9. Hawkins, R.E. Encyclopedia of India Natural History, Bombay Natural History Society,

- Bombay (R)
10. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge University Press 1140 p.
  11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws Himalaya Pub. House, Delhi 284 p.
  12. Mckinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition 639 p.
  13. Mhaskar A.K. Matter Hazardous, Techno-Science Publications (TB)
  14. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
  15. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p
  16. Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt Ltd 345 p.
  17. Sharma B.K. 2001 Environmental chemistry Goel Publ House, Meerut.
  18. Survey of the Environment, The Hindu (M ).
  19. Townsend C. Harper, J and Michael Begon, Essentials of Ecology, Blackwell science (TB)
  20. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R).
  21. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science Publications (TB).
  22. Wagner K.D. 1998 Environmental Management. W.B. Saunders Co. Philadelphia USA 499 p  
(M) Magazine (R) Reference (TB) Textbook
  23. <http://nbaindia.org/uploaded/Biodiversityindia/Legal/33%20Biological%20Diversity%20Rules,%202004.pdf>.

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**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE  
(AUTONOMOUS)**

SUNDARAKKOTTAI, MANNARGUDI -614016.

*(For the candidate admitted in the academic year 2022-2023)*

**DEPARTMENT OF NUTRITION AND DIETETICS  
B.Sc., NUTRITION AND DIETETICS**

**Semester: III – CC - III: Principles of Nutrition**

**Ins. Hrs. /Week: 6**

**Course Credit: 5**

**Course Code: 23ND305**

**OBJECTIVES:**

- To impart basic knowledge on different nutrients and their importance for human health.
- To make the students understand the role of nutrients in maintaining health of the individual and Community.
- To teach the interrelationship between health and nutrients.

**UNIT- I: Nutrition and Recommended dietary allowances (19 Hours)**

Introduction to Nutrition– Definition of nutrition, health, nutrients, nutritional status and malnutrition-under nutrition, over nutrition, imbalance, specific deficiency, Inter-relationship between health and nutrition.

Recommended dietary allowances – Definition, General principles of deriving Recommended Dietary Allowances -Dietary intake, Growth, nutrient balance, obligatory loss of nutrients, factorial approach, nutrient turnover, Factors affecting Recommended Dietary Allowances-variability in nutrient requirements, Dietary factors. Determination of Recommended Dietary Allowances of different nutrients, uses of Recommended Dietary Allowances.

**UNIT-II: Carbohydrate, Dietary fiber and Proteins (19 Hours)**

Carbohydrates– Definition, Nutritional classification, Functions, Sources, Requirements and deficiency. Regulation of Blood Sugar level.

Dietary Fibre – Definition, Classification, Role of fibre in preventing disease, recommended dietary allowances and sources.

Proteins – Definition, Composition, Nutritional classification of protein-complete, incomplete and partially incomplete proteins and amino acids, Functions of Proteins and amino acids, Sources and Requirements, Deficiency. Evaluation of Protein quality – Biological assays, Biological Value (BV), Net protein utilization (NPU), Net Dietary protein ratio, Protein Digestibility, Protein digestibility-corrected amino acid score (PDCAAS), Protein Efficiency Ratio (PER) and chemical score.

**UNIT- III: Lipids and Energy and Basal Metabolic Rate (18 Hours)**

Lipids – Definition, Composition, Nutritional classification, Functions, Sources and requirements; Essential fatty acids – Definition, Functions, Sources and effects of deficiency.

Energy – Definitions, Energy units, Determination of energy value of foods by direct and indirect calorimetry and physiological energy value of foods.

Basal Metabolic Rate(BMR) – Definitions, Measurements of basal metabolism, Determinations, Factors affecting the Basal Metabolic Rate, Energy requirements for physical activity – Factorial method, Specific Dynamic action(SDA)-Measuring total energy

requirements, factors affecting thermic effect of food, Resting Energy Expenditure(REE). Energy requirement and sources.

**UNIT –IV: Vitamins** (16 Hours)

Vitamins – Classification, General Functions and Deficiency.

Fat Soluble Vitamins – Vitamin A,D,E and K – Functions, Requirements, Sources and Effect of deficiency.

Water soluble vitamins – Thiamine, Riboflavin, Niacin, Ascorbic acid, Folic acid, Vitamin B6 and B12 – Functions, Requirements, Sources and Effects of deficiency.

**UNIT- V: Minerals and Water** (18 Hours)

Minerals- Classification and General Functions.

Macro minerals – Calcium, Phosphorus, Magnesium, Sodium and Potassium – Functions, Requirements, Sources, Effects of Deficiency, Effect of imbalance of Sodium and Potassium.

Micro Minerals – Iron, Iodine, Copper, Fluorine and Zinc – Functions, Requirements, Sources and Effect of Deficiency.

Water – Definition, distribution of water, function, requirements, sources, water balance, maintenance of water balance, distribution of electrolytes, maintenance of electrolyte balance.

**Total Lecture Hours - 90**

**COURSE OUTCOME:**

The students will be able to,

1. Understand the relationship between health and nutrition and identify food sources of macro and micro nutrients
2. Understand the role of macro nutrients and are able to evaluate the energy value of foods
3. Understand the important role of vitamins and water in human body.
4. Gain knowledge of minerals and their functions.

**TEXT BOOK(S)**

1. Food Composition Table. National Institute of Nutrition, Hyderabad.
2. Gajalakshmi R .2014 .Nutrition Science. CBS Publishers and Distributors Pvt. Ltd.
3. Longvah R, Anandhan K, Bhaskarachar Y and Venkaiah K. 2017. Indian
4. Mahtab S. Bamji, 2017. Textbook of Human Nutrition. Oxford & IBH Publishing Company Private Limited.
5. Srilakshmi.B. 2004. Nutrition Science. New age International, Private Limited, New Delhi.

**REFERENCE BOOK(S)**

1. Berdanier Carolyn D. 2009. Advanced Nutrition: Macronutrients, Micronutrients and Metabolism. Atlantic Publishers and Distributors, New Delhi.
2. Bonnie, Worthington, Roberts and Sue Rodwell Williams. 1996. Nutrition throughout the lifecycle. 3<sup>rd</sup> edition, WCB/MC Graw Hill Publisher, New York.
3. Frances sizer and Ellie Whitney, 2006. Nutrition Concepts and Controversies. Thomson wadsworth Publisher, New York
4. Mangale Kango. 2005. Normal Nutrition, Curing Diseases through Diet. CBS publication, First edition.
5. Martin Eastwood. 2013. Principles of Human Nutrition. Wiley Publishing, Private Limited

## **E-RESOURCES**

1. <https://foodfuturefoundation.org/media/i0ld30zx/recommended-dietary-allowances-rda-for-indians-2020.pdf>
2. <http://www.signutra.com/nutripedia/role-of-dietary-fiber-in-health-and-disease>
3. [https://www.researchgate.net/publication/293012690\\_Protein\\_Evaluation\\_of\\_Foods](https://www.researchgate.net/publication/293012690_Protein_Evaluation_of_Foods)
4. <https://www.healthline.com/nutrition/micronutrients#types-and-functions>
5. <https://www.uofmhealth.org/health-library/ta3868>

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**DEPARTMENT OF NUTRITION AND DIETETICS  
B.Sc., NUTRITION AND DIETETICS**

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**Semester: III –CP-III: Principles of Nutrition Practical**

**Ins. Hrs./Week:3**

**Course Credit: 2**

**Course Code: 23ND306P**

**OBJECTIVES:**

- To create awareness about the importance of the nutrients.
- To make the students understand the techniques of estimation of micronutrients.
- To inculcate knowledge on nutritive value of Indian foods.

**PRACTICAL:**

1. Planning, Preparation and Nutritive value calculation of macronutrient rich dishes
  - Carbohydrate- Starch, Fibre
  - Protein
  - Fat
  - Fiber
2. Planning, Preparation and Nutritive value calculation of micronutrient rich dishes
  - Vitamins- Vitamin A, Vitamin C, Thiamine, Riboflavin and Niacin
  - Minerals- Calcium, Iron, Zinc, Phosphorus, potassium
3. Estimation of nitrogen
4. Estimation of fibre
5. Estimation of total fat

**TEXT BOOK(S)**

1. Gajalakshmi R 2014 .Nutrition Science. CBS Publishers and Distributors Pvt. Ltd.
2. Oser BL, Harke's.2001.Physiological Chemistry.14<sup>th</sup> Edition Tata McGraw Hill Publishing Company Ltd., Bombay.
3. Raghuramulu N, Madhavannairn K and Kalyana Sundaram. 2013. National Institute of Nutrition. A Manual of Laboratory Techniques, Hyderabad.
4. Sadasivam S and Manickam, A. 2003. Biochemical Method. Second Edition, New Age International P. Ltd., Publishers, New Delhi.
5. Varley H, Gowenlak AH and Hill M.2000.Practical Clinical Biochemistry, William Itinmaon Medical Books, London.

**REFERENCE BOOK(S)**

1. Food Safety and Standards Authority of India. 2015 Manual of Analysis of Foods Food Safety and Standards Authority of India.
2. Gopalan C, Rama Sastri VB and Balasuramanian SC. 2016 Nutritive Value of Indian Foods National Institute of Nutrition (ICMR) Hyderabad.
3. Graham Dodgshun and Michel Peters .2010 Cookery for the Hospitality Industry Cambridge



University Press, New Delhi.

4. Kathleen Mahan, 2008 .Krause's Food and Nutrition Therapy. Saunders Elsevier, Missouri.
5. Thangam E.Philip .2015. Modern Cookery for Teaching and the Trade Volume-I Orient Blackswan Private Limited, New Delhi.

### **E-RESOURCES**

1. <https://www.trifectanutrition.com/blog/macro-meal-planner-how-to-portion-foods-to-fit-your-macros>
2. <https://fitmencook.com/recipes/workout/high-carbs>
3. <https://www.ars.usda.gov/is/np/NutritiveValueofFoods/NutritiveValueofFoods.pdf> 44.
4. <https://onlinelibrary.wiley.com/doi/pdf/10.1002/j.2050-0416.1936.tb05656.x>
5. <https://www.youtube.com/watch?v=p1a3kctJuIs>
6. <https://www.youtube.com/watch?v=ylyjm8iY23Q>

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**DEPARTMENT OF NUTRITION AND DIETETICS  
B.Sc., NUTRITION AND DIETETICS**



**Semester: III-AC-III: Family Resource Management and Interior Design**

**Ins. Hrs. /Week: 4**

**Course Credit: 3**

**Course Code: 23AND305**

**OBJECTIVES**

- Students have a foundation in the fundamentals of art and design; theories of design, green design, and discipline-related history.
- Students understand and apply the knowledge, skills, processes, and theories of interior design.
- Individual with customer service experience, extensive knowledge of design techniques, and a background in management seeking interior design position at any company.

**UNIT – I: Management and Concepts**

**(11 Hours)**

Management – Definition, Principles and elements involved in management Process – planning, organizing, controlling, coordinating and motivating. Management Concepts - Goals and Values – their relationship to decision-making, Standard of Living – Definition, constituents, Means for raising the standard of living of families. Decision Making – steps, importance, types of decisions, Habitual versus Conscious decision making. Individual and group decisions, resolving conflicts in group decisions.

**UNIT – II: Resources and Family**

**(12 Hours)**

Resources – Human and non-human resources. Characteristics of Resources, utilization of resources to achieve family goals. Family Income – Definition, Types - Money, Real and Psychic income, HUDCO classification, various ways of improving the income of the family, Family finance management, Family Budget – Definition and meaning, importance of budgeting, steps, factors affecting the budget. Engles's Law of Consumption. Savings – Meaning, objectives, Needs for savings in the family, types of savings schemes.

**UNIT III: Basics in Interior Design**

**(12 Hours)**

Concept of Interior Design-Meaning of Interior Design and Interior Decoration. Design – Definition, Meaning, Purpose. Types, elements and principles Concept of colour. Dimensions of colour – Hue, value and intensity, Colour therapy & Psychology of Colour systems, harmonies, Application of colour harmonies in the interiors and exteriors

**UNIT- IV: Lighting, Accessories and Furnitures**

**(13 Hours)**

Importance of lighting. Sources, Types, Glare- Types, causes and prevention. Accessories-Meaning, Types-functional, decorative, both functional and decorative, Lighting accessories- fixtures, Lighting for areas and specific activities. Picture mounting, wall hangings. Styles of furniture – traditional, contemporary and modern design. Furniture for different purpose,

furniture materials. Selection and arrangement – Furniture for various rooms, Furniture Dimensions, Care and maintenance.

**UNIT -V: Window/ Door Treatments and Flower Arrangements (12 Hours)**

Draperies, curtains - different doors and window and its coverings - Selection, Use & Care of furnishing materials. Use of flowers and containers for Interior Decoration – Importance, materials required, care and maintenance of flowers, vase selection, basic shapes. Styles in flower arrangement dried and pressed flowers, and Japanese arrangements – IKEBANA, MORIBANA & SHABANA.

**Total Lecture Hours- 60**

**COURSE OUTCOME:**

The students will be able to

1. Recognize the importance of wise use of resources to achieve one's goals, & become a good home maker.
2. Gain knowledge in various aspects in home economics.
3. Recognize the effective use of resources and learn skills in using principles elements of art & design.
4. Acquire the ability to conceptualize and design interior spaces for homes, retails, hotels, offices.
5. Gain knowledge how to work as an interior designer, visual merchandiser and interior decorator.

**TEXT BOOK(S)**

1. Anita T. 2011. Textiles for Apparel and Home Furnishing. Sonali Publications, New Delhi, India.
2. Chaudhari SN. 2005. Interior Design. Aavishkar Publishers, Jaipur, India.
3. Kasu AA. 2005. Interior Design. Ashish Book Centre Delhi.
4. Kharuna S. 2012. Fabrics for Fashion and Textile Design. Sonali Publications, New Delhi, India.
5. Neeru Garg Sushma Gupta. 2008. Text book of Family Resource Management, 9<sup>th</sup> Edition.
6. Seetharaman P and Pannu P. 2009. Interior Design and Decoration. CBS Publishers and Distributors
7. Sylvia M., Asay, Tami, J., Moore. 2016. Family Resource Management, Third Edition,
8. Varghese MA. Ogale, Srinivasan K. 1992. Home Management. Wiley Eastern Ltd.

**REFERENCE BOOK(S)**

1. Chaudhari SN. 2006. Interior Design. Aavishkar Publishers Jaipur.
2. Gary Gordon & Jamco L. Nuckolls. 1995. Interior lighting for Designers, Third edition John Wiley & Sons, New York.
3. Nickell P and Dorsey. J.M. 1960. Management in Family Living. John Wiley and Sons Inc, New Delhi.
4. Sharma N. 2006. Home Management. Murari Lal Publishers, Ahmedabad.
5. Sharma V. 2005. Modern Home Management. Shree Niwas Publications, Jaipur.
6. Shukul M and Gandotra, V. 2006. Home Management and Family Finance. Dominant Publishers, New Delhi.
7. Tamilnadu State Council for Higher Education. 1974. Interior Design and Decoration, Fourth Edition, Sherrill Whiton Prentice Hall,
8. Varghese M.A et al. Home Management, Second Edition, New Age International (P) Limited, Publishers, New Delhi.
9. William Hardy & Steve Adams. 1988. The Encyclopaedia of Decorative Styles. New Burlington books, London.

## **E-RESOURCES**

1. <https://youtu.be/Q25Ig09kK-A>
2. <https://youtu.be/rkDquOipXLA>
3. <https://youtu.be/2YMCQAUnfm4>
4. [http://www.hillagric.ac.in/edu/coa/vegetables/lectures/VSF\\_233\\_HSc/VSF\\_233\\_HSc\\_Lect\\_15.pdf](http://www.hillagric.ac.in/edu/coa/vegetables/lectures/VSF_233_HSc/VSF_233_HSc_Lect_15.pdf)
5. [https://www.brainkart.com/article/Decision-Making\\_33511/](https://www.brainkart.com/article/Decision-Making_33511/)

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B.Sc., NUTRITION AND DIETETICS**

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**Semester: III AP – III: Interior Design Practical**

**Ins Hrs. /Week: 3**

**Course Credit: 2**

**Course Code: 23AND306P**

**CONTENTS**

- Eliciting values of students
- Maintaining family accounts.
  - Developing budget for the family
  - Analysis of design for their qualities.
  - Arrangement of furniture using cut-outs.
  - Arranging flowers suitable for various areas.
  - Application of colour in the interior
  - Application of designing in the interior.

**REFERENCE BOOK(S)**

1. Ahmedabad, Shukul M. Gandotra V. 2006. Home Management and Family Finance.
2. Chaudhari SN. 2006. Interior Design. Aavishkar Publishers, Jaipur. Dominant Publishers New Delhi.
3. Gary Gordon & Jamco L. Nuckolls.1995. Interior lighting for Designers, Third edition JohnWiley & Sons, New York.
4. Sharma N.2006. Home Management. Murari Lal Publishers ,
5. Sharma V. 2005. Modern Home Management. Shree Niwas Publications, Jaipur.
6. Varghese MA et al. Home Management, Second Edition, New Age International (P)Limited, Publishers, New Delhi .
7. William Hardy & Steve Adams.1988.The Encyclopaedia of Decorative Styles. New Burlington books, London.

**E –RESOURCES**

1. [https://youtu.be/lyjC\\_QYZdx4](https://youtu.be/lyjC_QYZdx4)
2. [https://youtu.be/BYHrefWA\\_eE](https://youtu.be/BYHrefWA_eE)
3. [https://newskillsacademy.com/wp-content/uploads/cs\\_portal/pdfs/interior-design-certification/module-04-use-colour-interior-design.pdf](https://newskillsacademy.com/wp-content/uploads/cs_portal/pdfs/interior-design-certification/module-04-use-colour-interior-design.pdf)
4. <https://interiordesignstudent.com/study-notes/colour-in-interior-design/>
5. <https://www.yourarticlelibrary.com/home-management/interior-decoration-arrangement-of-furniture/4786>

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**DEPARTMENT OF NUTRITION AND DIETETICS**

**B.Sc., NUTRITION AND DIETETICS**



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**Semester: III NME– I: Basics of Nutrition**

**Ins Hrs. /Week: 2**

**Course Credit: 2**

**Course Code: 23NMEND31**

**OBJECTIVES:**

- To be able to discriminate in dealing with a vast amount of nutrient information.
- Recognize the consequences of over nutrition, under-nutrition, and malnutrition.
- Describe the principle of caloric balance.

**UNIT- I: Basic of Nutrition and Water**

**(06 Hours)**

**Basic of Nutrition-** Basics in Nutrition - Definition of Nutrition, Importance of nutrition for health, Basic five food groups, portion size of foods and the functions of food, Food pyramid, Balanced Diet, Nutrients and their functions , Recommended dietary allowances , factors affecting RDA, malnutrition (Under nutrition, and over nutrition).

**UNIT- II: Carbohydrates, Proteins and Lipids**

**(07 Hours)**

**Carbohydrates-** Classification, Sources, Requirements and Functions of carbohydrates in the body. Dietary fiber- Definition, soluble and insoluble fibers, sources of fiber, Role of fiber in human nutrition.

**Proteins -** Classification, Sources, Requirements and functions of protein. Protein deficiency- Protein Energy Malnutrition- Kwashiorkor and Marasmus – etiology, clinical features, treatment and prevention.

**Lipids-** Classification, Sources, Requirements and functions, Essential fatty acids- deficiency, food sources and functions, dietary lipids and its relation to Cardiovascular diseases.

**UNIT- III: Fat Soluble Vitamins and Water Soluble Vitamins**

**(06 Hours)**

**Fat Soluble Vitamins -** Functions, food sources, requirements, unit of measurements and hyper vitaminosis of vitamins A, D, E and K, Effect of deficiency.

**Water Soluble Vitamins -** Ascorbic acid and B complex vitamins- Thiamine, Riboflavin and Niacin- Functions, effects of deficiency, food sources and requirements for different age groups. Importance of folic acid, Pyridoxine, Vitamin B12.

**UNIT-IV: Macro and Micro Minerals**

**(06 Hours)**

**Macro Minerals-** Calcium, Phosphorous, Magnesium, Potassium, & Sodium Distribution in the body; functions, effects of deficiency, food sources and Recommended Dietary Allowances..

**Micro / Trace Minerals-** Iron, Zinc, and Iodine Distribution in the body; functions, effects of deficiency, food sources and requirements for different age groups.

**UNIT- V: Water****(05 Hours)**

**Water-** Sources, Functions, requirements. Distribution of water in the body, exchange of water in the body, Water balance, dehydration, water intoxication, Role of ADH in water balance.

**Total Lecture Hours- 30****COURSE OUTCOME**

The students will be able to

1. Understand the importance of nutrients in relation to health.
2. Identify the major nutrients, their functions, interactions, and needs of the body.
3. Infer knowledge on micro nutrients and their functions.
4. Understand the importance of water balance and health.

**TEXT BOOK(S)**

1. Gajalakshmi R. 2014. Nutrition Science. CBS Publishers and distributors Pvt Ltd, New Delhi.
2. Raheena Begum M. 2012. A Text Book of Foods Nutrition and Dietetics. Sterling publishers private Limited.
3. Ranjana Mahna & Seema Puri Kumud Khanna, Sharda Gupta, Santosh Jain Passi, Rama Seth. 2016. Textbook of Nutrition and Dietetics. Elite Publishing House Pvt. Ltd, ISBN-10 : 8188901539; ISBN-13 : 978-8188901531
4. Srilakshmi B. 2017. Nutrition Science. sixth edition. New Age International Publishers ISBN-10 : 9386418886; ISBN-13 : 978-9386418883,
5. Swaminathan M. 1993. Principles of Nutrition and Dietetics. Bappco 88, Mysore Road, Bangalore-560 018.

**REFERENCE BOOK(S)**

1. Bogert J.G.V. Briggs, D.H. 1985. Calloway Nutrition and physical fitness 11th edition
2. Guthrie H.A. – Introductory Nutrition C.V. Mosby Co. St. Louis.
3. Maurice E, Shils, James A. Olson, Moshe Shike, 1994 “Modern Nutrition in health and disease”
4. Eighth edition, Vol. I & II Lea and febiger Philadelphia, A Waverley Company.
5. W.B. Saunders Co., Philadelphia, London, Toronto.
6. Wardlaw G.M. Insel, P.H. – Perspectives in Nutrition (1990) Times Mirror / Mosby College Publishing Co. St. Louis, Toronto, Boston.
7. William S.R. 1985. Nutrition and Diet Therapy. 5th edition, Mosbey Co. St. Louis.

**E - RESOURCES**

1. <https://youtu.be/HxequpJWJ5U>
2. [https://youtu.be/WecTpcuha\\_4](https://youtu.be/WecTpcuha_4)
3. <http://www.kgmu.org/download/virtualclass/biochemistry/Fat%20Soluble%20Vitamins.pdf>
4. <https://www.megazyme.com/focus-areas/dietary-fiber-portal/what-is-dietary-fiber>
5. <https://www.ncbi.nlm.nih.gov/books/NBK218759/>
6. <https://www.aao.org/eye-health/diseases/vitamin-deficiency>
7. <https://www.medicalnewstoday.com/articles/248>

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**Semester: IV CC – IV: Nutrition Through Life Cycle**

**Ins Hrs. /Week: 5**

**Course Credit: 4**

**Course Code: 23ND407**

**OBJECTIVES**

- Gain knowledge on the importance of nutrition during life span.
- To do computation of nutrient allowances during life span.
- Enlighten on the dietary modifications.

**UNIT-I: Meal Planning**

**(14 Hours)**

Meal Planning – Definition, Principles of meal planning, Importance of meal planning, Recommended Dietary Allowances, Food groups and food exchange list; Factors affecting meal planning and types of eating behavior, Dietary guidelines for Indians.

**UNIT-II: Nutrition for Pregnancy and Lactation**

**(16 Hours)**

Nutrition during pregnancy, Importance of preconception nutrition; Pre pregnancy weight and foetal outcome. Foetal weight gain. Physiological changes during pregnancy, complications in pregnancy. Intrauterine growth retardation. High risk pregnancies. Importance of antenatal care. Maternal nutrient metabolism and recommended dietary allowances in pregnancy. Nutrition during lactation- Breast feeding biology, Psycho – physiological aspects of lactation, Recommended Dietary Allowances and nutritional needs of a nursing mother, nutritional guidelines, composition of breast milk and advantages, disadvantages of bottle feeding, Factors affecting lactation capacity, Effect of breast feeding on maternal health.

**UNIT-III: Nutrition in infancy**

**(16 Hours)**

Nutrition during Infant – Growth and physiological development. Infant nutritional needs and concerns. Nutrition and brain development. Infant feeding, Weaning – Definition, types of supplementary foods, points to be considered in introducing weaning foods. Nutritional problems in infant feeding. Preterm and Low Birth Weight infants.

**UNIT-IV: Nutrition for Preschool Children, School Children and Adolescence (15 Hours)**

Nutrition during preschool children- Growth and development, Nutritional needs and feeding for preschool children. Malnutrition among preschool children. Nutrition during school children- Growth and development, Nutritional requirements and RDA. Feeding school children, behavioural characteristics and feeding problems. Dietary patterns, packed lunch – factors to be considered, sample menu, school lunch programmes and nutritional problems.



Nutrition during adolescence- Growth during adolescence, nutritional requirements, hormonal influences, age of menarche-factors affecting, physiological problems and nutritional problems in adolescence.

**UNIT-V: Nutrition for Adulthood and Nutrition for Old Age (14 Hours)**

Nutrition for Adulthood- Food and nutritional requirements, dietary guidelines, nutritional problems.

Nutrition for old age – Process of ageing, food and nutritional requirement, dietary guidelines, nutrition related problems, physiological and Biochemical changes.

**Total Lecture Hours- 75**

**COURSE OUTCOME**

The students will be able to:

1. Apply the knowledge of the science of nutrition to human health across the life span.
2. Understand the physiological basis for nutritional needs of normal healthy humans throughout the life cycle.
3. Understand the importance of maternal nutrition on foetal outcome
4. Assess and compare the diet and nutritional requirements related to diseases.
5. Recognize the composition, quality, and appropriateness of nutrition products and formulate dietary interventions to address nutritional deficiencies.

**TEXT BOOK(S)**

1. Khanna K. Gupta S. Passi S.J. Seth R. Mahna R. Puri S. 2013. Textbook of Nutrition and Dietetics. Phoenix Publishing House.
2. Mahtab S. Bamji, Kamala Krishnaswamy G.N.V Brahman. 2012. Text book of Human Nutrition. 3<sup>rd</sup> edition. Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi.
3. Ravinder Chadha and Pulkit Mathur. 2015. Nutrition: A Lifecycle Approach Publisher The Orient Blackswan, First edition ISBN-10: 812505930X; ISBN-13:978-8125059301
4. Seth V and Singh K. 2006. Diet planning through life cycle. Part 1. Elite publishing house Pvt. Ltd, New Delhi.
5. Srilakshmi B. 2013.. Dietetics, New Age International ( P). Ltd, New Delhi.
6. Swaminathan M. 2012. Advanced Textbook on Food and Nutrition. Vol-1, Second Edition, Bangalore Printing and Publishing Co. Ltd, Bangalore.

**REFERENCE BOOK(S)**

1. Chadha R and Mathur P. 2015. Nutrition: A Lifecycle Approach. Orient Blackswan, Delhi.
2. Gopalan C. Rama Sastri BV. Balasubramanian SC. 2014. Nutritive Value of Indian Foods. National Institute of Nutrition. ICMR, Hyderabad.
3. Krause MV. and Hunscher M.A. Food, Nutrition and Diet Therapy, 14<sup>th</sup> Edition W.B .Saunders.
4. Park K. 2011. Text Book of Preventive and Social Medicine. 21<sup>st</sup> edn, Banarsidas Bhanot Publishers, Jabalpur, India.
5. Shills ME. Olson JA. Moshe S and Ross CA. 2006. Modern Nutrition in Health and Disease, 9<sup>th</sup> Edition, Lippincott Williams and Wilkins.

6. Smolin and Grosvenor. 2000. Nutrition Science and Applications, 3rd edn, Saunders College Publishing, Philadelphia.
7. Wardlaw GM. Hampi JS. Disilvestro RA. 2004. Perspectives in Nutrition. 6<sup>th</sup> edition, McGraw Hill.

#### **E – Resources**

1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5104202/>
2. <https://www.ncbi.nlm.nih.gov/books/NBK525242/>
3. <https://www.health.gov.au/English/Topics/SeniorHealth/HealthPromo/Pages/nutrition-elderly.aspx>
4. <https://youtu.be/2d0ane8uuR8>
5. <https://youtu.be/TTIOQN24YJ4>
6. [https://nptel.ac.in/content/storage2/courses/126104004/LectureNotes/Week-1\\_05-pdf](https://nptel.ac.in/content/storage2/courses/126104004/LectureNotes/Week-1_05-pdf)
7. <https://www.biologyonline.com/dictionary/degenerative-disease>

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**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE  
(AUTONOMOUS)**

**SUNDARAKKOTTAI, MANNARGUDI -614016.**

*(For the candidate admitted in the academic year 2022-2023)*

**DEPARTMENT OF NUTRITION AND DIETETICS  
B.Sc., NUTRITION AND DIETETICS**

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**Semester: IV CP – IV: Nutrition through Life Cycle Practical**

**Ins Hrs./Week:3**

**Course Credit: 2**

**Course Code:23ND408P**

**CONTENTS**

- 1. Prepare a day's menu based on food groups**
  - a. Calculate Calories (Kcal)
  - b. Calculate Protein (g)
  - c. Calculate Fat (g)
- 2. Plan, prepare and calculate nutritive value for**
  - a. Pregnant women
  - b. Lactating women
  - c. Infant
  - d. Preschooler
  - e. School going children
  - f. Adolescent
  - g. Adult
  - h. Old age

**REFERENCE BOOK(S)**

1. Chadha R and Mathur P. 2015. Nutrition: A Lifecycle Approach. Orient Blackswan, Delhi.
2. Gopalan C. Rama Sastri BV. Balasubramanian SC. 2014. Nutritive Value of Indian Foods. National Institute of Nutrition, ICMR, Hyderabad.
3. Krause MV and Hunscher MA. Food. Nutrition and Diet Therapy. 14<sup>th</sup> Edition, W.B.Saunders.
4. Park K. 2011. Text Book of Preventive and Social Medicine. 21<sup>st</sup> edn, Banarsidas Bhanot Publishers, Jabalpur. India.
5. Shills ME. Olson JA. Moshe S and Ross CA. 2006. Modern Nutrition in Health and Disease, 9<sup>th</sup> Edition, Lippincott Williams and Wilkins. .
6. Wardlaw GM. Hampi JS. DiSilvestro RA. 2004. Perspectives in Nutrition. 6<sup>th</sup> edition, McGraw Hill.

## **E- RESOURCES**

1. <https://youtu.be/kdfFTRbHsIU>
2. [https://youtu.be/\\_Ap4BXhig5c](https://youtu.be/_Ap4BXhig5c)
3. <https://www.healthychildren.org/English/healthy-living/nutrition/Pages/The-5-Food-Groups-Sample-Choices.aspx>
4. <https://heas.health.vic.gov.au/early-childhood-services/menu-planning/babies>
5. [http://www.efad.org/media/1351/nutritional\\_guidelines\\_and\\_menu\\_checklist\\_march2014.pdf](http://www.efad.org/media/1351/nutritional_guidelines_and_menu_checklist_march2014.pdf)

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**Semester: IV AC–IV: Basic Food Processing and Preservation**

**Ins Hrs. /Week: 3**

**Course Credit: 3**

**Course Code: 23AND407**

**OBJECTIVES**

- Apply different techniques used in the preservation of foods.
- Understand the processing techniques for food products.
- Understand and learn basics of foods, food composition, nutritive value, functions and roles of foods in relation to human consumption.

**UNIT- I: Food Preservation and Processing**

**(08 Hours)**

Definition and scope of food preservation, principles and role of preservation, preservatives and its types, shelf life of food products, Permitted Preservatives, FPO Specification. Principles of fresh food storage : storage, effect of cold storage and quality – storage of grains – Water activity, spoilage- Types of Spoilage ,Factors influencing the spoilage.

**UNIT-II: Processing of Cereals and Millet**

**(08 Hours)**

Milling products and by products of wheat, rice, corn, barley, oats, sorghum and other millets, whole wheat atta, blended flour, fortified flour, flaked, puffed and popped cereals, malted cereals, processed foods – bakery products, pasta products and value added products.

**UNIT-III: Processing of Milk and Milk Products**

**(10 Hours)**

Milk – manufacture of different types of milk, drying of whole and skim milk, cream separation, churning of butter, processing of different types of cheese, Probiotic milk products- yoghurt, dahi and ice-cream, indigenous milk products – khoa, burfi, kalakhand, gulab jamun, rasagola, srikhand, channa, paneer, ghee, lassi

**UNIT- IV: High Temperature – Processing and Preservation**

**(09Hours)**

Blanching, pasteurization, sterilization and Ultra High Temperature (UHT) processing, canning, dielectric heating microwave heating, baking, roasting and frying. Retort processing of Ready to Eat (RTE) products.

**UNIT-V: Low Temperature Processing and Preservations**

**(10 Hours)**

Refrigeration, Freezing and thawing, Food irradiation: Introduction, freezing point and freezing rate, comparison of Freezing and thawing process; freezing methods: Air freezing, plate freezing, liquid immersion freezing and cryogenic freezing. Freezer selection. Advantages and disadvantages of freezing. Freezing curve and changes in food during freezing storage.

**Total Lecture Hours- 45**

## **COURSE OUTCOME**

The students will be able to

1. Integrate knowledge on food preservation and spoilage.
2. Understand the fundamental principles of food processing.
3. Comprehend the role of milk in indigenous milk products.
4. Infer knowledge on high temperature food processing and preservation
5. Exemplify the low temperature food storage and preservation

## **TEXT BOOK(S)**

1. Avantina Sharma. 2019 Textbook of Food Science and Technology, 3<sup>rd</sup> edition, CBS publishers, ISBN-10: 9789386478009, ISBN-13:978-9386478009.
2. Sivasankar. 2002. Food Processing and Preservation, Prentice Hall India Learning Private Limited. ISBN-10: 8120320867; ISBN-13:978-8120320864
3. Subbulakshmi G. 2006. Food Processing and Preservation. First edition. New age publishers; ISBN-10: 8122412831, ISBN-13:978-8122412833
4. Vijaya Khader. 2001. Text book of Food Science and Technology. Indian Council of Agricultural Research, New Delhi.
5. Warris DS. 2020. Food Processing and Preservation .2 –Vol, ISBN-10: 9389688590 ISBN-13:978-9389688597.

## **REFERENCE BOOK(S)**

1. Arthey D and Ashurst PR. 1996. Fruit processing, Blackie academic and professional. London.
2. Fellows PJ. 2016. Food Processing Technology. Second edition, Principles and Practice, CRC Wood head publishing Ltd, Cambridge.
3. Gould GW .1995. New methods of food preservation. Blackie academic and professional. London.
4. John, Kingslee. 2014. A professional text to Bakery and Confectionary, New Age International (P) Limited.
5. Neelam Khetarpaul, Raj Bala Grewal and Sudesh Jood. 2013. Bakery science and cereal technology, Daya publishing house.

## **E- RESOURCES:**

1. <http://labgraos.com.br/manager/uploads/arquivo/cap--26-handbook-of-food-preservation-pdf>
2. <http://www.uop.edu.pk/ocontents/Lecture%20no%202.pdf>
3. [https://www.canr.msu.edu/smprv/uploads/files/Safe\\_Practices\\_for\\_Food\\_Processes\\_Chpt.\\_3\\_Factors\\_that\\_Influence\\_Microbial\\_Growth.pdf](https://www.canr.msu.edu/smprv/uploads/files/Safe_Practices_for_Food_Processes_Chpt._3_Factors_that_Influence_Microbial_Growth.pdf)
4. <https://www.medicalnewstoday.com/articles/318630>
5. <https://www.ifst.org/resources/information-statements/food-irradiation>

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**Semester: IV AP – IV: Basic Food Processing and Preservation Practical**

**Ins. Hrs./Week: 3**

**Course Credit: 2**

**Course Code: 23AND408P**

**CONTENTS**

- Stages of preparation and observation of sugar syrup
- Preparation of Bakery Products – Cakes, Cookies, Breads, Pies, Pastries
- Extrusion Cooking – Preparation of Pastas
- Dehydration & Evaporation – Preparation of Condensed Milk & Salted Dry Fish
- Fruit & Vegetable Processing; Use of Chemical Additives for Preservation;
- Thermal Processing of Foods – Preparation of Jams, Jellies, Squashes, Pickles, Chutneys, Sauces (Preservation by salt, sugar and oil)
- Emulsions and Emulsifying Agents – Preparation of Mayonnaise and Vinaigrette
- Fermented Foods – Preparation of idlis and curds/ yoghurt
- Frozen Foods – Preparation of Ice Cream & Fruit/ Vegetable Pulp

**TEXT BOOK(S)**

1. Avantina Sharma. 2019 Textbook of Food Science and Technology, 3<sup>rd</sup> edition, CBS publishers, ISBN-10: 9789386478009, ISBN-13:978-9386478009.
2. Sivasankar. 2002. Food Processing and Preservation, Prentice Hall India Learning Private Limited. ISBN-10: 8120320867; ISBN-13:978-8120320864
3. Subbulakshmi G. 2006. Food Processing and Preservation. First edition. New age publishers; ISBN-10: 8122412831, ISBN-13:978-8122412833
4. Vijaya Khader. 2001. Text book of Food Science and Technology. Indian Council of Agricultural Research, New Delhi.
5. Warris DS. 2020. Food Processing and Preservation .2 –Vol, ISBN-10: 9389688590 ISBN-13:978-9389688597.

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1. Arthey D and Ashurst PR. 1996. Fruit processing, Blackie academic and professional. London.
2. Fellows PJ. 2016. Food Processing Technology. Second edition, Principles and Practice, CRC Wood head publishing Ltd, Cambridge.
3. Gould GW .1995. New methods of food preservation. Blackie academic and professional. London.
4. John, Kingslee. 2014. A professional text to Bakery and Confectionary, New Age International

(P) Limited.

5. Neelam Khetarpaul, Raj Bala Grewal and SudeshJood.2013.Bakery science and cereal technology, Daya publishing house.

## **E – RESOURCES**

1. <https://youtu.be/DnwC8t8aCAQ>
2. <https://youtu.be/V5pddQGbHKQ>
3. <https://www3.epa.gov/ttn/chief/ap42/ch09/final/c9s09-5.pdf>
4. <https://www.indianhealthyrecipes.com/masala-pasta/>
5. <https://www.allrecipes.com/article/making-mayonnaise/>

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**Semester: IV NME– II: Women's Health and Nutrition**

**Ins Hrs. /Week: 2**

**Course Credit: 2**

**Course Code: 23NMEND42**

**OBJECTIVE:**

- Identify nutrition principles to women's health choices and behaviors.
- Plan proper dietary intake during pregnancy and throughout the lifetime.
- Critically analyze and transfer current nutrition trends in women's health.
- Recommend approaches to disorders, medical conditions, and weight management.

**Unit- I: Concept and definition of nutrition**

**(06 Hours)**

Common nutritional disorders among women and children and their preventive measures .Importance of Women's Health, Psycho social aspects of women's health.

**Unit –II: Normal nutrition through life cycle**

**(06 Hours)**

Nutrition in adolescence, diet, Adolescent pregnancy, eating disorders, food consumption patterns in women, nutritional needs of elderly women, Nutrition for female athlete.

**Unit- III: Nature and use of Health care Delivery System**

**(06 Hours)**

Nature and use of Health care Delivery System: Problems & Prospects Reproductive health and Reproductive rights. Nutrition and reproduction: Diet, menstrual cycle and sex steroid hormones, nutrition concern during pregnancy and lactation, nutritional concerns in pre and post menopausal phase, hormone replacement therapy, use of oral contraceptives and nutrition.

**Unit- IV: Health Education**

**(06 Hours)**

Health Education special reference to rural women Family Welfare methods of Gender bias Practices. Food processing techniques and its merits and demerits.

**Unit- V: Communicable diseases in women**

**(06 Hours)**

Health Concept and definition, Spread of sexually transmitted diseases, HIV/AIDS and its impact on women; preventive measures. Common Communicable diseases and their preventive measures, National Health Programmes

**Total Lecture Hours- 30**

## **COURSE OUTCOME**

The students will be able to

1. Understand the various factors influencing health and nutritional status of women
2. Plan and undertake various activities to improve the status of women
3. Understand the implications of women's health on family, community and national development.
4. Understand the importance of maternal nutrition on foetal outcome
5. Infer knowledge on impact of communicable diseases in women's life.

## **TEXT BOOK(S)**

1. Arpita Verma. 2017. Women's Health and Nutrition. Role of State and Voluntary Organizations, Rawat publishers, ISBN-10:8131609138 ISBN-13:978-8131609132.
2. Mahtab S. Bamji Kamala Krishnaswamy, G.N.V., Brahman. 2012. Text book of Human Nutrition. 3<sup>rd</sup> edition. Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi.
3. Srilakshmi E. 2014. Dietetics. Seventh multi colour edition, New Age International Publishers, New Delhi.
4. Srilakshmi E. 2017. Nutrition Science. Sixth edition. New Age International Publishers, New Delhi.
5. Swaminathan M. 2010. Hand book of Foods and Nutrition. Bappco Publisher

## **REFERENCE BOOK(S)**

1. Gopalan C. Rama Sastri BV. Balasubramanian SC. 2014. Nutritive Value of Indian Foods.
2. Gordon M. Wardlaw Anne M. 2006. Smith contemporary Nutrition. Mc Graw – Hill International Edition.
3. Krause M V. and Hunscher M A., Food, Nutrition and Diet Therapy, 14<sup>th</sup> Edition W.B.Saunders.
4. Mahan Kathleen L. Krause. 2004. Food, Nutrition and Diet Therapy. 11<sup>th</sup> Edition. W.B.Saunders. National Institute of Nutrition, ICMR, Hyderabad.
5. Roberta Larson Duyff. 2002. Complete food and Nutrition guide. 2<sup>nd</sup> edition. John Wiley & sons, Inc American Dietetic Association.
6. Vishwannath M. Sardesai. 2011. Introduction to clinical Nutrition. 3<sup>rd</sup> edition. CRC Press.

## **E- RESOURCES**

1. <https://www.betterhealth.vic.gov.au/health/healthyliving/food-and-your-life-stages>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6349991/>
3. <https://apps.who.int/iris/bitstream/handle/10665/204764/B0239.pdf;sequence=1>
4. [https://niti.gov.in/planningcommission.gov.in/docs/plans/planrel/fiveyr/10th/volume2/v2\\_ch2\\_10.pdf](https://niti.gov.in/planningcommission.gov.in/docs/plans/planrel/fiveyr/10th/volume2/v2_ch2_10.pdf)
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3329060/>

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**Semester IV – SBE – I Bakery and Confectionary**

**Ins Hrs. /Week: 2**

**Course Credit: 2**

**Course Code: 23SBEND1**

**OBJECTIVES**

- Understand the principles and methods of baking.
- Acquire basic skills in baking and confectionery.
- Understand the role of various food components in baking and the interaction of the elements used for baking.
- Expand their knowledge related to the art of decoration of baked foods and confectionery items.

**UNIT-I: Basic Baking and Equipments**

**(06 Hours)**

Baking: Meaning, process and scientific principles involved. Classification of baked products. Basic plan and layout of a bakery unit. Equipments used in bakery: Large and small equipments and tools; types of ovens. Nutritional aspects of bakery products Storage and evaluation (objective and subjective methods) of baked products.

**UNIT-II: Baking Ingredients**

**(07 Hours)**

Ingredients used in bakery: Functional classification of ingredients- structure builders, tenderizers, moisteners, driers and flavors. Flour: Composition, types and quality characteristics. Sugar.

Fats: Fats used as shortenings- Butter, margarine, emulsified fats and flavored oils; properties and uses of shortenings. Leavening agents: Definition and classification- physical; chemical- baking powder and its types, baking soda; biological- yeast- types and role in baking.; Moisturizing agents: Egg, water and milk- their role in baking.

**UNIT-III: Bread & Cakes**

**(06 Hours)**

Bread: Ingredients used, steps in bread making process, processing methods, characteristics of good bread (external and internal), faults in shape, texture, crust and flavor of bread. Cakes: Ingredients, types, cake making methods, test for doneness, characteristics of good cake (external and internal), cake faults and remedies. Icing: Meaning, types, ingredients used and preparation guidelines.

**UNIT-IV: Cookies & Pastries**

**(05 Hours)**

Cookies: Characteristics, preparation methods and problems in cookie making. Biscuits: Steps involved in biscuit making. Pastries: Types and method of preparation.

## **UNIT-V: Sugar Confectionaries**

**(06 Hours)**

Sugar confectionery – Types, role of sugar in preparation, Candies –Fondant like toffee, fudge, marshmallows, gums, jellies, chocolates – properties of these candies.

**Total Lecture Hours- 30**

### **COURSE OUTCOME**

The students will be able to

1. Explain the properties and functions of various ingredients in bakery science.
2. Understand the role and use of equipments in the production of baked foods.
3. Apply, Prepare, variety of doughs, batters, and fillings for baking with a sound understanding of mixing methods and baking techniques.
4. Classify and prepare basic confectionary products.
5. Infer knowledge on role of sugar in confectionaries.

### **TEXT BOOK(S)**

1. Avantina Sharma. 2019. Textbook of Food Science and Technology. 3<sup>rd</sup> edition. CBS publishers, ISBN-10: 9789386478009, ISBN-13:978-9386478009.
2. Dubey S C. 2002. Basic Baking. Society of Indian Bakers, New Delhi.
3. John Kingslee.2006. A professional text book to Bakery and Confectionary. New Age International Pvt Limited Publisher, New Delhi.
4. Uttam K. Singh. 2011.Theory of Bakery and Confectionary An operational approach. Kanishka Publishers and Distributors, New Delhi.
5. Yogambal Ashokkumar. 2012. Bakery and Confectionary. PHI publication.

### **REFERENCE BOOK(S)**

1. John Kingslee. 2014. A professional text to Bakery and Confectionary. New Age International (P) Limited.
2. Lilian Hiagl and Meyer.2004. Food chemistry. CBS publishers and Distributors.
3. Shakunthala Manay N and Shadak sharaswamy M. 2005. Food Facts and Principles, New Age International (P) Ltd Publishers.
4. Neelam Khetarpaul, Raj Bala Grewal and Sudesh Jood. 2013. Bakery science and cereal technology. Daya publishing house.
5. Vijaya Khader. 2001. Text book of Food Science and Technology. Indian Council of Agricultural Research, New Delhi

### **E- RESOURCES**

1. <https://www.sihmbalangir.org/upload/Cakes%20&%20Pastries%20Book.pdf>
2. <https://www.cookingandme.com/2010/05/31/types-of-ovens-how-tochoose-oven/>
3. <https://www.chinimandi.com/types-of-sugar/>
4. <http://penyrheol-comp.net/technology/wpcontent/uploads/sites/2/2014/06/Cake-Making- Methods>
5. <http://ecoursesonline.iasri.res.in/mod/resource/view.php?id=5880>

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