

BSC HOMESCIENCE-CLINICAL NUTRITION AND DIETETICS

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To provide life-long learning in order to become effective collaborators and innovators, leading or participating in ventures that address social, technical and business challenges.

PEO2: To transform learners into holistic individuals acquiring higher levels of knowledge and competence.

PEO3: To approach life skills which are inclusive and value-based to appreciate human values and ethics

PROGRAMME OUTCOMES (POs)

PO1: Develop sharp cognizance of concepts, apply the domain knowledge with utmost confidence and be assertive at any given opportunity.

PO2: Possess deeper understanding of life skills to appraise life and draw logical conclusions.

PO3: Design and develop solutions for challenging problems of society.

PO4: Acquire programme centric thought process facilitating further studies in the respective domain.

PO5: Engage in life-long learning to easily adapt to the dynamic environment and obtain clarity and preparedness for field specialization.

PO6: Self-actualize and self-regulate, focusing on ethical and moral values to become a compassionate human being

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: To develop a wide knowledge in allied fields of food, health and nutrition for fulfilling the current demands of the nation

PSO2: To build a strong foundation in the areas of clinical and therapeutic nutrition for applying conceptual and analytical skills in the health care sector

PSO3: To nurture the students in intellectual, personal, interpersonal and societal skills for overall development and professional growth

PSO4: To empower students with basic research skills related to nutrition and its allied fields

PSO5: To utilize and manage locally available resources to contribute to the needs of the community

PSO6: To develop managerial abilities and competencies to promote entrepreneurship

B.Sc. HOMESCIENCE-CLINICAL NUTRITION AND DIETETICS

TOTAL CREDITS: 140

PART	COURSE	TITLE OF THE PAPER	CODE	L	T	H	C
I SEMESTER							
III	Core Major-Paper I	Food Science	20UNDCT1001	4	2	6	4
III	Core Major-Paper II	Food Microbiology	20UNDCT1002	4	2	6	4
III	Allied I-Paper I	Allied Chemistry – I	20UNDAT1001	4	2	6	4
II SEMESTER							
III	Core Paper III	Human Physiology	20UNDCT2003	4	2	6	4
III	Core Practical I	Human Physiology Practical	20UNDGP2001	0	6	6	4
III	Allied Paper II	Allied Chemistry – II	20UNDAT2002	4	2	6	4
III	Allied Practical I	Chemistry II – Practical	20UNDAP2001	0	0	2	2
III SEMESTER							
III	Core Major-Paper V	Nutrition through life cycle		4	2	6	4
III	Core Major-Paper VI	Human Nutrition I		4	2	6	4
III	Allied II-Paper III	Fundamentals of Biochemistry		3	2	5	5
IV	Non-Major Elective I	NME		1	1	2	2
IV SEMESTER							
III	Core Major-Paper VII	Medical Nutrition Therapy		4	2	6	4
III	Core Major-Paper VIII	Medical Nutrition Therapy Practical		0	6	6	4
III	Allied III-Paper IV	Food Preservation		2	2	4	5

IV	Non-Major Elective II	NME		1	1	2	2
V SEMESTER							
III	Core Major - Paper IX	Community Nutrition		4	2	6	4
III	Core Major - Paper X	Food Service Management I		4	2	6	4
III	Core Major - Paper XI	Human Nutrition II		4	2	6	4
III	Core Major - Paper XII	Sports Nutrition		4	2	6	4
III	Core Elective- I	Functional foods and Nutraceuticals		3	1	4	5
IV	Skill Enhanceme nt course	Basic Techniques of Food Production/SWAYAM/MOOC		2	1	3	3
VI SEMESTER							
III	Core Major - Paper XIII	Clinical Nutrition		4	2	6	4
III	Core Major - Paper XIV	Food service management		4	2	6	4
III	Core Major - Paper XV	Nutrition and Clinical Biochemistry practicals		0	6	6	4
III	Core Elective- II	Basic concepts of Home science		3	2	5	5
III	Core Elective- III	Diet counselling – Techniques and Practice		3	2	5	5
IV		Internship		-	-	-	2

L =Lecture Hrs; **T** =Tutorial Hrs; **H** = Hrs per week; **C** =Credits

RUBRICS FOR CONTINUOUS ASSESSMENT

Assignment	5
Seminar	5
Field visit	-
Participatory Learning	5
Group Discussion	-

Flipped/Blended Learning	-
--------------------------	---

**Assessment Model (from 2020 – 21 onwards)
Under graduation programme
40% Internal 60% External**

S.No	Assessment Component	Marks	Weighted %
A.	Theory		
1	INTERNAL ASSESSMENTS		
	Continuous Assessment Test(best two out of three)	2 x 50 = 100	15
2	Quiz/Group Discussion/Seminar/Assignment/Role Play/ Case Study/ Open Book/ snap Test/ Video Presentation/ Review (any three to be considered)	3 x 10 = 30	15
3	MCQ (one test to be conducted online during the semester)	20	05
4	Attendance*	05*	05
5	EXTERNAL ASSESSMENT		
	End semester examinations	75	60
	Grand Total		100
B	Practical		
1	INTERNAL ASSESSMENTS		
	Continuous Assessment Test(best two out of three)	2 x 50 = 100	15
2	Record + Observation	10 +10 = 20	15
3	MCQ (one test to be conducted online during the semester)	20	05
4	Attendance*	5*	05
5	EXTERNAL ASSESSMENT		
	End semester Examinations	60	60
	Grand Total		100

Attendance* - awarding marks for attendance (out of 5)

Attendance below 60% = 0 marks; 61% to 75% = 3 marks; 76% to 90% = 4 marks; above 91% = 5 marks

**SDNB VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS), CHENNAI-600044.
(DEPARTMENT OF HOME SCIENCE- CLINICAL NUTRITION AND DIETETICS)**

**COURSE FRAMEWORK
SEMESTER I**

SEM	COURSE CODE	COURSE TITLE	TITLE OF THE PAPER	HRS	CREDITS	CA	SE	T
I	20ULTFC1001 20ULHFC1001 20ULSFC1001 19ULFFC1001	Language (Tamil/Hindi/Sanskrit / French)	Tamil – I/ Hindi-I/ Sanskrit-I/ French –I		3	40	60	100
	20UGEFC1001	English	General English-I		3	40	60	100
	20UNDCT1001	Core Major-Paper I	Food Science		4	40	60	100
	20UNDCT1002	Core Major-Paper II	Food Microbiology		4	40	60	100
	20UNDAT1001	Allied I-Paper I	Allied Chemistry – I		4	40	60	100
	18USSLC1001	Soft Skill	Essentials of communication skills		3	50	-	50
	18UESVE1001	Value education (as applicable)	Environmental Studies		-			

SEMESTER II

SEM	COURSE CODE	COURSE TITLE	TITLE OF THE PAPER	HRS	CREDITS	CA	SE	T
II	20ULTFC2002 20ULHFC2002 20ULSFC2002 19ULFFC2002	Language (Tamil/Hindi/Sanskrit/ French)	Tamil – II/ Hindi-II/ Sanskrit-II/ French -II		3	40	60	100
	20UGEFC2002	English	General English II		3	40	60	100
	20UNDCT2003	Core Paper III	Human Physiology		4	40	60	100
	20UNDCP2001	Core Practical I	Human Physiology Practical		4	40	60	100

	20UNDAT200 2	Allied Paper II	Allied Chemistry – II		4	40	60	100
	20UNDAP200 1	Allied Practical I	Chemistry II – Practical		2	40	60	50
	18USSSP2002	Soft skill	Essentials of Spoken and Presentation Skills		3	50	-	50
	18UESVE1001	EVS	Environmental Studies		2	50	-	50
		Value education (as applicable)	Yoga and Wellness		2	50	-	50

SEMESTER III

SEM	COURSE CODE	COURSE TITLE	TITLE OF THE PAPER	HRS	CREDI TS	CA	SE	T
III		Language (Tamil/Hindi/ Sanskrit/ French)	Tamil – III/ Hindi-III/ Sanskrit-III/ French -III		3	40	60	100
		English	General English III		3	40	60	100
		Core Major- Paper V	Nutrition through life cycle		4	40	60	100
		Core Major- Paper VI	Human Nutrition I		4	40	60	100
		Allied II- Paper III	Fundamentals of Biochemistry		5	40	60	100
		Non- Major Elective I	Basic Nutrition[Offered to other department]		2	50	-	50

SEMESTER IV

SEM	COURSE CODE	COURSE TITLE	TITLE OF THE PAPER	HRS	CREDITS	CA	SE	T
IV		Language (Tamil/Hindi/ Sanskrit/ French)	Tamil – IV/ Hindi-IV/ Sanskrit-IV/ French -IV		3	40	60	100
		English	General English IV		3	40	60	100
		Core Major- Paper VII	Medical Nutrition Therapy		4	40	60	100
		Core Major- Paper VIII	Medical Nutrition Therapy practicals		4	40	60	100
		Allied III- Paper IV	Food Preservation		5	40	60	100
		Non-Major Elective II	Basic Nutrition[Offered to other department]		2	50	-	50

SEMESTER V

SEM	COURSE CODE	COURSE TITLE	TITLE OF THE PAPER	HRS	CREDITS	CA	SE	T
V		Core Major - Paper IX	Community Nutrition		4	40	60	100
		Core Major - Paper X	Food Service Management I		4	40	60	100
		Core Major - Paper XI	Nutrition II		4	40	60	100
		Core Major - Paper XII	Sports Nutrition		4	40	60	100
		Core Elective- I	Functional foods and nutraceuticals		5	40	60	100
		Skill Enhancement course	Basic Techniques of Food Production/SWAYAM/MOOC		3	50	-	50

SEMESTER VI

SEM	COURSE CODE	COURSE TITLE	TITLE OF THE PAPER	HRS	CREDITS	CA	SE	T
VI		Core Major - Paper XIII	Clinical Nutrition		4	40	60	100
		Core Major - Paper XIV	Food Service Management II		4	40	60	100
		Core Major - Paper XV	Nutrition and Clinical Biochemistry practicals		4	40	60	100
		Core Elective- II	Basic concepts of Home science		5	40	60	100
		Core Elective- III	Diet counselling – Techniques and Practice		5	40	60	100
		IV	Internship		2	40	60	100
		Skill Based Elective	Computing Skills – Swayam-Mooc courses/DIET CAL Software		3	50	-	50

SEMESTER I

FOOD SCIENCE

TOTALHOURS: 75

SUBCODE: 20UNDCT1001

CREDIT: 6

L-T-P: 4 2 0

COURSE OBJECTIVES

To enable the students to

1. To enable students to obtain knowledge of different food groups and their contribution to nutrition.
2. To help them study the different methods of cooking and their advantages and disadvantages.
3. To enable them gain them to experience in the preparation of foods with attention to the preservation of their nutritive value - oriented to Indian cooking.
4. To help them understand the scientific principles governing the acceptability of food preparations

COURSE OUTCOME:

On completion of the course the students will be able to...

CO No.	CO statement
CO. 1	Outline the food groups and their functions
CO. 2	Gain skills to prepare healthy and nutritious foods according to availability and affordability
CO. 3	Assure quality of food by analyzing physical, chemical and functional properties.
CO. 4	Identify locally available foods for the development of new food products.
CO. 5	Acquire knowledge on nutritional classification, structure and processing of different foods and apply it for the benefit of society.

SYLLABUS

UNIT I

15 Hrs

NUTRIENT CONTENT OF FOODS - Classification of foods according to nutrient content. ICMR basic four food groups for balanced diets - Food in relation to health. Study of the different cooking methods, merits and demerits – solar cooking, microwave cooking, charcoal, electric cookers, air fryers, induction stove.

CEREALS AND MILLETS - Structure, composition, storage, processing, milling and parboiling of rice, wheat, maize and millets. Cereal cookery: Effect of moist heat - Hydrolysis, Gelatinization and factors affecting gelatinization, gel formation, retro gradation and syneresis; Effect of dry heat.

UNIT II

15 Hrs

PULSES - Processing, nutritive value, judicious combination of cereals and pulses, toxic factors, lathyrism – removal of toxins.

VEGETABLES- Classification, colour, nutritive value, effect of cooking on colour, texture, flavour, appearance and nutritive value, Purchase – storage and preservation.

FRUITS –Classification, nutritive value, uses, preservation. Enzymatic and non-enzymatic browning.

UNIT III

15 Hrs

FLESH FOODS-Meats – nutritive value, methods of cooking, purchase, storage. Fish – classification, nutritive value, purchase, storage, cooking and preservation.

EGGS- Structure and composition, nutritive value, evaluation of egg quality, methods of storage, preservation and uses in cookery.

MILK AND MILK PRODUCTS-Nutritive value, coagulation of milk, milk cookery. Milk products – whole and skimmed milk, milk powders, yogurt, ghee, butter, cheese. Storage and preservation. Vegan milk- types and nutritional importance.

UNIT IV

15 Hrs

BEVERAGES-Classification, nutritive value and uses, coffee, tea, cocoa, malted beverages. Sources, processing, methods of preparation, serving.

NUTS AND OIL SEEDS: Nutritive value, toxins.

FATS AND OILS: Sources, hydrogenation, rancidity, smoking point, emulsification.

SUGAR COOKERY: Stages in sugar cookery, types of sugars available, crystallization in sugar cookery and jaggery.

UNIT V

15 Hrs

SPICES AND CONDIMENTS – Active components and role in health of various spices.

FOOD ADDITIVES – food colors, flavoring agents and preservatives.

Convenience foods - Definition and Types. Space food.

FOOD ADULTERATION - types of adulteration, methods of detection.

ACTIVITY

1. Measurement techniques and relation between edible and non-edible portions of food
2. Starch cookery
 - a. Microscopic structure of starch
 - b. Gelatinization and gluten formation
 - c. Preparation of white sauce
 - d. Methods of cooking rice
 - e. Cereal recipes and development of a novel recipe
3. Pulse cookery
 - a. Cooking quality of pulses
 - b. Pulse recipes and development of a novel recipe
4. Egg cookery
 - a. Ferrous sulphide formation in boiled egg
 - b. Quality of poached egg.
 - c. Whipping quality of egg white
 - d. Preparation of different types of custard.
 - e. Egg recipes and development of a novel recipe
5. Vegetable and fruit cookery.
 - a. Effect of cooking factors on different pigments.
 - b. Enzymatic browning.
 - c. Vegetable and fruit recipes and development of a novel recipe
6. Sugar cookery
 - a. Stages of sugar cookery
 - b. Sugar recipes and development of a novel recipe
- c. Chocolate making
7. Fats and oils
 - a. Smoking point of fats and oils.
 - b. Fats and oil recipes and development of a novel recipe
8. Milk cookery.
 - a. Coagulation of milk.

b. Milk recipes and development of a novel recipe

TEXTBOOKS:

- Srilakshmi, B. (2020). *Food Science*. (7th multicolour ed).New Delhi: New Age International P. Ltd. Publishers.
- Vaclavik, V. A. &Christian, E. W. (2014).*Essentials of food science*.(4th ed).New York: Springer-Verlag.
- Manay, S. N & Shadaksharaswamy, M.(2020). *Food Facts and Principles*.(4th ed). New Delhi: New Age International Publishers.
- Potter, N. N. &Hotchkiss, J. H. (2007).*Food Science*. (5th ed).New Delhi: CBS Publishers & Distributors Pvt. Ltd.
- Mudambi, S.R., Rao, S.M. & Rajagopal, M.V. (2006).*Food Science*.(Revised 2nd ed).New Delhi: New Age International Publishers.

REFERENCE:

- Edelstein, S. (2018).*Food science, An ecological approach*.(2nd ed). Massachusetts: Jones and Bartlett Publishers, Inc.
- Roday, S. (2018).*Food Science and Nutrition*.(3rd ed).New Delhi: Oxford University Press.
- Ward, J.D. (2006).*Principles of Food science*.(2nd ed). Illinois: Goodheart-Willcox Pub.
- Shewfelt, R. L., Orta-Ramirez, A. &Clarke, A. D. (2016).*Introducing Food science*. (2nd ed). Florida: CRC Press.
- Brown, A. (2015).*Understanding Food Principles and Preparation*.(5th ed).Connecticut: Cengage learning.

ELEARNING RESOURCES:

- www.fao.org
- www.wfp.org
- www.nutrition.gov
- www.nal.usda.gov/fnic
- www.nutrition.org

Mapping of CO with PSO:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO.1	2	2	1	2	0	0
CO.2	2	1	2	1	3	2
CO.3	2	2	1	3	1	1

CO.4	2	1	2	3	3	2
CO.5	2	2	2	2	0	2
Average	2	1.6	1.6	2.2	1.4	1.4

PEDAGOGY:

Lecture, PowerPoint presentation, Charts, Group discussions

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[CONVENTIONAL MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2	Section A Multiple choice questions 15x2=30	Mark the correct choice	30	75	Choose the best answer
K2, K3, K4	Section B 5 out of 7 Questions *5 Marks 5x5=25	Short answers (500 Words)	25		Short answers: Classify Beverages
K3, K4, K5, K6	Section C 2 Out of 5 Questions *10 Marks 2x10=20	Elaborate answers (approx 1000 Words)	20		Elaborate answers: Differentiate crystalline and non-crystalline candies.

*** 75 marks to be converted as 60 marks.**

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[ONLINE MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any	
INTERNAL SETTING						
K1,K2,K3	Section A Multiple Choice Questions 25 Questions *1 Marks (No Choice)	Choosethe best option	25X1=25	50	Choose the best answer	
EXTERNAL SETTING						
K2,K3,K4, K5,K6	Section B 5 out of 7 Questions *5 Marks 5x5=25	Not exceeding 500 words	25		Short answers: Explain the factors affecting crystallisation in sugar.	

*** 50 marks to be converted as 60 marks.**

FOOD MICROBIOLOGY

TOTALHOURS: 75

SUB CODE:

CREDIT: 4

L-T-P: 4 2 0

COURSE OBJECTIVES:

To enable the students to

1. Acquire knowledge of the role of micro-organisms in health and disease
2. To be aware of the role of micro-organisms in spoilage of various foods.
3. To expand knowledge of micro-organisms in relation to food and food preservation
4. To learn about various types of single cell protein and its application in real life situation.

COURSE OUTCOME:

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

CO No.	CO Statement
CO1	Distinguish the different microorganisms and their beneficial role to environment.
CO2	Gain knowledge about principles of various techniques used in the prevention, control of the microorganisms in foods and sources of contamination.
CO3	Application of microbes in food industry and their therapeutic use. (Single cell protein)
CO4	Identify water borne, air borne, food borne diseases, infections and food poisoning and techniques to prevent them.
CO5	To impart the knowledge on the methods of sterilization, disinfection, and pasteurization

UNIT I (15 HOURS)

INTRODUCTION TO MICROBIOLOGY AND ITS RELEVANCE TO EVERYDAY

LIFE - General Characteristics of microorganisms-bacteria, virus, yeasts, moulds, algae, protozoa. Morphology, classification, motility, nutrition, respiration and reproduction.

UNIT II (15 HOURS)

DESTRUCTION OF BACTERIA

a) Sterilization

- i) Application of dry heat, burning, flaming and hot air oven.
- ii) Application of moist heat, boiling, pasteurization, steam sterilizer and autoclave.
- iii) Sterilization with the use of filters

b) Disinfection

Methods of disinfection, natural, physical and chemical.

c) Pasteurization

Methods – Holder and flash, Advantages of pasteurization

d) Principles of food preservation

e) Purification of water - Industrial method of purification of water, sedimentation, filtration, slow sand filters, rapid sand filters. Domestic method of water purification - simple techniques like straining water through a muslin cloth, three pitchers system. Use of certain common chemicals like alum, quick lime and potassium permanganate in filtration.

UNIT III (15 HOURS)

FOOD MICROBIOLOGY - CONTAMINATION, SPOILAGE AND PRESERVATION

Principles of food spoilage by micro-biological, physical and biological factors.

- a) Cereal and Cereal products and baked products - Spoilage of bread, ropiness in bread, Red bread and chalky bread.
- b) Fruits and vegetables and their products
- c) Meat and their products
- d) Eggs: Contamination, preservation and spoilage
- e) Milk and Milk Products

UNIT IV (15 HOURS)

GENERAL PRINCIPLES UNDERLYING FOOD SPOILAGE, FOOD POISONING, FOOD INFECTIONS. PRINCIPLES OF FOOD PRESERVATION

Chemical changes caused by Micro-organisms, fit or unfit food for consumption –causes of spoilage - classification of food by the case of spoilage. Microbial food poisoning by Staphylococci, Salmonella and clostridium botulinum (Botulism). Measures to prevent microbial food poisoning. Food infections -food borne diseases - Dysentery, Diarrhea, Typhoid, Cholera.

Principles of food preservation - Use of high and low temperatures. Canning of fruits and vegetables. Preservation by drying, Use of chemicals in food preservation. Part played by antibiotics in the preservation of fleshy food.

UNIT V (15 HOURS)

ROLE OF MICROBES IN FOOD INDUSTRY – Single Cell Protein (SCP) - **Fungi** - *Aspergillus niger*, *Rhizopus cyclopean*. **Yeast**- *Saccharomyces cerevisiae*, *Candida tropicalis*. **Algae** - *Spirulina* sps, *Chlorella pyrenoidosa*. **Bacteria**- *Pseudomonas fluorescens*, *Lactobacillus*. Production of SCP, Advantages and disadvantages, Applications.

ACTIVITY

I. Experiments

Identify the shape and arrangement of bacteria present in given culture/curd/idly batter/yeast by performing simple staining method.

Identification of the fungus (*Aspergillus/Mucor/Rhizopus*) by wet mount using LPCB.

II. Spotters

Petri plate, Inoculation loop, Glass slide, Cavity slide, L-Rod, Cover slip, Autoclave, Hot air oven

III. Stained Slides

Bacilli, Cocci, Spirilli, *Aspergillus*, *Rhizopus*, Yeast, *Penicillium*, *Chlamydomonas*, *Spirogyra* – Conjugation.

TEXTBOOKS

- WM Foster. (2016). Food Micro-biology. CBS publishers and distributors. I ed
- Vasanthakumari. (2016) Text book of Microbiology. Wolter Kluwer Publications.
- Adams MR. (2018). Food microbiology. New age publishers. I ed.
- Ananthanarayan.R & Paniker C.K. (2017) Textbook of Microbiology. Universities press.10 th edition.
- Frazier.W.C. (2017) Food Micro-biology. McGraw Hill Publisher. 5 th ed.

REFERENCES:

- R.C. Rubey & D.K.Maheshwar.(2018) A Textbook of Microbiology.S.Chand .

- Pelczar J.Michael. (2018) Micro-biology concepts and Application.Mc Graw Hill publications.
- Sumathy Muralidhar.(2019) Lipincott's Microbiology. Wolter kluwers publication.
- CP Baveja.(2021) Textbook of microbiology.Arya Publications .
- Apurba Sastry. (2020) Essentials of Microbiology. Jaypee publications

E LEARNING RESOURCES

- <https://www.who.int/news-room/fact-sheets/detail/botulism>
- <https://www.cdc.gov/foodsafety/prevention.html>
- www.fao.org
- www.wfp.org
- <https://youtu.be/JR6yHykfYJE>

PEDAGOGY:

Lecture, E-content, PowerPoint presentation, Charts, Group discussions

CO/PSO MAPPING

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO. 1	3	3	3	3	3	3
CO. 2	2	2	3	3	3	2
CO. 3	2	2	3	2	3	2
CO. 4	2	2	2	2	3	3
CO. 5	2	2	2	2	3	3
Average	2.2	2.2	2.6	2.4	3	2.6

QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION [CONVENTIONAL MODE]

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any
K1,K2	Section A Multiple Choice Questions 15x2=30 *2 mark	Correct choice	30	75	Bloody bread is caused by ----- Penicillium Erwinia Serratia Proteus
K3, K4	Section B 5 out of 7 Questions *5 Marks	Not exceeding 500 words	25		Classify the family of protozoa based on organs of motility
K4,K5,K6	Section C 2 Out of 5Questions *10 Marks	Not exceeding 1000 words	20		Evaluate the various methods by which the sanitary quality of water is determined

* 75 marks to be converted as 60 marks.

QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION [ONLINE MODE]

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any
INTERNAL SETTING					
K1,K2,K3	A-Multiple choice questions [No choice] 25x1=25marks	Choose the best option	25	50	Bloody bread is caused by ----- Penicillium, Erwinia Serratia , Proteus
EXTERNAL SETTING					
K3, K4,K5,K6	B-5/7 5x5=25marks	Not exceeding 500 words	25		Classify the family of protozoa based on organs of motility

* 50 marks to be converted as 60 marks

ALLIED CHEMISTRY-I

TOTAL HOURS: 60

SUB CODE: 20UNDAT1001

CREDITS: 4

L-T-P: 4 2 0

Course Objectives:

- To explore the basic concepts in chemistry
- To learn and apply the theoretical principles
- To learn the basic principles in electrochemistry
- To know the methods suitable for water purification
- To learn the fundamentals of organic chemistry and heterocyclic compounds
- To know the basic principles of photochemistry

Course Outcome

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

CO NO	CO Statement
CO1	Know and identify methods suitable for water purification
CO2	Acquire knowledge about the advantages of solid, liquid and gaseous fuel
CO3	Gaining the knowledge about basic of fundamental organic chemistry
CO4	Acquire knowledge about basics of physical chemistry
CO5	Know and prepare the good fertilizer

UNIT-I: ELECTROCHEMISTRY

(10hrs)

1.1 Electrochemistry: Strong and Weak electrolyte, common ion effect, pH, Buffer solutions. Henderson equation and buffer action in biological systems

UNIT-II: INDUSTRIAL CHEMISTRY

(15hrs)

2.1 Fuels-gaseous – water gas, natural gas, semi-water gas
2.2 Fertilizers - Preparation and uses of urea, ammonium sulphate, Superphosphate, Triple super phosphate, NPK.
2.3 Hardness of water: Temporary and permanent hardness, disadvantage of hard water-softening of hard water-reverse osmosis-purification of water for domestic use: uses of chlorine, ozone and uv- light.

UNIT-III: FUNDAMENTALS OF ORGANIC CHEMISTRY

(15hrs)

3.1 Classification of organic compounds- Hybridisation in methane, ethane, acetylene,
3.2 Classification of reagents- Electrophiles, Nucleophiles and Free radicals definition examples-classification of reactions-addition, substitution, elimination, condensation and polymerization
3.3 Electrophilic substitution reaction mechanism in benzene (Nitration and Sulphonation only)

UNIT-IV: HETEROCYCLIC COMPOUNDS

(10hrs)

4.1 Introduction to Heterocyclic compounds preparation and properties of furan, thiophene, pyrrole and pyridine.

UNIT-V: PHOTOCHEMISTRY

(10hrs)

5.1 Introduction to photochemistry-statement of Grothus-Draper Law, Stark-Einsteins law,

quantum yield , Hydrogen –chlorine reaction (Elementary idea only). Photosynthesis, Photosensitization, phosphorescence, fluorescence and chemiluminescence - Definition with examples

Text Books

- Soni, P. L., & Katyal, M. (2006). Textbook of inorganic chemistry. Sultan Chand
- Soni, P. L. (2006). Textbook of organic chemistry. Sultan Chand.
- Sharma, B. K. (2000). Industrial chemistry. Krishna Prakashan Media.
- Myers, R. (2003). The basics of chemistry. Greenwood Publishing Group.
- Goldberg, D. E. (2006). Fundamentals of chemistry. McGraw-Hill.

Reference books

- Bahl, B. S., & Bahl, A. (2008). Advanced Organic Chemistry, Revised ed. S. Chand and Company, India.
- Puri, L. B., Sharma, I. R., & Pathania, M. S. (2013). Principles of physical chemistry. Vishal
- McMurry, J., Ballantine, D. S., Hoeger, C. A., Peterson, V. E., & Castellion, M. (2010). Fundamentals of general, organic, and biological chemistry. Pearson Education.
- Mills, K., & Joule, J. A. (2010). Heterocyclic Chemistry. Blackwell.
- Saha, S., & Mondal, S. (Eds.). (2018). Photochemistry and Photophysics: Fundamentals to Applications. BoD–Books on Demand.

E-LEARNING RESOURCES:

1. www.virtlab.com
2. <http://nptel.ac.in>
3. MATLAB
4. Mooc.org
5. <http://swayam.gov.in>

PEDAGOGY

Example: Lecture, Group discussion, PPT

Mapping CO with PSO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	2	3	0
CO2	3	2	2	2	3	1
CO3	3	3	3	3	3	1
CO4	3	2	2	2	2	0
CO5	3	2	3	3	2	1
Average	3	2.2	2.4	2.4	2.6	0.6

QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION [CONVENTIONAL MODE]

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any
K1,K2	Section A Multiple Choice Questions 15x2=30 *2 mark	Correct choice	30	75	-
K3, K4	Section B 5 out of 7 Questions *5 Marks	Not exceeding 500 words	25		-
K4,K5,K6	Section C 2 Out of 5 Questions *10 Marks	Not exceeding 1000 words	20		-

*** 75 marks to be converted as 60 marks.**

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[ONLINE MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any	
INTERNAL SETTING						
K1,K2,K3	A-Multiple choice questions [No choice] 25x1=25marks	Choose the best option	25	50	-	
EXTERNAL SETTING						
K3, K4,K5,K6	B-5/7 5x5=25marks	Not exceeding 500 words	25		-	

*** 50 marks to be converted as 60 marks.**

**SEMESTER II
HUMAN PHYSIOLOGY**

TOTALHOURS: 75

SUB CODE:

CREDIT: 4

L-T-P: 4 2 0

COURSE OBJECTIVES:

To enable the students

1. To understand the structure and physiology of various organs in the body.
2. To assist students to obtain a better understanding of the principles of nutrition and dietetics through the study of human physiology.

COURSE OUTCOME:

CO No.	CO Statement
CO1	Acquire knowledge about cell physiology, prominent organelles, different type of tissues, their functions and location in the systems of the human body.
CO2	Explore location, structure and functioning of various components of a body system under normal conditions.
CO3	Correlate physiology with various health disorders and their pathogenesis.
CO4	Identification of terminologies and conditions for describing the anatomy of the body.
CO5	Develop awareness about major communicable and non-communicable diseases

SYLLABUS:

UNIT -I

(15 HOURS)

CELL

Introduction - cell under e/m, recent concepts, structure and functions of different organelles, transport across cell membranes.

TISSUES

Classification, structure and functions.

UNIT -II

(15 HOURS)

BLOOD AND BODY FLUIDS

Composition and functions of plasma, RBC, WBC, Platelets, Reticulo - endothelial system, Blood groups.

HEART AND CIRCULATION

Structure of the heart and blood vessels, properties of cardiac muscle, origin and conduction of heart beat, cardiac cycle, cardiac output, heart sounds, pulse, blood pressure - definition and factors affecting blood pressure, measurement of arterial blood pressure - direct and indirect method.

UNIT -III

(15HOURS)

RESPIRATORY SYSTEM

Anatomy and physiology of respiratory organs. Gaseous exchange in the lungs, mechanism of respiration

DIGESTIVE SYSTEM

Anatomy of gastro-intestinal tract. Digestion and absorption of carbohydrates, proteins and fats.

UNIT – IV

(15 HOURS)

NERVOUS SYSTEM

General anatomy of nervous system, central nervous system, peripheral nervous system, structure of neuron, reflex arc, brain.

SENSE ORGANS

Physiology of vision, hearing, taste, smell and cutaneous sensations.

UNIT -V

(15 HOURS)

EXCRETORY SYSTEM

Structure of kidney, Structure of nephrons, formation of urine, acid-base balance and water balance.

ENDOCRINOLOGY

Pituitary, thyroid, parathyroid, adrenal and pancreas - functions of the hormones and their relationships.

REPRODUCTIVE SYSTEM

Anatomy of male and female reproductive organs, menstruation, ovulation, fertilization, placenta, pregnancy.

TEXT BOOKS

- K. Sembulingam, Prema Sembulingam. (2019). Essentials of medical physiology. Eighth edition. Jaypee publications.
- Waugh A, Ross and Wilson (2018). Anatomy and physiology in health and illness 13ed. Elsevier publications.
- CC Chatterjee. (2020). Human Physiology 13 ed. CBS publishers.
- Indu Khurana. (2020). Medical physiology for under graduate students. Second edition. Elsevier Publication.
- GK Pal. (2019). Textbook of human physiology, third edition, Elsevier publications.

REFERENCES

- Best, CH and NB Taylor. (2011)The living body.13 th edition. Wolter and Kluwers Publication.
- Guyton and Hall. (2020) Textbook of medical physiology, third edition, Elsevier Publication
- Stuart Ira Fox. (2003). Medical physiology, Eighth edition, MC Graw hill Publication
- AK. Jain. (2019). Human physiology. sixth edition. Avichal publication company.
- Vidya Ratan. (2004) Hand book of Human Physiology. Jaypee publication.

E LEARNING RESOURCES

- <https://youtu.be/MZDy0RvA52Y>-Osmosis
- <https://youtu.be/TgeviVQnVBs>- Respiratory system
- <https://youtu.be/44B0ms3XPKU>- nervous system
- <https://youtu.be/xIZQRjkwV9Q>- Cardiac cycle
- https://youtu.be/3a_aLsFvNWs -Autonomic nervous system

PEDAGOGY

Lecture, Powerpoint presentation, Charts, E content, Youtube videos, Group discussions

CO/PSO MAPPING

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO. 1	3	3	3	1	3	3
CO. 2	3	2	3	1	3	3
CO. 3	3	2	2	1	3	3
CO. 4	3	2	3	1	2	2
CO. 5	3	3	3	1	3	2
Average	3	2.4	2.8	1	2.8	2.6

QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION [CONVENTIONAL MODE]

Bloom's Category Level	Sections	Marks	Word limit	Total	Special Instructions if any
K1, K2	Section A Multiple Choice Questions 15X2=30 *2 mark	30	Mark the correct choice	75	----- organelle is known as the garbage system of the cell. Mitochondria, Golgibody Lysosome, Vacoule
K2, K3, K4	Section B 5 out of 7 Questions *5 Marks	25	Short answers (500 Words)		Explain the digestion of carbohydrate and fat in small intestine.
K3, K4, K5, K6	Section C 2 Out of 5 Questions *10 Marks	20	Elaborate answers (approx 1000 Words)		With an illustration, analyse cardiac cycle

* 75 marks to be converted as 60 marks.

QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION [ONLINE MODE]

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any
INTERNAL SETTING					
K1,K2,K3	A-Multiple choice questions[No choice] 25x1=25marks	Choosethe best option	25	50	Choose the best answer ----- organelle is known as the garbage system of the cell. Mitochondria,Golgibody Lysosome, Vacoule
EXTERNAL SETTING					
K3, K4,K5,K6	B-5/7 5x5=25marks	Not exceeding 500 words	25		Short answers: Explain the digestion of carbohydrate and fat in small intestine.

*** 50 marks to be converted as 60 marks**

HUMAN PHYSIOLOGY PRACTICALS

CREDITS: 4

SUB CODE:

TOTAL HOURS: 60

L-T-P: 0 0 4

COURSE OBJECTIVES:

To enable the students to

1. To develop ability to estimate the various blood constituents
2. To learn about the normal value of blood parameters.
3. To become aware of heart rate, respiratory rate, bleeding time and clotting time.

COURSE OUTCOME:

CO No.	CO Statement
CO1	Analysis of the basic parameters of blood.
CO2	Develop skills to interpret the results of basic parameters of blood.
CO3	Recognize the different type of tissues, their function and location in all the systems of the human body.
CO4	Gain knowledge about the application of different apparatus and equipment commonly used in the laboratory for experimental purpose.
CO5	Develop ability to apply the principles in real life to serve the community.

SYLLABUS:

EXPERIMENTS:

1. Estimation of hemoglobin concentration - (2 hours)
2. Identification of different blood groups - (2 hours)
3. Examination of blood smear - (5 hours)
4. Estimation of WBC - (10 hours)
5. Estimation of RBC - (10 hours)
6. Measurement of blood pressure. Comparison of BP using various devices - (5 hours)
7. Measurement of respiratory rate and pulse rate. - (1 hours)
8. Estimation of bleeding and clotting time - (5 hours)
9. Spotters – Specimens of heart, lungs, kidneys, liver, eyes, brain, thyroid, pituitary, pineal. - (10 hours)
10. Microscopic studies of different tissues - Epithelial, connective, muscular and nervous tissues. - (10 hours)

TEXTBOOKS:

- Pravati Pal, G.K. Pal. (2020). Text Book Of Practical Physiology. Fifth edition.

Universities Press.

- Varshney and Mona Bedi,(2018) Ghai's Text book of Practical physiology.9 th edition. Jaypee publications.
- SR Kale and RR Kale. (2018) Practical human physiology. Seventh edition. Nirali prakashan.
- AK. Jain. (2019). Human physiology. sixth edition. Avichal publication company.
- Vidya Ratan. (2004) Hand book of Human Physiology. Jaypee publication.

REFERENCES:

- K. Sembulingam, Prema Sembulingam.(2019) Essentials of medical physiology. Seventh edition. Jaypee publications.
- Waugh A, Ross and Wilson(2018) anatomy and physiology in health and illness 13ed. Elsevier publications.
- Indu Khurana.(2020) Medical physiology for under graduate students. Second edition Edition. Elsevier Publication.
- GK Pal. (2019) Textbook of human physiology, third edition, Elsevier publications.
- Stuart Ira Fox. (2003). Medical physiology, Eighth edition, MC Graw hill Publication

E LEARNING RESOURCES:

- <https://youtu.be/KSs0SMfERuA> smear preparation
- <https://youtu.be/s-Zt9jCZyDQ>-TLC
- <https://youtu.be/C9M2fb71Ijc>-RBC
- <https://youtu.be/-TDL9Jp0dg4>-HB estimation
- <https://youtu.be/3oUvqNuWzPg>- blood group

PEDAGOGY:

Demonstration and individual hands on practical

CO/PSO MAPPING

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO. 1	3	3	3	3	3	3
CO. 2	3	3	3	3	3	3
CO. 3	3	3	2	3	3	2
CO. 4	3	3	3	3	3	2
CO. 5	3	3	3	3	3	3
Average	3	3	2.8	3	3	2.6

ALLIED CHEMISTRY-II

TOTAL HOURS: 60

SUB CODE: 20UNDAT2002

CREDITS: 4

L-T-P: 4 2 0

Course Objectives:

- To explore the basic concepts in chemistry
- To learn and apply the theoretical principles
- To understand the preparation and properties of carbohydrates and proteins
- To learn the analytical techniques in chemistry
- To learn and remember pharmacological terms used in medical fields

Course outcome:

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

CO NO	CO Statement
CO1	Gaining the knowledge about carbohydrates and proteins
CO2	Acquired the knowledge in analytical techniques in chemistry
CO3	Gaining the knowledge about pharmacological terms in medicinal chemistry

SYLLABUS

UNIT-I: CARBOHYDRATES

(15hrs)

- 1.1 Classification - Preparation and reactions of glucose and fructose. Discussion of open and ring structure of glucose, mutarotation
- 1.2 Inter conversion of glucose to fructose and vice versa-properties of sucrose
- 1.3 Properties of Starch, cellulose and derivatives of cellulose

UNIT-II: PROTEINS

(15hrs)

- 2.1 Amino acids-classification, preparation and properties of alpha amino acids- preparation of dipeptide using Bergman method
- 2.2 Proteins-classification according to composition-biological functions and shape- Nucleic acids- Elementary idea of DNA and RNA

UNIT-III: PHARMACEUTICAL CHEMISTRY

(10hrs)

- 3.1 Definition and one example each- analgesics, antipyretics, tranquilisers, sedatives, hypnotics, local anesthetics and general anesthetics.
- 3.2 Cause and treatment of – Diabetes, cancer and AIDS

UNIT-IV: SEPARATION AND PURIFICATION TECHNIQUES

(10hrs)

- 4.1 Separation techniques-Extraction-distillation, Vacuum, fractional and steam-crystallization, sublimation.

UNIT-V: CHROMATOGRAPHY

(10hrs)

- 5.1.Principles and application of column, paper and thin layer chromatography

Text Books

- Soni, P. L., & Katyal, M. (2006). Textbook of inorganic chemistry. Sultan Chand
- Soni, P. L. (2006). Textbook of organic chemistry. Sultan Chand
- Myers, R. (2003). The basics of chemistry. Greenwood Publishing Group.
- Sharma, B. K. (2000). Instrumental methods of chemical analysis. Krishna Prakashan Media.
- Gopalan, R., Subramanian, P. S., & Rengarajan, K. (2003). Elements of Analytical Chemistry. Sultan Chand & Sons, New Delhi

Reference Books

- Goldberg, D. E. (2006). Fundamentals of chemistry. McGraw-Hill.
- McMurry, J., Ballantine, D. S., Hoeger, C. A., Peterson, V. E., & Castellion, M. (2010). Fundamentals of general, organic, and biological chemistry. Pearson Education.
- Ghosh, J. (2006). Fundamental concepts of applied chemistry. S. Chand Publishing.
- Bahl, B. S., & Bahl, A. (2008). Advanced Organic Chemistry, Revised ed. S. Chand and Company, India
- Cairns, D. (Ed.). (2012). Essentials of pharmaceutical chemistry. Pharmaceutical Press.

E-LEARNING RESOURCES:

1. www.virtlab.com
2. <http://nptel.ac.in>
3. MATLAB
4. Mooc.org
5. <http://swayam.gov.in>

Mapping CO with PSO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	2	1
CO2	3	3	3	3	3	3
CO3	3	2	1	2	1	1
Average	3	2.6	2.3	2.6	2	1.6

PEDAGOGY

Example: Lecture, Group discussion, PPT

QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION [CONVENTIONAL MODE]

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any
K1,K2	Section A Multiple Choice Questions 15x2=30 *2 mark	Correct choice	30	75	-
K3, K4	Section B 5 out of 7 Questions *5 Marks	Not exceeding 500 words	25		-
K4,K5,K6	Section C 2 Out of 5 Questions *10 Marks	Not exceeding 1000 words	20		-

*** 75 marks to be converted as 60 marks.**

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[ONLINE MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any	
INTERNAL SETTING						
K1,K2,K3	A-Multiple choice questions [No choice] 25x1=25marks	Choose the best option	25	50	-	
EXTERNAL SETTING						
K3, K4,K5,K6	B-5/7 5x5=25marks	Not exceeding 500 words	25		-	

*** 50 marks to be converted as 60 marks.**

ALLIED CHEMISTRY PRACTICAL

TOTAL HOURS: 40
CREDITS: 2

SUB CODE: 20UNDAP2001
L-T-P: 0 0 2

COURSE OBJECTIVES:

To enable the students to practically

- a) Estimate the given substance volumetrically.
- b) analyze and identify the organic compounds qualitatively

COURSE OUTCOME:

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

CO NO	CO Statement
CO1	Know and define the various terms in volumetric analysis
CO2	Acquire knowledge and perform the volumetric analysis and estimate the quantity present.
CO3	Identify and analyze organic compounds

SYLLABUS

VOLUMETRIC ANALYSIS

1. Estimation of Sodium hydroxide using standard Sodium Carbonate and link Hydrochloric acid
2. Estimation of Borax using standard Sodium Carbonate and link Hydrochloric acid
3. Estimation of Ferrous sulphate using standard Mohr salt solution and link potassium permanganate
4. Estimation of Oxalic acid standard ferrous sulphate solution and link potassium permanganate
5. Estimation of Hydrochloric acid standard oxalic acid solution and link sodium hydroxide

ORGANIC COMPOUND ANALYSIS

Systematic analysis of organic compounds containing one functional group to distinguish between aliphatic and aromatic, Saturated and unsaturated, detection of Elements (Nitrogen, Sulphur and Halogen) and characterization by confirmatory tests - Phenols, Acids (mono and di), Aromatic primary amine, Aliphatic Amide and Glucose

TEXT BOOK:

- Lab Manual- Prepared by Faculty, Department of Chemistry, SDNB Vaishnav College for Women

REFERENCE BOOK:

- Gnanapragasam, N. S., & Ramamurthy, G. (2004). Organic Chemistry Lab Manual. New Ed., SV.
- Furniss, B. S. (1989). Vogel's textbook of practical organic chemistry. Pearson Education India.
- McPherson, P. (2014). Practical Volumetric Analysis. Royal Society of Chemistry.

MAPPING CO with PSO

CO/PO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO. 1	3	3	3	3	2	2
CO. 2	3	3	3	3	3	2
CO. 3	3	3	3	3	3	2
Average	3	3	3	3	2.7	2

PEDAGOGY:

Demonstration and individual hands on practical

SEMESTER-III

NUTRITION THROUGH LIFE CYCLE

TOTALHOURS:75

SUB CODE:

CREDIT:4

L-T-P: 4 2 0

OBJECTIVES:

To enable the students to:

- a) Acquire knowledge on the nutritional needs of individuals at different age levels.
- b) Develop basic concepts and gain experience in planning, preparing and serving of meals for various age groups at different income levels based on nutritional status.

COURSE OUTCOMES:

On completion of the course the students will be able to

CO No.	CO Statement
CO1	Analyze the nutritional requirements for different age groups that helps in controlling nutrition related deficiencies pertaining to such groups
CO2	Acquire the basic principles involved in meal planning for various age groups
CO3	Demonstrate basic skills in planning different kinds of menus for different age groups based on their recommended daily allowance.
CO4	Identify and plan meals taking into considerations different income groups

SYLLABUS:

UNIT I

(15 HOURS)

- a. Introduction to meal management. Balanced diet, RDA, Basic five foodgroups.
- b. Principles of meal planning - steps involved in planning a diet, food exchange, food cost, food guide pyramid, foodplate.
- c. Adult-nutritional requirements, Reference man & Reference women, planning balanced diets for adult men andwomen.

UNIT II

(15 HOURS)

- a. Nutrition in pregnancy - physiological changes during pregnancy – nutritional requirement- food selection- General dietary problems in pregnancy, complications of pregnancy.
- b. Nutrition during lactation - Physiology of lactation - Nutrition requirements during lactation, Special foods given during lactation - lactogogues.

UNIT III

(15 HOURS)

- a. Nutrition during infancy - Growth and development - Low birth weight, Pre-term baby, Nutrition requirements, Breast feeding and its advantages, Artificial/Bottle feeding, Infant formula, Weaning and complications of weaning, Introduction of supplementary foods -low cost supplementary foods.
- b. Nutrition during early childhood (Toddler/Preschool)
Nutritional requirements – Food acceptance, problems in feeding patterns, PICA, Picky eating, food acceptance, PEM, Vitamin-A, Feeding programmes – ICDS.

UNIT IV

(15 HOURS)

- a. Nutrition of school children – Nutritional requirement & Physical development, packed lunch, Importance of snacks. Mid-day meal, Feeding problems- childhood Obesity.
- b. Nutrition during Adolescence- Growth & development- nutritional requirement, food choices and factors influencing them. Nutritional problems- bulimia, anorexia nervosa, nutritional Anemia.

UNIT V

(15 HOURS)

- a. Old age: Physiological changes in ageing, nutritional requirement, Factors affecting food intake, complications and nutritional deficiencies in old age.

NUTRITION THROUGH LIFE CYCLE - ACTIVITY

1. Basic principles of meal and menu planning
2. Daily food guide - The 5 food groups, the use of the food groups.
3. Planning for adult man and woman during different physical activities - sedentary, moderate, heavy worker. Preparation of above diet.
4. Planning and Preparation of a balanced diet for a pregnant woman - Nutrient requirements, modifications of dietary pattern.
5. Planning and preparation of a balanced diet for a nursing mother - modification of normal meal pattern – nutritional requirements.
6. Nutrition during infancy - nutritional requirements during Infancy.
7. Supplementary feeding-preparation of weaning foods
8. Planning and preparation of diet for a toddler, pre-school child-nutritional requirements - food pattern.
9. Nutrition during school age - nutritional considerations -planning and preparation of meals / packed lunch.
10. Nutrition during adolescence - nutritional requirements. Factors influencing food habits - preparation of meal.
11. Planning a diet for older adult- factors affecting food intake and nutrient use - special needs – nutritional requirements - Preparation of meals.
12. Planning a diet for obesity and underweight.

TEXT BOOKS

- Krause, Food Nutrition & Diet therapy,(2016) 8th edition saunders.
- Srilakshmi,B,(2014) Dietetics, seventh edition, New age international publishers.
- Maureen martaugh and Janet Issac, (2010) Nutrition through lifecycle,4th International edition.

- Judith.E.Brown ,(2010) Nutrition through lifecycle, 4th edition, Cengage learning inc.
- Prakesh Shetty, (2002),Nutrition through life cycle,Illustrated edition, Leatherhead food research association.

REFERENCES

- 1.Ruby R Puckeet and Rebecca ann Lucas ,(2009), Food nutrition and medical nutrition therapy through life cycle, 4 th edition, Hunt publishing co.
- Dr.M.Mohammad Essa,(2016) Hand book of Nutritional Assessment through life cycle,1st edition, Nova science publishers.
- Jeff Lowenfels, (2013) Teaming with Nutrients the Organic gardeners guide to optimizing plant nutrition, , 13th edition ,Timper press.
- Patricia Barnes, (2015), The Handy nutrition hand book , Visible ink press.
- 5.Judith Brown ,(2019)Nutrition through life cycle, 7th edition, Brooks and Cole

E-LEARNING SOURCES:

- www.nutrition.gov-
- www.nal.usda.gov/fnic-
- <https://www.medicalnewstoday.com/articles/160774>
- <https://www.healthline.com/health/food-nutrition>
- <https://nutrition.org/>

CO PSO MAPPING

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	2	3	2
CO2	3	3	3	3	3	2
CO3	3	3	3	3	3	1
CO4	3	3	3	3	3	2

PEDAGOGY:

Lectures, PowerPoint presentation, charts, e- content,case study, Group discussion.

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[CONVENTIONAL MODE]**

Bloom's Category Level	Sections	Marks	Word limit	Total	Special Instructions if any
K1, K2	Section A Multiple Choice Questions 15X2=30 *2 mark	30	Mark the correct choice	75	----- is one of the major deficiencies in school going children. Vitamin-A, Vitamin -E Vitamin-C, Vitamin- B1
K2,K3,K4	Section B 5 out of 7 Questions *5 Marks	25	Short answers (500 Words)		Explain in detail the nutritional requirements during pregnancy.
K3, K4, K5,K6	Section C 2 Out of 5 Questions *10 Marks	20	Elaborate answers (approx 1000 Words)		Elaborate in detail about the nutritional deficiencies in Old age.

* 75 marks to be converted as 60 marks

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[ONLINE MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any
INTERNAL SETTING					
K1,K2,K3	A-Multiple choice questions[No choice] 25x1=25marks	Choose the best option	25	50	Choose the best answer Packed lunch for school children should be_____ Colorless Tasteless Balanced odourless
EXTERNAL SETTING					
K3, K4,K5,K6	B-5/7 5x5=25marks	Not exceeding 500 words	25		Short answers: State the various types of nutritional disorders in adolescence.

* 50 marks to be converted as 60 marks

HUMAN NUTRITION I

TOTAL HOURS:75

SUB CODE:

Credits: 4

L-T-P: 4 2 0

COURSE OBJECTIVES

To enable the students

- 1.To learn about nutrients, RDA and their role in human health
- 2.To acquire knowledge of importance of macro nutrients and their functions
- 3.To study the metabolism, deficiency and toxicity of nutrients in order to understand their clinical role
- 4.To impart knowledge on nutrients and their metabolism

COURSE OUTCOME

CO No.	CO Statement
CO1	Understand the importance of key terms related to nutrition, energy, macro nutrients, RDA and their role in human health
CO2	Classify nutrients and examine /discuss their functions, metabolism, deficiencies and toxicity
CO3	Define and explain the relationship between nutrients and nutrient metabolism
CO4	Identify and analyze the distribution, sources, functions, metabolism, deficiency of macro nutrients in order to effectively utilize available foods
CO5	Gain knowledge about sources, functions, metabolism, RDA of macro nutrients to understand their clinical role

UNIT 1

History of Nutrition-Development of Nutrition as a Science-Definition of Nutrition-Under nutrition, over nutrition and malnutrition.

Introduction to nutrition-food as a source of nutrients, function of foods, definition of nutrients, adequate, optimum and good nutrition, malnutrition. Inter relationship between nutrition and health, visible symptoms of good health.

UNIT 2

Energy-Energy units-Kilo calories, Megajoules, determination of energy value of foods, using Bomb Calorimeter, diagram of Bomb Calorimeter-gross calorific values. Physiological energy value of foods, relation between oxygen used and calorific value.

Determination of energy requirements, direct calorimetry. Relation between Respiratory Quotient and energy output-Specific Dynamic Action of food(Thermogenic food in REE) indirect calorimetry- Basal metabolism-definition, determination-Benedict Roth Basal metabolism Apparatus -factors affecting BMR-determination of energy metabolism during work -energy requirements for various types of activities, factorial methods for calculation of the daily energy requirements of an adult for varying degrees of physical activity - recommended allowances for calories, energy requirements of adults expressed in terms of Reference man and Reference woman.

UNIT 3

CARBOHYDRATES-Definition and composition classification, Review of digestion, absorption and utilization -Regulation of blood sugar, Hormonal controls, functions of carbohydrates in the body. Dietary fibre- definition, soluble and insoluble fibres, sources of fibre, components, physiological effects of dietary fibre, role of fibre in human nutrition, sources and requirements. Introduction to Prebiotics.

UNIT 4

LIPIDS-Classification, composition, digestion and absorption. Function-essential fatty acids, deficiency, food sources of EFA, functions of TGL, Characteristics of animal and vegetable fats, sterols-cholesterol-function, food sources, phospholipids-function, ketone bodies-fat requirements-food sources, dietary lipids and their relation to the causation of Atherosclerosis and Ischemic heart disease.

UNIT 5

PROTEINS-Composition-structure and classification, digestion and absorption. Function of protein, Amino acids -Indispensable and dispensable amino acids-special function of amino acids- protein deficiency- Protein Energy Malnutrition-Kwashiorkor and Marasmus -etiology, clinical features, treatment and prevention- Evaluation of protein quality- PER, BV, NPU and NPR, chemical score, mutual and amino acid supplementation of proteins.

TEXT BOOKS

- Swaminathan M.(2020).Essentials of Food and Nutrition .Vol I .Second Revised Edition.Bappco,Bangalore
- Sumathi R,Mudambi and Raja Gopal MV(2001).Foods and Nutrition".4th Edition. New Age International Ltd Publishers,New Delhi
- Gopalan, C., Sastri, B. R., & Balasubramanian, S. C. (2001). *Nutritive value of Indian foods*. New Delhi: National Institute of Nutrition, Indian Council of Medical Research.
- Srilakshmi,B.(2016).Nutrition Science .New age International Pvt Ltd
- Joshi, SA.(2011).Nutrition and Dietetics.Tata McGraw Hill

REFERENCES

- Whitney EN and Rolfes SR(2005).Understanding Nutrition.10th Edition.Thomson/Wordsworth
- Bender A.David,(2002).Nutritional Biochemistry of the Vitamins.Cambridge University Press
- Garrow,J.S.et al.,(2000).Human Nutrition and Dietetics.Churchill Livingstone
- Bamji SM,Rao,PN and Reddy V (2003).Textbook of Human Nutrition.Oxford&IBH Publishing,New Delhi
- Roday,S.(2010).Food science and Nutrition.Oxford University Press

E Learning Resources

- Scientific and Medical Abstracts: www.ncbi.nlm.nih.gov/Pubmed/
- Information on vitamins: www.eatright.org
- Information on Protein Energy Malnutrition: www.who.org

MAPPING OF CO WITH PSO

CO/PSO	PSO 1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	3	3	3	3	1
CO 2	3	3	1	2	2	1
CO 3	3	3	1	2	2	1
CO 4	3	3	1	2	3	1
CO 5	3	3	3	3	2	1
AVERAGE	3	3	1.8	2.4	2.4	5

PEDAGOGY

Lecture, Charts, Models, PowerPoint presentation E content, Group discussion

QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION [CONVENTIONAL MODE]

Bloom's Category Level	Sections	Marks	Word limit	Total	Special Instructions if Any
K1, K2	Section A Multiple Choice Questions 15X2=30 30 marks	30	Mark the correct choice	75	Choose the best answer
K2, K3, K4	Section B 5 out of 7 Questions *5 Marks	25	Short answers (500 Words)		Short answers: Classify Proteins
K3, K4, K5, K6	Section C 2 Out of 5 Questions *10 Marks	20	Elaborate answers (approx 1000 Words)		Elaborate answers Determine the role of dietary lipids and their relation to CHD

*** 75 marks to be converted as 60 marks.**

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[ONLINE MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any	
INTERNAL SETTING						
K1,K2,K3	A-Multiple choice questions [No choice] 25x1=25marks	Choose the best option	25	50	Choose the best answer	
EXTERNAL SETTING						
K3, K4,K5,K6	B-5/7 5x5=25marks	Not exceeding 500 words	25		Short answers: Illustrate Bomb calorimeter	

* 50 marks to be converted as 60 marks

FUNDAMENTALS OF BIOCHEMISTRY

TOTALHOURS: 60

SUB CODE:

CREDIT: 5

L-T-P: 3 1 0

COURSE OBJECTIVES:

To enable the students

1. To learn about the different types of macronutrients that are essential for human life
2. To know about the metabolism of various macronutrients
3. To gain knowledge about nucleic acids, enzymes and the inborn errors of metabolism

COURSE OUTCOME:

CO No.	CO Statement
CO1	Obtain an insight into chemistry of major nutrients & physiologically important biomolecules.
CO2	Understand the biological processes and systems as applicable to nutrition.
CO3	Apply the knowledge acquired to human nutrition and dietetics.
CO4	To understand principles of bioenergetics and inborn errors of metabolism.
CO5	To relate the role of nutrients and enzymes in biochemical processes and pathways

SYLLABUS

UNIT I

INTRODUCTION TO BIOCHEMISTRY: (15 HOURS)

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

UNIT II

(15 HOURS)

CARBOHYDRATE - Structure, general reaction of mono, di, tri and oligo saccharides, Metabolism of carbohydrate – glucose oxidation through glycolysis – Krebs cycle, pentose phosphate cycle and gluconeogenesis.

UNIT III

(15 HOURS)

AMINO ACIDS – Chemical properties due to amino and carboxyl groups. Proteins – primary, secondary, tertiary structure of proteins– Hydrolysis of proteins – Denaturation, precipitation, coagulation, deamination, transamination, decarboxylation – urea cycle, fate of carbon skeleton of amino acids.

UNIT IV

(15 HOURS)

LIPIDS AND LIPID METABOLISM – Classification of fats, physical and chemical properties, β oxidation of fatty acids, Bio synthesis of fatty acids – formation of acetoacetate, ketogenesis. Biosynthesis of cholesterol.

UNIT V

(10 HOURS)

Nucleic acids, nucleotides, nucleoprotein. Purines and pyrimidines- Biological function of nucleic acid, and nucleotides. Inter relationship between carbohydrate, fat and protein metabolism. Inborn errors of metabolism with reference to carbohydrate – Fructosuria and galactosemia. Protein – Phenyl ketonuria, Alkaptonuria, amino aciduria.

ACTIVITY

1. Qualitative tests for sugars – glucose, fructose, lactose, maltose and glucose.
2. Qualitative tests for proteins – Albumin, casein, globulin, and gelatin

TEXT BOOKS

- Shanmugham Ambika (2016) – Fundamentals of bio-chemistry to medical students. Wolters Kluwers Publication. Eighth edition.
- Sathyanarayan U. (2020) Biochemistry. 5th edition, New central book agency.
- Jain JL (2004) Fundamentals of biochemistry. 6th edition. S Chand publisher.
- DM. Vasudevan. (2019) Textbook of biochemistry for medical students, Ninth edition, Jaypee publishers.
- Rama Rao A.V.S.S. (1990) Text book of biochemistry. 5th edition, L K and Publishers. 2009.

REFERENCES

- Prasad R. (2019) Biochemistry for medical students. 5th edition. Prasad Publication.
- Rodwell and Blender. (2018) Harpers Illustrated biochemistry. 31st edition, McGraw Publication.
- Shivananda Nayak. (2020) Handbook of biochemistry and nutrition. 1st edition. Jaypee publications.
- Ferrier. Lipincotts Illustrated reviews in Biochemistry. (2017) 7th edition. Wolter and Kluwer publications.
- Nayak Pankaja. (2019) Essentials of biochemistry. Jaypee Publications.

E LEARNING CONTENT

- <https://youtu.be/vxDSI9XKB1A>-carbohydrate metabolism
- <https://youtu.be/xZdTfhsypjM> -fatty acid synthesis
- <https://youtu.be/JxK5rZxbyQY> -Cholesterol synthesis
- <https://youtu.be/ubzw64PQPqM>- krebs cycle
- <https://youtu.be/0I8vaXqfElo>- ureacycle

CO/PSO MAPPING

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	2	2	3
CO2	3	3	3	2	2	2
CO3	3	3	3	2	2	2
CO4	3	3	3	2	2	3
CO5	3	3	3	2	2	3
Average	3	3	3	2	2	4.6

PEDAGOGY: Lecture, Powerpoint presentation, Charts, E content, YouTube videos, Group

discussions

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[CONVENTIONAL MODE]**

Bloom's Category Level	Sections	Marks	Word limit	Total	Special Instructions if any
K1, K2	Section A Multiple Choice Questions 15x2=30 *2 mark	30	Mark the correct choice	75	Ninhydrin test is a qualitative test to detect ----- Carbohydrate Protein Fat Vitamin
K2,K3,K4	Section B 5 out of 7 Questions *5 Marks	25	Short answers (500 Words)		
K3, K4, K5,K6	Section C 2 Out of 5 Questions *10 Marks	20	Elaborate answers (approx 1000 Words)		Elaborate on the synthesis of fatty acids using enzyme complex system

*** 75 marks to be converted as 60 marks.**

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[ONLINE MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any
INTERNAL SETTING					
K1,K2,K3	A-Multiple choice questions[No choice] 25x1=25marks	Choose the best option	25	50	Ninhydrin test is a qualitative test to detect ----- Carbohydrate Protein Fat Vitamin
EXTERNAL SETTING					
K3, K4,K5,K6	B-5/7 5x5=25marks	Not exceeding 500 words	25		Differentiate glycolysis and TCA Cycle with energetics

*** 50 marks to be converted as 60 marks**

**SEMESTER IV
MEDICAL NUTRITION THERAPY**

TOTAL HOURS: 75
CREDIT: 4

SUB CODE:
L-T-P: 4 2 0

COURSE OBJECTIVES

1. To recognize the growth and scope of clinical nutrition and understand the concepts of diet therapy.
2. To gain knowledge about the role of nutrition in disease conditions.
3. To understand the causes, symptoms, physiological and metabolic abnormalities of acute and chronic diseases.
4. To develop skills in the planning and preparation of therapeutic diets for various diseases.

COURSE OUTCOMES: On completion of the course the students will be able to

CO No.	CO Statement
CO1	Identify and list the predisposing factors, modifiable causes, metabolic imbalances and symptoms during various clinical conditions for their effective treatment.
CO2	Apply the concept, purpose and principles of diet therapy to take up the role of a dietitian in clinical settings.
CO3	Analyze and interpret the role of specific nutrients and their effect of deficiency in the disease management process.
CO4	Formulate dietary recommendations, nutrition intervention strategies, and plan diets based on the clinical condition and lifestyle
CO5	Interpret the biochemical parameters to determine the appropriate nutritional requirements to combat various diseases and improve quality of life.

SYLLABUS

UNIT 1: Basic concepts of diet therapy (15 HOURS)

Routine Hospital diets: Regular diet, soft diet, full fluid and clear fluid diet. Special feeding methods: Enteral and Parenteral Nutrition, nutritional implications and complications.

Diet in febrile conditions: Classification of fever/infection, causes, clinical symptoms and nutritional implications in tuberculosis and typhoid.

UNIT 2: Gastrointestinal disorders (15 HOURS)

Etiology, risk factors, clinical signs and symptoms, dietary management in peptic ulcer, gastritis, diarrhea, constipation, inflammatory bowel diseases, malabsorption syndrome – tropical sprue, celiac disease, lactose intolerance.

UNIT 3: Diabetes mellitus (15 HOURS)

Predisposing factors, types – Type I DM, Type II DM, Gestational diabetes mellitus, clinical features and biochemical changes, diagnostic tests – GTT and HbA1c, nutritional implications, dietary management of impaired glucose tolerance, Glycemic Index and Glycemic Load – definition and purpose, acute and chronic complications of

diabetes.

UNIT 4:Renal diseases

(15 HOURS)

Etiology, symptoms, dietary modifications in glomerulonephritis, nephrosis, acute and chronic renal failure. Dialysis– principles, types and modifications of diet in dialysis. End stage renal disease and its dietary management. Urinary calculi –etiology, types, nutritional care and dietary modifications.

UNIT 5: Cardiovascular diseases

(15 HOURS)

Predisposing factors, etiology, clinical symptoms, dietary management in atherosclerosis, congestive cardiac failure, and hypertension. Classification of lipoproteins and role of fat in the development of atherosclerosis. Hyperlipidemia – definition, types, dietary management. Functional foods in the prevention of heart diseases.

TEXT BOOKS:

- Mahan L.K., Sylvia Escott-Stump, (2012), Krause’s Food Nutrition and Diet Therapy, 13th edition, W.B. Saunders Company, London.
- Srilakshmi B., (2014), Dietetics, 7th edition, New Age International Pvt. Ltd. New Delhi.
- Antia F.P., Abraham P, (2002), Clinical Dietetics, 4th edition, Oxford Publishing Company.
- Whitney, E., & Rolfes, S. R., (2018), Understanding nutrition. Cengage Learning.
- Mahtab S Bamji, Prasad Rao, Vinodini Reddy., (2003), Textbook of Human Nutrition, Second Edition, Oxford and IBH Publishing Company.

BOOKS FOR REFERENCE:

- Gopalan C., Rama Sastri B.V., Balasubramaniam S.C., (2006), Nutritive Value of Indian Foods, Hyderabad.
- Schlenker, E., & Gilbert, J. A., (2018), Williams' Essentials of Nutrition and Diet Therapy-E-Book. Elsevier Health Sciences.
- Wardlaw, GM., (2004), Contemporary Nutrition, 2nd edition, Mosby Publishing.
- Rolfes, S. R., Pinna, K., & Whitney, E. (2020), Understanding normal and clinical nutrition, Cengage learning.
- Carol Byrd – Bredbenner, (2013), Wardlaw's perspectives in Nutrition, 9th edition McGraw – Hill International Edition.

E-LEARNINGRESOURCES:

- <https://www.nhp.gov.in/>
- <https://eatrightindia.gov.in/>
- <https://www.nutrition.gov/>
- <https://www.eatright.org/>
- <https://nutrition.org/>

Mapping of CO with PSO:

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO. 1	3	3	2	2	1	2
CO. 2	3	3	3	3	3	3
CO. 3	3	3	2	3	2	2
CO. 4	3	3	3	3	3	2
CO. 5	3	3	3	3	3	1
Average	3	3	2.6	2.8	2.4	2

PEDAGOGY (TEACHING METHODOLOGY):

Lecture (Chalk and talk, LCD presentation), Case study, Group discussion, Peer learning, Videos, Quiz

**QUESTION PAPER PATTERN – END SEMESTER EXAMINATION
(CONVENTIONAL MODE)**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2	Section A Multiple Choice Questions 15*2 = 30 Marks	Mark the correct choice	30	75	Choose the correct answer
K2, K3, K4	Section B 5 out of 7 Questions 5*5 = 25 Marks	500 Words	25		Short Answers Ascertain the role of fat in the development of atherosclerosis.
K4, K5, K6	Section C 2 Out of 5 Questions 2*10 = 20 Marks	Approx. 1000 Words	20		Elaborate answers Appraise the role of micronutrients and fibre in the control of diabetes.

***75 marks to be converted as 60 marks**

QUESTION PAPER PATTERN – END SEMESTER EXAMINATION

(ONLINE MODE)

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any	
INTERNAL SETTING						
K1, K2, K3	Section A Multiple Choice Questions (No Choice) 25*1 = 25 Marks	Mark the correct choice	25	50	Choose the correct answer	
EXTERNAL SETTING						
K3,K4,K5, K6	Section B 5 out of 7 Questions 5*5 = 25 Marks	500 Words	25		Ascertain the etiology of peptic ulcer.	

* 50 marks to be converted as 60 marks.

MEDICAL NUTRITION THERAPY PRACTICAL

TOTAL HOURS: 50

SUB CODE:

CREDIT: 4

L-T-P: 0 0 6

COURSE OBJECTIVES

1. To comprehend the basic principles in diet planning.
2. To develop skills and techniques in planning and preparation of various therapeutic diets.
3. To gain experience in preparing diets for different disease conditions.

COURSE OUTCOMES: On completion of the course the students will be able to

CO No.	CO Statement
CO1	Comprehend the principles involved in planning diets for different disease conditions.
CO2	Plan and prepare diets to meet the quality and quantity requirements for specific disease conditions.
CO3	Apply the dietary and nutritional recommendations to formulate customized diets for gastrointestinal, metabolic disorders, kidney diseases, atherosclerosis, and hypertension.
CO4	Interpret the nutritive value calculations for the planned and prepared diet.

SYLLABUS

To plan and prepare therapeutic diets for

1. Peptic ulcer (4 hours)
2. Ulcerative colitis (4 hours)
3. Constipation (4 hours)
4. Typhoid (4 hours)
5. Tuberculosis (4 hours)
6. Insulin dependent diabetes mellitus (4 hours)
7. Non-insulin dependent diabetes mellitus (4 hours)
8. Nephritis (4 hours)
9. Nephrosis (4 hours)
10. ESRD with dialysis (5 hours)
11. Atherosclerosis (5 hours)
12. Hypertension (4 hours)

TEXT BOOKS:

- Mahan L.K., Sylvia Escott-Stump, (2012), Krause's Food Nutrition and Diet Therapy, 13th edition, W.B. Saunders Company, London.
- Srilakshmi B., (2014), Dietetics, 7th edition, New Age International Pvt. Ltd. New Delhi.
- Antia F.P., Abraham P, (2002), Clinical Dietetics, 4th edition, Oxford Publishing Company.
- Whitney, E., & Rolfes, S. R., (2018), Understanding nutrition. Cengage

Learning.

- Mahtab S Bamji, Prasad Rao, Vinodini Reddy., (2003), Textbook of Human Nutrition, Second Edition, Oxford and IBH Publishing Company.

BOOKS FOR REFERENCE:

- Gopalan C., Rama Sastri B.V., Balsubramaniam S.C., (2006), Nutritive Value of Indian Foods, Hyderabad.
- Schlenker, E., & Gilbert, J. A., (2018), Williams' Essentials of Nutrition and Diet Therapy-E-Book. Elsevier Health Sciences.
- Wardlaw, GM., (2004), Contemporary Nutrition, 2nd edition, Mosby Publishing.
- Rolfes, S. R., Pinna, K., & Whitney, E. (2020), Understanding normal and clinical nutrition, Cengage learning.
- Carol Byrd – Bredbenner, (2013), Wardlaw's perspectives in Nutrition, 9th edition McGraw – Hill International Edition.

E-LEARNING RESOURCES:

- <https://www.nhp.gov.in/>
- <https://eatrightindia.gov.in/>
- <https://www.nutrition.gov/>
- <https://www.eatright.org/>
- <https://nutrition.org/>

Mapping of CO with PSO:

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO. 1	3	3	3	2	3	2
CO. 2	3	3	3	3	3	2
CO. 3	3	3	3	3	3	3
CO. 4	3	3	2	2	2	2
Average	3	3	2.75	2.5	2.75	2.25

PEDAGOGY (TEACHING METHODOLOGY):

Case study Analysis, Hands-on training in the food science lab pertaining to food preparation and calculation of nutritional value for diets planned.

FOOD PRESERVATION

TOTALHOURS:60

SUB CODE:

CREDIT:5

L-T-P: 2 2 0

COURSE OBJECTIVES

To enable the students to

1. Classify the various types of food spoilage
2. Distinguish between high and low temperature processing
3. Distinguish between chemical preservation and fermentation
4. Introduce the basics of various food preservation technologies.

COURSE OUTCOME:

On completion of the course the students will be able to...

CO No.	CO statement
CO. 1	Acquire basic principles and concepts in food preservation techniques.
CO. 2	Gain knowledge on the types of food spoilage
CO. 3	Comprehend the use of different temperatures in food processing and provide sustainable solutions
CO. 4	Examine the processing of various foods using suitable food preservation technique.
CO. 5	Identify the principles and functions of food fermentation and apply its fundamentals in day-to-day food processing activities.
CO. 6	Understand the importance of food preservation and processing

SYLLABUS

UNIT I Introduction to Food Preservation

9 Hrs

Food Preservation- Basic principles and importance, Types of Spoilage, Definition of shelf life, perishable foods, semi perishable foods, shelf stable foods.

UNIT II Preservation by the Use of Low and High Temperature

Low temperature

10 Hrs

Refrigeration, advantages, factors to be considered, common spoilages in freezing, methods of freezing, freeze drying and freeze concentration, steps involved in freezing common foods, and storage. Introduction to thawing, changes during thawing and its effect on food.

High Temperature

10 Hrs

Sun drying, solar drying and dehydration, method of drying, mechanical dehydration, merits and demerits, factors affecting drying, preparation of foods for drying, freeze drying and dehydro freezing, spray drying, canning- types of cans, pasteurization and sterilization

UNIT III Preservation by Using Sugar

12 Hrs

Sugar Concentrates – Principles of Gel Formation, Preparation of Jam, Jelly, Marmalades, sauce and squash Preserves, Candied, Glazed, Crystallized Fruits

UNIT IV Preservation by Using Chemicals and Salt Fermentation 14Hrs

Definition, Types of Fermentation, Advantages, Preparation and Preservation of Fruit Juices, RTS Pickling – Principles Involved and Types of Pickles- Indian Pickles, Vinegar, Salt.

Preservation Chemical Preservatives – Definition, Role of Preservation, Permitted Preservatives, FPO Specification

UNIT V Preservation by Fermentation 5Hrs

Specified fermented Foods- Sauerkraut, gherkins, vinegar, idli & dosa, bread, dhokla, yoghurt, coffee, cocoa, Tempe; Wine and Cheese Making

TEXTBOOK:

- Sivasankar, B., (2013), Food Processing and preservation, 2nd edition, prentice Hall, Pvt, Ltd.,
- Srilakshmi, N., (2016), Food Science, 6th Edition New Age International Private Ltd., New Delhi.
- Swaminathan, M., (2014), Food Science, Chemistry and Experimental Foods, Bappco Publishers, Bangalore.
- Subbulakshmi, G. & Udipi, Shobha , A, (2006), Food Processing & Preservation, New Age International Private Ltd., New Delhi.
- Adams, M.R. and Moss, M.O., (2018), Food Microbiology, New Age International (P) Ltd., New Delhi.

REFERENCE:

- Frazier WC and Westhoff DC, (2017), Food Microbiology, 5th edition, TMH Publication, New Delhi.
- Desrosier, N.W., Desrosier, J.N., (2004), The technology of food preservation, 4th edition, CBS publishers and distributors Pvt. Ltd. New Delhi.
- Triveni, P., Food Preservation, (2010), 1st edition, Aadi Publications, Jaipur.
- Sunetra Roday, (2017), Food Hygiene and sanitation, 2nd edition, McGraw Hill Education.
- Dr. Anju Singh, (2017), Handbook of food preservation, Agrotech Press.

E-LEARNING RESOURCES:

- **USDA FSIS - shelf stable food**

safetyhttps://www.fsis.usda.gov/wps/wcm/connect/77ffde83-dc51-4fdf-93be-048110fe47d6/Shelf_Stable_Food_Safety.pdf?MOD=AJPERES

PEDAGOGY:

Lecture, PowerPoint presentation, Charts, Group discussions

Mapping of CO with PSO:

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO.1	2	1	2	2	2	1
CO.2	1	1	1	2	2	2
CO.3	2	1	2	2	3	2
CO.4	2	1	2	2	2	2
CO.5	2	2	1	2	3	2
CO.6	3	1	1	2	3	2
Average	2	1.16	1.5	2	2.5	1.83

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[CONVENTIONAL MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2	Section A Multiple choice questions 15x2=30	Mark the correct choice	30	75	Choose the best answer
K2, K3, K4	Section B 5 out of 7 Questions *5 Marks 5x5=25	Short answers (500 Words)	25		Short answers: Classify the spoilage of foods.
K3, K4, K5, K6	Section C 2 Out of 5 Questions *10 Marks 2x10=20	Elaborate answers (approx 1000 Words)	20		Elaborate answers: Describe the preparation of jam.

*** 75 marks to be converted as 60 marks.**

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[ONLINE MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any	
INTERNAL SETTING						
K1, K2, K3	Section A Multiple Choice Questions 25 Questions *1 Marks (No Choice)	Choose the best option	25X1=25	50	Choose the best answer	
EXTERNAL SETTING						
K2, K3, K4, K5, K6	Section B 5 out of 7 Questions *5 Marks 5x5=25	Not exceeding 500 words	25		Short answers: Determine the factors affecting drying.	

*** 50 marks to be converted as 60 marks**

**SEMESTER V
COMMUNITY NUTRITION**

TOTAL HOURS: 75

SUB CODE:

CREDIT: 5

L-T-P: 3 3 0

COURSE OBJECTIVES:

To enable the students

1. To enable students to understand the importance of nutrition in national progress and the significance of assessment of nutritional statuses.
2. To recognize the solutions to overcome problems of malnutrition in the country and the role of national and international agencies in eradicating malnutrition.

COURSE OUTCOME:

CO No.	CO Statement
CO1	Gain knowledge about the various factors that cause malnutrition and measures to overcome it
CO2	To develop in-depth knowledge about the crucial role played by various international and national bodies
CO3	Acquire skills to assess the nutritional status of a community and provide nutrition education to them
CO4	To initiate action, enrich community's knowledge about healthy eating practices, immunity and immunization schedule

SYLLABUS:

UNIT 1.

(15 hours)

(a) Nutrition and health in National development (b) Nutritional problems confronting our country – The causes of malnutrition in India, Balances food production and population growth.

UNIT 2.

(15 hours)

Methods of assessment of nutritional status - Sampling techniques. - Identification of risks groups. - Direct assessment – Diet surveys, Anthropometry, Clinical and Biochemical estimations. - Indirect assessment – food balance sheets and Agricultural data, Ecological parameters and vital statistics. - Use of growth charts.

UNIT 3.

(20 hours)

a- Nutrition intervention schemes in the company lecture and demonstration, nutrition exhibitions and visual aids. b- Recent advances in community nutrition research -Fortification & enrichment of foods. National and International agencies in community nutrition ICDS, SNP, ANP, Midday meal programme, FAO, WHO, UNICEF, CARE, AID, ICMR, CSIR, NIN, CFTRI

UNIT 4

(20 hours)

Breast feeding and its implications, Hazards of bottle feeding – Review. Weaning foods-planning, formulating and preparing importance of correct and timely weaning – Review

UNIT 5

(5 hours)

Nutrition and infection-relationship, immunization and its importance

TEXT BOOKS

- Suryatapa das. (2019). Textbook of Community Nutrition 4th Ed. Academic Publishers.
- Salil and Rita. (2007)Text book of community nutrition. ICAR.
- Srilakshmi B. Dietetics. (2007)New Age International Pvt. Ltd.
- Manju Patni.(2020)Community Nutrition in India. Star publications.
- Whitney and Rolfes. (2012) Understanding nutrition. Cengage learning.

REFERENCES

- Lawrence and Worsley. (2008) Public health nutrition.Third edition. Allen and Unwin publishers.
- VK Muthu. Short book of public health. (2014) Second edition.Jaypee publication.
- Sudip and Shailesh.(2020) Public health and management. Second edition. White falcon publishing.
- ANC. Nutrition for The Community. (2018)First edition.
- Virginia Bridge. (2016). Public Health: A Very Short Introduction. II edition.

E LEARNING CONTENT

- <https://youtu.be/sbMhQPS9GaM> -Public health
- <https://youtu.be/8PH4JYf4Ns> -malnutrition
- <https://youtu.be/r7jTe4phFeM> -vaccination
- <https://youtu.be/bqEIcMMmj5M>- childmalnutrition
- <https://youtu.be/Fm15SkyOvtE>- Nutrition assessment

PEDAGOGY: Lecture, Powerpoint presentation, Charts, E content, YouTube videos, Group discussions

CO/PSO MAPPING

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO.1	3	3	3	1	3	3
CO.2	3	2	3	2	2	3
CO.3	3	2	2	2	2	3
CO.4	3	2	3	2	2	2
CO.5	3	3	3	3	1	3
Average	3	2.4	2.8	2	2	2.8

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[CONVENTIONAL MODE]**

Bloom's Category Level	Sections	Marks	Word limit	Total	Special Instructions if any	
K1, K2	Section A Multiple Choice Questions 15x2=30 *2	30	Mark the correct choice	75	Colostrum is secreted within ----- days of parturition. ___ 3 days 7 days 2 weeks 1 month_____	
K2,K3,K4	Section B 5 out of 7 Questions *5 Marks	25	Short answers (500 Words)			List the functions carried by WHO and ICDS to eradicate malnutrition
K3, K4, K5,K6	Section C 2 Out of 5 Questions *10 Marks	20	Elaborate answers (approx 1000 Words)			Analyze in detail the various methods of nutritional assessment carried out for a pregnant mother

* 75 marks to be converted as 60 marks

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[ONLINE MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any
INTERNAL SETTING					
K1, K2, K3	A-Multiple choice questions [No choice] 25x1=25marks	Choose the best option	25	50	Colostrum is secreted within ----- days of parturition. ___ 3 days 7 days 2 weeks 1 month_____
EXTERNAL SETTING					
K3, K4,K5,K6	B-5/7 5x5=25marks	Not exceeding 500 words	25		List the functions carried by WHO and ICDS to eradicate malnutrition

* 50 marks to be converted as 60 marks

FOOD SERVICE MANAGEMENT-I

TOTALHOURS: 75

SUB CODE:

CREDIT:4

L-T-P: 4 2 0

OBJECTIVES:

To enable the students to

1. To develop skills in organizing and managing Food service institution.
2. To gain knowledge about food service responsibilities.
3. To understand about the manpower planning and the various labour sources.
4. To develop skills on planning and understanding financial management and its control in food service institution.

COURSE OUTCOMES: On completion of the course the students will be able to

CO No.	CO Statement
CO1	Identify and understand the basic principles of management in food service units
CO2	Analyze and accept the various responsibilities in catering establishments.
CO3	Apply knowledge to become conscientious caterer and food service administrator.
CO4	Analyze the skills in setting up food service units.
CO5	Compile the concept and principles of resource management

UNIT I

15 HOURS

Definition and scope of food Industries, classification of food industry-Profit oriented, public health facility oriented and service oriented.

UNIT II

15 HOURS

Management Definition, principles and functions of management, Tools of management Organization – Types and theories of organisation.

UNIT III

15 HOURS

Staffing- Manpower Planning -Labour sources, Selection, Recruitment and training- wages, salaries, incentives, promotion demotion, leadership styles – traditional leader ship role. New approaches to leadership, Effective communication, Functional Responsibilities and Skills required. Theories of motivation and controlling.

UNIT IV

15 HOURS

Trends affecting food service design, Regulatory considerations. Planning of Food Service unit -Layout of food plants, different work area, planning of storage, production and service areas. Special considerations for specific type of food service.

UNIT V

15 HOURS

Financial management- Book keeping- Single entry and double entry systems, types of accounts, advantages of double entry system. Elements of cost- food, labor and overhead costs. Break even analysis. Control- factors affecting cost control.

Budgeting, books of accounts- Journal, Ledger, difference between Journal and Ledger; trial balance and balance sheet, inventories, records for control. Pricing- dish costing, meal/menu pricing, factors affecting pricing

TEXTBOOKS

- Sethi, M and Malhan, S. (2015). Catering Management An integrated approach, 3rd edition, New age international publishers, New Delhi
- Sethi, M. (2015). Institutional Food Management, 3rd edition, New age international publishers, New Delhi
- Singaravelavan, R.(2011). Food and Beverage Service, 1st edition, Oxford university press
- V, Suganthi and C, Premakumari. (2019).Food Service Management, 1st edition, Dipti Press (OPC) Pvt.Ltd, Chennai
- Roday, S. (2017). Food Hygiene and Sanitation. 2nd edition. Tata Mc Graw Hill Publishing, New Delhi

REFERENCES

- West, B. B. and Wood, L. revised by Harger, Shugart and Palacio (2000). Food Service Institutions. Sixth edition. Mac Millan Publishing Company, New York
- Cousins, J.A, Lilicrap,D.R and Weekes,S. (2014).Food and Beverage Service, ELBS, 9th edition.
- Payne-Palacio,J and Theis,M. (2009).Introduction to Foodservice.11thedition, Pearson/Prentice Hall
- Andrews,S. (2008). Food and Beverage Management. Tata Mc Graw Hill Publishing, New Delhi
- Bali, P.S. (2011). Quantity food Production operations & Indian Cuisine, Oxford University Press, New Delhi, 2011
- George, B and Chatterjee, S. (2010). Food and beverage Service and Management, JAICO

E-LEARNING RESOURCES

- <https://www.fda.gov/food/hazard-analysis-critical-control-point-haccp/haccp-principles-application-guidelines>
- <https://www.ccohs.ca/oshanswers/hsprograms/house.html>
- <https://www.eatrightpro.org/practice/practice-resources/foodservice>
- <https://www.ers.usda.gov/topics/food-markets-prices/food-service-industry.aspx#.U1leEVVdW4I>
- <https://theicn.org/>

CO /PSO MAPPING

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	3	3	3
CO2	3	1	2	3	3
CO3	3	2	3	3	3
CO4	3	3	3	3	3
CO5	2	2	2	2	3
Average	2.8	1.8	2.6	2.8	3

PEDAGOGY (TEACHING METHODOLOGY):

Assignment, Quiz, Group discussion, Seminar, Field visit

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[CONVENTIONAL MODE]**

Bloom's Category Level	Sections	Marks	Word limit	Total	Special Instructions if any
K1, K2	Section A Multiple Choice Questions 15X2=30 *2 mark	30	Mark the correct choice	75	----- is one of the functions of management. Planning , Fixing Motivating, Command.
K2,K3,K4	Section B 5 out of 7 Questions *5 Marks	25	Short answers (500 Words)		Explain in detail different kinds of accounts used in food service establishment.
K3, K4, K5,K6	Section C 2 Out of 5 Questions *10 Marks	20	Elaborate answers (approx 1000 Words)		Elaborate on the methods to control food cost.

* 75 marks to be converted as 60 marks

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[ONLINE MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any
INTERNAL SETTING					
K1,K2,K3	A-Multiple choice questions[No choice] 25x1=25marks	Choose the best option	25	50	Choose the best answer The type of goal setting used in planning_____
EXTERNAL SETTING					
K3, K4,K5,K6	B-5/7 5x5=25marks	Not exceeding 500 words	25		Short answers: State the various types of recruitment processes in food service unit.

* 50 marks to be converted as 60 marks

HUMAN NUTRITION II

TOTAL HOURS: 75

SUB CODE:

CREDIT: 4

L-T-P: 4 2 0

COURSE OBJECTIVES

1. To analyze the role of different micronutrients in maintaining the health and wellbeing.
2. To acquire an integrated overview of physiological roles, dietary sources, and requirements of various micronutrients and water.
3. To understand the metabolism of micronutrients in the body.
4. To comprehend the deficiency states of micronutrients and suggest suitable dietary interventions.

COURSE OUTCOMES: On completion of the course the students will be able to

CO No.	CO Statement
CO1	Identify and list the key concepts related to various micronutrients and its RDA to apply it in the disease management process
CO2	Classify the different micronutrients and interpret its functions, metabolism and deficiency.
CO3	Analyze the relationship between different micronutrients and their interaction in human body to prevent various disease states.
CO4	Create a list of locally available foods that are the richest bioavailable dietary sources of various micronutrients.
CO5	Analyze the importance and role of water and electrolytes in maintaining optimum health.

SYLLABUS

UNIT 1: Fat Soluble Vitamins

(15 HOURS)

Metabolism, functions, effects of deficiency, food sources, requirements, unit of measurements and hypervitaminosis of vitamins A, D, E and K.

UNIT 2: Water Soluble Vitamins

(15 HOURS)

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, Biotin and Pantothenic acid to the body.

UNIT 3: Macro and micro minerals

(15 HOURS)

Calcium, Phosphorous, Magnesium, Potassium, Sodium and Chloride-Distribution in the body; functions, effects of deficiency, food sources and RDA. Micro minerals - Iron, Zinc, Fluoride and Copper-Distribution in the body; functions, effects of deficiency, food sources and requirements for different age groups.

UNIT 4: Ultra trace minerals

(15 HOURS)

Iodine, Selenium, Manganese, Chromium, Molybdenum and Cobalt- Distribution in the

body; functions, effects of deficiency, food sources and requirements. Selenium and Vitamin E relationship. Chromium and glucose tolerance factor.

UNIT 5: Water

(15 HOURS)

As a nutrient, functions, sources, requirements. Distribution of water in the body, composition of body fluids, water exchange between plasma and interstitial fluid. Water balance – neural thirst mechanism and regulation by kidney. Water imbalance – dehydration and intoxication, water and electrolyte balance–role of hormones.

TEXT BOOKS:

- Mahan, L.K., Stump, S.E., & Raymond, J.L. (2012). Krause's Food and Nutrition Care Process, 13th edition, Elsevier Saunders.
- Robinson, C. H., & Lawler, M. R. (2010). Normal and therapeutic nutrition. 16th edition. Collier Macmillan Publishers.
- Srilakshmi, B. (2016). Nutrition Science. 4th revised edition. New Age International.
- Whitney, E., & Rolfes, S. R. (2018). Understanding nutrition. Cengage Learning.
- DeBruyne, L. K., Pinna, K., & Whitney, E. N. (2015). Nutrition and diet therapy. Nelson Education.

BOOKS FOR REFERENCE:

- Swaminathan, M. (2020). Advanced textbook on food and nutrition (Vol I). 2nd revised edition. The Bangalore Printing and Publishing Co. Ltd.
- Mudambi, S. R. (2001). Fundamentals of foods and nutrition. 4th edition. New Age International.
- Carol Byrd – Bredbenner,(2013), Wardlaw's perspectives in Nutrition, 9th edition McGraw – Hill International Edition.
- Gopalan C., Rama Sastri B.V., Balsubramaniam S.C., (2006), Nutritive Value of Indian Foods, Hyderabad.
- Mahtab S Bamji, Prasad Rao, Vinodini Reddy., (2003), Textbook of Human Nutrition, Second Edition, Oxford and IBH Publishing Company.

E - LEARNING RESOURCES:

- <https://www.ncbi.nlm.nih.gov/books/NBK218749/>
- https://www.who.int/health-topics/micronutrients#tab=tab_1
- <https://www.cdc.gov/nutrition/micronutrient-malnutrition/micronutrients/index.html>
- <https://www.nin.res.in/NICE.html>
- <https://nutrition.org/>

PEDAGOGY (TEACHING METHODOLOGY):

Lecture (Chalk and talk, LCD presentation), E-contents, Case study, Group discussion, Peer learning, Videos, Quiz

Mapping of CO with PSO:

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO. 1	3	2	1	2	1	1
CO. 2	3	2	2	2	1	1
CO. 3	3	2	2	2	3	2
CO. 4	3	2	2	3	3	3
CO. 5	3	2	2	2	2	1
Average	3	2	1.8	2.2	2	1.6

**QUESTION PAPER PATTERN – END SEMESTER EXAMINATION
(CONVENTIONAL MODE)**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any
K1, K2	Section A Multiple Choice Questions 15*2 = 30 Marks	Mark the correct choice	30	75	Choose the correct answer
K2, K3, K4	Section B 5 out of 7 Questions 5*5 = 25 Marks	500 Words	25		Short Answers Interpret the Vitamin D metabolism in human body.
K4, K5, K6	Section C 2 Out of 5 Questions 2*10 = 20 Marks	Approx. 1000 Words	20		Elaborate answers Appraise the functions of calcium and relate the consequences of its deficiency.

***75 marks to be converted as 60 marks**

**QUESTION PAPER PATTERN – END SEMESTER EXAMINATION
(ONLINE MODE)**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any	
INTERNAL SETTING						
K1, K2, K3	Section A Multiple Choice Questions (No Choice) 25*1 = 25 Marks	Mark the correct choice	25	50	Choose the correct answer	
EXTERNAL SETTING						
K3, K4, K5, K6	Section B 5 out of 7 Questions 5*5 = 25 Marks	500 Words	25		Ascertain the importance of B-complex vitamins in human body	

*** 50 marks to be converted as 60 marks.**

SPORTS NUTRITION

TOTAL HOURS: 75

SUB CODE

CREDITS: 4

L-T-P: 4 2 0

COURSE OBJECTIVES

To enable the students

- 1.To learn about the role and importance of Nutrition in Sports Personnel
- 2.To find out sources of energy generation for muscle force
- 3.To understand the role of water in our body, thermo regulation and heat illness
- 3.To know about ergogenic aids and supplements available in the market

COURSE OUTCOME

After completing this course, the students will be able to)

CO No.	CO Statement
CO1	Understand the knowledge related to physical fitness and exercise physiology
CO2	Emphasize the role of macro and micro nutrients in maintaining the optimum nutritional status of athletes.
CO3	Inculcate the management of ideal body weight, composition and energy balance in individuals
CO4	Develop the skill in practicing aerobic and anaerobic power to enhance the energy capacity
CO5	Excel as fitness counsellor in fitness centers and in athletic fields

SYLLABUS

Unit 1

15hrs

Physical Fitness and Exercise Physiology

Definition, components and relationship among physical fitness, benefits of fitness training. Pulmonary structure and function, cardio vascular regulation and integration, skeletal and neural control, endocrines and exercise. Stress management techniques

Unit 2

15hrs

Fuel Sources for Muscle and Exercise Metabolism

Sources of energy for muscle force generation - fuel stores on skeletal muscle- energy pathways- metabolic response to exercise - muscle adaptation to exercise, cardio pulmonary adaptation to exercise - factors influencing choice of fuels - components of energy expenditure - energy balance. Training for aerobic and anaerobic power.

Unit 3

15hrs

Macro Nutrients in Sports

Role of carbohydrates before, during and after exercise, carbohydrate loading-Protein requirements for exercise - role of proteins before, during and after exercise - health risks with excessive protein intake. Role of fats before, during and after exercise- fat as a fuel during exercise

Unit 4

15hrs

Micro Nutrients and Fluid Requirements

Micro nutrients -role of antioxidants- essential function of vitamins and minerals in athletes. Water- thermo regulation, heat illness, effect of dehydration in sports performance - fluid guidelines before, during and after exercise.

Unit 5

15hrs

Weight Management and Body Composition

Weight management- Ideal body weight and composition - weight loss, making weight, importance of body composition. Eating disorders - types, prevalence, effect on sports performance and prevention. Types of sports foods, anabolic steroids, WADA.

TEXT BOOKS

- Cooper, R. K. (1991). Health and Fitness Excellence.
- Dakin & Burke, (2012). 4th Edition. Clinical Sports Nutrition .McGrawHill ,Australia
- Bean, A. (2017). *The complete guide to sports nutrition*. Bloomsbury Publishing.
- Girard Eberle, S. (2000). Endurance sports nutrition. *Champaign, IL, Human Kinetics*.
- Srilakshmi ,B.,Suganthi V.,and Kalaivani,C.(2017).Exercise Physiology ,Fitness and Sports Nutrition .New Age International (P) Ltd Publishers

REFERENCES

- Baker, A. (2005). Essentials of nutrition for sports. *Arnie Baker Cycling*.
- Brouns, F. (2003). *Essentials of sports nutrition*. John Wiley & Sons.
- Maughan ,RJ.(2002). Nutrition in Sports.Blackwell Science
- LanhamSA.(2011).Sports& Exercise Nutrition.The Nutrition Society Textbook Series
- Antonio, J., Kalman, D., Stout, J., Greenwood, M., Willoughby, D., & Gregory, G. (2008). Essentials of Sports Nutrition and Supplements. Texas, USA. Ed

E LEARNING RESOURCES

- American College of Sports Medicine for Physical fitness: www.acsm.org
- Eating for exercises and sports: nutrition.org
- Exercise Physiology: <http://www.ncbi.nlm.nih.gov/PubMed/>
- Gatorade sports science Institute for sports drinks: www.gssiweb.com

MAPPING OF CO WITH PSO

CO/PSO	PSO 1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	3	3	1	2	3
CO 2	3	3	2	3	3	2
CO 3	3	3	1	1	2	1
CO 4	2	3	2	1	1	1
CO 5	3	3	3	2	2	3
AVERAGE	2.8	3	2.6	1.6	2.0	5

PEDAGOGY

Lecture, Charts, Models, PowerPoint presentation, E content, Group discussion

QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION

[CONVENTIONAL MODE]

Bloom's Category Level	Sections	Marks	Word limit	Total	Special Instructions if Any
K1, K2	Section A Multiple Choice Questions 15X2=30 30 marks	30	Mark the correct choice	75	Choose the best answer
					Short answers: Define body composition
K2, K3, K4	Section B 5 out of 7 Questions *5 Marks	25	Short answers (500 Words)		
K3, K4, K5, K6	Section C 2 Out of 5 Questions *10 Marks	20	Elaborate answers (approx 1000 Words)		Elaborate answers: Explain Energy pathways

*** 75 marks to be converted as 60 marks.**

QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION

[ONLINE MODE]

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any	
INTERNAL SETTING						
K1,K2,K3	A-Multiple choice questions[No choice] 25x1=25marks	Choose the best option	25	50	Choose the best answer	
EXTERNAL SETTING						
K3, K4,K5,K6	B-5/7 5x5=25marks	Not exceeding 500 words	25		Short answers:Classify Eating disorders	

* 50 marks to be converted as 60 marks

**SEMESTER V
FUNCTIONAL FOODS AND NUTRACEUTICALS**

TOTALHOURS: 75

SUB CODE:

CREDIT: 4

L-T-P: 3 2 0

COURSE OBJECTIVES:

To enable the students

1. To enable students to understand the relation between functional foods and nutraceuticals
2. To impart knowledge on the role of functional foods and nutraceuticals in the area of preventive nutrition

COURSE OUTCOME:

CO No.	CO Statement
CO1	To learn about specific issues concerning functional foods and nutraceuticals
CO2	To understand about the use of functional foods in various therapeutic conditions.
CO3	To develop diet supplements incorporating functional foods
CO4	To gain in-depth knowledge on the effect of functional foods in health and disease

SYLLABUS:

UNIT – I: Introduction to functional foods and nutraceuticals (20 Hours)

Functional Food and Nutraceutical-Definition, History of functional foods and classification
FOSHU and regulatory issues for functional foods and nutraceuticals
Phytochemicals- Definition, need, importance, classification, types, sources.

UNIT – II: FUNCTIONAL FOODS FROM PLANT SOURCES (15 Hours)

Role of functional foods and nutraceuticals on health from plant foods: Garlic, Turmeric, Cinnamon, Cruciferous vegetables

UNIT – III: FUNCTIONAL FOODS FROM ANIMAL SOURCES (15 Hours)

Role of functional foods and nutraceuticals on health from animal foods: Animal milk, egg, fish, meat, Role of omega 3 and omega 6 fatty acids

UNIT – IV: MICROBES AS FUNCTIONAL FOODS (15 Hours)

Prebiotics - Definition, role of prebiotic as functional ingredient.
Probiotics- Definition, role of probiotic as functional ingredient.
Synbiotics- Definition, role of synbiotic as functional ingredient.

UNIT – V: NUTRIGENOMICS (10 Hours)

Definition, Recent Trends, And Relation Ship Between Nutrition Supplementation, Gene Expression, And Disease prevention. Introduction to Nutrigenetics

TEXT BOOKS

- Mary K Schmidl and Theodore P.Labuza.(2002) Essential of functional Foods.ASPEN publication.

- G.Mazza.(2002)Functional Foods Biochemical Processing Aspects and Culinary and Hospitality Industry Publications.
- Robert E C Wildman.(2001)Handbook of Nutraceuticals and functional Foods Culinary and Hospitality Industry Publications.
- SubbuLakshmi G Subhadra M.(2020) Functional Foods and Nutrition. Astral publications.
- Sivapriya T. (2020). Introduction to functional foods. First edition. Dipti press

REFERENCES

- Israel Goldberg. (2015) Functional foods, nutraceuticals, designed foods. Springer publications.
- Dilip Ghosh. (2014) Functional foods and nutraceuticals. First edition. CRC press.
- Debashish Bachi. (2010). Biotechnology in nutraceuticals. First edition. CRC press.
- Rotime E. (2016). Functional foods and nutraceuticals. First edition. Springer publications.
- R Chatwick et al. (2003). Functional Foods. Springer publications.

E LEARNING CONTENT

- <https://youtu.be/BHiJ30Om50E>- Functional foods
- <https://youtu.be/PsUti5rP1ec>-Nutraceuticals
- <https://youtu.be/zlzvXcr020M> -phytochemical
- <https://youtu.be/uduvZzmL7QI>- antioxidants
- <https://youtu.be/UnzIfafzqi8>-radical theory

PEDAGOGY: Lecture, Powerpoint presentation, Charts, E content, YouTube videos, Group discussions

CO/PSO MAPPING

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	2	2	3
CO2	3	3	3	2	2	2
CO3	3	3	3	2	2	2
CO4	3	3	3	2	2	3
CO5	3	3	3	2	2	3
Average	3	3	3	2	2	4.6

QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION

[CONVENTIONAL MODE]

Bloom's Category Level	Sections	Marks	Word limit	Total	Special Instructions if Any
K1, K2	Section A Multiple Choice Questions 15X2=30 30 marks	30	Mark the correct choice	75	Broccoli contains the phytochemical ----- Chalcone, Sulforaphane . Monacolin Lovastatin
K2,K3,K4	Section B 5 out of 7 Questions *5 Marks	25	Short answers (500 Words)		Relate the functional properties of house hold fermented foods.
K3, K4, K5,K6	Section C 2 Out of 5 Questions *10 Marks	20	Elaborate answers (approx 1000 Words)		Justify cruciferous vegetables as a functional based on its phytochemical and mechanism of action.

* 75 marks to be converted as 60 marks.

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[ONLINE MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any	
INTERNAL SETTING						
K1,K2,K3	A-Multiple choice questions[No choice] 25x1=25marks	Choosethe best option	25	50	Broccoli contains the phytochemical -----Chalcone, Sulforaphane .MonacolinLovastatin	
EXTERNAL SETTING						
K3, K4,K5,K6	B-5/7 5x5=25marks	Not exceeding 500 words	25		Relate the functional properties of house hold fermented foods.	

* 50 marks to be converted as 60 marks

**SKILL-BASED ELECTIVE
BASIC TECHNIQUES OF FOOD PRODUCTION
SUB CODE-16USSE3ND3**

OBJECTIVES:

- Develop skills in food production and service

SYLLABUS

UNIT I- Definition and steps in Standardization of recipes and importance of Portion control.

UNIT II- Standardization four selected recipes from each of the following cuisines- South Indian North Indian. Organizing, preparing and serving food for three different meals for 50 members or more

UNIT III- Standardization four selected recipes from each of the following cuisines- East Indian and West Indian. Organizing, preparing and serving food for three different meals for 50 members or more

UNIT IV- Laying of table cover, setting up the silver and other table arrangements.
Folding of serviettes

UNIT V- Market survey on Equipment- Large, medium and small.

REFERENCES

- Conol A. King (1988). Professional Dining Room Management, VNR, New York.
- John Fuller and Hutchinson, (1983). Modern Restaurant Services.
- Dorothy Tompkins (1969). Table Layout and Decoration, Wardlock & co Ltd
- Lillicarp, D.R, (1989). Food and Beverage Services, 2nd Ed. BLBS Reprinted.
- Besbe, B., West, Le Velle, (1986) Revised by HArger V. Shugant M.S. June Payn

SEMESTER VI

CLINICAL NUTRITION

TOTAL HOURS: 75

SUB CODE:

CREDIT: 4

L-T-P: 4 2 0

COURSE OBJECTIVES

1. Understand the nutrition principles and apply it in the prevention and treatment of various diseases.
2. Interpret medical and nutritional terminology associated with disease conditions.
3. Gain deeper understanding about the pathophysiology and metabolic changes happening in human body during various disease states.
4. Plan, monitor and evaluate nutrition intervention strategies according to the individual requirements.

COURSE OUTCOMES: On completion of the course the students will be able to

CO No.	CO Statement
CO1	Identify and list the etiologic factors, modifiable causes, clinical manifestations and symptoms of various diseases for their effective treatment.
CO2	Apply the concept and principles of nutrition therapy to take up the role of a dietitian in clinical settings.
CO3	Evaluate data from anthropometrics, lab findings, diet history, lifestyle and environmental impact to arrive at a comprehensive subject assessment.
CO4	Formulate dietary recommendations, nutrition intervention strategies, and plan customized diets based on the clinical condition.
CO5	Create nutritional, lifestyle and dietary management strategies to prevent and control the progression of various diseases among individuals, groups and population.

SYLLABUS

UNIT1:

(15 HOURS)

Nutritional management in liver, gall bladder, and Pancreatic diseases - Etiology, symptoms, nutritional implication and dietary management of Hepatitis, Cirrhosis, Hepatic Encephalopathy, Cholecystitis, Cholelithiasis and Pancreatitis

UNIT2:

(15HOURS)

Nutrition in Weight management - Etiology, assessment, grades of obesity, dietary

management, types of obesity diet and complications in Obesity and Underweight.
Gout- Nature and occurrence of uric acid, causes, symptoms and dietary management

UNIT3: (15 HOURS)

Medical nutrition therapy for thyroid related disorders and PCOS – Clinical significance and reference range of thyroid disorders, etiology, pathophysiology, clinical manifestations and nutritional management in hypothyroidism, hyperthyroidism, Polycystic Ovarian Syndrome.

UNIT4: (15 HOURS)

Nutritional management in cancer – Etiology and risk factors, pathophysiology, symptoms, metabolic abnormalities, phases of carcinogenesis, goals of cancer treatment, nutrients for cancer prevention, managing cancer cachexia, dietary management and nutritional problems of cancer treatments.

UNIT5: (15 HOURS)

Nutritional management in AIDS and rheumatic diseases – Etiology, pathophysiology, nutritional implications in AIDS and special considerations in pregnancy and lactation. Understanding pathophysiology and inflammation in rheumatic diseases, importance of weight management and nutritional implications in arthritis, rheumatic arthritis and osteoarthritis.

TEXT BOOKS:

- Mahan L.K., Sylvia Escott-Stump, (2012), Krause's Food Nutrition and Diet Therapy, 13th edition, W.B. Saunders Company, London.
- Srilakshmi B., (2014), Dietetics, 7th edition, New Age International Pvt. Ltd. New Delhi.
- Antia F.P., Abraham P, (2002), Clinical Dietetics, 4th edition, Oxford Publishing Company.
- Whitney, E., & Rolfes, S. R., (2018), Understanding nutrition. Cengage Learning.
- Mahtab S Bamji, Prasad Rao, Vinodini Reddy., (2003), Textbook of Human Nutrition, Second Edition, Oxford and IBH Publishing Company.

BOOKS FOR REFERENCE:

- Gopalan C., Rama Sastri B.V., Balsubramaniam S.C., (2006), Nutritive Value of Indian Foods, Hyderabad.
- Schlenker, E., & Gilbert, J. A., (2018), Williams' Essentials of Nutrition and Diet Therapy-E-Book. Elsevier Health Sciences.
- Wardlaw, GM., (2004), Contemporary Nutrition, 2nd edition, Mosby Publishing.
- Rolfes, S. R., Pinna, K., & Whitney, E. (2020), Understanding normal and clinical nutrition, Cengage learning.
- Carol Byrd – Bredbenner, (2013), Wardlaw's perspectives in Nutrition, 9th edition McGraw – Hill International Edition.

E-LEARNINGRESOURCES:

- <https://www.nhp.gov.in/>

- <https://eatrightindia.gov.in/>
- <https://www.nutrition.gov/>
- <https://www.eatright.org/>
- <https://nutrition.org/>

PEDAGOGY (TEACHING METHODOLOGY):

Lecture (Chalk and talk, LCD presentation), Case study, Group discussion, Peer learning, Videos, Quiz

Mapping of CO with PSO:

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO. 1	3	3	2	3	1	1
CO. 2	3	3	2	3	2	2
CO. 3	3	3	2	3	1	2
CO. 4	3	3	3	3	3	2
CO. 5	3	3	3	3	3	1
Average	3	3	2.4	3	2	1.6

**QUESTION PAPER PATTERN – END SEMESTER EXAMINATION
(CONVENTIONAL MODE)**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2	Section A Multiple Choice Questions 15*2 = 30 Marks	Mark the correct choice	30	75	Choose the correct answer
K2, K3, K4	Section B 5 out of 7 Questions 5*5 = 25 Marks	500 Words	25		Short Answers Interpret the pathophysiology of cancer.
K4, K5, K6	Section C 2 Out of 5 Questions 2*10 = 20 Marks	Approx. 1000 Words	20		Elaborate answers Appraise the role of nutritional management in obesity.

***75 marks to be converted as 60 marks**

**QUESTION PAPER PATTERN – END SEMESTER EXAMINATION
(ONLINE MODE)**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any	
INTERNAL SETTING						
K1, K2, K3	Section A Multiple Choice Questions (No Choice) 25*1 = 25 Marks	Mark the correct choice	25	50	Choose the correct answer	
EXTERNAL SETTING						
K3, K4, K5, K6	Section B 5 out of 7 Questions 5*5 = 25 Marks	500 Words	25		Ascertain the etiology of food allergies.	

*** 50 marks to be converted as 60 marks**

FOOD SERVICE MANAGEMENT-II

TOTAL HOURS: 75

SUB CODE:

CREDIT: 4

L-T-P: 4 2 0

COURSE OBJECTIVES:

1. To understand different styles of food service
2. To obtain skills for quality food preparation

COURSE OUTCOMES: On completion of the course the students will be able to

CO No.	CO Statement
CO1	Identify the basic principles in production of the food
CO2	Apply knowledge in selection and purchase of food.
CO3	Formulate the skills in menu planning and styles of service for quantity preparation.
CO4	Apply knowledge in formulating different styles of food and beverage service.
CO5	Compile and develop skills in handling equipment and its maintenance

SYLLABUS

UNIT I

15 HOURS

Types of food service systems: Conventional systems, Commissary system, ready prepared system and assembly service system, cook-chill, cook freeze.

Menu planning – Definition, types, menu planning for various sectors and institutions, Health safety in menu planning.

UNIT II

15 HOURS

Equipment in food service -Classification of equipment, factors affecting selection of equipments-electrical and nonelectrical equipment for food storage, preparation, service and dishwashing. Base materials and insulating materials

UNIT III

15 HOURS

Food Purchase: Different purchasing methods, Buying- Qualities of food buyer and Receiving methods.

Food storage: Types of storage, maintenance of store records- Requisition slips, order form, stock book, invoice, goods received book, inventories.

UNIT IV

15 HOURS

Standardization of recipes, Recipe adjustment methods -factor method, percent method, forecasting, production scheduling, production control, portion control, Styles of food and beverage service.

UNIT V

15 HOURS

Hygiene, Sanitation and safety in food service e institution, garbage disposal, pest control. FSSAI (Food safety standard authority of India), HACCP, VACCP (Vulnerability Assessment Critical Control Points) and TACCP (Threat Assessment Critical Control Point)

TEXTBOOKS

- Sethi, M and Malhan, S. (2015). Catering Management An integrated approach, 3rd edition, New age international publishers, New Delhi
- V.Suganthi and C.Premakumari (2017).Food Service Management, Dipti Press (OPC) Pvt.LTD
- Andrews S,Food and Beverage Service, (2009) 2 nd edition, Tata McGraw hill publishing company limited.
- Mary B. Gregoire, Marian C. Spears, (2007), Food Service Organizations, Pearson Prentice Hall
- Jyoti.S, Sharma, (2006), Food Service Modern Technique and Practices, Akansha Publishing House.

BOOKS FOR REFERENCE

- Cousins, J.A, Lilicrap,D.R and Weekes,S. (2014).Food and Beverage Service, ELBS, 9th edition.
- Payne-Palacio,J and Theis,M. (2009).Introduction to Foodservice.11thedition, Pearson/Prentice Hall
- Andrews,S. (2008). Food and Beverage Management. Tata Mc Graw Hill Publishing, New Delhi
- Bali, P.S. (2011). Quantity food Production operations & Indian Cuisine, Oxford University Press, New Delhi, 2011
- Creed, P. G. (2001). The potential of foodservice systems for satisfying consumer needs. Innovative Food Science & Emerging Technologies

E-LEARNING RESOURCES

- <https://www.ccohs.ca/oshanswers/hsprograms>
- <https://www.eatrightpro.org/practice/practice-resources>
- <https://www.ers.usda.gov/topics/food-markets-prices/food-service-industry.aspx>
- <https://theicn.org/>
- www.fssai.gov.in

CO /PSO MAPPING

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	3	3	3
CO2	2	2	2	3	3
CO3	3	2	3	3	3
CO4	3	2	2	3	2
CO5	3	3	3	3	3
Average	2.8	2	2.6	3	2.8

PEDAGOGY (TEACHING METHODOLOGY):

Article Review, Quizzes/Objective tests, Class test, Home assignment, Paper presentation or seminar

QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION [CONVENTIONAL MODE]

Bloom's Category Level	Sections	Marks	Word limit	Total	Special Instructions if any
K1, K2	Section A Multiple Choice Questions 15X2=30 *2 mark	30	Mark the correct choice	75	----- offers different choice in menu. Fixed menu, Cycle Table d hote, A la carte menu
K2,K3,K4	Section B 5 out of 7 Questions *5 Marks	25	Short answers (500 Words)		Explain in detail different styles of food and beverage.
K3, K4, K5,K6	Section C 2 Out of 5 Questions *10 Marks	20	Elaborate answers (approx1000 Words)		Elaborate on the factors affecting the selection of equipment.

* 75 marks to be converted as 60 marks

QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION [ONLINE MODE]

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any
INTERNAL SETTING					
K1,K2,K3	A-Multiple choice questions[No choice] 25x1=25marks	Choose the best option	25	50	Choose the best answer _____ is one type of food service system. Conventional Convenient Freeze cold Dry cold
EXTERNAL SETTING					
K3, K4,K5,K6	B-5/7 5x5=25marks	Not exceeding 500 words	25		Short answers: State the various types of equipments used in food service unit.

* 50 marks to be converted as 60 marks

NUTRITION AND CLINICAL BIOCHEMISTRY PRACTICAL

TOTAL HOURS: 60

SUB CODE

Credits: 4

L-T-P:0 0 4

COURSE OBJECTIVES

- 1.To enable the students to develop skills in analysis of urine and serum.
- 2.To develop skills in carrying out the qualitative and quantitative estimation of vitamins and minerals

COURSE OUTCOMES:

(After completing this course, the students will be able to)

CO No.	CO Statement
CO1	Gain the knowledge related to Nutrition and Clinical Biochemistry
CO2	Develop the skills in analyzing urine and serum samples
CO3	Develop skills in qualitative and quantitative estimation of vitamins and minerals
CO4	To excel as Clinical Nutritionist in hospitals and allied fields

EXPERIMENTS

NUTRITION

1. Qualitative tests for minerals
2. Quantitative estimation of calcium
3. Quantitative estimation of phosphorus
4. Quantitative estimation of vitamin C

5. Demonstration Experiments.
 - a) Estimation of Iron
 - b) Qualitative tests for vitamin A
 - c) Quantitative estimation of carotene

CLINICAL BIOCHEMISTRY

1. Analysis of urine
2. Collection of blood and separation of plasma and serum
3. Estimation of blood glucose
4. Estimation of total protein
5. Determination of A/G ratio
6. Estimation of serum urea
7. Estimation of serum creatinine
8. Estimation of cholesterol
9. Estimation of Bilirubin

REFERENCES

- Pattabiraman T.N.(2015). Laboratory Manual and Practical Biochemistry. 4th Edition.All India Publishers and distributors
- Raghuramulu, N.,K. Madhavan Nair and Kalyanasundaram,S.(2003).A Manual of Laboratory Techniques.NIN, ICMR
- Jayaraman,J.(2011).Laboratory Manual in Biochemistry .New Age International Publishers
- R.Chawla ,(2014).PracticalClinical Biochemistry.Jaypee BrothersMedical Publishers (P) Ltd
- Kumar, V., & Gill, K. D. (2018). *Basic concepts in clinical biochemistry: a practical guide*. Springer Singapore.

E LEARNING RESOURCES

- <https://youtu.be/DyGIvs9zrVA>
- <https://youtu.be/-4smUapjbNY>
- <https://youtu.be/1kTbPx0WFiA>

MAPPING OF CO WITH PSO

CO/PSO	PSO 1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	2	3	3	1	2	1
CO 2	2	2	2	3	1	3
CO 3	3	3	2	3	1	3
CO 4	2	3	2	3	1	3
AVERAGE	2.2	2.7	2.2	2.5	1.2	2.5

PEDAGOGY

Demonstration and individual hands on practical

BASIC CONCEPTS OF HOME SCIENCE

TOTALHOURS: 75

SUB CODE:

CREDIT:5

L-T-P: 3 2 0

COURSEOBJECTIVES:

To enable the students to

1. Comprehend the concept and scope of Home science and its components.
2. Identify the trends and job opportunities in home science
3. Facilitate the students to expand knowledge on diverse areas of home science.

COURSE OUTCOME:

On completion of the course the students will be able to...

CO No.	CO statement
CO. 1	Identify a good design by knowing the principles and elements of design.
CO. 2	Acquire basic knowledge about fibers, yarn and fabric.
CO. 3	Realize the aspects of human growth and development and recognize the significance of mastering developmental tasks of each life span stage
CO. 4	Comprehend the notion of Extension Education and its importance
CO. 5	Understand the basics of resources and family management

SYLLABUS:

Unit –I: Meaning and Components of Home science

15 Hrs

Meaning of Home Science education – Philosophy of home and family, Components of Home science, career perspectives –its relation to other disciplines – science and humanities. The Home Science Association of India- history and objectives.

Unit –II: Interior Design and Textile and Clothing

15 Hrs

Interior design -definition, types of design, elements of art, principles of design. Colour - dimensions of colour, psychological effects of colour, colour schemes, factors affecting use of colour scheme for rooms.

Textile Fiber – definition, classification – natural and manmade. Yarn- definition, types of yarn – simple and novelty yarns, **Fabric** – definition, types of fabric; woven knitted and non-woven.

Apparel – selection of clothing for different age groups and its different uses, care and stain removal methods.

Unit –III: Resource Management and family studies

15 Hrs

Resource classification, characteristics. Management-values, goals and standards. Decision making and work simplification in family. Management of family income. Guidance and counselling- meaning, types, need and importance.

Unit –IV: Human development

15 Hrs

Human Development – definition, goals, domains and stages. Prenatal development and its stages, Infancy, Childhood and Adolescence – characteristics and developmental tasks. Adulthood and Old age – characteristics and problems. Parenting styles – authoritarian,

authoritative and permissive

Unit –V: Extension Education and communication for development 15 Hrs

Meaning, definition, objectives, philosophy and principles of extension education, Extension teaching methods. Communication – nature, characteristics, functions and its barriers. Diffusion of innovations.

TEXTBOOK:

- Premalata, M, (2012), ‘Text Book of Home science’, Kalyani Publishers, Chennai.
- Seetharaman, P., Pannu, P., (2017), Interior design and decoration, 1st edition, CBS Publishers & Distributors Pvt. Ltd.
- Serene (Gote) & Shekhar, A S., (2013), Textbook of Home Science Extension Education, illustrated edition, Daya Publishing House.
- Hurlock, E., (2017), Developmental Psychology: A: Life - Span Approach, 5th edition, McGraw Hill Education.
- Verghese M. A., Ogale N N., Srinivasan K., (2006), Home Management, 2nd edition, , New Age International Private Limited.

REFERENCE:

- Hurlock, E., (2017), CHILD DEVELOPMENT, 6th edition, McGraw Hill Education.
- Seema Sekhri, (2011), Textbook of Fabric Science, Fundamentals to finishing, New Delhi: PHI Learning Private Limited, India
- Meenakshi Rastogi, (2009), Fibres and Yarn, New Delhi: Sonali Publications, India.
- Jalihal, K.A and Veerabhadran, V., (2007), Fundamentals of Extension Education and Management in Extension, Concept Publishing Company, New Delhi.
- Reddy A.A, (2010), Extension Education, Bapatla: Sri Lakshmi Press, India.

ELEARNING RESOURCES:

- <http://www.homescienceassociationofindia.com/>

Mapping of CO with PSO:

CO /PSO MAPPING

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO.1	2	0	3	2	3	2
CO.2	2	0	2	3	3	3
CO.3	3	2	2	3	0	1
CO.4	3	1	2	2	3	3
CO.5	3	1	2	2	3	3
Average	2.6	0.8	2.2	2.4	2.4	2.4

PEDAGOGY: Lecture, PowerPoint presentation, Charts, Group discussion

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[CONVENTIONAL MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if Any
K1, K2	Section A Multiple choice questions 15x2=30	Mark the correct choice	30	75	Choose the best answer
K2, K3, K4	Section B 5 out of 7 Questions *5 Marks 5x5=25	Short answers (500 Words)	25		Short answers: Classify fabrics.
K3, K4, K5, K6	Section C 2 Out of 5 Questions *10 Marks 2x10=20	Elaborate answers (approx 1000 Words)	20		Elaborate answers: Differentiate guidance and counselling.

*** 75 marks to be converted as 60 marks.**

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[ONLINE MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any	
INTERNAL SETTING						
K1, K2, K3	Section A Multiple Choice Questions 25 Questions *1 Marks (No Choice)	Choose the best option	25X1=25	50	Choose the best answer	
EXTERNAL SETTING						
K2, K3, K4, K5, K6	Section B 5 out of 7 Questions *5 Marks 5x5=25	Not exceeding 500 words	25		Short answers: Compare the different styles of parenting.	

*** 50 marks to be converted as 60 marks.**

DIET COUNSELLING – TECHNIQUES AND PRACTICE

TOTAL HOURS: 75

SUB CODE:

CREDIT:5

L-T-P: 3 2 0

COURSE OBJECTIVES:

To enable the students to

1. Know the basics of nutritional assessment
2. Get used to the preparation and use of education materials
3. Learn the counselling strategies in relation to nutrition
4. Enlighten on the use of computer applications for maintaining records
5. Know how to counsel the patient effectively.

COURSE OUTCOME:

On completion of the course the students will be able to...

CO No.	CO statement
CO. 1	Relate the knowledge of dietetics in practice
CO. 2	Apposite skills in preparation of nutrition education materials
CO. 3	Expertise in nutritional counselling of patients
CO. 4	Comprehend the use of computer applications in dietetics practices
CO. 5	Develop into a health care professional

Unit –I:

15 Hrs

Medical Terminology, the Medical Record, Medical History assessment and Patient profile, Dietary Intake Assessment and Nutrition History: 24-hour recall, diet history, Food Frequency Questionnaire.

Unit –II:

15 Hrs

Dietician – Classification, code of ethics, roles and responsibilities. Indian Dietetic Association. Teaching aids used by dietitians - charts, leaflets, posters etc., preparation of teaching material for patients suffering from Digestive disorders, Hypertension, Diabetes and Atherosclerosis.

Unit –III:

15 Hrs

Nutrition counselling - Definition, expectations, goals, scope and limits. Skills and attributes of nutrition education counsellor. Practical consideration in giving dietary advice and counselling - Factors affecting individual food choice, Communication of dietary advice and Motivation.

Unit –IV:

15 Hrs

Counselling skills for behaviour change, developing behaviour change strategies through models. Assessment results-choosing focus area, counselling approaches after the assessment, resistance behaviour and strategies to modify them, ready to change counselling session and evaluation of effectiveness.

Unit –V:**15Hrs**

Computer application - Use of computers by dietitian, dietary computations, dietetic management, education/ training, information storage and administration.

ACTIVITY:

- Preparations of teaching aids in the field of nutrition.
- Preparation of case history of a patient

TEXT BOOK:

- Mahan, L.K., Raymond, J. L., (2017), Krause's Food and the Nutrition care process, 14th Edition, Elsevier Publication
- Sumati R. Mudambi, M.V. Rajagopal., (2015), Fundamental of food, nutrition and diet therapy. New age international publishers, New Delhi.
- Srilakshmi B., (2014), Dietetics, New age international publishers, New Delhi.
- Antia F.P. (2008), Clinical dietetics and nutrition., Oxford University Press, New Delhi.
- Gandy, J., (2014), Manual of dietetics practice, 5th edition, John Wiley & Sons, Ltd.

REFERENCE:

- Robinson., (2006), Normal and therapeutic nutrition: Macmillan Pub. Company New York.
- Kathy King and Bridget Klawitter, (2007), Nutrition Therapy: Advanced Counseling Skills, Third Edition, Lippincott Williams and Wilkins.
- Sylvia Escott Stump, (2008), Nutrition and Diagnosis – Related Care, Sixth Edition, Lippincott Williams and Wilkins.
- Snetselaar, Linda G., (2007), Nutrition counselling for lifestyle change, CRC Press.
- Snetselaar, Linda G., (2009), Nutrition counselling for the nutrition care process, 4th edition, Jones and Barlette Publishers.

ELEARNING RESOURCES:

- www.eatright.org
- <https://www.bcmj.org/cohp/practical-tips-nutritional-counseling>
- <http://idaindia.com/>
- <https://www.internationaldietetics.org/NDAs/India.aspx>
- <http://www.nutritionocietyindia.org/>
- <http://count-what-you-eat.ninindia.org>
- <https://vikaspedia.in/health/nutrition>

Mapping of CO with PSO:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO.1	3	3	3	2	3	3
CO.2	2	3	2	1	3	3
CO.3	3	3	2	2	1	3
CO.4	2	3	3	3	2	2
CO.5	3	3	2	2	2	3
Average	2.6	3	2.4	2	2.2	2.8

PEDAGOGY:

Lecture, PowerPoint presentation, Charts, Group discussions

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[CONVENTIONAL MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2	Section A Multiple choice questions 15x2=30	Mark the correct choice	30	75	Choose the best answer
K2, K3, K4	Section B 5 out of 7 Questions *5 Marks 5x5=25	Short answers (500 Words)	25		Short answers: Describe the attributes of nutrition education counselor.
K3, K4, K5, K6	Section C 2 Out of 5 Questions *10 Marks 2x10=20	Elaborate answers (approx 1000 Words)	20		Elaborate answers: Prepare a leaflet containing foods to be included for an anemic patient.

*** 75 marks to be converted as 60 marks.**

**QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION
[ONLINE MODE]**

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any	
INTERNAL SETTING						
K1, K2, K3	Section A Multiple Choice Questions 25 Questions *1 Marks (No Choice)	Choose the best option	25X1=25	50	Choose the best answer	
EXTERNAL SETTING						
K2, K3, K4, K5, K6	Section B 5 out of 7 Questions *5 Marks 5x5=25	Not exceeding 500 words	25		Short answers: Infer the practical consideration in giving dietary advice to an adolescent.	

*** 50 marks to be converted as 60 marks.**