

**SYLLABUS
OUTCOME-BASED EDUCATION**

BASED ON

**REVISED BLOOM'S TAXONOMY
(Under Choice Based Credit System)**



**PG DEPARTMENT OF NUTRITION AND DIETETICS
BISHOP HEBER COLLEGE (AUTONOMOUS)
TIRUCHIRAPPALLI-17**

2020-2021

PG. Department of Food and Nutrition

PROGRAMME OUTCOMES

On Successful Completion of B.Sc Nutrition and Dietetics program, the Graduates will be able to

KNOWLEDGE

- PO1: Recognize the composition of different foods and their physical, chemical and biological changes that occur during cooking/processing of foods and their effect on human beings.
- PO2: Extend nutrition services *as public health nutritionist, dietician nutritionist, clinical nutritionist or sports nutritionist* to a diverse community.
- PO3: Provide nutrition education to individuals, groups, and communities throughout the lifespan using a variety of communication strategies including ICT

Attitude

- PO4: Engage in self-directed continuous learning aimed at global competency, Which will promote professional and personal growth.

Skills

- PO5: Apply knowledge of public health, diseases, technical skills, clinical judgment and decision-making to make appropriate lifestyle and food choices.
- PO6: Implement strategies with reference to food access, procurement, Preparation, and safety
- PO7: Analyze, interpret, evaluate and use professional literature to make Evidence based decisions facilitating professional collaborations in the field of Nutrition and Dietetics
- PO8: Evaluate, adopt and apply the best practices relating to health, safety, Quality and client satisfaction in the field of Nutrition and Dietetics.

Ethical & Social Responsibility

- PO9: Develop management skills and entrepreneurial skills, by harnessing core Competencies tempered by values and ethics

Programme Specific Outcomes – B.Sc. Nutrition & Dietetics

On successful completion of B. Sc., Nutrition and Dietetics program, the Graduate will be able to

Intellectual Skills

- PSO1: Identify the components of foods and apply the concepts learned to provide professional nutrition services in a wide variety of settings including academic, hospital, government, corporate, military, sports and community-based organization.

Practical Skills

- PSO2: Exhibit skill and confidence to cater to the nutritional needs of diverse Population
- PSO3: Apply knowledge of food, nutrition and dietetics to develop practical skills of management of dietary departments of the various organizations

Transferable Skills

PSO4: Apply the principles of food science to produce commercial products for the benefit of the society honing the entrepreneur skills in students

Programme Articulation matrix

Course Name	Course code	Correlation with Programme Outcomes and Programme Specific Outcomes												
		PO 1	P O2	PO3	PO 4	PO 5	PO6	P O7	PO 8	P O9	PSO 1	PSO 2	PS O3	PS O4
Food Science	U17ND 101	H	-	L	M	L	M	-	M	L	H	-	H	H
Food Science Lab	U17ND 1P1	H	-	L	M	L	M	-	M	L	H	-	H	H
Food Microbiology	U17ND 1Y1	M	-	L	L	-	L	-	L	-	M	-	L	L
Food Microbiology & Food chemistry Practical	U17ND YP1	M	-	L	L	-	L	-	L	-	M	-	L	L
Human Physiology	U17ND 202	H	H	H	M	H	L	L	L	H	H	H	H	L
Human Physiology Practical	U17ND 2P2	H	H	H	M	H	L	L	L	H	H	H	H	L
Food Chemistry	U17ND 2Y2	H	-	L	M	L	M	-	M	L	H	-	H	H
Food Microbiology & Food chemistry Practical	U17ND YP1	H	M	M	L	L	M	-	M	L	H	-	H	H
Food Packaging	U17ND 2S1	M	L	L	-	-	L	-	M	-	M	-	M	M
Principles of Nutrition	U17ND 303	H	H	H	H	H	L	M	L	H	H	H	H	L
Principles of Nutrition Practical	U17ND 3P3	H	H	H	H	H	L	M	L	H	H	H	H	L
Food Standard and Quality Control	U17ND 3Y3	H	-	-	H	H	M	-	H	-	H	-	H	H
Food Standard	U17ND	H	-	-	H	H	M	-	H	-	H	-	H	H

and Quality Control & Nutritional Biochemistry Practical	YP2													
NMEC-I Basics in Nutrition	U17ND 4E1	H	H	-	H	-	M	H	H	H	H	H	H	L
Nutrition Through Life Cycle	U17ND 404	H	H	H	H	H	H	H	H	H	H	H	H	L
Nutrition Through Life Cycle Practical	U17ND 4P4	H	H	H	H	H	H	H	H	H	H	H	H	L
Nutritional Biochemistry	U17ND 4Y4	M	H	H	M	M	-	M	-	M	H	H	M	-
Food Standard and Quality Control & Nutritional Biochemistry Practical	U17ND YP2	H	-	-	H	H	M	-	H	-	H	-	H	H
NMEC-II Diet in Health and Diseases	U17ND 4E2	-	M	L	M	M	M	M	-	-	H	H	M	L
Dietetics –I	U17ND 505	M	H	H	H	H	H	H	H	H	H	H	H	M
Community Nutrition	U17ND 506	-	M	M	-	M	H	H	H	H	H	H	H	L
Dietetics –I Practical	U17ND 5P5	M	H	H	H	H	H	H	H	H	H	H	H	M
Food Preservation/ Functional Foods	U17ND 5:1/ U17ND 5:2	H	-	-L	M	L	M	L	M	H	H	H	H	H
Principles of Human Resource Management and Interior Design/Food Sanitation and Hygiene	U17ND 5:3/ U17ND 5:4	-	-	L	-	-	-	-	M	-	-	-	-	H
Nutrition in special	U17ND	-	H	H	H	H	H	H	L	M	H	H	H	L

B.Sc., Nutrition and Dietetics – Programme structure

Sem	Course	Course Title	Course Code	Hrs/week	Pre requisites	Credits	Marks		
							CIA	ESE	Total
I	Tamil I	Tamil	U15TM1L1	6		3	25	75	100
	English I	English for communication Skills -I	U16EGPL1	6		3	25	75	100
	Core I	Food Science	U17ND101	4		5	25	75	100
	Core Prac. I	Food Science Lab	U17ND1P1	3		3	40	60	100
	Allied I	Food Microbiology	U17ND1Y1	4		4	25	75	100
	Allied Prac.	Food Microbiology & Food chemistry Practical	U17NDYP1	3*			40	60	100
	Env. Stud	Environmental studies	U16EST11	2		2	25	75	100
	Value Education	Value EducationRI/MI	U15VL1:1 /U15UL1:2	2		2	25	75	100
II	Tamil II	Tamil	U15TM2L2	6		3	25	75	100
	English II	English for communication Skills -II	U16EGPL2	6		3	25	75	100
	Core II	Human Physiology	U17ND202	6		5	25	75	100
	Core Prac. I	Human Physiology Practical	U17ND2P2	3		3)	40	60	100
	Allied II	Food Chemistry	U17ND2Y2	4	U17ND101	4	25	75	100
	Allied Prac.	Food Microbiology & Food chemistry Practical	U17NDYP1	3*		2	40	60	100
	SBEC I	Food Packaging	U17ND2S1	2		2	40	60	100
III	Tamil III	Tamil	U15TM3L3	6		3	25	75	100
	English III	English for Competitive Examination Business Communication in English	U16EGPL3 / U17EGCL3	6		3	25	75	100
	Core III	Principles of Nutrition	U17ND303	6		5	25	75	100
	Core Prac. II	Principles of Nutrition Practical	U17ND3P3	3		3	40	60	100
	Allied III	Food Standard and Quality Control	U17ND3Y3	40		4	25	75	100
	Allied Prac.	Food Standard and Quality Control & Nutritional Biochemistry Practical	U17NDYP2	3*		-	--	--	--
	NMEC –I	To be selected from the courses offered by other		2		2	25	75	100

		departments							
IV	Tamil IV	Tamil	U15TM4L4	6		3	25	75	100
	English IV	English through Literature	U16EGNL4	6		3	25	75	100
	Core IV	Nutrition Through Life Cycle	U17ND404	6		5	25	75	100
	Core Prac. II	Nutrition Through Life Cycle Practical	U17ND4P4	3		3	40	60	100
	Allied IV	Nutritional Biochemistry	U17ND4Y4	4		4	25	75	100
	Allied Prac.	Food Standard and Quality Control & Nutritional Biochemistry Practical	U17NDYP2	3*		2	40	60	100
	NMEC-II	To be selected from the courses offered by other departments		2		2	25	75	100
	Soft Skills	Life skills	U16LFS41	2		1			100
	Extension activities	NSS, NCC, Rotract, Leo Club, Etc.	U16ETA41			1			
V	Core V	Dietetics –I	U17ND505	6		5	25	75	100
	Core VI	Community Nutrition	U17ND506	6		5	25	75	100
	Core Prac. III	Dietetics –I Practical	U17ND5P5	3		3	40	60	100
	Elective I	Food Preservation /Functional Foods	U17ND5:1 / U17ND5:2	5		4	25	75	100
	Elective II	Principles of Human Resource Management and Interior Design /Food Sanitation and Hygiene	U17ND5:3 / U17ND5:4	5		4	25	75	100
	SBEC – II	Nutrition in special conditions	U17ND5S2	2	U17ND2S1	2	40	60	100
	SBEC –III	Bakery and Confectionery	U17ND5S3	2		2	40	60	100
VI	Core VII	Dietetics –II	U17ND607	6	U17ND505	5	25	75	100
	Core VIII	Nutrition and Fitness	U17ND608	6		5	25	75	100
	Core IX	Institutional Food Service management	U17ND609	6		5	40	60	100
	Core Prac. IV	Dietetics –II Practical & Dietary Internship	U17ND6P6	3		3	40	60	100
	Elective III	Food product development and marketing strategy	U17ND6:1	4		3	25	75	100
	Core Project	Project	U17ND6PJ	4		3			100
	Gender studies	Gender studies	U16GSD61			2	1		

SBEC – Skill Based Elective Courses; NMEC – Non Major Elective Courses;

CORE I: FOOD SCIENCE

Semester: I
Credits: 5

Code: U17ND101
Hours/Week: 6

1. Course Outcomes:

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

CO. No	Course Outcomes	Level	Unit
CO1	Identify, Define and classify different food groups, nutrients, and evaluate various pre-preparation and cooking techniques in order to adopt best practices for health and safety	K2	I
CO2	Compare the composition and nutritive value of various nutrients present in cereals and pulse and also the effect of cooking and processing on cereals and pulses	K4	II
CO3	Elaborate the importance of fruits and vegetables in health and disease with special reference to the changes taking place on their nutritive value, palatability and texture during cooking and processing	K5	III
CO4	Evaluate the role of protein rich foods such as milk, egg, meat and fish and assess their perishability in order to formulate techniques to control the perishability of these foods.		IV
CO5	Analyze the role of Indian herbs as anti-oxidants and also assess the importance of various beverages, artificial sweeteners, sugar, fats and oils in health and disease.	K4	V
CO6	Develop various sustainable food practices like energy and nutrient conservation and food product development.	K5	I, II, III, IV, V

2. A. SYLLABUS

UNIT-I

-15 Hours

Introduction to Food science

a) **Definition** -Food Science, Food, Nutrients, Nutritional status, Mal – nutrition-under nutrition over nutrition, Hunger- Hollow Hunger, Appetite Satiety and Health.

b)**Food groups** - Basic five food groups, Nutritional classification of foods - energy yielding, body building and protective foods.

c)**Methods of cooking** - Moist, dry and combination heat methods of cooking, Merits and demerits. Microwave cooking- principle, Merits & demerits.

UNIT-II

10 Hours

Cereals & Pulses

a) **Cereals:**Structure and nutritive value of rice and wheat, Gelatinization, Process of milling and malting - wheat, Rice, Gluten formation , Nutritive value of millets - ragi, bajra.

- b) **Pulses:** Germination process, factors affecting cooking quality of pulses, composition, nutritive value, and its advantages in cookery.

UNIT-III

10 hours

Vegetables and Fruits

- a) **Vegetables** – Selection of vegetables, Nutritive value , Changes in nutritive value before and after cooking,, Effect of cooking on the vegetable pigments.- chlorophyll, carotenoids, anthocyanin, anthoxanthin.
- b) **Fruits-** Classification, nutritive value, ripening of fruits, Effect of browning and its prevention , Storage of fruits.

UNIT-IV

15 Hours

Milk and meat products

- a) **Milk and Milk Products:** Types of milk , pasteurization of milk , composition and nutritive value, milk products – cheese, paneer and khoa
- b) **Egg:**Structure, composition and nutritive value,Qualitative determination of egg and its role in cookery .
- c) **Meat:**Structure, composition and nutritive value of meat, cutting process of meat, cooking changes in meat, and tenderness of meat.
- d) **Poultry-**classification,Nutritive value, Selection and cooking methods poultry.
- e) **Fish** -selection of fish,Structure, composition and nutritive value.

UNIT-V

10 Hours

Fats, Sugar, Beverages and Spices

- a) **Fats and Oils-** composition of common fats and oils, smoking temperature, rancidity and role of fats and oils in cookery.
- b) **Sugar** – Nutritive value, sugar related products, stages of sugar cookery, Crystallization, Factors affecting crystallization.
- c) **Beverages:** classification, nutritive value - coffee, tea, cocoa, milk based beverages, fruit juices and aerated beverages.
- d) **Spices and condiments** – Types and use in Indian cookery, Medicinal value.

B. Topics for self-study

Sl. No.	Topics	Reference
1	Antioxidants in vegetables – Definition of antioxidants – relationship between free radicals and antioxidants - their role in boosting immunity.	https://www.nccih.nih.gov/health/antioxidants-in-depth
2	Refining cooking oils – Process – advantages and disadvantages of refining oils –	https://www.salonioil.com/refined-cooking-oil-their-dangerous-effects-on-health/

	conventional oils vs refined oils.	
3	Comparison between sugar, jiggery and unrefined sugars.	https://thewholetruthfoods.com/blog/sugar-honey-jaggery-which-is-healthier/
4	Genetically modified vegetables – advantages and disadvantages.	https://www.gktoday.in/gk/advantages-and-disadvantages-of-genetically-modified-crops/

C. TEXT BOOK

1. Srilakshmi, B., “Food science” ,7th edition, New Age International Pvt. Ltd., New Delhi., 2018.
2. Potter, N.N. and Hotchkiss, H.J., “Food Science”, 5th edition, CBS Publishers and Distributors, New Delhi, 2007.

D. REFERENCE BOOKS

1. Mudambi, R.S. and Rao. S. “Food Science”, 2nd Edition, Wiley Eastern limited. New Delhi. 2007,
2. Mudambi, R.S. and Rajagopal, M.Y., “Fundamentals of Food, Nutrition and Diet Therapy” 5th Edition, Wiley Eastern Limited. New Delhi., 2010
3. Manay. N.S., “Foods – facts and principles”, 3rd Edition, New age International Pvt. Ltd. Publishers, New delhi, 1996.
4. Swaminathan, M. “Food Science and Experimental Foods”, Ganesh and Co., Chennai, 1988.

E. WEB LINKS:

<https://www.nccih.nih.gov/health/antioxidants-in-depth>

<https://www.salonioil.com/refined-cooking-oil-their-dangerous-effects-on-health/>

<https://thewholetruthfoods.com/blog/sugar-honey-jaggery-which-is-healthier/>

<https://www.gktoday.in/gk/advantages-and-disadvantages-of-genetically-modified-crops/>

4. Mapping Scheme for the PO, PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	H	L	L	L	-	-	-	-	-	H	-	H	H
CO2	H	-	-	-	-	-	-	L	-	H	-	L	-
CO3	H		-	-	M		-	L	-	H		H	H
CO4	M		-	-	-	M		-	M	L	-	M	H
CO5	H		-	-	M	L				H	-	H	
CO6	H	-	-	-	-	-	-	H	-	L	-	H	H

L-Low

M-Moderate

H- High

5. Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation
3. End Semester Examination

Indirect

Feedback – online and offline

NAME OF THE COURSE COORDINATOR: MRS. K. MEERA

CORE I LAB : FOOD SCIENCE LAB

Semester: I
Credits: 3

Code: U17ND1P1
Hours/Week: 6

1. Course outcomes

CO. No	Course Outcomes	Level	Unit
CO1	Analyze the structure of starches microscopically and the changes that take place during cooking of cereals and pulses.	K4	II
CO2	Evaluate the changes taking place in vegetable pigments during the application of heat, acid, and alkali.	K5	IV
CO3	Compare enzymatic and non-enzymatic browning and analyze the changes taking place in both critically.	K5	IV
CO4	Interpret the effect of cooking on proteins with special attention to milk, meat and egg.	K3	V, VI
CO5	Explain the various stages of sugar cookery and their role in food industry and the effect of heat on fats and oils.	K2	VII
CO6	Formulate new food products, keeping the knowledge obtained through the study of food science.	K6	II,III,IV

2.A. Syllabus

1. INTRODUCTION TO LABORATORY

Laboratory rules

Familiarizing with laboratory equipment, procedure, and learn to weigh food ingredients.

2. CEREALS

5 Hours

Microscopic examination of various starches.

Preparation of modified starch and their application.

Estimation of Gluten formation.

Preparation of cereal products using rice, wheat, ragi based on steaming, absorption, pressure cooking and straining methods.

3. PULSES:

5 Hours

Determination of Factors affecting cooking quality of pulses- use of hard water, soft water, sodium bicarbonate, vinegar; soaking and pressure cooking.

Preparation of few pulse recipes.

4. VEGETABLES AND FRUITS:

5 Hours

Effect of heat and pH on vegetable pigments like: chlorophyll, carotenoids, anthocyanin, anthoxanthin.

Effect of cooking on flavouring compounds of vegetables.

Browning reaction and its prevention.

Preparation of vegetable recipes by using the above experiment.

CO1	M	-	-	-	-	L	-	L	-	-	-	L	M
CO2	L	-	-	-	-	L	-	L	-	-	-	-	H
CO3	M	-	-	M	-	M	-	H	M	M	M	M	H
CO4	M	-	-	-	-	M	-	H	-	L	-	-	H
CO5	M	-	-	L	-	M	-	H	M	M	M	M	H
CO6	L	-	-	L	-	H	-	M	-	L	L	M	M

L-Low M-Moderate H- High

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Result Discussion, experiments, laboratory practices
3. End Semester examination

Indirect

Feedback

NAME OF THE COURSE COORDINATOR: MRS. K. MEERA

ALLIED I : FOOD MICROBIOLOGY

Semester: I
Credits: 4

Code: U17ND1Y1
Hours/Week: 60

1. Course Outcomes:

After the completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Apply the concept of microbiology and use of microscope in identifying the microbes in foods.	K4	I
CO2	Assess the different types of microorganism involved in food spoilage and the conditions under which they will grow.	K5	II
CO3	Analyze the characteristics of foodborne, waterborne and spoilage microorganisms, and methods for their isolation, detection and identification.	K4	III
CO4	Evaluate the role of microorganisms in fermentation and assess the benefits and adverse effects of fermentation.	K5	IV
CO5	Determine the role and significance of microbial inactivation, adaptation and environmental factors on growth and response of microorganisms in various environments.	K5	V
CO6	Develop the knowledge on the effects of microorganisms in health and disease.	K5	III, V

2.A. Syllabus

UNIT- I

10 Hours

Introduction to Food Microbiology

History and Development of Food Microbiology, Light and Electron microscopy, Definition and Scope of food microbiology ,Inter-relationship of microbiology with other sciences

UNIT- II

15 Hours

Characteristics of Microorganisms in Food

Types of microorganisms associated with food, - Bacteria, Virus, Fungi, Protozoan and Algae their morphology and structure, Growth and multiplication- growth curve, definition of batch and continuous culture. Factors influencing the growth- intrinsic factors, nutrient content, pH, redox potential, anti -microbial barrier and water activity. Significance of spores in food microbiology

UNIT- III

Microbial Food Spoilage

10 Hours

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

UNIT- IV

15 Hours

Food Fermentations

Fermentation –definition and types, Microorganisms used in food fermentations

Dairy Fermentations-starter cultures and their types, concept of probiotics, types of fermented foods, methods and preparation for vinegar, sauerkraut, soya sauce.

UNIT- V

15 Hours

Soil – Role of microorganism in nitrogen cycle.

Water – bacteriological examination of water, water borne disease and their control.

Sewage – Types of sewage, method of sewage disposal

Air – principles of air borne disease and their control

B. Topic for Self Study

Sl. No.	Topics	Reference
1	Probiotics and prebiotics – difference - role of probiotics and prebiotics in gut health – natural and artificial probiotics	https://www.prebiotin.com/prebiotin-academy/what-are-prebiotics/prebiotics-vs-probiotics/
2	Flavour changes in cheese due to the fermentation through various moluds	https://www.cheesescience.org/microbes.html
3	Canning – principle behind canning – puffing of can – maintenance of headspace in can – botulism and botulinum poisoning in canned foods	https://ir.library.oregonstate.edu/downloads/ft848t80r

C. Text Books:

- 1) Adams, M.R., and Mosses, M.O., “Food Microbiology”, 5th Edition, New age International (P) Ltd.,New Delhi, 20155.
- 2) VijayaRamesh,K, “Food Microbiology”, MJP Publishers, Chennai,2007.

D. REFERENCES

- 1) Frazier William. C., and Westhoff, Dennis C.,“Food Microbiology”, TMH, New Delhi, 2004
- 2) Jay, James M. “Modern Food Microbiology”, CBS Publication, New Delhi, 2000
- 3) Garbutt, J.,“Essentials of Food Microbiology”, Arnold, London, 1997.
- 4) Banwart.G.J.,“Basic Food Microbiology”, Chapman and Hall, NewYork,1991.

E. Weblinks:

<https://www.prebiotin.com/prebiotin-academy/what-are-prebiotics/prebiotics-vs-probiotics/>

<https://www.cheesescience.org/microbes.html>

4. Mapping scheme for the POs PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
C01	L	-	L	-	-	L	-	-	-	L	-	L	-
C02	H	-	L	-	-	H	L	M	-	H	L	M	-
C03	H	-	L	M	M	H	M	M	M	L	-	M	-
C04	H	-	-	-	-	M	-	-	L	M	-	M	H
C05	L	-	M	-	-	M	-	L	-	-	-	-	-
C06	H	L	L	-	-	H	-	M	-	L	-	L	-

L-Low M-Medium H-High

5. Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment
3. End Semester Examination

Indirect

Feedback

NAME OF THE COURSE COORDINATOR: C. ROSELIN

ALLIED I LAB : FOOD MICROBIOLOGY AND FOOD CHEMISTRY

Semester: I
Credits: 2

Code: U17NDYP1
Hours/Week: 45

1. Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Analyze the various staining methods to identify the microbes in foods.	K4	I
CO2	Assess the role of microorganisms in fermentation.	K5	I
CO3	construct the role of microorganisms in food spoilage and their effects.	K5	I
CO4	Evaluate the role of heat in cereals and structure and shape of various starch.	K5	II
CO5	: Explain the changes taking place in fats and oils on heating	K2	II
CO6	Demonstrate the changes taking place in starch cookery and the structure of microorganisms in syneresis.	K5	II

4. A. Syllabus:

1.FOOD MICROBIOLOGY:

20 Hours

1. Instrumentation in microbiology laboratory and their function. (Microscope, autoclave& hot air oven)
2. Preparation of culture media.
3. Preparation of Pure culture techniques (Spread plate, Streak plate, pour plate methods)
4. Estimation of Staining technique - simple and differential.
5. Preparation of Microbiological evaluation of milk and milk products.
6. Isolation of spoilage organism from different food commodities.
7. Estimation of Microbiological analysis of water and air.

2. FOOD CHEMISTRY

25 Hours

Chemistry of Starch and Sugars:

Gelatinization of starch,

Microscopic examination of uncooked and gelatinized starch

Estimation of Retro gradation and syneresis

Preparation of Gluten formation

Identification of Stages of sugar cookery

Preparation of fondant, Fudge, and Toffee

Preparation of Scum formation in milk.

Chemistry of Proteins:

Effect of Soaking, germination and fermentation of pulses

Preparation of coagulation in egg white and egg yolk.

Preparation of Boiled egg, poached egg, omelet's, Custards, Cake and Mayonnaise.

Preparation of Coagulation and precipitation of milk proteins.

Preparation of cooking Meat, Fish and Poultry,

Testing the tenderness of meat by food thermometers

Chemistry of fat and Oils:

Estimation of Smoking temperature in different Fats.

Analysis of Factor affecting absorption of fat.

Effect of acids, alkali and heat on water soluble and fat-soluble pigments, Enzymatic browning and methods of prevention.

B. References:

1. Bennion M. and Hughes D., "Introductory foods", Macmillan Publishing Co.Inc, New York, 1975
2. Brich, C.G., Spencer .M and Cancerron A.G. "Food Science", Pergamon Press, New York, 1977.
3. Dennis D Miller., "Food Chemistry", WileyInter Science Edition,1998.
4. Gopalan.C, Ramasastrri.P.N.,Balasuramanian S.C. "Nutritive value of Indian Foods", National Institute of Nutrition, Hyderabad, 1977.

4.Mapping scheme for the POs PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	L	-	L	M	-	L	-	-	-	-	-	-	-
CO2	M	-	L	L	-	M	-	M	L	M	L	L	L
CO3	H	-	M	H	-	H	-	M	M	H	M	-	M
CO4	-	-	-	-	-	H	-	-	M	M	M	M	-
CO5	-	-	M	L	-	H	-	M	H	H	M	H	L
CO6	-	-	-	-	-	L	-	-	-	M	-	L	M

L-LOW M-MEDIUM H-HIGH

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation, Case study, Preparation of questionnaire, Assessment of Anthropometry

3) End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: C. ROSELIN

CORE II : HUMAN PHYSIOLOGY

Semester: II
Credits: 5

Code: U17ND202
Hours/Week: 90

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Recollect the functions of basic units of the human system -cell.	K3	I
CO2	Explain the role of circulatory system in carrying the nutrients throughout the body and crucial role of heart and lungs in maintaining bodily functions.	K2	I,II, III
CO3	Correlate the importance of various hormones present in the body and the deficiency and excess of each hormone	K5	IV
CO4	Analyze the role of digestive, excretory and nervous system in regulating the smooth functioning of the body.	K4	III
CO5	Evaluate the role of sense organs and nervous, voluntary and involuntary control of various functions.	K5	V
CO6	Develop competency in analyzing the correlation between health, disease and physiology.	K5	I,II,III,IV,V

2.A.Syllabus

UNIT – I

20 Hours

Blood, Heart and Circulation

a) **Blood** : Composition, functions, RBC – Structure, functions, erythropoiesis, Haemoglobin, WBC – Structure, functions, Classification.

Blood Platelets: Structure, functions, Reticulo endothelia system, Blood groups –Rh factor. Blood coagulation, spleen –Structure and functions, Lymph – Lymphatic system.

b) **Heart and Circulation:** Heart – Anatomy and physiology, Blood vessels –Structure of artery, vein, capillaries, Cardiac output, Arterial Blood pressure, clinical measurement of blood pressure, properties of cordite muscle, origin and conduction of heart beat, cardiac cycle, Regulation of the Heart's action.

UNIT – II

18 Hours

Respiratory and Excretory System

a) **Respiratory System:** Structure of respiratory organs, Mechanics of respiration, subdivisions of lung air, Chemistry of respiration. Artificial respiration, control of respiration.

b) Excretory System - Physiology of kidney – nephron, formation of urine, voiding of urine. Skin – Structure and functions, Regulations of body temperature.

UNIT – III

15 Hours

Digestive System-

a) General anatomy of digestive system – Digestive in the mouth, stomach and intestines, Movements of small intestine, Role of pancreas, Liver – Structure and function.

UNIT – IV

20 Hours

Endocrine and Reproductive system:

a) **Endocrinology** - Structure and functions of thyroid, pituitary, parathyroid, adrenals, islets of langerhans of pancreas, sex glands.

b) **Reproductive System** - General anatomy – Female and male reproductive system. Testis – Spermatogenesis, male sex hormones, ovaries – genesis, Female sex hormones, menstrual cycle. Phases and endocrine control. Mammary glands – Structure, lactation and process of reproduction, fertilization, development of embryo, pregnancy and parturition..

UNIT – V

17 Hours

Nervous System and Special Senses

Nervous System:

Spinal cord – Structure and functions. Ascending and descending tracts, reflex action.

Brain – Structure and functions of cerebrum, optic thalamus, midbrain, Pons medulla oblongata, Hypo thalamus, cerebellum.

Autonomic nervous system, sympathetic and parasympathetic.

Special Senses.

Physiology of vision, Structure of eye, dark and light adaptation, accommodation of the eye, visual fields, common due to abnormalities – presbyopia, cataract, Astigmatism, Blindness.

Ear – Structure and Physiology of hearing.

B. Topic for Self Study:

Sl. No.	Topics	Reference
1	Immunity – innate and acquired immunity.	https://www.creative-diagnostics.com/innate-and-adaptive-immunity .
2	Heart lung machine.	https://www.youtube.com/watch?v=RmwMzw_YTNU
3	Renal failure –Kidney transplantation and artificial kidney dialysis and home remedies of detoxification diet,.	https://www.healthline.com/health/dialysis#risks
4	Neurotransmitters – dopamine, serotonin, endorphins, oxytocin.	https://www.healthline.com/health/happy-hormone#food

C. Text

1. Guyton A.C., "Human Physiology and Mechanism and Disease", 13th Edition, Elsevier., 2015 .
2. Sembulingam, K., "Essentials of Medical Physiology", 6th Edition, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2012.

D. Reference

1. Best and Taylor, "The Physiological Basis of Medical Practice", 13th Edition, Saunders Company, (2011)
2. Chaudhri, K., "Concise Medical Physiology", 7th Edition, New Central Book Agency (Parental) Ltd., Calcutta, (2016).
3. Chatterjee C.C., "Human Physiology, Volume I & II", 11th Edition, CBS Publishers, 2017.

E. WEBLINKS:

<https://www.creative-diagnostics.com/innate-and-adaptive-immunity>.

https://www.youtube.com/watch?v=RmwMzw_YTNU

<https://www.healthline.com/health/dialysis#risks>

<https://www.healthline.com/health/happy-hormone#food>

3. Mapping Scheme for the PO, PSOs and COs

L-Low M-Moderate H-High

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	M	M	L	-	-	M	-	-	-	H	M	-	L
CO2	-	M	-	-	H	M	-	H	-	-	L	-	-
CO3	-	H	-	-	-	M	-	-	-	M	M	-	-
CO4	M	L	-	-	-	M	L	-	M	-	M	M	-
CO5	M	M	-	-	M	H	L	M	M	H	M	-	-
CO6	-	M	-	M	L	-	M	L	-	L	-	L	M

5. Course assessment methods

Direct

1 Continuous Internal Assessment I, II

1. Group discussion, Presentation, Assignment, Poster presentation
2. End Semester Examination

Indirect

FEEDBACK

NAME OF THE COURSE COORDINATOR: MRS. K. MEERA

CORE II LAB : HUMAN PHYSIOLOGY LAB

Semester: II
Credits: 3

Code: U17ND2P2
Hours/Week: 45

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Identify the structure of various tissues microscopically.	K2	I
CO2	Analyze blood groups and differentiate the various blood groups.	K4	VI
CO3	Apply the various instrument like stethoscope and sphygmomanometer.	K3	IX
CO4	Estimate the amount of hemoglobin in blood.	K4	IV
CO5	Correlate the use of various equipment in the evaluation of normal body functions	.K5	IX
CO6	compare the various organs and it's functions	K5	X

3. A. Syllabus:

HUMAN PHYSIOLOGY

1. Histology of the epithelial, muscular, connective tissue.
2. Microscopic structure of bone and cartilage.
3. Microscopic structure of nerve.
4. Estimation of Haemoglobin, RBC and WBC count Demonstration.
5. Identification of different types of white blood cells – Demonstration.
6. Determination of blood groups.
7. Recording of normal heart beat of frog.
8. Effect of temperature on heart beat – demonstration.
9. Arterial blood pressure and pulse rate, effect of exercise.
10. Histology of artery, vein, trachea and lung.

Related Experiences

1. Visit to blood bank.
2. Observation of blood transfusion.

B. Reference

1. Clark Patricia., "Human Physiology Lab Manuel Study Guide", Second Edition, Pat Clark., India.
2. Best and Taylor , "The Physiology Basis For Medical Practice", Saunders Company, 1992.

4. Mapping Scheme for the PO, PSOs and COs

L-Low M-Moderate H- High

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	M	-	-	L	-	L	L	L	-	H	M	-	H
CO2	H	M	L	-	H	M	-	H	M	-	L	-	L
CO3	-	H	L	-	-	M	-	-	-	H	L	-	-
CO4	M	L	M	-	-	M	L	-	M	-	M	M	-
CO5	M	M	L	-	M	H	L	M	M	H	L	-	-
CO6	L	M	M	M	L	-	M	L	-	L	-	H	L

5. Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation, Case study
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: MRS. K. MEERA

ALLIED II : FOOD CHEMISTRY

Semester: II

Code: U17ND2Y2

Credits: 4

Hours/Week: 60

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Discuss sugar cookery and the role of sugar cookery in the making of traditional Indian sweets.	K2	II
CO2	Explain the chemical changes taking place in starches.	K2	II
CO3	Acquire knowledge on the concept of cooking of fats and absorption of fats in deep fried foods.	K4	IV
CO4	Analyze the effect of soaking and germination of pulses and its advantages to our body.	K4	III
CO5	Interpret the changes taking place in meat while cooking.	K4	III
CO6	Analyze the plant pigments and its estimation methods.	K4	V

2.A. Syllabus:

UNIT – I

10 Hours

Chemical properties of food

Moisture in food, Hydrogen Bonding, Bound water, Water activity foods, Determination of moisture content in food.

True solution dispersion, Sols, Gels, Foams, Colloids and Emulsions

UNIT- II

10 Hours

Chemistry of sugar and starch.

Components of starch, Swelling of starch granules, Gel formation, Retro gradation, Syneresis.

Stages of sugar, Acid, Alkali, Fat and surface Active agents of starch.

Chemistry of Milk Sugar, Non Enzymatic Browning.

UNIT- III

20 Hours

Chemistry of Proteins

Components of wheat protein, Structure, Gluten Formation

Effect of soaking, Fermentation and Germination on Pulse proteins

properties of Egg Protein, Chemistry of Milk Protein, Changes in milk, Egg and Meat protein during Heating action of heat, Acid, Alkalis on Vegetables Proteins and Animal Proteins.

UNIT- IV

10 Hours

Chemistry of Fat and oils

physical and chemical properties of fat and oils.

Rancidity , Hydrogenation, Winterization, Decomposition of Triglycerides,
Shortening power of fats, Changes in fats and oils during Heating, Factors affecting fat absorption in foods.

UNIT- V

10 Hours

Plant Pigments

Pectins, Phenolic Components, Enzymatic browning in Fruits and vegetables.

Volatile compounds from cooked vegetables,

Estimation of different types of plant pigments – Water and fat soluble pigments Such as Chlorophylls,

B. Topic for Self Study:

Sl. No.	Topics	Reference
1	Relationship between moisture content of food and microbial spoilage.	https://www.fda.gov/inspections-compliance-enforcement-and-criminal-investigations/inspection-technical-guides/water-activity-aw-foods
2	Postharvest changes and storage of fruits and vegetables.	http://www.fao.org/3/y4358e/y4358e05.htm
3	Prevention of rancidity in oils – addition of antioxidants.	https://en.wikipedia.org/wiki/Rancidification#:~:text=Antioxidants%20are%20often%20used%20as,and%20tocopherols%20(vitamin%20E)
4	Role of non-enzymatic browning in food industry.	https://en.wikipedia.org/wiki/Food_browning

C. Text Books:

1. Shakuntala Manay, Shadaksharaswamy, M. “ Foods, Facts and Principles”, 2nd Edition, New Age International Pvt Ltd Publishers, (2017) .
2. Chandrasekhar, U. “Food Science and applications in Indian Cookery”, Phoenix Publishing House, New Delhi
3. Swaminathan, M. Food Science, “Chemistry and Experimental Foods”, Bappco Publishers, Bangalore, (2015).

D. Reference Books:

1. Meyer, L.H, “Food Chemistry”, (2004) CBS Publishers and Distributors, 4th edition
2. Paul, P.C. and Palmer, H.H. “Food Theory and Applications”, JohnWiley and Sons, New York, (Revised Edition) (2002)
3. Chopra H.K, Panesar, P.S, “Food Chemistry”,Narosa Publishing House, New Delhi, (2010).

E. Weblinks:

<https://www.fda.gov/inspections-compliance-enforcement-and-criminal-investigations/inspection-technical-guides/water-activity-aw-foods>

<http://www.fao.org/3/y4358e/y4358e05.htm>

[https://en.wikipedia.org/wiki/Rancidification#:~:text=Antioxidants%20are%20often%20used%20as,and%20tocopherols%20\(vitamin%20E\)](https://en.wikipedia.org/wiki/Rancidification#:~:text=Antioxidants%20are%20often%20used%20as,and%20tocopherols%20(vitamin%20E))

4.Mapping scheme for the POs PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	L	-	-	-	-	M	-	M	-	H	-	M	H
CO2	H	L	-	L	-	-	-	L	-	M	-	M	H
CO3	M	M	H	M	M	L	-	L	L	H	-	H	H
CO4	H	-	M	-	-	M	-	L	L	M	H	M	H
CO5	H	-	L	M	-	L	-	-	-	M	-	L	H
CO6	H	L	M	L	M	L	-	L	M	H	H	H	H

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: MS. C. ROSELIN

ALLIED I & II : FOOD MICROBIOLOGY AND FOOD CHEMISTRY PRACTICAL

Semester: II
Credits: 2

Code: U17NDYP1
Hours/Week: 45

1. Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Classify the various staining methods to identify the microbes in foods.	K3	I
CO2	Assess the role of microorganisms in fermentation.	K4	I
CO3	Explain the role of microorganisms in food spoilage and their effects.	K4	I
CO4	Evaluate the role of heat in cereals and structure and shape of various starch.	K5	II
CO5	Demonstrate the changes taking place in fats and oils on heating.	K5	II
CO6	Compare the changes in sugar during various temperatures.	K5	II

2. A. Syllabus

1. Instrumentation in microbiology laboratory and their function. (microscope, autoclave & hot air oven)
2. Preparation of culture media.
3. Estimation of Pure culture techniques (Spread plate, Streak plate, pour plate methods)
4. Preparation of staining technique simple and differential method.
5. Estimation of Microbiological evaluation of milk and milk products.
6. Isolation of spoilage organism from different food commodities.

FOOD CHEMISTRY

I. Chemistry of Starch and Sugars:

Estimation of Gelatinization of starch

Microscopic examination of uncooked and gelatinized starch

Determination of Retro gradation and syneresis ,

Preparation of Gluten formation,

Estimation of Stages of sugar cookery ,

Preparation of fondant, Fudge, and Toffee, Scum formation in milk.

II. Chemistry of Proteins:

Effect of Soaking, germination and fermentation of pulses

Determination of coagulation of egg white and egg yolk.

Preparation of Boiled egg, poached egg, omelettes, Custards, Cake and Mayonnaise.

Preparation of Coagulation and precipitation of milk proteins.

Changes observed in cooking Meat, Fish and Poultry, Testing the tenderness of meat.

III. Chemistry of fat and Oils:

Estimation of Smoking temperature of different Fats, Factors affecting absorption of fats .

IV. Chemistry of plant pigments

Effect of acids, alkali and heat on water soluble and fat soluble pigments Enzymatic browning and methods of prevention.

B. References :

1. Denis D Miller., "Food chemistry a laboratory Manual", John wileyNasher, Newyork.
2. James G. Cappuccino and Natalie Shermen, "Microbiology- A laboratory Manual", Pearson Education Publishers,USA, 2008.
3. Fennema,Owen.R., "Food Chemistry", 3rd Edition, Marcell Dekker,Newyork,1996.

4.Mapping scheme for the POs PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	L	-	L	M	-	L	-	-	-	-	-	-	-
CO2	M	-	L	L	-	M	-	M	L	M	L	L	L
CO3	H	-	M	H	-	H	-	M	M	H	M	-	M
CO4	-	-	-	-	-	H	-	-	M	M	M	M	-
CO5	-	-	M	L	-	H	-	M	H	H	M	H	L
CO6	-	-	-	-	-	L	-	-	-	M	-	L	M

L- LOW M-MEDIUM H-HIGH

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: C. ROSELIN

SBEC I : FOOD PACKAGING

Semester: II
Credits: 2

Code: U17ND2S1
Hours/Week: 30

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Obtain an in-depth understanding of the role of packaging in the food industry.	K2	I
CO2	Compare the advantages and disadvantages of various packaging material.	K5	II
CO3	Evaluate the types of packaging and their usage in packing various foods.	K5	III
CO4	Analyze the differences in packing fresh and processed foods.	K4	IV
CO5	Interpret the packaging designs and environmental issues in various packing techniques.	K5	V
CO6	Construct the various laws relating to packaging industry.	K5	V

2.A.Syllabus:

UNIT I **10 Hours**
PACKAGING

Concepts, definition, significance, classification. Development, unit/Retail. Fresh and processed, general characteristics and food preservation.

UNIT II **15 Hours**
PRIMARY PACKAGING MEDIA

Properties and applications.

Paper boards, metals, plastics, wood and plywood, glass, flexible, etc.

Labels, caps and closures, waxes, adhesives, inks and lacquers, cushioning materials.

UNIT III **15 Hours**
FOOD PRODUCTSPACKAGING SYSTEMS AND METHODS

General classification and packaging types.

Vacuum packaging, gas flush Packaging, CAP and MAP, aseptic and retort packing bagin-boxete.

UNIT IV **10 Hours**
STORAGE, HANDLING AND DISTRIBUTION OF PACKAGES (FOODS)

Palletization and containerization. Marketing - barcoding and marketing.

UNIT V
PACKAGING LAWS AND REGULATIONS

10 Hours

FDA, FPO, packaging commodity.Rules, Weight and Measures Act.Meat Food Products Order (MFPO),Agricultural Grading & Marking (AGMARK) Rules,Edible Oil Packaging (Regulation) Order, 1998

The Standards of Weights & Measures Act (SWMA),Other Packaging Requirements under PFA

B. Topics for self-study

Sl. No.	Topics	Reference
1	History of food packaging.	https://en.wikipedia.org/wiki/Food_packaging
2	Marketing strategies involved in food packages.	https://www.pkgbranding.com/blog/why-food-packaging-design-matters-to-your-overall-marketing-strategy
3	Edible food wraps.	https://www.ecolotec.com/do-eat/home-use.html

C. Reference Books

1. Bhatia, S.C., “Canning and Preservations of Fruits and Vegetables” – New Delhi, Inc. 2010.
2. Darry, R. Blackie. T. “Principles of Applications of MAP”, Academic Professions, 1996
3. Multon, J.K. Food packaging Technology, (Vol.1 and 2) VCH – Publishers, Inc. New York,1986
5. Robertson, G.L., Food Packaging – Marcell, Dekker, Inc, New York.
6. Sacharow&Griffini, Food Packing, AVI Publications, 1987

D. WEBLINK

https://en.wikipedia.org/wiki/Food_packaging
https://www.pkgbranding.com/blog/why-food-packaging-design-matters-to-your-overall-marketing-strategy
https://www.ecolotec.com/do-eat/home-use.html

4.Mapping Scheme for the PO, PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	L	-	-	-	-	M	-	L	-	-	-	-	M
CO2	L	-	-	L	-	H	-	M	L	-	-	M	M
CO3	-	-	-	L	-	H	-	L	-	-	-	L	M
CO4	-	-	-	M	-	H	-	L	-	-	-	L	M
CO5	L	-	-	M	-	H	-	M	L	-	-	-	M
CO6	-	-	-	M	-	H	-	-	-	-	-	-	M

L- LOW M-MEDIUM H-HIGH

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: K. MEERA

CORE III : PRINCIPLES OF NUTRITION

Semester: III
Credits: 5

Code: U17ND303
Hours/Week: 90

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Identify macro and micronutrient and learn to critically evaluate the methodology and derivation of requirements for specific macro and micro nutrients.	K2	IV, VI
CO2	Explain the recommended dietary allowances in different age groups.	K2	I, II
CO3	Discuss the various components of foods with regards to carbohydrates, proteins and fats.	K4	I
CO4	Compare and correlate various diseases caused due to the excess and deficiency of nutrients.	K5	III, IV, V
CO5	: Perceive with clarity, the role of micro nutrients including various vitamins and minerals in the normal functioning of the body and identify the deficiency diseases.	K5	IV, V
CO6	Evaluate the best nutrition based services for students and ultimately the entire society.	K5	II

2.A. Syllabus

UNIT I

20 Hours

- a) Recommended dietary allowances – Definition, General principles of deriving RDA, Factors affecting RDA, Methods used for deriving RDA.
- b) Carbohydrates – Definition, Nutritional classification, Functions, Digestion and absorption, Requirements and Sources.
- c) Disorders- Diabetes mellitus – causes, symptoms, types of diabetes, principles of diet, preventing measures of diabetes mellitus, hormones involved in diabetes mellitus.
- d) Dietary Fibre – Definition, Classification, Sources and Role of Fibre in human Nutrition.

UNIT II

20 Hours

- a) Energy – Definitions, units of Energy, Determination of energy value of foods ,Bomp Calorimeter, Types of calorimeter- Direct and Indirect calorimeter and Thermal effect of food.

- b) BMR – Definitions, Determinations, Factors affecting the BMR, Specific dynamic action, Energy requirement and sources.

UNIT III

20 Hours

- a) Proteins – Definition, Nutritional classification of protein, Functions of Proteins, Digestion and absorption Sources and Requirements. Deficiency Disorder- PEM, Amino acids- Essential and non-essential Evaluation of Protein quality – PER, BV, NPU and chemical score.
- b) Lipids – Definition, Nutritional classification, Functions, Digestion and absorption, Sources and requirements, Deficiency disorder – diseases related to heart

UNIT IV

15 Hours

- a) Vitamins – Classification, functions and Deficiency,
Fat Soluble Vitamins – Vitamin A, D, E and K – Functions, Requirements, Sources and Effect of deficiency.
- b) Water soluble vitamins – Thiamine, Riboflavin, Niacin, Ascorbic acid, Folic acid, Vitamin B6 and B12 – Functions, Requirements, Sources and Effects of deficiency

UNIT V

15 Hours

- a) Minerals – Classification and General Functions. (B) Macro minerals – Calcium, Phosphorus, Magnesium, Sodium and Potassium – Functions, Requirements, Sources, Effects of Deficiency, Effect of imbalance of Sodium and Potassium.
- b) Micro Minerals – Iron, Iodine, Copper, Fluorine and Zinc – Functions, Requirements, Sources and Effect of Deficiency..

B. Topics for self-study

Sl. No.	Topics	Reference
1	Fiber present in fenugreek and flaxseed – effect of flaxseed and fenugreek in reducing blood sugar and cholesterol level.	https://www.healthline.com/health/type-2-diabetes/fenugreek-blood-sugar#potential-risks . https://www.healthline.com/nutrition/flaxseed-for-diabetes
2	Vitamin C and vitamin D as immunity boosters.	https://medicaldialogues.in/diet-nutrition/news/vitamin-c-vitamin-d-supplements-may-boost-immune-system-to-fight-covid-19-65125
3	Effect of potassium rich foods in prevention of hypertension.	https://www.cdc.gov/salt/potassium.htm

C. Text books

1. Swaminathan, M., “Essentials of food and Nutrition”, Vol I & II, Bappco Publishers, Madras 2000.
2. Srilakshmi. B., “Nutrition Science”, New age International (p) ltd, publishers, 2004.

D. Reference

1. Frances sizer and Ellie whitney, “Nutrition Concepts and Controversies”, Thomson wadsworth Publisher, New York, 2006.
2. MangaleKango, “Normal Nutrition, Curing Diseases through Diet”, 1st Edition, CBS publication, 2005.
3. Bonnie, Worthington – Roberts and Sue Rodwell Williams, “Nutrition throughout the lifecycle”, 3rd edition, WCB/MC Graw Hill Publisher, New York, 1996.
4. Paul. S., “Text of Bio Nutrition Fundamental and Management”, RBSA Publishers, 2003

E. WEBLINK:

[https://www.healthline.com/health/type-2-diabetes/fenugreek-blood-sugar#potential-risks.](https://www.healthline.com/health/type-2-diabetes/fenugreek-blood-sugar#potential-risks)

<https://www.healthline.com/nutrition/flaxseed-for-diabetes>

<https://medicaldialogues.in/diet-nutrition/news/vitamin-c-vitamin-d-supplements-may-boost-immune-system-to-fight-covid-19-65125>

<https://www.cdc.gov/salt/potassium.htm>

4.Mapping Scheme for the PO, PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO3	PSO4
CO1	H	M	H	H	M	H	H	M	-	H	H	M	H
CO2	H	L	M	H	M	M	M	H	L	H	H	H	H
CO3	H	H	M	M	H	M	H	H	M	H	M	H	M
CO4	H	H	H	M	M	H	H	M	H	H	H	H	H
CO5	M	M	H	M	M	L	M	L	L	M	H	M	L
CO6	H	M	H	H	H	H	M	M	M	H	M	L	L
CO7	L	H	M	M	M	M	H	M	L	M	H	H	H
CO8	H	H	M	H	H	H	H	H	H	M	H	M	M

L-Low

M-Moderate

H- High

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: MRS. C.ROSELIN

CORE III LAB : PRINCIPLES OF NUTRITION LAB

Semester: III
Credits: 3

Code: U17ND3P3
Hours/Week: 30

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Obtain in-depth knowledge on the structure of nutritional components.	K2	ALL
CO2	– Differentiate the various components of carbohydrates and proteins using qualitative tests.	K4	I, II
CO3	Analyze quantitatively the carbohydrates, proteins and fats present in various food stuff.	K4	I, II
CO4	Evaluate the various components of protein metabolism such as nitrogen in the food stuff.	K5	II, IV
CO5	Estimate the quantity of crude fiber present in various foods.	K5	V
CO6	Analyze the composition of foods with regards to its nutrient composition.	K4	ALL

2.A.SYLLABUS

Qualitative Analysis:

1. Qualitative test for Carbohydrate – Glucose, Fructose, Lactose, Maltose and Galactose.
2. Qualitative test for Protein.
3. Qualitative estimation of iron, Ascorbic acid Vitamin A.
4. Demonstration of estimation of nitrogen.
5. Demonstration of fiber estimation.
6. Demonstration of total fat estimation.

B. TEXT BOOKS

1. Varley, H., Gowenlak, A.H. and Hill, M. "Practical Clinical Biochemistry", William Itinmaon Medical Books, London, 2000.
2. Oser, B.L., "Harke's Physiological Chemistry", 15th Edition, Tata McGraw Hill Publishing Company Ltd., Bombay, 2001.

C. REFERENCE BOOKS

1. Sadasivam, S. and Manickam, "A. Biochemical Method", Second Edition, New Age International P. Ltd., Publishers, New Delhi, 2003.
2. Raghuramulu, N., Madhavannair, K. and KalyanaSundaram, National Institute of Nutrition, "A Manual of Laboratory Techniques", Hyderabad, 500007, 2013.
3. practical organic and chemistry by R. Plimmer - Longmans
4. Practical Biochemistry by Keith Wilson, John M Walker (Paperback).2000
5. Scientific Foundations of Clinical Biochemistry: Biochemistry in Clinical Practice v. 2: Amazon.co.uk: David L. Williams, Vincent Marks: Books.

4.Mapping Scheme for the PO, PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO3	PSO4
CO1	H	H	M	M	H	L	-	L	L	M	M	L	L
CO2	M	M	L	M	M	M	M	L	L	-	M	M	-
CO3	H	H	-	M	H	H	-	-	H	H	H	H	H
CO4	H	H	H	M	-	H	H	M	H	H	H	H	H
CO5	H	H	H	M	M	-	M	M	M	M	H	M	M
CO6	L	M	-	-	-	-	-	M	-	M	-	-	L

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II

2. Group discussion, Presentation, Assignment, Poster presentation
3. End Semester Examination

Indirect

Feedback

NAME OF THE COURSE COORDINATOR : MRS. C. ROSELIN

ALLIED III: FOOD STANDARD AND QUALITY CONTROL

Semester: III
Credits: 4

Code: U17ND3Y3
Hours/Week: 60

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Identify and apply the various quality control measures involved in the food industry.	K2	I
CO2	Evaluate critically the role of food specification and the importance of reading food label.	K4	II
CO3	Analyze the effect of food additives and preservatives in processed foods.	K4	IV
CO4	Apply the role of sensory evaluation in the quality assessment of food products.	K4	III
CO5	Interpret the effects of food adulterants and experimentally identify common food adulterants and also the effects of naturally occurring toxins in foods.	K5	IV
CO6	Analyze various food laws in detail and their day-to-day application	.K4	V

2. A. Syllabus:

Unit I:

12 Hours

Food quality ,quality features of food, quality checking of raw materials and processed food ,simple technique of quality checking of raw food materials – cereals ,pulses, vegetables, fruits , milk and meat products, oils and spices and condiments, processed foods- tinned foods ,baked food, advantages of quality control and stages of quality control.

Unit-II

12 Hours

Quality control measures:

(a)Food specifications:- Food specifications for various food products- starchy food , milk and milk products, fruit products , beverages , spices and condiments , oils and fats; objectives and advantages .

(b)Food Additives & their specifications:- Classifications of food additives , usages and optimal level recommended for usage as specifications - Food colors , leavening agents , preservatives.

UNIT III

12 Hours

Quality Evaluation of food

(a) Subjective evaluation: Sensory characters of food, organs involved in assessment – physiological process, types of sensory test- requirements to contact sensory evaluation, Role and purpose and defects in sensory evaluation- panel member, essential qualities of a panel member, procedure of sensory evaluation, popular centres for sensory evaluation in India and their role.

(b), objective evaluation:

Objectives, requirements, different test, and instruments used for objective valuation, advantages and limitations, popular centre in India.

Unit-IV

Food contaminates and adulterants:

12 Hours

(a). Food toxins – Myco toxins – aflatoxins, aspergills and penicillium species, Mushroom poisoning sea food toxins.

(b) Other toxins- Naturally occurring in foods, Lathyragens, haemoagglutinins, goitrogens

(c) toxic minerals and other inorganic components in food and water: selenium, Fluorine, nitrates and nitrites, oxalate and phytates.

(d). Food adulterations and food standards : adulterations- Definition, common food adulterants : Test for detecting food adulterants, contamination with toxic minerals, pesticides and insecticides : Effects of food adulterants and contamination, measures to control food adulterants. Prevention of food adulterants act

Unit –V

12 hours

Food standards and food laws:

(a) international food standard and Codex Alimentarius

(b) AGMARK & BIS

(c) FSSAI

(d) HACCP,

B. Topic for Self Study:

Sl. No.	Topics	Reference
1	Adverse effects of excessive food colourants.	https://www.newdelhitimes.com/adverse-effects-of-artificial-food-dyes123/
2	Case studies from food industry regarding mishandling of food additives.	https://www.intechopen.com/books/nutrition-in-health-and-disease-our-challenges-now-and-forthcoming-time/food-additives-in-food-products-a-case-study

3	Role of sensory evaluation in coffee and tea industry	https://www.alpha-mos.com/coffee-tea-0
	Safety standards to be followed in food processing units.	https://www.ag.ndsu.edu/foodlaw/processingsector/rules-and-standards-for-food-processing

C. TEXT BOOK

1. Srilakshmi, B., “Food science” ,7th edition, New Age International Pvt. Ltd., New Delhi., 2018.
2. Potter, N.N. and Hotchkiss, H.J., “Food Science”, 5th edition, CBS Publishers and Distributors, New Delhi, 2007.

D. REFERENCES:

1. EdwardG.Schilling, “Acceptance Sampling in Quality control”, 2nd Edition, CRC Press, Mallbook., 1996
2. Swaminathan.M., “Essential of Food and Nutrition”, New Age publication, New Delhi.2011
3. EillianH.Meyer, “Food Chemistry”, Affiliated West PressPvt.,Ltd, New Delhi,1973.

D. WEBLINK:

https://www.newdelhitimes.com/adverse-effects-of-artificial-food-dyes123/
https://www.intechopen.com/books/nutrition-in-health-and-disease-our-challenges-now-and-forthcoming-time/food-additives-in-food-products-a-case-study
https://www.alpha-mos.com/coffee-tea-0
https://www.ag.ndsu.edu/foodlaw/processingsector/rules-and-standards-for-food-processing

4.Mapping Scheme for the PO, PSOs and COs

L-Low M-Moderate H- High

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	M	L	-	L	-	L	L	L	-	M	M	-	H
CO2	-	M	-	-	H	M	-	H	-	-	L	-	H
CO3	-	H	-	-	-	M	-	-	-	M	M	-	H

CO4	M	L	-	-	-	M	L	-	M	-	M	M	H
CO5	M	M	-	-	M	H	L	M	M	H	M	-	H
CO6	-	M	-	M	L	-	M	L	-	L	-	H	M

4. Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation, Case study, Preparation of questionnaire, Assessment of Anthropometry
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: MRS. K. MEERA

ALLIED PRACTICAL -II : FOOD STANDARD AND QUALITY CONTROL AND NUTRITIONAL BIOCHEMISTRY

Semester: III
Credits: 2

Code: U17NDYP2
Hours/Week: 45

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Interpret label and identify various preservatives and additives present in foods.	K4	III
CO2	Perform simple techniques of identifying food adulterants.	K4	III
CO3	Evaluate foods subjectively.	K4	IV
CO4	Identify presence of sugar and protein in urine.	K2	I
CO5	Estimate the quantity of glucose present in blood.	K4	I
CO6	Estimate the cholesterol content of blood.	K4	I

2.A. SYLLABUS

I Qualitative Analysis of urine and blood.

1. Quantitative analysis of Urine sugar, protein, Bile pigments, Bile Salts
2. Estimation of Glucose in Urine(Benedict's Method)
3. Estimation of Urea in Urine (DAM Method)
4. Estimation of Blood Glucose (Folin-WU Method)
5. Estimation of Blood Urea (DAM Method)
6. Estimation of serum cholesterol (Zak's Method)

II FOOD STANDARD AND QUALITY CONTROL PRACTICAL

Display the standard food products available in the market.

III Food Adulterants

Physical and chemical method of identifying common food adulterants.

IV SE Common foods:

Sensory Evaluation of common foods by using five point Hedonic scale.

B. References :

1. InteazAlli., "Food Quality Assurances, Principles and Practices", CRC press, India.
2. Margaret M.C. Williams, "Food Fundamentals", John Wiley and Sons, London, 1974.

4. Mapping Scheme for the PO, PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	M	L	-	L	-	L	L	L	-	M	M	-	H
CO2	-	M	-	-	H	M	-	H	-	-	L	-	H
CO3	-	H	-	-	-	M	-	-	-	M	M	-	H
CO4	M	L	-	-	-	M	L	-	M	-	M	M	H
CO5	M	M	-	-	M	H	L	M	M	H	M	-	H
CO6	-	M	-	M	L	-	M	L	-	L	-	H	M

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, laboratory maintenance
3. End Semester Examination

Indirect

Feedback

NAME OF THE COURSE COORDINATOR : MRS. K. MEERA

NMEC-I: BASICS IN NUTRITION

Semester: III

Code: U17ND3E1

Credits: 2

Hours/Week: 30

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Correlate the role of food and its importance in disease prevention.	K3	I
CO2	Compares the basic components present in food and the recommended allowance of each and every component.	K4	I, II
CO3	Classify the macronutrients in foods and their vital role in energy giving and body building functions.	K4	I
CO4	Analyze the micro and macronutrient deficiencies and the role of food in preventing them.	K4	II, III, IV, V
CO5	Acquire basic knowledge in the treatment of diseases through diet.	K4	II, III, IV, V
CO6	Appreciate the importance of good food habits in leading a healthy lifestyle.	K4	I

2.A. Syllabus:

Unit-I

Food:

Food definition, classification of food, basic five food groups classification of nutrients, RDA- reference man and women, factors influencing RDA

Unit-II

Carbohydrates: functions, sources, classifications and requirements, disorder of CHO- under nutrition and obesity and Diabetes mellitus, Role of dietary fibre in health and disease.

Unit-III

Proteins:

Sources, functions of proteins, nutritional classifications of amino acids and its requirements, deficiency of protein metabolism.

Unit-IV

Lipids:

Lipids - sources, functions of protein classifications and types of fatty acids and requirements, disorder of lipid metabolism- disease related to heart- hypertension and atherosclerosis.

UNIT -V

Macro minerals & Vitamins

Macro minerals: sources, functions. Classifications, Requirements of macro minerals and effect of deficiency and excess.

Micro minerals: sources, functions. Classifications, Requirements of iron, Iodine Zinc and flourine effect of deficiency and excess.

Vitamins

Fat soluble Vitamins: Vitamin A, Vitamin D, E & K. Functions, Sources, Requirements and Deficiency diseases.

Water soluble vitamins: Thiamine, Riboflavin, Niacin, Pantothenic acid, Biotin, Folic acid, Vitamin B12, VitaminB6 and Vitamin C, Functions, Sources , Requirements and Deficiency diseases.

B. Topics for self-study:

Sl. No.	Topics	Reference
1	Life style modification in prevention of diseases.	https://www.health.harvard.edu/newsletter_article/Lifestyle_prevention_Does_it_work_And_why
2	Food labels and their importance.	http://www.amzbolt.com/blog/Importance-of-checking-food-label/index.aspx
3	Hazards of junk food.	https://www.icicilombard.com/blog/health-insurance/hi/5-harmful-effects-of-junk-food
4	Role of vegetables in boosting immunity.	https://www.onhealth.com/content/1/immune_system_boosting_foods

C. Text Books

1. Srilakshmi, B., “Food science”, 7th edition, New Age International Pvt. Ltd., New Delhi., 2018.
2. “Dietary Guidelines for Indians”, ICMR, National Institute of Nutrition, Hyderabad, 2013

D. WEBLINKS

https://www.health.harvard.edu/newsletter_article/Lifestyle_prevention_Does_it_work_And_why
http://www.amzbolt.com/blog/Importance-of-checking-food-label/index.aspx
https://www.icicilombard.com/blog/health-insurance/hi/5-harmful-effects-of-junk-food
https://www.onhealth.com/content/1/immune_system_boosting_foods

4.Mapping scheme for the POs PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	L	M	H		-	L	-	-	L	H	M	L	-
-CO2	H	L	H		-	M	-	-	M	M	H	M	-

CO3	L	H	L		-	-	-	-	H	L	M	M	-
CO4	M	H	H		-	M	-	M	H	H	M	H	-
CO5	M	H	H		-	-	-	-	M	H	H	H	-
CO6	H	L	H		-	L	-	-	M	M	H	M	-

L- LOW M-MEDIUM H-HIGH

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation, Case study,
Preparation of questionnaire, Assessment of Anthropometry
3. End Semester Examination

Indirect

Feedback

NAME OF THE COURSE COORDINATOR : K. MAHESWARI

CORE IV: NUTRITION THROUGH LIFECYCLE

Semester: IV
Credits: 5

Code: U17ND404
Hours/Week: 90

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit Covered
CO1	Study the relationship between nutrition and health.	K2	I
CO2	Obtain knowledge on the nutritional needs pertaining to different stages of life.	K2	I
CO3	Compare the physiological changes on various stages of life and coping up with their daily dietary requirements.	K5	I,II,III,IV,V
CO4	Evaluate the changes during various stages of growth and development throughout life cycle.	K5	I,II,III,IV,V
CO5	Estimate the nutritional requirements throughout life cycle.	K5	I,II,III,IV,V
CO6	Plan and execute a diet for all stages of life and health conditions.	K5	I,II,III,IV,V

2.A. Syllabus :

UNIT – I

20 Hours

a. Basics principles of meal planning, RDA , Food allowance for different age groups, factors influencing nutritional requirements for all age groups.

b. Nutrition during Pregnancy- stages of pregnancy, physiological changes, Weight gain in pregnancy, Complications, factors influencing the outcome of pregnancy, nutritional requirements and diet planning for pregnant women.

UNIT – II

15 Hours

Nutrition for lactating women- physiology and psychology of lactation, hormonal control, colostrums-composition, composition of breast milk, Factors affecting the volume and composition of breast milk, nutritional requirements of a nursing mother, diet planning, factors responsible for the lactating failure.

UNIT – III

20 Hours

a. Nutrition in infancy- birth weight of infants, rate of growth, milestones in development (only stage) immunization schedule, nutritional requirements, process of breast feeding, comparison of human milk with cow's milk, artificial feeding, weaning and supplementary foods, feeding problems.

b. Nutrition in pre- school age- growth and development, nutritional requirements, factors affecting nutritional status, food requirement, low cost supplementary foods, nutrition related problems in childhood, diet planning for the pre- school child.

UNIT- IV

20 Hours

a. Nutrition in school age children – growth in school children, nutritional and food requirement, packed lunch-factors to be considered, sample menu for the school children.

b. Nutrition in adolescence – growth and development, body composition, puberty, secondary sexual characteristics, psychological changes, nutritional requirements, nutritional problems, malnutrition due to early marriage, food habits and diet plan.

UNIT- V

15 Hours

a. Nutrition in adulthood – reference men and reference women, nutritional requirements of an adult man and women, body composition, nutrition and health issues, planning diet to suit different income levels.

b. Nutrition in elderly – definitions of geriatrics, changes in body composition, physiological changes, psychological and socio economic factors in relation to food intake, nutritional requirement, modification of diet in old age.

B. Topics for self-study

Sl. No.	Topics	Reference
1	Effects of alcohol and smoking on pregnancy.	https://share.upmc.com/2016/03/how-smoking-alcohol-drugs-harm-your-baby/
2	Myths and realities regarding lactation.	https://www.chla.org/blog/rn-remedies/ten-myths-and-facts-about-breastfeeding
3	Feeding pre-term infants.	https://www.who.int/elena/titles/feeding_vlbw_infants/en/
4	Traditional food practices that are followed during puberty in girls and its significance.	https://www.prb.org/nutritionofwomenandadolescentgirlswhyitmatters/

C. TEXT BOOKS:

1. Mahtab,S, Banarji, Kamala Krishnasamy ,G.N.V. Brahmam, “Text book of Human Nutrition”, Third Edition,Oxford and IBH PublishingCo.P.Lit.,New Delhi, 2012.

2. Srilakshmi, B., “Dietetics”, Sixth Edition, New Age International (p) Ltd., New Delhi,2013.

D. Reference books:

1. “Dietary Guidelines for Indians”, ICMR, National Institute of Nutrition, Hyderabad,2013.

2. Gobalan,C. Rama Sastri B.V. andBalasubramanian, “Nutritive value of Indian Foods”, NIN, ICMR, Hyderabad,2014.

3. Krause,M.V and Hunscher, M.A., “Food, Nutrition and Diet Therapy”,14th Edition, W.B.Saunders. 2014

E. Weblinks

<https://share.upmc.com/2016/03/how-smoking-alcohol-drugs-harm-your-baby/>

<https://www.chla.org/blog/rn-remedies/ten-myths-and-facts-about-breastfeeding>

https://www.who.int/elena/titles/feeding_vlbw_infants/en/

<https://www.prb.org/nutritionofwomenandadolescentgirlswhyitmatters/>

4. Mapping Scheme for the PO, PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO3	PO4
CO1	M	H	H	M	H	L	L	L	H	H	H	M	M
CO2	H	H	H	H	M	M	M	-M	M	H	M	H	L
CO3	H	H	H	M	L	M	M	-M	M	H	H	M	L
CO4	M	H	H	H	M	M	M	M	M	H	H	M	L
CO5	M	H	H	H	M	L	H	M	M	L	H	H	M
CO6	H	H	H	H	M	M	H	L	L	H	M	M	L
CO7	H	H	H	H	H	H	M	H	L	M	H	M	M

L-Low

M-Moderate

H- High

5. Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation, Case study
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: MRS. C. ROSELIN

CORE IV PRACTICAL: NUTRITION THROUGH LIFECYCLE LAB

Semester: IV

Credits: 3

Code: U17ND4P4

Hours/Week: 45

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit Covered
CO1	Estimate the critical nutritional factors that contribute to healthy growth, development and functional capacity throughout life.	K4	I
CO2	Apply a variety of dietary assessment methods and describe the various measurements employed to monitor nutritional status at different life stages.	K3	I
CO3	Plan a nutritional requirement of women before and during pregnancy and lactation, discuss strategies to overcome nutrition-related problems.	K5	I
CO4	Integrate the physiological, cultural and behavioral factors that determine nutrition requirements from infancy to adulthood.	K5	I
CO5	Describe conditions associated with ageing and their nutritional implications, discuss successful dietary interventions to stabilize physiological decline and enhance physical and mental resilience.	K4	I
CO6	Support practical session equips one with the knowledge and skills to handle an emergency situation.	K5	I

2.A. Syllabus:

Menu planning

1. Planning, Preparing and serving a meal for

- a. Expectant women
- b. Lactating women
- c. Infancy
- d. Pre-School children
- e. School going children
- f. Adolescent
- g. Adult
- h. Old age person

C. References:

1. "Dietary Guidelines for Indians", ICMR, National Institute of Nutrition, Hyderabad,2013.
2. Gobalan,C. Rama Sastri B.V. andBalasubramanian, "Nutritive value of Indian Foods", NIN, ICMR, Hyderabad,2014.
3. Krause,M.V and Hunscher, M.A., "Food, Nutrition and Diet Therapy",14th Edition, W.B.Saunders. 2014

4.Mapping Scheme for the PO, PSOs and COs

L=Low M= Medium H= High

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO3	PO4
CO1	M	H	H	M	H	L	L	L	H	H	H	M	M
CO2	H	H	H	H	M	M	M	-M	M	H	M	H	L
CO3	H	H	H	M	L	M	M	-M	M	H	H	M	L
CO4	M	H	H	H	M	M	M	M	M	H	H	M	L
CO5	M	H	H	H	M	L	H	M	M	L	H	H	M
Co6	M	M	H	M	L	L	L	L	H	H	M	M	L

5.Course assessment methodsDirect

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation, Case study, Preparation of questionnaire, Assessment of Anthropometry
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: MRS. C. ROSELIN

ALLIED IV : NUTRITIONAL BIOCHEMISTRY

Semester: IV
Credits: 4

Code: U17ND4Y4
Hours/Week: 60

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit Covered
CO1	Obtain an in-depth understanding on the functioning of cells.	K2	I
CO2	Correlate various metabolic pathways with thorough understanding of their interrelationship.	K4	I
CO3	Evaluate the effects of the essential amino acids and their role in carbohydrate metabolism and vitamin synthesis.	K5	II
CO4	Analyse the effect of metabolism on various disorders.	K4	I,II,III,IV,V
CO5	Interpret the role of nucleic acids and the role of DNA and RNA.	K5	IV
CO6	Interpret the fate of food in the body in both health and disease	K5	I,II,III,IV,V

2.A. Syllabus:

UNIT-I **12Hours**
Carbohydrate Metabolism
Definition, Classification of carbohydrates – Monosaccharide, Disaccharide and polysaccharide. Metabolism – glycolytic pathway, Electron transport chain, glycogenesis, Glycogenolysis and Gluconeogenesis. Disorder of carbohydrate metabolism-Diabetes mellitus – Definition, Types, Diagnosis and Complications

UNIT-II **12 Hours**
Protein metabolism
a) Definition, Classification of protein, Structure, Physical properties, Chemical properties, Amino acids- Essential and non- essential.
b) Inborn errors of amino acid metabolism-Albuminuria, phenylketonuria, cystinuria and Maple syrup disease.

UNIT-III **12 Hours**
Lipid metabolism
a) Definition, Structure, Classification of lipids-Saturated, Unsaturated fatty acid, Bio Synthesis of fatty acid.
b) **Lipoproteins:** Types, composition, role and significance in diseases.

- c) **Inborn errors of fat metabolism**-Wolman disease, Gaucher's disease and Niemannpick disease.

UNIT-IV

12 Hours

Genetic & Liver Function Metabolism

- a) Nucleic acids – Types, Composition, Functions, Replication and Transcription.
- b) **Liver function test**- Functions of Liver, Tests based on metabolic functions, capacity for detoxification, enzymes, Bile Synthesis.

UNIT-V

12 Hours

Basic Clinical Techniques:

- a) Collection and preservation of blood and urine - Normal and abnormal constituents of urine and blood.

Renal Function Tests:

- b) Insulin clearance test, urea clearance test, endogenous creatinine clearance, concentration test, addis test, mosenthal test, urea concentration test and dye test.

B. Topics for self-study

Sl. No.	Topics	Reference
1	Oligosaccharides in health and disease.	https://www.verywellfit.com/oligosaccharides-and-prebiotics-health-benefits-2242223
2	Branched Chain Amino Acids in energy production.	https://nutritionandmetabolism.biomedcentral.com/articles/10.1186/s12986-018-0271-1
3	EPA and DHA in health.	https://www.webmd.com/diet/features/what-to-know-about-omega-3s-and-fish#1
4	Common genetic aberrations.	https://www.medicinenet.com/genetic_disease/article.htm

C. TEXT BOOKS

1. AmbikaShanmugam, "Fundamentals of Biochemistry for Medical Students", Seventh Edition, New age publishing Pvt.Ltd., New Delhi, 1986.
2. Deb.A.C., "Fundamentals of Bio chemistry", 5th edition, New Central Book Agency(P) Ltd.,1992.
3. Sathyanarayana,U.,Chakrapani,U., "Textbook of Biochemistry". 3rd edition, Books and Allied (P) Ltd, Kolkata, , 2010.

D. REFERENCE BOOKS

1. West, E.S., Todd, W.R., Mason, H.S and Van Bruggen, J.T, "Text book of biochemistry", Amerind , 4th Edition, Publishing Co PvtLTd., 1974.

2. Devlin, T.M., "Text Book of Biochemistry (with Clinical corrections)", 2nd edition, John Wiley and sons, 1986.
4. Ramakrishnan,S.,Prassanan,K.G.,Rajan,R., "Text book of Medical Bio chemistry", 2nd edition, Orient Longman limited, 1989.

E. Weblinks :

https://www.verywellfit.com/oligosaccharides-and-prebiotics-health-benefits-2242223
https://nutritionandmetabolism.biomedcentral.com/articles/10.1186/s12986-018-0271-1
https://www.webmd.com/diet/features/what-to-know-about-omega-3s-and-fish#1
https://www.medicinenet.com/genetic_disease/article.htm

4.Mapping Scheme for the PO, PSOs and COs

L-Low M-Moderate H- High

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	M	L	-	L	-	L	L	L	-	M	M	-	H
CO2	-	M	-	-	H	M	-	H	-	-	L	-	H
CO3	-	H	-	-	-	M	-	-	-	M	M	-	H
CO4	M	L	-	-	-	M	L	-	M	-	M	M	H
CO5	M	M	-	-	M	H	L	M	M	H	M	-	H
CO6	-	M	-	M	L	-	M	L	-	L	-	H	M

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation, metabolic cycle representation
3. End Semester Examination

Indirect

Feedback

NAME OF THE COURSE COORDINATOR: MRS. K. MEERA

**ALLIED PRACTICAL II: FOOD STANDARD AND QUALITY CONTROL AND
NUTRITIONAL BIOCHEMISTRY PRACTICAL**

Semester: III & IV
Credits: 2

Code: U17NDYP2
Hours/Week: 45

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Read label and identify various preservatives and additives present in foods.	K2	II
CO2	Perform simple techniques of identifying food adulterants.	K5	III
CO3	Evaluate foods subjectively.	K5	IV
CO4	Analyze presence of sugar and protein in urine.	K4	I
CO5	Estimate the quantity of glucose present in blood.	K5	I
CO6	Estimate the cholesterol content of blood.	K5	I

2.A. Syllabus:

Qualitative Analysis of urine and blood.

1. Quantitative analysis of Urine sugar, protein, Bile pigments, Bile Salts
2. Estimation of Glucose in Urine(Benedict's Method)
3. Estimation of Urea in Urine (DAM Method)
4. Estimation of Blood Glucose (Folin-WU Method)
5. Estimation of Blood Urea (DAM Method)
6. Estimation of serum cholesterol (Zak's Method)

II FOOD STANDARD AND QUALITY CONTROL PRACTICAL

Display the standard food products available in the market.

III Food Adulterants

Physical and chemical method of identifying common food adulterants.

IV SE Common foods:

Sensory Evaluation of common foods by using five point Hedonic scale.

B. References :

1. IntezAlli., "Food Quality Assurances, Principles and Practices", CRC press, India.
2. Margaret M.C. Williams, "Food Fundamentals", John Wiley and Sons, London, 1974.

4.Mapping Scheme for the PO, PSOs and COs

L-Low M-Moderate H- High

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	M	L	-	L	-	L	L	L	-	M	M	-	H
CO2	-	M	-	-	H	M	-	H	-	-	L	-	H
CO3	-	H	-	-	-	M	-	-	-	M	M	-	H
CO4	M	L	-	-	-	M	L	-	M	-	M	M	H
CO5	M	M	-	-	M	H	L	M	M	H	M	-	H
CO6	-	M	-	M	L	-	M	L	-	L	-	H	M

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Laboratory Practices
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: MRS. K. MEERA

NMEC -II : DIET IN HEALTH AND DISEASE

Semester: IV

Code: U17ND4E2

Credits: 2

Hours/Week: 30

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Identify the essentials of food constituents and its important functions in our body.	K2	I
CO2	Explain the role of diet for persons with fever, obesity, underweight and anemia.	K4	II
CO3	Compare the effect of healthy food and physical activity on human body.	K4	III
CO4	Interpret the results of unhealthy lifestyle and inheritance of genes.	K4	IV
CO5	Discuss the nutritional requirements during different diseases and disorders.	K4	IV
CO6	Analyze the nutritional deficiencies and other risk factors associated with various nutritional problems and its dietary management.	K4	V

2.A.Syllabus:

Unit-I

6 Hours

Nutrition and nutrients:

Food - definition ,classification of food, basic five food groups classification of nutrients, RDA- reference man and women, factors influencing RDA.

Macronutrients and micronutrients.

UNITII

6 Hours

Diet in Fever

- Causes, Types, general Dietary consideration
- Typhoid, Influenza, Malaria and Tuberculosis
- Diet in Obesity and underweight.
- Nutritional Anaemia – prevalence, causes, Types, iron deficiency anaemia and Prevention of anaemia.

UNIY – III**6 Hours****Diet in Cardio vascular disease**

- a. Prevalence, clinical effects
- b. Risk factors, Role of fat in the development of atherosclerosis
- c. Hypertension
- d. Dietary management
- e. physical activity and Heart diseases

UNIT IV**6 Hours****Diet in Diabetes Mellitus**

- a. Prevalence, Types, etiology and symptoms
- b. Diagnosis, treatment and Complication
- c. Dietary management

Diet in diseases of the Kidney

- a. Functions of kidney
- b. Symptoms, Chronic and acute renal failure and urinary Calculi
- c. Principles of Dietary Management

UNIT V**6 Hours****Diet in Cancer**

- a. Risk factors and Symptoms
- b. Nutritional problems of Cancer therapy
- c. Nutritional requirements
- d. Role of food in the prevention of cancer.

B. Topics for self-study:

Sl. No.	Topics	Reference
1	Role of fiber in health and disease.	https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/fiber/art-20043983
2	Common immunity boosters which help in viral infections .	https://www.onhealth.com/content/1/immune_system_boosting_foods
3	Prevention of diabetes and heart disease through lifestyle modification.	https://www.health.harvard.edu/newsletter_article/Lifestyle_prevention_Does_it_work_And_why
4	Harmful preservatives found in junk food.	https://www.icicilombard.com/blog/health-insurance/hi/5-harmful-effects-of-junk-food

C. References:

1. Antia P. "Clinical Dietetics and Nutrition", 2nd edition, Oxford University Press.
2. Garrow J.S, James W.P.T, Ralph A, (2000), "Human Nutrition and Dietetics", 10th edition, Churchill Livingstone, London.
3. Srilakshmi B, "Dietetics", 7th Edition, New Age International, New Delhi, (2016).

D. WEBLINKS:

<https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/fiber/art-20043983>

https://www.onhealth.com/content/1/immune_system_boosting_foods

https://www.health.harvard.edu/newsletter_article/Lifestyle_prevention_Does_it_work_And_why

<https://www.icicilombard.com/blog/health-insurance/hi/5-harmful-effects-of-junk-food>

4. Mapping scheme for the POs PSO and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	H	-	M	L	-	-	-	-	M	M	M	M	-
CO2	-	H	M	H	-	-	M	H	H	H	H	H	-
CO3	H	-	L	H	L	-	L	-	-	-	M	-	-
CO4	-	M	M	M	L	-	L	-	-	-	M	-	-
CO5	L	-	M	H	H	L	M	L	H	M	H	H	-
CO6	M	M	M	H	H	L	M	H	H	M	H	H	-

5. Course assessment methods

Direct

1. Continuous Internal Assessment I, II
2. Group discussion, Presentation, Assignment, Poster presentation, Case study, Preparation of questionnaire, Assessment of Anthropometry
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: K. MAHESWARI

CORE V : DIETETICS- I

Semester: V

Code: U17ND505

Credits: 5

Hours/Week: 90

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	comprehend the concept, purpose and principles of diet therapy and role and types of dietitians.	K4	I
CO2	Explain in-depth knowledge in the running of a dietary department in a hospital.	K3	I
CO3	Identify and solve problems by thinking critically and integrating scientific information and research into practice.	K3	II
CO4	Develop and deliver appropriate information, products, and services to individuals, groups, and populations.	K5	III
CO5	Evaluate the role of various feeding techniques and identify the appropriate technique needed for a specific patient and discuss the role of various nutraceuticals as a dietary supplement.	K5	V
CO6	Formulate etiological factors and complications, assessment parameters and dietary modifications in management of weight and the dietetic treatment for diseases of digestive system.	K5	IV

2.A.SYLLABUS

UNIT – I

(18hours)

Basic Concepts about Dietetics

- a. Definition of dietetics, dietitian, goals of diet therapy.
- b. Types of dietitian, role and responsibilities of dietitians, qualifications, qualities and professional ethics, code of conduct.
- c. Therapeutic adaptations of normal diet, Routine hospital diets –Regular, soft, full fluid, clear fluid diet.
- d. Specially modified therapeutic diets, High calorie, low calorie, high and low protein, bland, high and low residue diets.

UNIT- II

(18hours)

Special feeding methods

- a. Enteral nutrition – methods – nasogastric, gastrostomy and jejunostomy. Types of food, infusion techniques, TPN – Types of infusion, TPN formula for adults.
- b. Dietary modification, diet planning and preventive measures for – PEM, iron deficiency anaemia and Vitamin A deficiency.
- c. Causes, risk factors, pathogenesis, dietary modifications, diet planning and counseling measures for febrile conditions – fevers of long duration and short duration.

UNIT- III**(18hours)****Malnutrition**

- Causes, risk factors, pathogenesis, dietary modifications, diet planning and counseling measures for overweight.
- Causes, risk factors, pathogenesis, dietary modifications, diet planning and counseling for underweight.
- Anorexia nervosa and Bulimia.

UNIT IV**(18hours)****Diseases of the gastrointestinal tract**

Diseases of upper-gastrointestinal tract: Causes, pathogenesis, dietary modification and diet planning for:

- GERD
- Gastritis
- Peptic ulcer

Diseases of lower-intestinal tract: Causes, pathogenesis, dietary modification and diet planning for:

- Diarrhea, dysentery
- Constipation.
- Haemorrhoids.
- Surgery of colon – gastrostomy, jejunostomy.
- Cancer of colon.

UNIT V**(18hours)****Nutraceuticals & Dietary counselling**

- Nutraceuticals** – Definition, types, use of nutraceuticals in the prevention and treatment of – obesity, Diabetes, CVD and Cancer.
- Functional foods .

B. Topics for self-study:

Sl. No.	Topics	Reference
1	Type of feeding in pre-term neonates.	https://www.who.int/elena/titles/feeding_vlbw_infants/en/
2	Different type of feeding techniques in bariatric surgery.	https://www.mayoclinic.org/tests-procedures/gastric-bypass-surgery/in-depth/gastric-bypass-diet/art-20048472
3	Traditional functional foods in preventing viral infections.	https://encyclopedia.pub/item/revision/1c614cb88c258b6b3e8e24d193f76d33

C. Text Books:

- Srilakshmi, B. “Dietetics”, 7th Edition, New Age International P. Ltd., New Delhi, 2016.
- “Dietary Guidelines of Indians” – A Manual, National Institute of Nutrition, Hyderabad, 2011.
- Garg, M. ,“Diet, Nutrition and Health”, ABD Publishers, 2006.
- Corinne H.Robinson, M.R.Lawber, W.L.Chenoweth and A.E.Garwick, “Normal and Therapeutic Nutrition”, MacMillan Publishing CO, New York, 1982

D. Reference Books:

1. Krause, M.V. and Mahan, L.K. "Food, Nutrition and Diet Therapy", 14th Edition W.B. Saunders Company, Philadelphia, 2009.
2. MaimunNisha, "Diet Planning for Diseases", Kalpaz Publishers, 2006.

4.Mapping Scheme for the PO, PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO3	PO4
CO1	H	H	H	H	H	L	M	L	M	H	H	H	M
CO2	H	H	H	H	H	M	H	L	L	H	H	L	L
CO3	H	H	H	H	H	H	H	M	M	M	H	M	M
CO4	M	M	H	H	H	H	M	M	L	H	H	M	L
CO5	L	M	M	M	M	M	M	M	M	M	H	L	M
CO6	M	M	M	M	M	M	M	L	L	H	M	M	M

L-Low

M-Moderate

H- High

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: C. ROSELIN

CORE VI : COMMUNITY NUTRITION

Semester: V

Code: U17ND506

Credits: 5

Hours/Week: 90

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit Covered
CO1	Develop ideas to improve health and nutrition in the community.	K4	I
CO2	Predict the reasons for malnutrition and improve the health status of affected individuals.	K5	II
CO3	Summarize the role of different National and International organizations for the welfare of individuals.	K5	IV
CO4	Explain prophylaxis programmes, a Solution to nutrition crisis using nutrition education.	K4	IV
CO5	Evaluate the relationship between malnutrition and national disasters and other environmental factors to create awareness using nutrition education.	K5	V
CO6	Assess the nutritional status of the individuals using various assessment methods.	K5	III

2.A. SYLLABUS

UNIT-I (15hours)
Malnutrition
Nutrition and healthin National Development: Malnutrition - Etiology , symptoms, Under nutrition and Over nutrition, Prevalence of malnutrition, balance between food and population growth.

UNIT-II (18hours)
Macro and Micro Nutrient Deficiency
Nutritional problems confronting our country - PEM - classification - Kwashiorkar and Marasmus - etiology, symptoms, pathological changes, biochemical changes, Anaemia- etiology, symptoms, prophylaxis Prevalence programmes.

UNIT-III (21hours)
Nutritional Assessment
Methods of assessment of Nutritional status - sampling, Direct assessment - Diet survey, anthropometry, clinical and biochemical estimation. Indirect assessment - Food balance sheet, Agricultural data, Ecological parameter and vital statistics, use of growth chart.

UNIT-IV (18hours)
Nutritional Programme
Role of National and International organizations - ICDS, Noon Meal Programme, FAO, WHO, UNICEF, CARE, ICMR, ICAR, CSIR, NIN, CFTRI, National Nutrition Policy, NGO.

UNIT-V (18hours)

Nutrition Education& Intervention programme:

Nutrition Education - Meaning, Scope, Methods - Planning, conduct of evaluation of Nutrition education Programme.

B. Topics for self-study:

Sl. No.	Topics	Reference
1	Incidence of vitamin B-complex deficiency in malnourished children.	http://www.theprofesional.com/index.php/tpmj/article/download/3937/3041/
2	Food security and national development.	http://www.fao.org/sustainable-development-goals/overview/fao-and-the-post-2015-development-agenda/food-security-and-the-right-to-food/en/
3	New nutritional policies implemented recently (after 2018).	https://niti.gov.in/writereaddata/files/document_publication/Nutrition_Strategy_Booklet.pdf
4	Public distribution system.	https://economictimes.indiatimes.com/definition/Public-distribution-system

C. TEXT BOOKS

1. A Lesties Banks and Hislop J.A., “Health and Hygiene”, Universal Tutorial Press, London, 1987.
2. Senha H.K, “Challenges in Rural Development” I Discovery publishing, 1996.
3. “Food consumption and planning” - Vol V, International encyclopedia, 1998

D. REFERENCE

1. Willium Hobson., “Theory and practice of public Health”, Oxford University press, London, 2001
2. Sabarwal B, “Applied Nutrition and Health Education”, Common wealth publishers, New Delhi, 2003
3. Barbara Hernandez., McGraw Hill., “Foundations of Community Health Education, London, 1999
4. P.K. Shukla, “Nutritional Problems of India”, Prentice Hall, India, 2001

E. WEBLINKS:

http://www.theprofesional.com/index.php/tpmj/article/download/3937/3041/
http://www.fao.org/sustainable-development-goals/overview/fao-and-the-post-2015-development-agenda/food-security-and-the-right-to-food/en/
https://niti.gov.in/writereaddata/files/document_publication/Nutrition_Strategy_Booklet.pdf

<https://economictimes.indiatimes.com/definition/Public-distribution-system>

4. Mapping scheme for the POs PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	M	H	H	H	-	L	-	M	H	H	H	M	-
CO2	H	-	H	H	M	M	H	H	H	H	H	L	M
CO3	-	H	-	-	M	H	L	L	-	-	-	-	-
CO4	M	H	H	H	-	H	M	H	H	M	-	H	L
CO5	-	-	M	H	H	H	H	H	-	M	-	L	L
CO6	L	L	-	M	H	-	-	L	-	-	L	-	-

L- LOW M-MEDIUM H-HIGH

5. Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation, community nutrition camps, nutrition education
3. End Semester Examination

Indirect

Feedback

NAME OF THE COURSE COORDINATOR: K. MEERA

PRACTICAL -CORE V : DIETETICS- I LAB

Semester: V

Code: U17ND5P5

Credits: 3

Hours/Week: 60

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Analyze the epidemiology of various diseases and plan diet accordingly.	K4	I
CO2	Evaluate the need of each and every patient and plan diet according to their individual needs.	K5	I
CO3	Plan and execute a diet for various disease conditions.	K6	I
CO4	Acquire practical knowledge in hospitals by attending dietary internship.	K5	I
CO5	Equip themselves in the field of dietetics and to approach different patients.	K6	I
CO6	Develop the managerial skills in preparation of diet and supervision both professionally and personally.	K6	I

2.A.SYLLABUS

1.Planning,Nutritive value calculation and preparation of Various Diets

- a. Clearfluid diet, full fluid diet and soft diet.
- b. Low and medium cost diet for protein calorie malnutrition,
- c. Fevers
- d. Diet for Vitamin A deficiency and iron deficiency anaemia
- e. diet for Obese and underweight conditions.
- f. Diet for Peptic ulcer, diarrhoea and constipation.
- g. Diet for Surgery and burns.

B. References:

1. Garg.M. Diet, "Nutrition and Health", ABD Publishers,2006.

2. NIN.,“Dietary Guidelines of Indians- A Manual”, National Institute of Nutrition, Hyderabad,2011.

4.Mapping scheme for the POs PSOs and Cos

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	L	L	M	H	H	M	H	H	L	H	H	H	L
CO2	M	M	M	H	H	M	H	H	L	H	H	H	L
CO3	M	H	H	H	M	H	M	H	M	H	H	H	L
CO4	-	M	L	L	L	-	-	M	L	M	M	H	-
CO5	L	H	L	H	L	-	-	M	M	M	M	M	-
CO6	H	H	L	H	L	M	-	H	-	L	-	-	H

5.COURSE ASSESSMENT METHODS

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation, Case study
3. End Semester Examination

NAME OF THE COURSE COORDINATOR: C. ROSELIN

Elective I: FOOD PRESERVATION

Semester: V

Code: U17ND5;1

Credits: 4

Hours/Week: 75

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Extend the knowledge in preservation, needs and in their principles.	K2	I
CO2	Utilize various food additives and techniques in surplus foods during season to avoid wastage.	K3	II
CO3	Compare and contrast the ancient and modern techniques of food preservation that helps in preventing food spoilage.	K4	III
CO4	Analyze the role of microbes in food spoilage and its effects on human.	K4	IV
CO5	List the preserved food products available in the market and the preservatives used with its uses.	K4	V
CO6	Apply the preservation techniques in preserving various foods to become a successful entrepreneur.	K3	V

2.A.SYLLABUS

UNIT I PRESERVATION

(13hours)

- (i) History, importance.
- (ii) Definition, needs, principles of food preservation.
- (iii) Methods of low and high temperature.
- (iv) Dehydration – Types, objectives and principles of dehydration, steps involved in dehydration process, merits and demerits- effects on nutritive value in dehydrated foods.

UNIT II FOOD ADDITIVES

(15hours)

- (i) Food additives – Definition; Preservatives – class 1 and class 2 preservatives, colours, flavouring agents, sweeteners, emulsifiers and stabilizers, leavening agents, antioxidants, flour improvers.
- (ii) Government regulations.

UNIT III PRESERVATION TYPES

(17hours)

- (i) Bacteriostatic – Dehydration-types of dehydration (Sun drying, spray drying) Pickling, Salting, Smoking, Freezing – slow and quick, merits and demerits.
- (ii) Bactericidal – Canning-steps involved in the process of canning, Irradiation, microwave cooking.

UNIT IV**(15hours)****Food Spoilage**

- (i) Definition, role of microorganisms in food spoilage, types of food spoilage, causes of spoilage, factors affecting spoilage, kinds of spoilage – perishable and non-perishable.
- (ii) Anaerobic and aerobic microorganisms involved in food preservation – mold, fungi, bacteria.
- (iii) Remedial measures to be taken on spoilage.
- (iv) Storage conditions – storage conditions leading to food spoilage.

UNIT V**(15hours)****PRESERVED FOODS**

- (i) Products using sugar - squash, jam, jelly
- (ii) Products using salt - tomato ketchup, pickles, chutneys.
- (iii) Preservation using vinegar
- (ii) Preparation of dehydrated products – papads, vathal, vadams and dehydrated vegetables.

B. Topics for self-study

Sl. No.	Topics	Reference
1	Walk-in refrigerators in Five-star hotels.	https://www.irl.co.in/products/walk-in-cooler.html
2	Conventional sun drying versus mechanized dehydration.	http://ecoursesonline.iasri.res.in/mod/page/view.php?id=111449
3	Natural food additives as antioxidants.	https://madridge.org/journal-of-food-technology/mjft-1-1000102.php
4	Fenugreek as a preservative.	https://www.freepatentsonline.com/6372220.html#

C. TEXTBOOKS

1. N.ShakuntalaManay&M.Shadaksharaswamy, “Foods Facts and Principles (III Revised Edition)”, New Age International (P) Ltd. Publishers, New Delhi,2011
2. M.Swaminathan., “Food and Nutrition”, Bangalore Printing and Publishing Company, Bangalore,2010

D. REFERENCES

1. Maria Parloa (2012), “Canned fruit, preserves and jellies: Household methods of preparation”, Published by US department of Agriculture, Washington
2. M. Shafiur, Rahman (2017), “Handbook of food preservation,” 2nd edition, CRC press.

E. WEBLINKS:

<https://www.irl.co.in/products/walk-in-cooler.html>

<http://ecoursesonline.iasri.res.in/mod/page/view.php?id=111449>

<https://madridge.org/journal-of-food-technology/mjft-1-1000102.php>

<https://www.freepatentsonline.com/6372220.html#>

4. Mapping scheme for the POs PSOs and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	L	-	-	-	-	H	-	M	L	H	-	M	H
CO2	-	-	-	L	-	H	-	-	L	L	-	L	H
CO3	-	-	M	-	-	H	-	M	-	-	-	L	M
CO4	H	-	L	H	L	H	M	L	M	L	-	M	-
CO5	H	-	L	L	M	M	-	-	-	L	-	L	M
CO6	-	-	-	-	M	L	M	M	-	H	-	M	H

L- LOW M-MEDIUM H-HIGH

5. Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation, collection of labels
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: K. MAHESWARI

Elective II: PRINCIPLES OF RESOURCE MANAGEMENT AND INTERIOR DESIGN

Semester: V

Code: U17ND5:3

Credits: 4

Hours/Week: 75

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Make use of efficient management skills with good managerial potentials and Identify human and non-human resources for efficient management of the family	K3	I
CO2	Explain put forth by recent trends in availability of resources	K2	II
CO3	Evaluate elements needed for appropriate designing to achieve required visual effect.	K5	III, V
CO4	Analyze theme-based color harmonies in interiors.	K3	II
CO5	Evaluate and choose furniture for different areas of an establishment.	K5	IV
CO6	Determine the composition, construction, and finishes applied on fabrics for furnishings.	K5	V

2.A.SYLLABUS

UNIT I

(18hours)

1.1 **Resource Management:** Understanding, meaning, classification and characteristics of resources, factors affecting utilization of resources.

1.2 Maximizing the use of resources and resource conservation.

1.3 Availability and management of specific resources by an individual / family-money, time, energy, space.

1.4 **Functions of management:** Decision making, planning, supervising, controlling, organizing.

UNIT II

(18hours)

2.1 **Design and good taste:** Objectives of aesthetic planning, beauty, expressiveness, functionalism, concept of design, purpose of design, elements of design, types of design, structural design and decorative design.

2.2 **Colour:** Sources of colour – dimension of colour (hue, value, intensify/chroma). The pang colour system (primary, secondary, intermediate hue, tertiary and quaternary colour).

2.3 **Procedure for making a colour scheme for a room:** Factors affecting the use of colour scheme for room (the room, mood, style, fashion, personality, possession).

2.4 Application of art principle in the use of colours for a room (balance, proportion, harmony, rhythm, emphasis).

UNIT III

(18hours)

3.1 **Lighting:** Source of light (natural, artificial light).

3.2 **Types of lighting:** General/ambient lighting, task lighting, accent lighting.

3.3 **Requirements of an ideal lighting installation** – Steadiness of the source of light, elimination of glare, avoidance of shadows, sufficient illumination to suit the nature of the visual task, nonproduction of excessive heat, minimum consumption of oxygen from the air.

UNIT IV

(18hours)

- 4.1 **Furniture:** Requirement and arrangement in the home, materials used in furnishing items.
 4.2 **Furnishing:** Different types of furnishing, factors considered in the selection of furnishing.
 4.3 **Floor coverings:** Factors for selecting floor coverings, salient features of carpet, types use and care of floor coverings.

UNIT V

(18hours)

- 5.1 Accessories: Selection, types, use and care of accessories.
 5.2 Traditional and Modern: Art objects, pictures.
 5.3 Flower arrangement: Principles, types and steps in preparing flower arrangement.

B. Topics for self-study:

Sl. No.	Topics	Reference
1	Comparison of resource management techniques at home and industry.	https://www.planview.com/resources/guide/resource-management-software/top-12-resource-management-best-practices/
2	Interior design for budget consumers.	https://www.housebeautiful.com/home-remodeling/interior-designers/g4293/interior-designer-tricks-to-update-a-room/
3	National and international flower arrangements.	https://www.myweddingplanning.in/wedding-flower-decor
4	Personal touch in decorating your house.	https://www.homify.in/ideabooks/729123/heres-how-to-add-a-personal-touch-to-your-home-decor

C. TEXTBOOKS

1. Graig, H.T., and Rush, C.H. “Homes with Character”, D.C. Health and Company, Boston 1965.
2. Alexender, M.J., “Designing Interior Environment”, Har Court Brace Jauaroui Inc., New York, 1972.
3. Sherwood, R.F. “Homes Today and Tomorrow”, Chart Bannet, Co., Inc., PEORIC, Illinois, 1972.
4. Premavathy Seetharaman and Parveen Banu, “Interior Design and Decoration”, CBS Publishers, New Delhi, 2007.

D. REFERENCES

1. Nickell, P. and Dorsey, J.M. “Management in Family Living”, John Wiley and Sons, Inc, New York 1960.
2. Goldstein, H and Goldstein, V. “Art in Everyday Life”, Macmillan and Company, New York, 1966.

3. Rutt, A.H., "Home Furnishings", John Wiley and Sons, New York, 1961.
4. Roy Day, "All about Decorating Your Home" Hamlyn, London, 1976.

D. WEBLINK:

https://www.planview.com/resources/guide/resource-management-software/top-12-resource-management-best-practices/
https://www.housebeautiful.com/home-remodeling/interior-designers/g4293/interior-designer-tricks-to-update-a-room/
https://www.myweddingplanning.in/wedding-flower-decor
https://www.homify.in/ideabooks/729123/here-s-how-to-add-a-personal-touch-to-your-home-decor

4.Mapping scheme for the POs PSOs and COs

L- LOW M-MEDIUM H-HIGH

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	-	-	M	-	M	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation, model making
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: S. PREETHI

SBEC II: NUTRITION IN SPECIAL CONDIIION

Semester: V

Code: U17ND5S2

Credits: 2

Hours/Week: 30

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Evaluate the concept, purpose and principles of diet therapy for children with special needs.	K5	I
CO2	Gain in-depth knowledge in various epidemics and endemics and planning a diet for the same.	K4	II
CO3	Identify and solve food related issues during natural disasters.	K2	III
CO4	Develop and deliver appropriate information, products, and services to individuals, groups, and populations.	K6	II
CO5	Evaluate the role of various feeding techniques for people in special environments such as spacecraft and remote areas such as army personnel.	K5	V
CO6	Plan and prepare a balanced diet for people with special needs.	K6	IV

2.A. SYLLABUS

UNIT I:

(6 hours)

Nutritional care for the children with special needs

Overview of the disability, food and nutritional needs and their modification.

- i. Attention deficit hyperactivity disorder.
- ii. Autism.
- iii. Cerebral palsy.
- iv. Down's syndrome.

Unit-II

(6 hours)

Epidemic diseases - (i) Dengue, chikenguniya and other epidemic conditions.

Hypothyroidism and hyperthyroidism.

Wilson's Disease.

Unit- III

(6 hours)

Nutritional Emergency

Nutrition during emergency: Natural calamity - war, flood, fire famine

Nutrition in sea voyage, Mountaineering,

Unit- IV

(6 hours)

Space Nutrition:

Food Selection. Food preparation for space ,Planning and serving the food, Classification of space food and Dehydrated foods use in space.

Unit – V**(6 hours)****Armed forces nutrition:**

The history of Military nutrition, Nutrient Support in Military person, the role of nutrient in injured person, Estimation of energy and protein metabolism in armed person.

B. Topics for self-study:

Sl. No.	Topics	Reference
1	Role of nutrition in pandemic. .	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7306972/#:~:text=Nutritional%20status%20of%20individuals%20has,to%20strengthen%20the%20immune%20system
2	Recent natural calamity which needed nutritional support.	https://www.todaysdietitian.com/newarchives/0118p34.shtml
3	Military nutrition in different terrains.	https://apps.dtic.mil/dtic/tr/fulltext/u2/a269969.pdf
4	Evolution of space nutrition.	https://www.history.com/news/cosmic-cuisine-the-evolution-of-space-food#

C.References:

1. Gibney ., “Public Health Nutrition”,Blackwell Publishing, 2004.
2. Khanna., “Textbook of Nutrition and Dietetics”, Phoenix Publisher,2013.
- 3.Sharma S, Wadhwa A.,“Nutrition in the Community- A textbook”, Elite Publishing House Pvt. Ltd, 2003.
4. Srilakshmi B. “Dietetics” Seventh Edition, New Age International (P) Ltd, 2016
5. Bamji MS, Rao NP, and Reddy V. Text Book of Human Nutrition; Oxford & IBH Publishing Co. Pvt Ltd, 2009.
6. Lakra P, Singh MD. Textbook of Nutrition and Health,, First Ed, 2008; Academic
7. Defiance Food Services Integrated Project Food for thought (DVD), Team 2007.

D. WEBLINKS:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7306972/#:~:text=Nutritional%20status%20of%20individuals%20has,to%20strengthen%20the%20immune%20system
https://www.todaysdietitian.com/newarchives/0118p34.shtml
https://apps.dtic.mil/dtic/tr/fulltext/u2/a269969.pdf
https://www.history.com/news/cosmic-cuisine-the-evolution-of-space-food#

4.Mapping Scheme for the PO, PSOs and COs

L=Low M= Medium H= High

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO3	PO4
CO1	M	H	H	H	M	M	L	L	L	H	H	L	L
CO2	M	H	H	H	M	M	L	L	M	H	M	L	L
CO3	H	M	H	M	M	M	M	L	M	M	L	M	L
CO4	H	H	M	M	M	M	M	L	L	M	M	M	L
CO5	M	H	M	M	L	L	M	M	M	M	H	L	M
CO6	H	M	H	M	M	M	M	M	M	H	M	L	M

L-Low

M-Moderate

H- High

5. Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment
3. End Semester Examination

Indirect

Feedback

NAME OF THE COURSE COORDINATOR: K. MEERA

SBEC III: BAKERY AND CONFECTIONERY

Semester: V

Code: U17ND5S3

Credits: 2

Hours/Week: 30

1.Course Outcomes:

After completion of this course the students will be able to

CO. No	Course Outcomes	Level	Unit
CO1	Develop knowledge on the basic principles and concepts of bakery industry	K3	I
CO2	Analyze the role of various major and minor ingredients in baking	K4	II
CO3	Examine the role of yeast in bread making and the type of doughs in bakery industry	K4	III
CO4	Develop deep sense of knowledge in cake making, the faults and remedial measures in cakes	K3	II
CO5	Apply principles of baking in the preparation of biscuits and cookies, faults and its remedies in it.	K3	V
CO6	Develop entrepreneur skills with the knowledge of baking.	K3	IV

2.A.SYLLABUS

UNIT I

(6hours)

Introduction of bakery—definition, principles, types of baked and confectionary products.

Major and minor equipment – required to start a small bakery unit.

UNIT II

(6hours)

Major and minor ingredient in baking

Major ingredients – flour, fat, sugar and leavening agent – types, role in bakery

Minor ingredients – milk, water, salt – types, role in bakery

UNIT III

(6hours)

Bread

Principles involved in the yeast products preparation, methods – straight dough method, salt delayed method, no dough time method, sponge and dough method, ferment and dough method.

Methods of Processing

Faults and remedies in baked bread, types of bread improvers.

UNIT IV

(6hours)

Cake

Principles involved in the preparation of cake, sponge cake – types (fatless sponge, Genoese sponge, plain sponge, gel sponge).

Methods – sugar batter method, flour batter method, blending method, boiling method, sugar water method, all-in process method (slow speed, medium speed, fast speed), foaming method.

Faults and remedies in baked cakes.

Icing –Types and Preparation Methods

UNIT V

(6hours)

Biscuits and cookies

Principles involved in cookies preparation, methods for mixing cookies – single or one stage method, creaming or sugar batter method, blending or rub in method, foaming method, flour batter method.

Types – sheeted types, piped types, bar types, dropped types, rolled types
Difference between biscuits and cookies

Faults and remedies in baked biscuits and cookies

B. Topics for self-study:

Sl. No.	Topics	Reference
1	Preparation of pastries.	https://hmhub.me/pastry-recipes-and-methods-of-preparation/
2	Cookies using millets.	https://www.superhealthykids.com/recipes/millet-cookies/
3	Alternative for all-purpose flour.	https://www.thespruceeats.com/a-substitute-for-all-purpose-flour-3976522
4	International bakery products.	https://www.britannica.com/topic/baking

C.TEXT BOOKS

1. John Kingslee A, “Professional Text to Bakery and Confectionary”, 1st edition, New Age International (P) Limited Publishers, 2006.
2. YogambalAshokkumar, “Theory of Bakery and Confectionery”, 5th edition, PHI Learning Private Limited, New Delhi 2009.

D. REFERENCE BOOKS

1. Wayne Gisslen, “The Professional Baking”, 6th edition, Publishers John Wiley & Sons 2012.
2. Pat Sinclair, “Basic Baking”, Publisher Agate, 2006

4.Mapping scheme for the POs PSO and COs

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	-	-	L	-	-	-	-	-	L	H
CO2	H	-	-	-	-	H	-	-	L	L	-	M	H
CO3	M	-	-	-	-	H	-	-	M	L	-	M	M
CO4	-	-	-	L	-	H	-	-	-	M	-	H	H
CO5	-	-	-	M	-	L	-	L	L	L	-	-	H
CO6	M	-	M	H	-	M	-	L	H	H	L	M	H

L- LOW M-MEDIUM H-HIGH

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation,
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: K. MAHESWARI

CORE VII: DIETETICS-II

Semester: VI

Code: U17ND607

Credits: 5

Hours/Week: 6

1. COURSE OUTCOMES

At the end of the course, the students will be able to:

CO. No	Course Outcomes	Level	Unit
CO1	Identify the concept, purpose and principles of diet therapy and the effect of the role and types of dietitians. Gain in-depth knowledge in the running of a dietary department in a hospital.	K2	I
CO2	Analyze solve problems by thinking critically and integrating scientific information and research into practice.	K4	II
CO3	Develop and deliver appropriate information, products, and services to individuals, groups, and populations.	K5	II, III
CO4	Evaluate the role of various feeding techniques and identify the appropriate technique needed for a specific patient.	K5	IV
CO5	Suggest the tilogical factors and complications, assessment parameters and dietary modifications in management of weight.	K5	V
CO6	Provides opportunity for interaction with patients, and thus, students get hands-on training in hospitals, in association with dietitians and clinicians.	K5	V

2.A. SYLLABUS

UNIT- I

(15 hours)

Diabetes Mellitus

a) Types –IDM, NIDM, GDM

b) Pathogenesis, Symptoms, Causes, Diagnostic tests, Complications.

c) Dietary modification and diet planning of the disease.

UNIT II

(18 hours)

Diseases of the liver

a) Diseases of the liver, gall bladder and exocrine pancreas – pathogenesis, causes, signs and symptoms, dietary modifications and diet planning for:

- i. Liver- fatty liver, hepatitis, cirrhosis, hepatic coma
- ii. Gall bladder – cholecystitis, cholelithiasis
- iii. Pancreas – Pancreatitis.

b) Nutritional care for patients with inborn errors of metabolism – prognosis, symptoms, dietary management – phenylketonuria, galactosemia.

UNIT- III

(21 hours)

Kidney Disease:

Pathogenesis, Symptoms, causes, Nutritional modification, diet planning and dialysis for kidney disease

a) Nephritis

b) Nephrosis

c) Urinary Calculi

d) Renal failure – acute and chronic

UNIT IV

(16 hours)

Disease of the cardio vascular system

Pathogenesis, symptoms, causes, diagnostic tests, complications, dietary modification and diet planning of:

- a) Hypertension
- b) Atherosclerosis – Myocardial infarction
- c) Ischemic heart disease
- d) Hyperlipidemia
- e) Acute and Chronic cardiac disease and congestive cardiac failure.
- f) CABG.

UNIT-V

(20 hours)

Skeletal and Allergy

a) **Nutritional care in disease of the musculoskeletal system** – Arthritis, Osteoporosis, Gout, dental caries.

b) **Allergies** – Food allergy and intolerance, Factors influencing ,Symptoms, test for allergy, Nutritional care and elimination diet.

Nutrition Care in Cancer and AIDS

c) **Cancer** – mechanism of cancer formation, pathophysiology ,classification, , etiology, symptoms, dietary management and role of food in prevention of cancer.

d) **AIDS** – epidemiological features, mode of transmission, clinical manifestation and dietary management.

B. TOPICS FOR SELF-STUDY

B. Topics for self-study:

Sl. No.	Topics	Reference
1	Diseases caused due to autoimmunity and dietary modifications for the same.	https://www.todaysdietitian.com/newarchives/110211p36.shtml
2	Correlation between diabetes, cardiac disease and renal disease.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4045477/#
3	Cardiac transplant and liver transplant – feeding patterns.	https://journals.lww.com/transplantationdirect/Fulltext/2019/01000/Simultaneous_Versus_Sequential_Heart_liver.9.aspx
4	Nutrition in neurological disorders.	https://illnutrition.com/mod_ill/TOPIC25/m251.pdf

C.TEXT BOOKS

1. Antia, F.P, “Clinical dietetics and Nutrition”,4th Edition, Oxford University Press, New Delhi,2002.
2. Joshi, S.A, “Nutrition and Dietetics”,2nd edition, TATA McGraw Hill publications, New Delhi, 2008.
3. Srilakshmi. B, “Dietetics”, 7th Edition, New Age International (P) Ltd. Publishers, Chennai, 2016.
4. Swaminathan, M. “Essentials of Food and Nutrition-Vol. I and II”BAPPCO., The Bangalore Printing and Publishing co., Ltd., No.88, Mysore Road, Bangalore ,2010
5. Davidson and passmore, “Human Nutrition and Dietetics”, English Language Book Society, Livingstone,1986.

D. REFERENCES

1. Mahan,L.K.,Arlin.M.T.,Krause’s, “Food Nutrition and Diet Therapy”, 14TH Edition. W.B.Saunders Company, London ,2016.

2. Williams, S.R., “Nutrition and Diet Therapy”, 6th Edition, Times Mirror / Mosby College Publishing, St. Louis, 1989.
3. Raheena Begum, “A Text Book of Foods, Nutrition and Dietetics”, Sterling Publishers, New Delhi, 1989.
4. Gopalan, C., “Dietary Guidelines for Indians – A Manual”, National Institute of Nutrition, Hyderabad, 2005
5. Shills, M.E, Oslon, J.A, Shike, M and Ross, A.C, “Modern Nutrition in Health and Disease”, 10th Edition, Lippincott Williams and Wilkins 2006.

E. WEB LINKS:

https://www.todaysdietitian.com/newarchives/110211p36.shtml
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4045477/#
https://journals.lww.com/transplantationdirect/Fulltext/2019/01000/Simultaneous_Versus_Sequential_Heart_liver.9.aspx
https://l1nutrition.com/mod_111/TOPIC25/m251.pdf

4. Mapping Scheme

L=Low M= Medium H= High

U17ND 607	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO3	PO4
CO1	H	H	H	H	H	M	M	M	M	H	H	H	L
CO2	H	H	H	H	H	M	L	L	M	H	M	M	M
CO3	H	H	M	M	M	M	M	M	M	M	M	M	M
CO4	H	H	H	M	H	H	M	M	L	L	M	M	M
CO5	M	H	M	M	L	M	M	M	M	M	H	M	L
CO6	H	H	H	H	H	M	M	M	M	H	M	L	M

5. Course assessment methods

Direct

1. Continuous Internal Assessment I, II

2. Group discussion, Presentation, Assignment
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: C. ROSELIN

COREVIII: NUTRITION AND FITNESS

Semester: VI

Code: U17ND608

Credits: 5

Hours/Week: 6

1. COURSE OUTCOMES

At the end of the course, the students will be able to:

CO. No	Course Outcomes	Level	Unit
CO1	Obtain knowledge regarding the body composition and their techniques to measure. K1	K1	I
CO2	Analyze the importance of fitness to enhance endurance, strength and flexibility. K4	K4	II
CO3	Assess the fluid requirement of the body of the sports person and supplement the required fluid and electrolyte appropriately. K5	K5	II, III
CO4	Appreciate the need of nutrients and their metabolism during exercise and supplement nutrient loss accordingly. K6	K6	IV
CO5	Evaluate the significant changes during exercise, needs of the sports persons and the role of nutritional supplements. K5	K5	V
CO6	Compare the effects of yoga and fitness on various body systems and the nutritional needs in special conditions. K6	K6	V

2.A. SYLLABUS

UNIT – I

(15 hours)

Body composition and fitness

Body Composition- classification (Fat mass and fat free Mass) and its components, factors influencing body mass composition. Techniques for measuring body composition

Fitness-definition, parameters of fitness- cardiovascular endurance, muscular strength, muscular endurance, flexibility and body composition

UNIT -II

(15 hours)

Assessment and benefit of exercise

Benefit of exercise- physiological, psychological and sociological. Physical activity guidelines.

Assessing personal fitness- preparticipation, screening and risk assessment.

Role of exercise in disease prevention – diabetes, cardiovascular disease, obesity, bone health and cancer.

UNIT – III

(15 hours)

Energy systems and electrolyte balance

Reviews of different energy systems for endurance and power activity- Fuels and nutrients to support physical activity .Shifts in carbohydrate and fat metabolism, mobilization of fat stores during exercise.

Water and electrolyte balance- Losses and their replenishment during exercise and sports event, effect of dehydration, sports drinks.

UNIT-IV

(15 hours)

Nutrition for sport persons

Definition, physiological and significant changes during exercise, types of stress faced by sports persons, nutrition needs of sports persons-macro and micronutrient needs, role of water and electrolytes.

Role of nutrition and recommendations – pre-exercise, during and post –exercise

Nutrition supplement and ergogenic aids.

UNIT-V

(15 hours)

Yoga and nutrition fitness in special conditions

5.1 Yoga and fitness- effects on general vitality and on immune, endocrine, neurons, digestion and muscular systems, dietary pattern. Awareness about the alternative systems for health and fitness like ayurveda, yoga, vegetarianism and traditional diets.

5.2 Nutrition and fitness in special conditions- space mission and high altitude-changes in body composition, nutrient requirements, food system and suitable types of food.

B. TOPICS FOR SELF-STUDY

Sl. No.	Topics	Reference
1	BCAA as sports supplement.	https://www.otsuka.co.jp/en/nutraceutical/about/nutrition/sports-nutrition/essential-nutrients/bcaa.html# :
2	Carbohydrate loading.	https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/carbohydrate-loading/art-20048518
3	Female athlete triad.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3435916/# :
4	Difference between sports drink and health	https://www.aappublications.org/content/32/6/

drink.	32.2#
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C. TEXTBOOK

1. Mahan, L.K. & Ecott-Stump, s., Krause's "Food, Nutrition and Diet therapy", 14th edition, W.B. Saunders Ltd, 2016.
- 2.Sizer, F. & Whitney, E., "Nutrition- Concepts & Controversies", 8th edition, Wadsworth Thomson learning, 2000.
3. Shills, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed), "Modern Nutrition in Health & disease", 9th edition, Williams & Wilkins, 1999

D. REFERENCES

1. Whitney, E.N. & Rolfes, S.R., "Understanding Nutrition", 8th edition, West/Wadsworth, an International Thomson publishing Co., 2002
2. Ira Wolinsky, (Ed), "Nutrition in exercise and sports", 3rd Edition, CRC press, 1988
3. Parizkova, J. "Nutrition, physical activity and health in early life", Ed. Wolinsky, I., CRC press, 2001
4. Mc Ardle, W. Katch, F. and Katch, V. "Exercise Physiology. Energy, Nutrition and Human performance", 4th edition, Williams and Wilkins, Philadelphia, 2009
5. Barbak Ann Dushman, "Complete guide to fitness and health", American college of sports medicine library and congress catalog in publication data, 2006.

E. WEB LINKS:

https://www.otsuka.co.jp/en/nutraceutical/about/nutrition/sports-nutrition/essential-nutrients/bcaa.html# :
https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/carbohydrate-loading/art-20048518
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3435916/# :
https://www.aappublications.org/content/32/6/32.2#

4. Mapping Scheme

L-Low M-Moderate H- High

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	M	L	L	-	L	-	-	L	-	L	L	M	-
CO2	H	-	H	-	H	-	-	H	M	H	-	-	-
CO3	-	H	-	H	M	-	L	-	M	H	-	-	-
CO4	L	M	-	M	-	-	-	-	-	M	-	L	-
CO5	-	M	M	-	L	L	-	-	M	M	-	M	-
CO6	-	-	-	L	-	-	M	L	-	M	M	-	-

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment
3. End Semester Examination

Indirect

Feedback

NAME OF THE COURSE COORDINATOR: MRS. K. MEERA

CORE IX: INSTITUTIONAL FOOD SERVICE MANAGEMENT

Semester: VI

Code: U17ND609

Credits: 5

Hours/Week: 6

1. COURSE OUTCOMES

At the end of the course, the students will be able to:

CO. No	Course Outcomes	Level	Unit
CO1	Obtain an in-depth knowledge about the layout of various areas in food establishments.	K2	I
CO2	Explain the factors involved in selection and purchase of equipment's and the base materials used in the manufacture of equipments.	K2	II
CO3	Analyse the various types of food service systems and styles of service.	K4	II, III
CO4	Relate the Indian menu pattern with the western world and the techniques in writing menu card.	K5	IV
CO5	Explain the duties of a purchasing officer, methods of purchasing and procedure to be followed while purchasing, receiving and storage.	K2	V
CO6	Evaluate the quality standards of a recipe, their portioning and the expenditure of the cost on food, labour and overhead expenses.	K5	V

2.A. SYLLABUS

UNIT – I

(15 hours)

Layout

Food Plan Layout: Flow of work, characteristics of a typical food service layout, layout of food plants-space allocation for the various areas and flow of traffic through receiving, storage, preparation, service and dish washing areas; arrangements of equipments in work centers; optimum working heights.

UNIT – II

(15 hours)

Equipment and Furnishings

(i) Classification of equipment, factors involved in selection of equipments; purchase of equipment, operational know-how, care and maintenance of equipments; dining room furnishings.

(ii) Materials Used: Base materials used in the manufacture of equipments, materials used for finishes, materials used in the manufacture of dining room furnishings.

UNIT III

(15 hours)

Food Service – Classification of food service according to

(i) Types of food service systems - Conventional systems, Commissary system, read prepared system and assembly –service system.

(ii) Styles of Service : Service of food-self-service, tray service, Waiter –Waitress Service and portable service, formal and informal service

Meal Planning

(iii) Menu : Types of menu, Principles involved in menu Planning: Indian and Western, menu planner, why menu Planning; techniques in writing menucard.

UNIT – IV *Quantity Food Purchasing and Storage.***(15 hours)**

Purchasing : Purchasing officer, duties, purchasing procedure, selection of supplier, methods of purchasing, purchase specifications.

(i) Receiving : Procedure and forms.

(ii) Storing and issuing : Objectives, types of store records, and stores issues.

Quantity Food Production and Service.

(iii) Quality standards and control.

(iv) Standardisation of recipes

(v) Portion control: Utilization of left over foods.

(vi) Ways and means of creating good atmosphere (Interior decoration)

(vii) Informal and formal service styles (Table Service)

UNIT – V**(15 hours)****Cost control**

(i) Food Cost Control : Principles of food cost control, elements of cost-food cost, labour cost and overhead expenses; why good cost control; factors responsible for losses in a food

(ii) Service industry; methods of controlling goods costs leading to profit; costing of dishes, meals and events; methods of pricing items.

B. TOPICS FOR SELF-STUDY

Sl. No.	Topics	Reference
1	International serving style.	https://djubo.com/blog/different-styles-service/
2	International cuisine.	http://www.your4sure.com/popular-international-cuisines/#
3	Basics of accounting.	https://www.indeed.com/career-advice/career-development/basic-accounting#
4	Balance sheet basics.	https://www.accountingverse.com/accounting-basics/how-to-make-a-balance-sheet.html

C. TEXTBOOK

1. Mohini Selti and Surjeet Malhan, "Catering Management – an integrated approach", Wiley Eastern Limited, New Delhi, 1987.
2. West, B.B., Wood, L., Harger, V.F. and Shugart, G., "Food Service in Institutions", John Wiley and Sons, New York, 1988.

D. REFERENCES

1. Kotschevar, L. and Terrel, M.E, "Food service Planning, Layout and Equipment", John Wiley and Sons, 1971.
2. Kotas, R and Davis, B., "Food Cost Control", Mc.Millan& Sons, 1973.

E. WEB LINKS:

https://djubo.com/blog/different-styles-service/
http://www.your4sure.com/popular-international-cuisines/#
https://www.indeed.com/career-advice/career-development/basic-accounting#
https://www.accountingverse.com/accounting-basics/how-to-make-a-balance-sheet.html

4.Mapping Scheme

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
C01	-	-	-	-	-	L	-	-	-	-	-	-	-
C02	-	-	-	-	-	L	-	-	-	-	-	-	-
C03	-	-	-	-	-	-	-	H	-	-	-	-	L
C04	-	-	-	-	-	L	-	L	-	-	-	-	L
C05	L	-	-	-	-	H	-	H	L	-	-	L	M
C06	L	L	-	L	-	M	L	H	L	M	-	M	H

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment
3. End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: Dr. SHINY RAVI

THEORY ELECTIVE-III : FOOD PRODUCT DEVELOPMENT AND MARKETING STRATEGY

Semester: VI

Code: U17ND6:1

Credits: 3

Hours/Week: 4

1. COURSE OUTCOMES

At the end of the course, the students will be able to:

CO. No	Course Outcomes	Level	Unit
CO1	Identify the basic principles and concepts of food product development –k2	K2	I
CO2	Analyze various cultural factors involved in the dietary pattern of various groups.-k4	K4	II
CO3	Discuss the steps involved in product development, portion size, cost calculation and nutritive value calculation.-k4	K4	II, III
CO4	Develop a new food product for different age groups.=k5	K5	IV
CO5	Compare the market structure and develop practical skills in formulating and promoting the food product in a market.=k5	K5	V
CO6	Develop of the global trends in developing entrepreneur skills.-k6	K6	V

2.A. SYLLABUS

UNIT-I

(15 hours)

Concepts of product development:

Basic principles and concept of food product development, cultural approach to development of dietary pattern of various groups-language, linguistic, regional, religious (ethnic), Factors involved in food habit alteration, availability, importance and role of different research and development departments in food production industry.

UNIT-II

(15 hours)

Market Process

Steps in product development-material resources based on market demand, standardization methods involved in product development. Portion size and portion control; Calculation of nutritive value and cost of production, shelf life and storage stability evaluation procedure of developed food products.

UNIT-III

(15 hours)

Formula Development

Formulation of new food products for infants, preschool children, adolescents, pregnant and nursing mothers, old age, sports persons, armed sources personnel and therapeutic uses. Selection and training of judges, Development of Score Card and analysis of data, Role of advertisement and Technologies in promotion of new products.

UNIT-IV

(15 hours)

Government proportion

Concept of market and marketing - approaches of study marketing and marketing functions, market structure, marketing efficiency and market integration, Role of Government in promoting agricultural marketing. Market promotion and positioning of food products.

UNIT-V

(15 hours)

Sanitation:

Conditions for sale, license and identification and quality processing, conditions for distribution, storage and sanitation, Studying the global market status, Role of export promoting agencies, Economic feasibility of new products.

B. TOPICS FOR SELF-STUDY

Sl. No.	Topics	Reference
1	Low cost recipes.	https://vikaspedia.in/health/nutrition/nutritive-

		value-of-foods/low-cost-nutritious-supplements
2	Novel foods without preservatives.	https://www.researchgate.net/publication/328283201_Novel_natural_food_preservatives_and_applications_in_seafood_preservation_A_review
3	Spirulina in food processing industry.	https://www.longdom.org/proceedings/spirulina-arthrospira-platensis-as-food-a-commodity-to-better-feed-the-world-37470.html
4	Nutrigenomics in new product development.	https://www.newfoodmagazine.com/article/77093/inspiring-the-food-of-tomorrow/

C. TEXTBOOK

1. Sudhir Gupta, “Handbook of Packaging Technology”, Engineers India Research Institute, New Delhi , (2017)
2. Khanaka, S.S., “Entrepreneurial Development”, S. Chand and Company Ltd, New Delhi, 2016.

D. REFERENCES

1. Suja, R. Nair, “Consumer Behaviour and Marketing Research”, 1st Edition, Himalaya Publishers, (2014).
2. Hmacfie, “Consumer led Food Product Development”, Weedhead Publishing Ltd., UK, (2017)
3. Fuller, Gordon, W., “New Food Product Development”, 2nd Edition, CRC Press, Boca Raton, Florida, (2015)
4. Schaffner .D,J, Schroder , W.R. “Food Marketing and International Perspectives”, Web/McGraw Hill , (2010)

E. WEB LINKS:

https://vikaspedia.in/health/nutrition/nutritive-value-of-foods/low-cost-nutritious-supplements
https://www.researchgate.net/publication/328283201_Novel_natural_food_preservatives_and_applications_in_seafood_preservation_A_review
https://www.longdom.org/proceedings/spirulina-arthrospira-platensis-as-food-a-commodity-to-better-feed-the-world-37470.html
https://www.newfoodmagazine.com/article/77093/inspiring-the-food-of-tomorrow/

4. Mapping Scheme

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	-	L	M	-	L	M	M	M	L	-	-	L	H
CO2	-	L	-	-	-	H	L	L	M	M	-	L	H
CO3	M	-	-	-	L	H	M	H	M	M	L	H	H
CO4	M	L	H	M	M	H	-	H	M	H	L	H	H
CO5	-	-	-	-	-	-	-	M	-	M	-	M	-
CO6	-	-	-	M	-	-	L	M	M	-	-	L	H

L-Low M-Medium H-High

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II
2. Group discussion, Presentation, Assignment, Poster presentation, End Semester Examination

Indirect

NAME OF THE COURSE COORDINATOR: S. PREETHI

**PRACTICAL CORE VI: DIETETICS- II PRACTICAL &DIETARY
INTERNSHIP**

Semester: VI

Code: U17ND6P6

Credits: 3

Hours/Week: 3

1. COURSE OUTCOMES

At the end of the course, the students will be able to:

CO. No	Course Outcomes	Level	Unit Covered
CO1	Identify the epidemiology of various diseases and plan diet accordingly	K2	I
CO2	Evaluate the need of each and every patient and plan diet according to their individual needs.	K5	II
CO3	Plan and execute a diet for various disease conditions.	K5	II, III
CO4	Acquire practical knowledge in hospitals by attending dietary internship.	K5	IV
CO5	Equip themselves in the field of dietetics and to approach different patients.	K5	V
CO6	Develop the managerial skills in preparation of diet and supervision both professionally and personally.	K5	V

2.A. SYLLABUS

PLANNING ,NUTRITIVE VALUE CALCULATION ANDPREPARATION DIET FOR...

1. Diabetes Mellitus-IDDM, NIDDM and Gestational Diabetes
2. Hypertension, atherosclerosis and congestive heart disease
3. Nephritis, nephrotic syndrome acute and chronic renal failure and nephrolithiasis.
4. Liver disease – cirrhosis, jaundice, hepatitis.
5. Cancer
6. AIDS

B. TOPICS FOR SELF-STUDY

C. TEXTBOOK-

D. REFERENCES

1. Krause,M.V.Mahan, “Nutrition Diet Therapy”, 13thEdition.,W.B.Saunders Company, Philadelphia,2013.
2. MaimunNisha,” Diet Planning for Disease”,Kalpaz Pub, 2006.
3. Srilakshmi.V. “Dietetics”, New age International pub., New Delhi,

4. Mapping Scheme

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	L	L	M	H	H	M	H	H	L	H	H	H	L
CO2	M	M	M	H	H	M	H	H	L	H	H	H	L
CO3	M	H	H	H	M	H	M	H	M	H	H	H	L
CO4	-	M	L	L	L	-	-	M	L	M	M	H	-
CO5	L	H	L	H	L	-	-	M	M	M	M	M	-
CO6	H	H	L	H	L	M	-	H	-	L	-	-	H

L-Low

M-Moderate

H- High

5.Course assessment methods

Direct

1. Continuous Internal Assessment I ,II

2. Group discussion, Presentation, Assignment, Poster presentation
3. End sem examination

Indirect

NAME OF THE COURSE COORDINATOR: C. ROSELIN

