CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Re-Accredited (3rd Cycle) with 'A' Grade (CGPA 3.41 out of 4) by NAAC

TIRUCHIRAPPALLI – 620 018

SYLLABUS FOR

M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS (2021-2022)

M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS

PROGRAMME EDUCATIONAL OBJECTIVES

PEO 1: The graduates will successfully serve as Dietitians, Nutritionist, Food Service Administrators, course instructors, Project officers in Nutrition and Child care.

PEO 2: The graduates will practice professional ethics and understand socio cultural issues, thereby provide solution for health problems.

PEO 3: The graduates will equip themselves for higher studies, research and entrepreneurship by applying the recent trends.

PROGRAMME OUTCOMES

PO 1: To analyze scientific concepts in the area of Food Service Management and Dietetics.

PO 2: To apply critical thinking and collaborative practice in nutritional care.

PO 3: To develop technical skills in applied nutrition science.

PO 4: To utilize local, national and global trends, emerging techniques and changes of legislation to enhance work performance.

PO 5: To establishing entrepreneurial skills in designing innovative healthy food products and facility planning.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PROGRAMME STRUCTURE -M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS
UNDER CHOICE BASED CREDIT SYSTEM
(For the candidates admitted from the academic year 2021-2022)

SEM	COURSE	COURSE TITLE	SUBJECT CODE	INS. HRS / WEEK	CREDIT	EXAM HRS	MARKS		TOTAL
							INT	EXT	
I	Core Course – I (CC)	Advanced Food Science	19PFS1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Human Nutrition and Public Health	19PFS1CC2	6	5	3	25	75	100
	Core Course – III (CC)	Biochemical Changes in Diseases	19PFS1CC3	6	5	3	25	75	100
	Core Course – IV (CC)	Advanced Dietetics I	19PFS1CC4	6	5	3	25	75	100
	Core Practical – I (CP)	Human Nutrition and Public Health – Practical	19PFS1CC1P	6	4	3	40	60	100
		TOTAL		**30**	**24**				**500**
II	Core Course – V (CC)	Advanced Dietetics II	19PFS2CC5	6	5	3	25	75	100
	Core Course – VI (CC)	Hospital Administration	19PFS2CC6	6	5	3	25	75	100
	Core Practical II (CP)	Advanced Dietetics – I & II - Practical and Dietary Internship	19PFS2CC2P	6	4	3	40	60	100
	Elective Course – I (EC)	I.A. Functional Foods and Nutraceuticals	19PFS2EC1A	6	4	3	25	75	100
		I.B. Paediatric Nutritional Care	19PFS2EC1B						
	Elective Course – II (EC)	II. A. Applied Physiology	19PFS2EC2A	6	4	3	25	75	100
		II. B. Nutrition for fitness	19PFS2EC2B						
	Extra Credit Course	SWAYAM ONLINE COURSE	To be Fixed Later	As per UGC Recommendation					
		TOTAL		**30**	**22**				**500**

III	Core Course – VII (CC)	Principles of Home Science	19PFS3CC7	6	5	3	-	100	100
	Core Course – VIII (CC)	Research Methods and Statistical Techniques	19PFS3CC8	6	5	3	25	75	100
	Core Practical – III (CP)	Catering Internship	19PFS3CC3P	6	5	-	40	60	100
	Elective Course – III (EC)	III.A.Food Microbiology and Sanitation	19PFS3EC3A	6	4	3	25	75	100
		III.B.Nutrition in Clinical Critical Care	19PFS3EC3B						
	Elective Course – IV (EC)	IV.A. Food Product Development	19PFS3EC4A	6	4	3	25	75	100
		IV.B.Basic Food Analytical Techniques	19PFS3EC4B						
	Extra Credit Course	SWAYAM ONLINE COURSE	To be Fixed Later	As per UGC Recommendation					
		TOTAL		**30**	**23**				**500**
IV	Core Course – IX (CC)	Quantity Food production and Service	19PFS4CC9	6	5	3	25	75	100
	Core Course – X (CC)	Food Service Management	19PFS4CC10	6	5	3	25	75	100
	Core Practical – IV (CP)	Quantity Food Production and Service -Practical	19PFS4CC4P	6	4	3	40	60	100
	Elective Course – V (EC)	V.A. Management and Accounting in Hospitality Industry	19PFS4EC5A	6	4	3	25	75	100
		V.B.Counselling Skills	19PFS4EC5B						
	Project Work		19PFS4PW	6	3	-	-	100	100
		TOTAL		**30**	**21**				**500**
		GRAND TOTAL		**120**	**90**				**2000**

SEMESTER - I	ADVANCED FOOD SCIENCE	HOURS / WEEK - 6	
CORE COURSE –I		CREDIT - 5	
COURSE CODE – 19PFS1CC1		INTERNAL 25	EXTERNAL 75

Preamble

- To gain knowledge on nutritional composition and properties of food.
- To develop skills to judge the quality of food.
- To apply the principles of cooking in food preparations.

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1.	State the importance of post harvest technology	K1
CO2.	Describe the properties of starch in food preparations	K2
CO3.	Predict the changes that take place during meat cookery	K3
CO4.	Examine effect of cooking on vegetable pigments	K4
CO5.	Evaluate components of food label	K5
CO6.	Generalize the sensory characteristics of food..	K6

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1.	M	M	S	S	S
CO2.	M	M	S	S	S
CO3.	M	S	S	S	S
CO4.	M	S	S	S	S
CO5.	M	M	S	S	S
CO6	M	S	S	S	S

S- Strong; M-Medium

Syllabus

UNIT I **(18 Hours)**

a. Post harvest technology

Importance, post harvest losses, priorities and strategies, post harvest industries , components of the system -transportation and distribution, marketing, grading and quality control, pest control, packaging, communication among all concerned, information, demonstration and advisory systems, manufacture and supply of essential equipment and machinery, financial control, price stabilization, and integration of the total system.

b. Colloidal systems

Types of colloidal dispersion, Properties of colloidal systems, sols, gels. Emulsions-Types, emulsifiers, stability of emulsions, Foams.

UNIT II **(20 Hours)**

a. Cereals

Structure, nutritional composition - rice, wheat and millets. Milling process. Gluten formation, factors affecting gluten formation. Gelatinization, gelation, retrogradation, syneresis, dextrinisation. Types of starches, modified starches. Role of cereals in cookery. Problems encountered during cereal cookery.

b. Pulses and Legumes:

Nutritional composition, processing of pulses- germination, decortication, fermentation, soaking, factors affecting cooking quality of pulses, toxins in pulses, quick cooking pulses

c. Nuts and oil seeds:

Classification, nutritive value, uses, toxins in nuts and oilseeds.

UNIT III **(16 Hours)**

a. Milk and milk products

Nutritional composition, effect of physical and chemical factors on milk components, milk processing methods- clarification, pasteurization and homogenization.

Types of milk, types of milk products – concentrated dairy products, dried dairy products, fermented milk products.

b. Meat, Poultry and fish

Meat – structure, types and nutritional composition, post mortem changes, ageing and tenderization of meat, cuts and grades of meat, meat cookery. Poultry-classification, nutritive value, selection and storage, methods of cooking. Fish - Classification, nutritive value, selection, storage and methods of cooking.

c. Egg

Structure and composition, selection, storage, quality check, coagulation of egg protein, foam formation, factors affecting foam formation. Novel egg products.

UNIT IV **(16Hours)**

a. Fruits and Vegetables

Fruits - Classification, composition, selection, storage, changes during ripening, artificial ripening fruit cookery,[#]enzymatic browning and preventive measures[#].

Vegetables - Classification, composition, selection, storage, changes during cooking, loss of nutrients while cooking, changes produced in pigments while cooking.

b. Fats and oils

Characteristics of fats and oils, Hydrogenation, winterization. Rancidity- types, prevention, flavor reversion, smoking point, thermal changes in fat, Acid value, Iodine value, Saponification value, unsaponifiable matter and Acetyl value. Role of fats and oils in cookery. Absorption of fat, factors affecting absorption of fat.

c. Sugars

Types of sugar, nutritive value, physical and chemical properties of sugar, role of sugar in cookery, stages of sugar cookery, crystallization, factors affecting crystallization

d. Spices and condiments

Types, role in cookery, volatile compounds in spices and condiments

UNITV **(20Hours)**

a. Evaluation of quality of foods

Sensory characteristics of food- Appearance, colour, flavour, odour, taste, mouth feel. Methods of sensory analysis-Difference tests, Rating tests, Sensitivity tests, Descriptive profile method. Requirements for conducting sensory tests. Objective

methods – chemical methods, physio-chemical methods, microscopic examination, physical methods.

b. Packaging Techniques

Requirements of packaging. Packaging materials. Ventilation of Packages. Cushioning materials. Controlled and Modified Atmospheric Packaging (CAP and MAP), Vacuum packaging, Edible Packaging, Eco friendly packaging materials. Properties of packaging materials. Labeling – types, functions and importance. Intellectual Property Right (IPR) – Patent, Copyright, Industrial Design Right, Trade mark, Trade dress, Trade secret.

-# : Self Study

Textbooks

S.No.	Author name	Year Of Publication	Title of the book	Publishers name
1.	Gladys C Peckham	1996	Foundations of food preparation	Macmillan Publishing Company, New York.
2.	Norman N Potter	1998	Food Science	CBS Publications and Distributors, NewDelhi.
3.	Shakuntala Manay N	2001	Food Facts and Principles	New Age International Publishers, New Delhi.
4.	Avantina Sharma	2006	Textbooks of Food science and technology	International book distributing Co.
5.	Mohini Sethi	2011	Food science experiments and applications	CBS publishersand distributors Pvt ltd
6.	Vickie A.Vaclavik, Elizabeth W.Christian	2014	Essentials of Food Science	Springer Science and Business Media, New York
7.	Srilakshmi B	2015	Food Science	New Age International (P) Ltd, New Delhi.

ReferenceBooks

S.No	Author name	Year of publication	Title of the book	Publishers name
1.	Sumati R Mudambi	2006	Food Science	New age international (P) Ltd, publishers
2.	Sunetra Roday	2012	Food science and Nutrition	Oxford University Press
3.	Umesh Kumar	2014	Food ScienceProcessing Technology	Venus Books Publishers and distributors

Journals:

- Food Science and Technology (London),Institute of Food Scienceand Technology, Unitedkingdom.
- Food Chemistry, Elsevier Sci. Ltd,England.
- Food Science and Technology, Soc Brasileira Ciencia Tecnologia Alimentos,Brazil.
- Food Research International, Elsevier Science Bv, UnitedStates.
- Journal of the Science of Food and Agriculture, Wiley-Blackwell,England.
- Journal of Food Science and Technology, Scientific Publishers,India

Web links:

https://www.nutrition.org.uk/attachments/207_Nutritional%20aspects%20of%20cereals.pdf

https://www.starch.eu/starch/

https://www.britannica.com/science/fat-processing

http://www.yourarticlelibrary.com/home-science/eggs/egg-definition-structure-and-classification/86599https://pubs.acs.org/doi/full/10.1021/jf072304bhttp://agritech.tnau.ac.in/expert_system/paddy/phtc.htmlhttps://www.sciencedirect.com/science/article/pii/S0023643810001374https://pdfs.semanticscholar.org/dcf1/9d5ff38489a3fa7517b258df603c6004e6ab.pdf

Pedagogy: E-content, Lecture, Power point presentation, Seminar, Assignment, Group discussion, Industrial visit.

Course designers

- Ms.B.Thanuja
- Ms.J.Sudharshini

ADVANCED FOOD SCIENCE -PRACTICAL (Related Experience)

Preamble

- To understand the sensory evaluation methods.
- To analyze the cooking quality of foods.

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1.	Identify structure of starch through microscopic Examination	K1
CO2.	Describe based recipes based on stages of sugar cookery	K2
CO3.	Prepare recipes based on milk products	K3
CO4.	Determine the factors affecting cooking quality of pulses.	K4
CO5.	Evaluate the quality of eggs.	K5
CO6.	Plan requirements to conduct sensory evaluation	K6

Syllabus

- **Starch cookery:** Microscopic examination of different starches, gelatinization of starch, preparation of gluten, factors affecting gluten formation.
- **Sugar cookery:** Stages of sugar cookery, preparation of fondant, fudge, caramel,pulled toffee and brittles.
- **Pulse cookery:** Factors affecting the cooking quality of pulses.
- **Milk Cookery:** Curdling of milk, Preparation of cheese, curd and ice-cream.
- **Meat, fish and poultry Cookery**: Effect of cooking methods on meat, fish ,poultry.
- **Egg Cookery:** Testing the quality of egg. Coagulation of egg white and egg yolk. Preparation of boiled egg, poached egg, scrambled egg, custard, cake, emulsion, mayonnaise.
- **Fruits and Vegetables :** Measures for the prevention of enzymatic browning**,** Effect of acid, alkali and heat on pigments in fruits and vegetables.
- **Fats and Oils:** Smoking temperature, factors affecting absorption of fat.
- **Sensory evaluation of food :**Evaluating the acceptability of foods, Subjective and Objective methods

Textbooks

S.No.	Author name	Year of Publication	Title of the book	Publishers name
1.	Gladys C.Peckham	1987	Foundations of food Preparation	Macmillan Publishing Company, New York
2.	Avantina Sharma.	2006	Textbooks of Food science and technology	International book distributing Co
3.	Srilakshmi B	2015	Food Science	New Age International (P) Ltd, New Delhi

Referencebooks

S.No.	Author name	Year of publication	Title of the book	Publishers name
1.	Krishna Arora	2011	Theory of Cookery	Frank Bros.& Co (publishers) Ltd, Noida
2.	Thangam E. Philip	2015	Modern Cookery for Teaching and the Trad Volume-I	Orient Blackswan Private Limited, New Delhi
3.	Parvinder.S.Bali	2016	Food Production Operations	Oxford University Press, New Delhi

Pedagogy: Demonstration

Course designers

- Ms.B.Thanuja
- Ms.S.Preethi

SEMESTER - I	HUMAN NUTRITION AND PUBLIC HEALTH	HOURS / WEEK - 6	
CORE COURSE –II		CREDIT - 5	
COURSE CODE – 19PFS1CC2		INTERNAL 25	EXTERNAL 75

Preamble

- To understand the importance of meal planning
- To comprehend the nutritional needs pertaining to different stages of life
- To plan diet for various age groups

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1.	Identify the stages, complications and physiological adaptations during pregnancy and lactation.	K1
CO2.	Explain growth and development and nutrition related problems in pre-school, school-going children and adolescent.	K2
CO3.	Predict malnutrition, ecological factors and nutritional Problems	K3
CO4.	Determine the nutritional status of community and the strategies to overcome malnutrition	K4
CO5.	Assess and compare National, International and Voluntary organizations to combat malnutrition	K5
CO6.	Plan and develop nutrition education aids for dissemination of nutrition knowledge	K6

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1.	S	S	S	M	M
CO2.	S	S	S	M	M
CO3.	S	S	S	M	M
CO4.	S	S	S	M	M
CO5.	S	S	S	M	M
CO6.	S	S	S	S	M

S- Strong; M-Medium

Syllabus

UNITI **(18Hours)**

a. **Nutrition and health** – Inter relationship between nutrition and health. Meaning of adequate nutrition, under nutrition, malnutrition. Basic five food groups, Balanced diet, principles of meal planning, Recommended Dietary Allowances (RDA)-Indian Council of Medical Research (ICMR-2010), Factors affecting RDA. Recommended Dietary Allowances and diet plan for pregnancy, lactation, infant, childrens, adolescents, adults and geriatrics.

b. **Nutritional Assessment** -Assessing the food and nutritional problems in the community, Methods available for individual and community, Anthropometric - Measurement of height, weight, head and chest circumferences, mid upper arm circumference, skin fold thickness, interpretation of measurements and comparison with standards (NCHS, ICMR), Biochemical parameters, Clinical examination and Dietary surveys.

UNIT II **(18 Hours)**

Nutrition through life cycle

a. **Pregnancy and Lactation –** Stages of gestation, physiological changes, weight gain , complications, factors influencing the outcome of pregnancy. Physiology of lactation - Hormonal control and reflex action, Importance of colostrum, composition of breast milk, advantages of breast feeding, Difference between breast milk and cow's milk, Galactagogues.

b. **Infancy, Pre-School, School-Going Children and Adolescents**- Growth and development of infants, pre-school children, school- going children and adolescence Artificial feeding, Breast feeding vs. bottle feeding, Weaning and Supplementary feeding, Feeding of premature infants. Factors influencing food habits of preschoolers. Eating disorders – Bulimia nervosa, Binge eating and Anorexia nervosa in adolescence.

c. **Adult and Geriatrics** -Reference Man and Reference Woman**,** Symptoms in Menopausal and post-menopausal women. Socio-economic and psychological factors in geriatrics, Physiological changes in geriatrics, Feeding old age people. Dietary guidelines for adults and menopausal women,

UNIT III **(18Hours)**

Epidemology, Nutritional problems and malnutrition

a) Principles of Epidemology – Definition, aim, components, measurement in Epidemology - IMR, NMR, MMR and tools of measurement, approach, Relation of nutrition to national development - socio-economic, industrial and agricultural development.
b) Nutritional problems - PEM, Vitamin A Deficiency Diseases, Anaemia, Iodine Deficiency Disorders and Fluorosis, Synergism between malnutrition and infection.
c) Definition of malnutrition, Ecological factors leading to malnutrition - income, size of families, dietary pattern, occupation, customs food fads, fallacies, ignorance and other factors.Classificationaccordingtogradesofmalnutrition,Visciouscycle of malnutrition

UNIT IV **(18Hours)**

a. Nutrition Intervention programmes

Nutrition intervention programmes in India – School Lunch Programme (SLP), Chief Minister's Nutritious Noon Meal Program (CMNNMP), Integrated Child Development Services (ICDS). National Nutritional Anaemia Prophylaxis Programme, National Prophylaxis Programme against Vitamin A Deficiency Diseases, Goitre Control Programme. National Nutrition policy- National food security, National nutrition policy- thrust areas and implementation at national level, Impact of National Nutrition policy.

b.Role of National and International Agencies in promoting Health

National Agencies concerned with food and nutrition – Indian Council of Medical Research (ICMR), National Institute of Nutrition (NIN), National Nutrition Monitoring Bureau (NNMB), Central Food Technological Research Institute (CFTRI), Defence Food Research Laboratory (DFRL), and *National Institute of Public Cooperation And Child Development*(NIPCCD).

#**International Agencies** concerned with Food and Nutrition- Food and Agricultural Organization (FAO), World Health Organization (WHO), United Nations International Children's Emergency Fund (UNICEF), World Bank#

UNIT V **(18Hours)**

Nutrition Education - Meaning, nature and importance of Nutrition education to the community and lessons to be taught. Methods of education- use of audio visual aids, Use of computers to impart nutrition education - power point presentation, E-learning, Organization of Nutrition education programmes: Principles of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.

- #: Self study

TextBooks

S.No.	Author name	Year of publication	Title of the book	Publishers name
1.	Judith.E.Brown	2008	Nutrition	Thomson wadsworth, USA
2.	M.Swaminathan	2012	Advanced Textbook on Food and Nutrition	Bangalore Printing and Publishing Co. Ltd., Bangalore
3.	B. Srilakshmi	2013	Dietetics	New Age International (P) Ltd., New Delhi
4.	B. Srilakshmi	2013	Nutrition Science	New Age International (P) Ltd., New Delhi
5.	Bamji M.S, PrahladRao N, Reddy V	2016	Textbook of Human Nutrition	Oxford and PBH Publishing Co. Pvt. Ltd, New Delhi

Reference Books

S.No.	Author name	Year of publication	Title of the book	Publishers name
1.	Prakash shetty	2002	Nutrition through the life cycle	Leatherhead publishing, Leather head International Ltd,UK.
2.	Gibney, M.J., Margetts, B.M., Kearney, J.M., Arab, L.	2004	Public Health Nutrition UK	Blackwell PublishingCo.
3.	A.Park	2007	Park's Textbook of Preventive and Social Medicine	M/S Banarasidas, Bharat Publishers, Jabalpur, India
4.	M.Raheena Begum	2008	A textbook of Foods, Nutrition and Dietetics	Sterling Publishers Pvt. Ltd., NewDelhi
5.	Krause's	2008	Food and Nutrition Therapy	Sauders Elsevier, Canada.
6.	Carolyn D. Berdanice	2009	Advanced Nutrition	CRC Press
7.	M. Swaminathan	2014	Advanced Textbook of Food and Nutrition	Bangalore Printing and Publishing Co. Ltd, Bangalore

Journals:

- Community, Work and Family, Carfax Publishing Ltd publishing, United Kingdom.
- Journal of Adult Development, Springer/Plenum Publishers, United States
- Journal of Child and Adolescent Mental Health, Nisc publisher, South Africa
- Journal of Food and Nutrition Research, Vup Food Research Inst publishing, Bratislava, Slovakia. Nutrition Reviews, Oxford University Press publishing, United States.
- Journal of the Academy of Nutrition and Dietetics, Elsevier Science Inc publishing, UnitedStates.
- Journal of Pregnancy, Hindawi Publishing Corporation, Egypt.
- Nutrition Journal, Biomed Central Ltd publishing, England.
- Nutrition Research Reviews, Cambridge Univ Press publishing, England.
- Nutrition Today, Lippincott Williams & Wilkins Ltd publisher, United States.

Web links:

http://www.fao.org/3/W3733E/w3733e03.htmhttp://www.fao.org/3/x0172e/x0172e08.htmhttp://www.foodstandards.gov.au/code/Pages/default.aspxhttps://childdevelopmentinfo.com/ages-stages/#.XMpmwIkzbIU

https://www.hhs.gov/fitness/eat-healthy/importance-of-good-nutrition/index.html

https://www.nasa.gov/sites/default/files/space_nutrition_book.pdfhttps://www.ncbi.nlm.nih.gov/pmc/articles/PMC1775335/?page=8https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2682454/https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5621667/https://www.ncbi.nlm.nih.gov/pubmed/12031199https://www.nichd.nih.gov/health/topics/pregnancy/conditioninfo/complications

Pedagogy : E-content, Lecture, Power point presentation, Seminar, Assignment, Demonstration.

Course Designers

- Ms.S.Preethi
- Ms.E.Agalya

SEMESTER - I	BIOCHEMICAL CHANGES IN DISEASES	HOURS / WEEK - 6	
CORE COURSE –III		CREDIT - 5	
COURSE CODE – 19PFS1CC3		INTERNAL 25	EXTERNAL 75

Preamble

- To Gain knowledge on the metabolism of the nutrients and the associated diseases
- To Understand importance of organ function tests in analysis of clinical manifestation

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1.	Identify biochemical parameters and interpret the results	K1
CO2	Describe the role of nutrients in genes	K2
CO3.	Classify Carbohydrate disorders	K3
CO4.	Associate relationship between body composition of Protein with disorders	K4
CO5.	Compare lipid profile with fat disorders	K5
CO6.	Plan appropriate technique to evaluate various organ Functions	K6

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1.	S	S	S	M	M
CO2.	S	S	S	M	M
CO3.	S	S	S	M	M
CO4.	S	S	S	M	M
CO5.	S	S	S	M	M
CO6.	S	S	S	S	M

S- Strong; M-Medium

Syllabus

UNIT I **(18 Hours)**

Biochemical Data acquisition and Interpretation

a. Basis for biochemical estimation of basic principles – General lab information, units of measure. Uses of biochemical data in clinical medicine. Acquisition and interpretation of biochemical data.

b. Nutrigenomics

Introduction to nutrigenomics -Scope and importance to human health, interactions genes nutrients.

UNITII **(18Hours)**

a. **Disorders of carbohydrate metabolism:**-#Diabetes mellitus#, glycohemoglobins, hypo-glycemias, galactosemia and ketone bodies. Various types of glucose tolerance tests. Glycogen storage diseases. Inborn errors of carbohydrate metabolism.

b. **Disorders of Protein metabolism:**-Phenylalanemia, homocystinuria, tyrosinemia, MSUD, phenylketonuria, alkaptonuria, albinism and aminoaciduria. Disorders in purine/ pyrimidine metabolism.

c. **Disorders of Fat metabolism:–**Dyslipidemia, Atherosclerosis, Coronary Artery Disease, Disorders of Lipoproteins and Steatorhea.

UNITIII **(18Hours)**

a. **Disorders of mineral metabolism**:-Hypercalcaemia, hypocalcaemia, normocalcaemia, hypophosphataemia and hyperphosphataemia. Electrolytes, blood gases, respiration and acid-base balance. Disorders of acid-base balance and their respiratory and renal mechanisms.

b. Environmental Pollution and Heavy metal poisons.

UNITIV **(18Hours)**

a. **Hormonal disturbances**:-Protein hormones (anterior pituitary hormones, posterior pituitary hormones), Steroid hormones (Adrenocorticosteroids, Reproductive endocrinology).

b. Enzymes of clinical importance, Enzymes of pancreatic origin and biliary tract. Detoxification mechanism – Phase one reaction-Oxidation, Reduction, Hydrolysis. Phase two – Glucoronic acid, Sulfate methylation and Phase three reactions.

UNIT V **(18 Hours)**

Biochemical aspects of hematology and Evaluation Organ Function Tests.

a. Disorders of erythrocyte metabolism, hemoglobinopathies, thalassemias, thrombosis and anemias.

b. Assessment and clinical manifestations of

- Renal - clearance test – Urea clearance, inulin clearance and creatine clearance, Dye test and Dilution test
- Hepatic - serum bilirubin, Types of Jaundice, Icteric index, Galactose tolerance test, Hippuric acid Test and Bromo Sulphthalein test,
- Pancreatic – Secretin stimulating test and Fecal Elastase test
- Gastric - Determination of free acidity, Fractional test, Examination of duodenal contents, Determination of serum amylase and lipase significance, Tests for Malabsorption – Examination of faeces, Determination of fat content to faeces , Fat balance study xylulose excretion test – Vitamin A absorption Test

#-#:Self Study

TextBooks

S.No.	Author name	Year of publication	Title of the book	Publishers name
1.	Beckett Geoffrey	2006	Clinical Biochemistry	Australia, Blackwell Publishing
2.	Lajja Das	2014	Medicinal Biochemistry	New Delhi: Venus Books

ReferenceBooks

S.No	Author name	Year of publication	Title of the book	Publishers name
1.	Beckett Geoffrey	2006	Clinical Biochemistry	Australia, Blackwell Publishing
2.	Murray Robert K Harper`s	2012	Illustrated Biochemistry	McGraw Hill Irwin Companies
3.	Das Lajja	2014	Medicinal Biochemistry	New Delhi, Venus Books
4.	Ambika Shanmugam.	2016	Fundamentals of biochemistry for medical students	Lippincott Williams and wilkin
5.	Satyanarayana U	2016	Fundamentals o Biochemistry	Books and Allied (p) Ltd,

Journals:

- CPD Bulletin Clinical Biochemistry, Rila Publications, Ltd, United Kingdom.
- Annals of Clinical Biochemistry, Sage Publications Inc, England.
- Clinical Biochemistry, Pergamon-Elsevier Science Ltd, Canada.
- IndianJournalofClinicalBiochemistry,AssociationofClinicalBiochemistsof India.
- Journal of Clinical Biochemistry and Nutrition Japan.

Web links:

https://ncdc.gov.in/
http://aiihph.gov.in/department-of-biochemistry-and-nutrition/

Pedagogy: E-content, Lecture, Power point presentation, Seminar, Assignment, Demonstration

Course Designers

- Ms.S.Fathima
- Ms.S.Preethi

BIOCHEMICAL CHANGES IN DISEASES- PRACTICAL (Related Experience)

Preamble

- To enable practical experience in laboratory techniques
- To develop skills on analysis of blood and urine

Course Outcomes

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

CO Number	CO statement	Knowledge level
CO 1	Identify various biochemical parameters	K1
CO 2	Interpret biochemical parameters	K2
CO 3	Apply different techniques in Collection and analysis of blood and urine	K3
CO4	Determine appropriate biochemical parameter in relevance to various disease conditions.	K4
CO5	Assess specificity, accuracy, sensitivity and Prognosis of diseases.	K5
CO6	Compile biochemical parameters and integrate with reference range	K6

Syllabus

1. Qualitative analysis of Urine for normal constituents.
2. Qualitative analysis of urine for abnormal constituents.
3. Estimation of blood glucose (Folin-Wu method).
4. Estimation of Hemoglobin (Drabkin's method).
5. Estimation of Triglycerides.
6. Estimation of Serum Calcium.
7. Estimation of Serum Alkaline Phosphatase.
8. Demonstration of automated Biochemical Analyzer.
9. Visit to biochemistry lab.

TextBooks

Author name	Year of publication	Title of the book	Publishers name
Pattabiraman N.T	2001	Laboratory Manual in Biochemistry	All IndiaPublishers and Distributors Regd, Chennai
Shanmugam S, Sathishkumar T, Panneer SelvamK	2010	Laboratory handbook on Biochemistry	PHI learningPrivate Ltd Chennai.

ReferenceBooks

Author name	Year of publication	Title of the book	Publishers name
Murray, Robert K	2012	Harper`s Illustrated Biochemistry	McGraw Hill Irwin Companies, New York
Das Lajja	2014	Medicinal Biochemistry,	Venus Books, New Delhi
Evangeline Jones	2016	Manual of Practical Medical Biochemistry,2nd Edition	Jaypee Brothers Medical Publishers(p) Ltd.

Pedagogy: E-content, Lecture, Power point presentation, Demonstration, visit to hospitals

Course Designers

- Ms.S.Fathima
- Ms.S.Preethi

SEMESTER – I	ADVANCED DIETETICS I	HOURS / WEEK – 6	
CORE COURSE –IV		CREDIT – 5	
COURSE CODE – 19PFS1CC4		INTERNAL 25	EXTERNAL 75

Preamble

- To plan therapeutic diets
- To analyze the underlying causes, patho physiology and complications of diseases.
- To outline the focus of nutrition and dietetics in the prevention of diseases.

Course outcomes

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

CO Number	CO statement	Knowledge level
CO 1	Identify the role of dietitian in the hospitals.	K1
CO 2	Interpret the nutritional status through assessment modules.	K2
CO 3	Predict drug and nutrient interaction.	K3
CO 4	Diagnose symptoms and complications and apply dietary principles in the management of gastric and biliary tract diseases.	K4
CO 5	Evaluate mechanism of food allergy	K5
CO 6	Design food products to satisfy therapeutic needs.	K6

Mapping with ProgrammeOutcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1.	S	S	S	S	M
CO2.	S	S	S	S	M
CO3.	S	S	S	S	M
CO4.	S	S	S	S	M
CO5.	S	S	S	S	M
CO6.	S	S	S	S	S

S- Strong; M-Medium

Syllabus

UNITI **(18Hours)**

a. **Dietitian -** Definition and types of dietitians, role of dietitian in the hospital and community, professional ethics and obligations.
b. **Counseling-** Definition, counsellor and Client, techniques of counseling and classification of counseling.
c. **Computers in Nutrition Practice -** General information – data input, data output, data analysis, data communication, clinical care – communication in patient care, Nutritional therapy.

UNITII **(18Hours)**

a. **Routine hospital diets -** Clear fluid diet, full fluid diet, soft diet, Regular diet
b. **Feeding the patients -** Psychology of feeding the patient, assessment of patient needs.
c. **Special feeding methods** – Enteral nutrition and Parenteral nutrition.
d. **Drug Nutrient Interaction**– Diet effects on drug disposition, Interactions of drugs and nutrients, Effect of drugs on food intake and absorption, Effect of nutrients on drug metabolism.

UNITIII **(18Hours)**

a. **Diet in Disease of Gastro intestinal tract -** Meaning, Pathogenesis, etiology, types, symptoms, treatment and dietary modification for gastro intestinal disorders – Gastritis, peptic ulcer, diarrhea, dysentery, constipation, malabsorption syndrome, and carcinoma of the stomach.
b. **Diet in biliary tract disorders -** Meaning, Pathogenesis, etiology, types, symptoms and clinical findings and dietary modification for Liver disorders - Fatty liver, Hepatitis and Cirrhosis, Gall bladder disorders - Cholecystitis and Cholelithiasis
c. **Diet in pancreatic disorders -** Meaning, Pathogenesis, etiology, types, symptoms and clinical findings and dietary modification for Pancreatitis

UNITIV **(18Hours)**

a. #**Diet in Food allergy -** Food allergy and food intolerance – Definition ,mechanism, symptoms, food allergens, Diagnosis of allergy and dietary management.#

b. **Nutritional care for patients having Metabolic stress**

Surgery – Preoperative Nutrition care and Postoperative nutrition care Burns – Pathophysiology and Medical nutrition therapy.

UNIT-V **(18Hours)**

Nutritional care in Inborn Errors of Metabolism, Developmental Disabilities and Palliative Care

a. **Nutritional care for the patients with inborn errors of metabolism -** Overview, diagnosis, symptoms, dietary management - Phenylketonuria, Galactosemia and Fructosuria
b. **Nutrition for Developmental Disabilities -** Down's syndrome, Cerebral Palsy, Autism and Attention Deficit Hyperactivity Disorder
c. **Basics of Palliative care** – definition, types, objectives and principles of palliative care.

#-#:Self Study

Textbooks

S.No.	Author name	Year of Publication	Title of the book	Publisher name
1.	Mahan, Kathleen L	2004	Krause's Food, Nutrition and Diet Therapy	Pennsylvania; Saunders (2004)
1.	Antia F P	2005	Clinical Dietetics and Nutrition	Oxford University Press, New Delhi
2.	Prakash S Lohar	2007	Endocrinology – Hormones and Human Health	MJP publishers, Chennai
3.	Srilakshmi B	2009	Dietetics	New Age International Publications, New Delhi
4.	Joshi A Shubhangini	2010	Nutrition and Dietetics	McGraw Hill Education Private Limited, New Delhi
5.	Swaminathan M	2012	Essentials of Food and Nutrition	Ganesh and Company, Madras
6.	Maity S P	2016	Pharmacology for Second Professional Students	Books & Allied Pvt. Ltd

Reference books

S.No.	Author name	Year of Publication	Title of the book	Publisher name
1.	Robbinson,Corrine H.	1982	Normal and Therapeutic Nutrition,	Macmillan McGraw Hill School Division, New York
2.	Udai Veer	2007	Elements of Food Science	Anmol Publications Pvt Ltd, New Delhi
3.	Srilakshmi B	2008	Nutrition Science	New Age International Publications, New Delhi
4.	Indrani T.K	2008	Nursing Manual of Nutrition and Therapeutic Diet	Jaypee Brothers medical publishers (P) Ltd.
5.	Mary Marian	2008	Clinical Nutrition for surgical patients	Jones and Barletta Publishers
6.	Sangeetha Karnik	2010	Nutrition and Dietetics Therapy	Biotech Pharma Publications, Hyderabad
7.	Sari Edelstein	2015	Life Cycle Nutrition – An Evidence based Approach	Jones and Barletta Publishers, London

Journal

- Food and Nutrition Bulletin, Sage Publications Inc,Japan.
- Food and Nutrition Research, Co-Action Publishing,Weden.
- Food Digestion, Springer Verlag,Germany.
- Nutritional Therapy and Metabolism, WichtigPublishing,Italy.
- Nutrition in Clinical Practice, Sage Publications Inc, UnitedStates

Weblinks

https://www.omicsonline.org/societies/indian-dietetic-association/

https://www.frontiersin.org/journals/nutrition/sections/clinical-nutrition

https://www.ncbi.nlm.nih.gov/pubmed/14685018

Pedagogy : Lecture, assignment, PowerPoint presentation, quiz, seminar, visit to hospital dietary units

Course designers

- Ms.S.Agalya
- Ms.B.Thanuja

SEMESTER – I	HUMAN NUTRITION AND PUBLIC HEALTH– PRACTICAL	HOURS / WEEK – 6	
CORE PRACTICAL - I		CREDIT – 4	
COURSE CODE – 19PFS1CC1P		INTERNAL 40	EXTERNAL 60

Preamble

- To understand the basic principles of menu planning
- To plan menu throughout life cycle with special reference to age, sex, physical activity and physiological status

Courseoutcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Identify deficiency problems	K1
CO2.	Interpret the foods to be included and avoided in various stages of life cycle	K2
CO3.	Apply menu planning principles	K3
CO4.	Determine the role of modified diet for the management of nutritional problems	K4
CO5	Assess the nutritional status of differrent life stages	K5
CO6.	Develop menu, calculate nutritive value and compare with recommended dietary allowances.	K6

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1.	S	S	S	M	M
CO2.	S	S	S	M	M
CO3.	S	S	S	M	M
CO4.	S	S	S	M	M
CO5.	S	S	S	M	M
CO6.	S	S	S	M	M

S- Strong; M-Medium

Syllabus

Menu planning, nutritive value calculation and preparation of meals for:

- Pregnant women.
- Lactating women.
- Infants.
- Pre-schoolchildren.
- School-going children.
- Adolescent girl.
- Adult man, Adult woman and menopausal women.
- Geriatrics.
- PEM
- Vitamin –A deficiency disease
- Anaemia
- Assessment of Nutritional Status
- Case study
- Visit to ICDS- Anganwadi centre.

TextBooks

S.No.	Author name	Year of publication	Title of the book	Publishers name
1.	Emma Derbyshire	2011	Nutrition in the childbearing years	Wiley Blackwell,UK
2.	M.Swaminathan	2012	Advanced Textbook on Food and Nutrition	Bangalore Printing and Publishing Co. Ltd., Bangalore
3.	B. Srilakshmi	2013	Dietetics	New Age International (P) Ltd., New Delhi

ReferenceBooks

S.No.	Author name	Year of publication	Title of the book	Publishers name
1.	M.Raheena Begum	2008	A textbook of Foods,Ster Nutrition and Dietetics	ing Publishers Pvt. Ltd., New Delhi
2.	Mahtab S, Bamji, Kamala Krishnasamy, G.N.V Brahman	2016	Textbooks of HumanOxf Nutrition	rd And IBH Publishing Co.(P). Ltd., New Delhi

Pedagogy: Lecture, demonstration and experiment

Course Designers

- Ms.S.Preethi
- Ms.E.Agalya

SEMESTER – II	ADVANCED DIETETICS II	HOURS / WEEK – 6	
CORE COURSE– V		CREDIT – 5	
COURSE CODE – 19PFS2CC5		INTERNAL 25	EXTERNAL 75

Preamble

- To plan therapeutic diets
- To analyze the underlying causes and complications of diseases.
- To understand the patho physiology of diseases.
- To outline the focus of nutrition and dietetics in the prevention of diseases.

Courseoutcomes

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

CO Number	CO statement	Knowledge level
CO 1	State the types of fever	K1
CO 2	Describe complications of Diabetes mellitus	K3
CO 3	Apply the dietary principles in the management of Cardiac and Renal diseases.	K3
CO 4	Associate symptoms of gout with clinical manifestations.	K4
CO 5	Evaluate role of diet counseling in the nutritional care.	K5
CO 6	Develop antioxidant rich recipes for Cancer Prevention.	K6

Mapping with ProgrammeOutcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1.	S	S	S	M	M
CO2.	S	S	S	M	M
CO3.	S	S	S	M	M
CO4.	S	S	S	M	M
CO5.	S	S	S	S	M
CO6.	S	S	S	S	M

S- Strong; M-Medium

Syllabus

UNITI **(18Hours)**

a. **Diet in Febrile conditions -** Meaning, Pathogenesis, etiology, types, symptoms, treatment and dietary modification for febrile condition - acute, chronic and recurrent fevers - typhoid, influenza, rheumatic fever, tuberculosis, malaria and poliomyelitis.

b. **Diet care in HIV** – Pathophysiology, aetiology, stages of HIV infection, ART, opportunistic infections, women and HIV, nutritional management

UNIT II **(18 Hours)**

Diet in metabolic disorders

a. **Diabetes Mellitus -** Meaning, types, screening and diagnostic criteria, pathogenesis, etiology, symptoms, complications, , Dietary management of Diabetes Mellitus – Food Exchange system, Glycemic Index, Glycemic Load, nutritive and non nutritive sweeteners. Lifestyle recommendations, drugs and insulin

b. #**Obesity –** Etiology, energy balance, theories, clinical manifestation, complications, dietary and lifestyle modifications and surgical management#

UNITIII **(18Hours)**

a. **Diet in Cardio Vascular diseases -** Meaning, Pathogenesis, etiology, types, symptoms, treatment and dietary modification for cardio vascular disorders – hyperlipidaemia, hypertension, atherosclerosis, hypercholesterolemia, acute and chronic cardiac diseases, and congestive heart failure

b. **Diet in Renal diseases**- Pathogenesis, etiology, types, symptoms, treatment and dietary modification for renal disorders– glomerulonephritis, nephrosis, nephrosclerosis, uremia, nephrolithiasis.

UNITIV **(18Hours)**

a. **Dietary Management in Nervous System Disorders**– Etiology, Clinical features and Dietary management for – Parkinson's disease and Alzheimer's disease

b. **Nutritional care in diseases of the musculoskeletal system -** Meaning, Pathogenesis, symptoms, causes, treatment and dietary management - arthritis, osteoporosis, gout and rheumatism.

UNIT-V **(18Hours)**

a. **Diet in Hormonal diseases -** Meaning, etiology, symptoms, and dietary modification for - Cushing's syndrome, Addison's disease, hypothyroidism and hyperthyroidism.

b. **Diet in Cancer -**Development, etiology, metabolic alterations, symptoms, nutritional and dietary management of cancer patients, side effects of cancer treatment, #role of antioxidants in cancer treatment#

#-#: Self Study

Textbooks

S.No.	Author name	Year of Publication	Title of the book	Publisher name
1.	Mahan, Kathleen L	2004	Krause's Food, Nutrition and Diet Therapy	Pennsylvania; Saunders (2004)
1.	Antia F P	2005	Clinical Dietetics and Nutrition	Oxford University Press, New Delhi
2.	Prakash S Lohar	2007	Endocrinology – Hormones and Human Health	MJP publishers, Chennai
3.	Srilakshmi B	2009	Dietetics	New Age International Publications, New Delhi
4.	Joshi A Shubhangini	2010	Nutrition and Dietetics	McGraw Hill Education Private Limited, New Delhi
5.	Swaminathan M	2012	Essentials of Food and Nutrition	Ganesh and Company, Madras
6.	Maity S P	2016	Pharmacology for Second Professional Students	Books & Allied Pvt. Ltd

Referencebooks

S.No.	Author name	Year of Publication	Title of the book	Publisher name
1.	Robbinson,Corrine H.	1982	Normal and Therapeutic Nutrition,	Macmillan McGraw Hill School Division, New York
2.	Udai Veer	2007	Elements of Food Science	Anmol Publications Pvt Ltd, New Delhi
3.	Srilakshmi B	2008	Nutrition Science	New Age International Publications, New

				Delhi
4.	Indrani T.K	2008	Nursing Manual of Nutrition and Therapeutic Diet	Jaypee Brothers medical publishers (P) Ltd.
5.	Mary Marian	2008	Clinical Nutrition for surgical patients	Jones and Barletta Publishers
6.	Sangeetha Karnik	2010	Nutrition and Dietetics Therapy	Biotech Pharma Publications, Hyderabad
7.	Sari Edelstein	2015	Life Cycle Nutrition – An Evidence based Approach	Jones and Barletta Publishers, London

Journal

- Food and Nutrition Bulletin, Sage Publications Inc,Japan.
- Food and Nutrition Research, Co-Action Publishing,Weden.
- Food Digestion, Springer Verlag,Germany.
- Nutrition and Cancer, Lawrence Erlbaum Associates Inc. UnitedStates
- Nutritional Therapy and Metabolism, Wichtig Publishing,Italy.
- Nutrition in Clinical Practice, Sage Publications Inc, UnitedStates

Web links

https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/heart-disease-and-foodhttp://idaindia.com/

https://www.omicsonline.org/societies/indian-dietetic-association/

https://www.frontiersin.org/journals/nutrition/sections/clinical-nutrition

https://www.cancer.gov/publications/dictionaries/cancer-terms/def/dietary-counseling

https://www.ncbi.nlm.nih.gov/pubmed/14685018

Pedagogy : Lecture, assignment, PowerPoint presentation, quiz, seminar, visit to hospital dietary units

Course designers

- Ms.S.Agalya
- Ms.B.Thanuja

SEMESTER – II	HOSPITAL ADMINISTRATION	HOURS / WEEK – 6	
CORE COURSE - VI		CREDIT – 5	
COURSE CODE – 19PFS2CC6		INTERNAL 25	EXTERNAL 75

Preamble

- To gain knowledge in hospital functions and administration.
- To acquire skills in maintaining medical records.
- To understand the management of resources in hospitals.

Courseoutcomes

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

CO number	CO statement	Knowledge Level
CO 1	Identify the functions of modern hospital.	K1
CO 2	Illustrate the infrastructure and layout of modern hospital.	K2
CO 3	Classify various patient care services administered in hospitals.	K3
CO 4	Determine the managerial activities of hospital Functioning	K4
CO 5	Evaluate the significance of marketing, materia and financial management in hospitals.	K5
CO6	Integrate the importance of hospitality services for patient support.	K6

Mapping with ProgrammeOutcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1.	S	M	M	S	S
CO2.	S	M	M	S	S
CO3.	S	S	M	S	S
CO4.	S	S	M	S	S
CO5.	S	S	M	S	S
CO6.	S	S	M	S	S

S- Strong; M-Medium

Syllabus

UNITI **(18Hours)**

Hospital based health care and its changing scenario

Effects of globalization on health care, concepts of corporate hospitals in developing countries, infrastructure and layout of an ideal corporate hospital, functioning of modern hospital and changing needs of patients, hospitality in hospital care.

UNITII **(18Hours)**

Patient Care Services

Patient Admission – Purpose, Policy and Procedure, Discharge - Process, Discharge Protocol and Discharge Summaries, Cafeteria and Dietary services, Front Office Services, Housekeeping Services, Blood Bank, Diagnostic services, Laboratory – scope, equipment, reagents and materials, Physiotherapy, Pharmacy – Objectives, Functions and Scope , Operation theatre, Outpatient ward admission and Inpatient ward admission.

UNITIII **(18Hours)**

Principles of Hospital management

Managerial activities for effective hospital functioning, duties and responsibilities of hospital managers**,** qualities of office managers and effective inter and intra departmental co-ordination. NABH standards**.**

UNITIV **(18Hours)**

Marketing and Material management

Human Resource Management – Process, Performance Appraisal System, Managerial accounting and Financial Management, Material management – Objectives and Process and Inventory management – Systems and Methods, Marketing principles and methods.

Basics of Computer: Components of computer, Knowledge about computer software& programmes commonly used in healthcare sector

UNITV **(18Hours)**

Management of Dietary Units

Management of dietary department - #diet planning for hospital diets, purchasing, storage, quantity food production, serving to patient- tray and trolley service#, plate waste management, washing and garbage disposal.

#-#: Self Study

Textbooks

S.No.	Author name	Year of Publication	Title of the book	Publisher name
1.	Sue Grossbauer, RD	2001	Managing Food Service Operations, A System Approach for Healthcare and Insitutions	Kendal/Hunt Publishing Company, Lowa, USA
2.	Ashok Arora, AkshayaBhatiya	2003	Management Information systems	Excel Books
3.	S.L.Goel & Dr.R.Kumar	2007	Hospital Administration and Management Theory and Practice	Deep and Deep Publication Ltd, New Delhi
4.	Dr. D.K.Sharma & Goyal R C	2017	Hospital Administration and Human Resuorce Management	Phi Learning, New Delhi
5.	Francis C M	1995	Hospital Administration	Jaypee Brothers Medical Pubs, New Delhi
6.	Llewellyn Davis R and Macaulay H M C	1995	Hospital Planning and Administration	Jaypee Brothers Publications, New Delhi

ReferenceBooks

S.No.	Author name	Year of Publication	Title of the book	Publisher name
1.	Savitha Sharma	1996	Hospital Management	Commonwealth Publishers, New Delhi

Journals

- Journal of Hospital and Healthcare Administration, Gavin publishers,USA
- International journal of research foundation of hospital and health careadministration, India
- JournalofHospitalManagementandHealthPolicy,AMEPublishingCompany,Hong Kong
- Frontiers of Health Services Management, Health Administration Press, UnitedStates

Web Links

https://www.ibef.org/download/Healthcare-January-2017.pdfhttps://www.ncbi.nlm.nih.gov/pmc/articles/PMC1299207/https://www.who.int/hiv/pub/imai/om_5_infrastructure.pdfhttps://www.ncbi.nlm.nih.gov/pmc/articles/PMC1208931/https://www.researchgate.net/publication/259389319_hospital_administrationhttps://www.nabh.co/h-doc.aspx

Pedagogy: Lecture, Seminar, Assignment, visit to multispeciality hospital

Course Designers

- Ms. S.Agalya
- Ms.V.Ramya

SEMESTER – II	ADVANCED DIETETICS - I & II - PRACTICAL AND DIETARY INTERNSHIP	HOURS / WEEK – 6	
CORE PRACTICAL - II		CREDIT – 4	
COURSE CODE – 19PFS2CC2P		INTERNAL 40	EXTERNAL 60

Preamble

- To understand the modification of normal diet for therapeutic purpose.
- To acquire the skills of preparing diet for various disease conditions.
- To study the importance of dietitian in hospitals

Course Outcomes

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

CO Number	CO statement	Knowledge level
CO 1	List various routine hospital diets	K1
CO 2	Describe nutrient composition of clear fluid, full fluid and soft diet.	K2
CO 3	Classify foods to be included and avoided in the treatment of diseases	K3
CO4	Determine importance of dietary principles in the management of diseases.	K4
CO5	Assess significance of dietary department at multi specialty hospitals.	K5
CO6	Design and develop tools for diet counseling	K6

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1.	S	S	S	M	M
CO2.	S	S	S	M	M
CO3.	S	S	S	M	M
CO4.	S	S	S	M	M
CO5.	S	S	S	S	M
CO6.	S	S	S	S	S

S- Strong; M-Medium

Syllabus

ADVANCED DIETETICS I & II PRACTICAL

ADVANCED DIETETICS I PRACTICAL

1. Preparation of clear liquid, full liquid and soft diet.
2. Planning and preparing diets for
    - Gastrointestinal disorders – Peptic ulcer, Diarrhea and Constipation.
    - Liver disorders - Hepatitis and Cirrhosis

ADVANCED DIETETICS II PRACTICAL

- Febrile Conditions –Acute, Intermittent and Chronic
- Metabolic disorders – Diabetes mellitus and Obesity
- Musculoskeletal Disorders -Gout
- Cardio vascular disorders – Hypertension and Atherosclerosis.
- Renal disorders – Acute Renal Failure, Chronic Renal failure, Renal stones and Dialysis.

3. Diet counseling for
    - Febrile Conditions
    - Gastrointestinal disorders
    - Liver disorders
    - Metabolic disorders
    - Cardio vascular disorders
    - Renal disorders

DIETARY INTERNSHIP

The Practical work consists of internship in a teaching hospital for 30 days

- Visits to the different wards to observe patients requiring Special diets.
- Experience in calculating and planning modified diets.
- Supervising and handling the food preparation and service in the dietary department of the hospital.
- Case study- Selecting and observing patients requiring a therapeutic diet in relation to Patients dietary history - income, occupation, food habits and social factors.
- Calculating the diet according to medical prescription.
- Accompanying the dietitian while visiting the patient.
- Use of the computer in diet
- Counselling and patient education
- Education of the patient.

Preparation of the report should include

- History of the hospital
- Location
- Facilities provided
- Layout of the kitchen
- Work organization
- Organization structure
- Duties of the dietitian
- Special dietary preparation
- Menus
- Types of service
- Equipments
- Storage of food
- Handling of leftovers and shortages
- Sanitation and hygiene

Textbooks

S.No.	Author name	Year of Publication	Title of the book	Publisher name
1	Shubhangini A Joshi	2010	Nutrition and Dietetics	McGraw Hill Education Private Limited, New Delhi
2	Gopalan C, Rama Sastri B V and BalasubramaniyanS C	2016	Nutritive value of Indian Foods	National Institute of Nutrition, Hyderabad

ReferenceBooks

S.No	Author name	Year of Publication	Title of the book	Publisher name
1.	Joshi Y K	2003	Basis of Clinical Nutrition	Jaypee Brothers, Medical Publishers, New Delhi

Pedagogy: Lecture and Demonstration

Course Designers

- Ms.S.Agalya
- Ms.E.Agaly

SEMESTER – II	FUNCTIONAL FOODS AND NUTRACEUTICALS	HOURS / WEEK – 6	
ELECTIVE COURSE I. A		CREDIT – 4	
COURSE CODE – 19PFS2EC1A		INTERNAL 25	EXTERNAL 75

Preamble

- To acquire a sound understanding of the sources and role of functional foods and nutraceuticals in health and diseases.

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Define the functional foods and nutraceuticals	K1
CO2.	Explain mechanism of action of functional foods and Nutraceuticals	K2
CO3.	Classify functional foods based on food sources	K3
CO4.	Examine role of functional foods and nutraceuticals on health and disease	K4
CO5.	Evaluate the isolated component derived from the functional food	K5
CO6.	Design dietary supplements from functional foods and Nutraceuticals	K6

Mapping with Programme outcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1.	S	S	S	S	M
CO2.	S	S	S	S	M
CO3.	S	S	S	S	M
CO4.	S	S	S	S	M
CO5.	S	S	S	S	M
CO6.	S	S	S	S	M

S- Strong; M-Medium

Syllabus

Unit-I **(18Hours)**

Functional foods and nutraceuticals

Definition, Classification of functional foods based on Food source - Plant, animal, microbial. Mechanism of action - antioxidant, antibiotic, anti inflammatory, antitumor, antihypertensive. Chemical nature - Fatty acids and structural lipids, isoflavones, phenolic substances, terpenoids, saponins, tocotrienols and simple terpenes, Isoprene derivatives, Amino acid derivatives, Carbohydrate derivatives.

Unit-II **(18Hours)**

a. **Role of functional foods and nutraceuticals on health from plant sources**

Cereals and its Products- rice bran, wheat bran, oats, barley, corn.

Pulses and its Products- grams, bean, soyabean.

Vegetables and fruits- GLV, Cruciferous vegetables, carrot, tomato, avacado, berries.

Nuts and oilseeds- flax seeds, walnut, almond.

Herbs- Oregano, thyme, Aloevera, Mint Roots

and tubers- Sweet potato, Cassava

Spices and Condiments- turmeric, red chilli, nutmeg, cloves, cardomom

b. **Role of functional foods and nutraceuticals on health from animal sources** Fish- tuna fish, mackerel, sardines and salmon

c. **Role of Functional foods and nutraceuticals on health from microbial sources**

#Probiotic microflora#, Prebiotics, Symbiotics

Unit III **(18Hours)**

Role of Functional Foods and Nutraceuticals in Diseases and Disorders

Diabetes mellitus ,hypertension, hypercholesterolemia, Neurological disorders and Nephrological disorders, Liver disorders, Osteoporosis, Psoriasis, Ulcers, cancer, obesity and stress.

Unit-IV **(18Hours)**

Isolation and Extraction functional component from plant and animal materials

Extraction methods- Extraction of phenolic compounds using solvents, Microwave-assisted Extraction, Ultrasonic – assisted Extraction. Recent developments in the isolation, purification and delivery of phytochemicals.

Unit-V **(18Hours)**

Regulatory Aspects of Functional Foods and Nutraceuticals

Regulatory aspects- FDA, CODEX, DSHEA, FOSHU, FSSAI, AYUSH, development of biomarkers to indicate the efficacy of functional ingredients, Research frontiers in functional foods

#-#:Self Study

Textbooks

S.No.	Author name	Year of Publication	Title of the book	Publishers name
1.	Susan Sungsoo Cho , Mark L.Dreher	2001	Handbook of Dietary Fibre	CRC Press, Newyork
2	Yahwant Vishnupant Pathak	2009	Handbook of Nutraceuticals- Vol-I	CRC Press, Newyork
3	Edward.R.Farnworth	2008	Handbook of Fermented functional foods	CRC Press, Newyork
4	Yahwant Vishnupant Pathak	2011	Handbook of Nutraceuticals-Vol-II	CRC Press, Newyork

Referencebooks

S.No.	Author name	Year of publication	Title of the book	Publishers name
1.	Robert E C. Wildman	2007	Handbook of Nutraceuticals and Functional Foods	CRC Press, Newyork
2.	Jim Smith and Edward Charter	2010	Functional Food Product Development	Wiley Blackwell, New Delhi
3.	Gordon W.Fuller	2011	New Food Product Development From Concept to Marketplace	CRC Press, Newyork
4.	HariNiwas Mishra, Rajesh Kapur, Navneet Singh Deora, AasthaDeswal	2016	Functional foods	New India Publishing Agency, New Delhi
5.	Nicola Graimes	1999	The practical Encyclopedia of whole foods	Anness Publishing Ltd

Journals:

- Functional foods in Health and Disease, Functional food centre, Unitedstates
- Future journal of pharmaceutical sciences, Elsevier, UnitedKingdom
- Nutrafoods, Springer, United States.
- Functional Foods in Health and Disease, Functional Food Center, Inc. UnitedStates.

Web Links

https://www.ncbi.nlm.nih.g
ovwww.nutrition.orgwww.
ncbi.nlm.nih.gov
www.foodinsight.org/foodsforhealth.axpx

Pedagogy: E-content , Lecture, Power point presentation, Seminar, Assignment, Quiz, Group Discussion**.**

Course designers

- MsM.Vinothini
- Ms..B.Thanuja

SEMESTER – II	PAEDIATRIC NUTRITIONAL CARE	HOURS / WEEK – 6	
ELECTIVE COURSE I. B		CREDIT – 4	
COURSE CODE – 19PFS2EC1B		INTERNAL 25	EXTERNAL 75

Preamble

- To understand growth ,development and nutritional requirements of children.
- To get an insight knowledge on pediatric critical care

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1.	Citethe importance of immunization	K1
CO2.	Explain the anthropometric assessment techniques in pediatric	K2
CO3.	Predict the nutritional support in critically ill children according to their metabolic changes	K3
CO4.	Diagnose the clinical assessment in pediatric	K4
CO5.	Assess metabolic changes and conclude dietary management	K5
CO6.	Plan tailor-made diets for special condition	K6

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1.	S	S	S	M	M
CO2.	S	S	S	M	M
CO3.	S	S	S	M	M
CO4.	S	S	S	S	M
CO5.	S	S	S	S	M
CO6.	S	S	S	S	S

S- Strong; M-Medium

Syllabus

UNITI **(18Hours)**

Pediatric, Assessment and Management of critically ill children

Normal growth in children –milestones, weight, height and head circumference in children (Birth to 12 years), factors affecting normal growth in children, immunization schedule.

Assessment of nutritional status in pediatric, interaction of nutrition and infection in children, low birth weight and preterm babies, determination of nutritional requirements in hospitalized children, nutritional support in critically ill children – metabolic changes during critical illness, TPN, EN and management of PEM – resuscitation, restoration and rehabilitation

UNITII **(18Hours)**

Dietary management in Peadiatric gastrointestinal disorders

a. Diarrhea – Types, Pathogenesis, Adverse effects, Oral Rehydration Therapy (ORT), Fluid and Electrolyte therapy, Dietary management and nutritional support.

b. #Constipation- Pathogenesis, dietary management#

c. Irritable Bowel Syndrome (IBD),Crohn's disease, Ulcerative colitis – Pathogenesis, dietary management.

UNITIII **(18Hours)**

Dietary management in Peadiatric cardiovascular, liver and renal disorders

a. **Cardio vascular diseases -** Congenital Heart disease- etiology, dietary management. Pediatric dyslipidemias and dietary management

b. **Liver–**Jaundice, Hepatitis, Cirrhosis- Pathogenesis, dietary management.'

c. **Renal Diseases** - Nephrotic syndrome, Acute Renal failure, Chronic renal failure- Pathogenesis, dietary management

UNITIV **(18Hours)**

Dietary management in Peadiatric diabetes, AIDS and Cancer

a. **Juvenile diabetes -** Metabolic changes , diagnosis, complications, Management – Medical Nutrition Therapy, Nutrient requirement, Insulin regime and diet plan.
b. **AIDS -** Effect of HIV infection on Nutritional status, Effect of anti- Retroviral therapy, feeding of HIV exposed child, breast feeding, replacement feeding, role of nutrition and nutritional requirements for HIV infected child
c. **Cancer –** Types, signs and symptoms, diagnosis, treatment and dietary management

UNITV **(18Hours)**

Dietary management in special conditions

a. **Allergies and intolerance**

Pathogenesis and types of allergic reactions-Type I hyper sensitivity, Type II hyper sensitivity, Type III immune complex reaction, Cell mediated reaction. Common food allergens and manifestations- skin, respiratory tract, GI (milk, egg, soy, fish, shell fish, peanuts). Diagnosis, treatment and dietary management.

b. **Inborn errors- diagnosis and dietary management**

CHO-glycogen storage disease, galactosemia, fructosemia, Proteins-PKUMSUD, Alkaptonuria Homocysteinuria, Tyrosenemia, Minerals-Wilson's disease.

c. **Nutrition for children with special needs**

Ketogenic diet- Epilepsy, Neutropenic diet- marrow transplant, Autism.

#-#: Self Study

Textbooks

S.No.	Author name	Year of Publication	Title of the book	Publishers name
1.	K.E.Elizabeth	2002	Fundamentals of Pediatrics	Paras Publishers, Hyderabad
2.	Madhu Sharma	2013	Pediatric Nutrition in Health and Disease	Jaypee Brothers Medical Publishers(P) Ltd, New Delhi
3.	MeenakshiN. Mehta	2014	Nutrition and Dietfor Children	Jaypee Brothers Medical Publishers(P) Ltd, New Delhi

Referencebooks

S.No	Author name	Year of publication	Title of the book	Publishers name
1.	Suraj Gupta	2010	Recentadvances in Pediatrics- Nutrition, Growth and Development	Jaypee Brothers Medical Publishers(P) Ltd, New Delhi
2.	Anjana Agarwal	2014	Text book of Human Nutrition	Jaypee Brothers Medical Publishers(P) Ltd, New Delhi

Journals

- The American Journal of Clinical Nutrition, NutritionPress
- Clinical Pediatric Dermatology, iMed PubLtd
- Pediatric Cardiology, Springer, UnitedStates
- Pediatric Allergy and Immunology, Wiley – Blackwell,Denmark

Web Links

http://medlineplus.govhttp://www.ohsu.eduhttp://www.ncbi.nlm.govhttp://www.niddk.nih.govhttp://academic.oup.com

Pedagogy: E-content, Lecture, Power point presentation, Seminar, Assignment

Course Designer

- Ms.M.Vinothini

SEMESTER – II	APPLIED PHYSIOLOGY	HOURS / WEEK – 6	
ELECTIVE COURSE – II. A		CREDIT – 4	
COURSE CODE – 19PFS2EC2A		INTERNAL 25	EXTERNAL 75

Preamble

- Acquire core knowledge about structure and functions of human organs.
- Learn about functioning abnormality of various human systems.

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1.	List various system present in human body	K1
CO2.	Illustrate cell adaptation and body fluid homeostatis	K2
CO3.	Predict physiological abnormality in circulatory and respiratory system	K3
CO4.	Ascertain disease conditions associated with nervous system and sense organs	K4
CO5.	Evaluate disease prognosis in digestive and excretory system	K5
CO6.	Conceive severity of degeneration prevalent in endocrine and reproductive system	K6

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1.	S	S	S	M	M
CO2.	S	S	S	M	M
CO3.	S	S	S	M	M
CO4.	S	S	S	M	M
CO5.	S	S	S	M	M
CO6.	S	S	S	M	M

S- Strong; M-Medium

Syllabus

UNITI **(20Hours)**

General physiology of cell and body fluids

a. **Cell** -Action potential of cell, Cell adaptation -Atrophy, hypertrophy, hyperplasia, dysplasia, metaplasia, Cell junction - herditary deafness, ichthyosis, sclerosing cholangitis, hereditary hypomagnesmia, synovial sarcoma, Gap junction -Abnormality deafness, keratoderma, cataract, peripheral neuropathy, mutation of genes- colon cancer, tumor, metastasis, transport of membranes-Abnormalities of sodium potassium pump, ion channel disease, Mechanism of homeostatic system – Negative feed back, Positive feed back. Cell death -Autophagy, apoptosis, necrosis.

b. **Body fluids –** Variation in plasma protein level, Abnormal haemoglobin, Anemia, abnormal leukocytes, autoimmune disease, allergy and immunological hypersensitivity, Abnormal thrombocytes, bleeding disorders, blood volume – hypervolemia, hypovolemia**.** Tissue fluid- Intracellular edema, Extracellular edema, Elephantiasis.

UNIT II **(20Hours)**

Cardiovascular and respiratory system

a. **Heart and Circulation** –Review on structure and function of Heart and blood Vessels[#;] Abnormal pulse-pulses deficit, pulsusalternans, anacrotic pulse, thready

pulse, pulsusparadoxus, water hammer pulse, abnormal pulse in patient ductus arterioses, abnormal pulse in aortic regurgitation, abnormal venous pulse, coronary artery disease; Arterial Blood Pressure- Hypertension, hypotension, Stroke, varicose vein, thrombophlebitis, heart failure.

b. **Respiratory System** –Review on structure and functions of Lungs; Apnea hyperventilation, hypoventilation, hypoxia, oxygen toxicity, hypercapnia, asphyxia, dyspnea, bronchial asthma; Infectious Diseases of Lungs-tuberculosis, pneumonia.

UNIT III **(20 Hours)**

Nervous system and sense organs

a. **Nervous System** –Review on structure and functions of Brain &Spinal Cord. Diseases of spinal cord-syringomyelia, tabesdorsalis, multiple sclerosis, disk prolapse, effects of motor neuron lesion, paralysis, thalamic lesion, thalamic syndrome. Disorders of basal ganglia - parkinson disease, Wilson disease, chorea, athetosis, choreathetosis, Huntington chorea, hemiballisms, kernicterus. Frontal lobe syndrome, temporal lobe syndrome. Sleep Disorder, epilepsy.

b. **Sense Organs** – Review on structure and functions of Sense Organs. Eye- Glaucoma, cataract, Errors of refraction, colour blindness. Conduction deafness and nerve deafness Abnormalities of taste sensation- Ageusia, hypogeusia, taste blindness, dysgeusia. Abnormalities of olfactory sensation – Anosmia, hyposmia, hypersomia.

UNIT IV **(15 Hours)**

Digestive system and excretory system

a. **Digestive system -** Review on structure and functions of Digestive system. Disorders of Upper Gastro Intestinal Tract-Hyposalivation, hypersalivation, esophageal, achalaria, gastroesophageal reflux disease(GERD), gastritis, gastric atrophy. Disorders of Lower Gastro Intestinal Tract-peptic ulcer, zollinger -Ellison syndrome, malabsorption, crohn's disease, celiac disease, diarrhea, constipation, appendicts, ulcerative colitis, dysphagia, gastric dumping syndrome, vomiting. Pancreatitis, jaundice, hepatitis, cirrohosis and gallstones.

b. **Excretory system** –[#]Review on structure and functions of Excretory System[#]; Osmotic diuresis, polyuria, hypersecretion of Anti Diuretic Hormone, Nephrogenic diabetes insipidus, Bartter's syndrome, renal failure, Abnormalities of micturition – Atonic bladder, Automatic bladder, unihbited neurogenic bladder, nocturnal micturition.

UNITV **(15Hours)**

a. **Muscular and Skeletal System**– #Review on structure and functions of Skeletal Muscle# ;Disorders of Skeletal Mucsle- Myopathy-Sprain and strain, Muscular Dystrophy, Diseases involving muscle tone, Tetany. Osteoporosis, Arthritis, Spondylitis, Osteomalacia, Rickets, Dislocations and fractures.

b. **Reproductive system** – Review on structure and functions of Reproductive System Effects of extirpation of testis, hypergonadism in males, hypogonadism in males, enlargement of prostrate gland, azoospermia, oligozoospermia, teratozoospermia, aspermia, oligospermia, hematospermia. Abnormal menstruation – menstrual symptoms, premenstrual syndrome, anovulatory cycle, amenorrhea, hypomenorrhea, menorrheagia, oligomenorrhea, polymenorrhea, dysmenorrhea and metrorrhagia.

#-#:Self Study

Textbooks

S.No.	Author name	Year of Publication	Title of the book	Publishers name
1.	Wilson and Ross	2014	Anatomy and Physiology in Health and Illness	New Delhi Reed Elsevier India Private Limited
2.	K.Sembulingam	2016	Essentials of Medical Physiology,	New Delhi Health Sciences Publisher
3.	Subramanyam, Sarada	2018	Textbook of Human Physiology	New Delhi S.Chand & Company Ltd

Referencebooks

S.No.	Author name	Year of Publication	Title of the book	Publishers name
1.	Waugh, Anne Ross and Wilson	2003	Anatomy and Physiology in Health and Illness	NewYorkChurchill Livingston (2003)
2.	N.Murugesh	2011	Basic Anatomy and Physiology	Madurai Sathya Publishers
3.	Indu Khurana	2013	Text book of Human Physiology	Elsevier
4.	Wilson and Ross	2014	Anatomy and Physiology in Health and Illness	NewDelhi: Reed Elsevier India Private Limited
5.	K.Sembulingam	2016	Essentials of Medical Physiology	NewDelhi Health Sciences Publisher

Journals

- Applied Physiology, Nutrition and Metabolism, National ResearchCouncil Canada,Canada
- Journal of Applied Physiology, Amer Physiological Soc, United States
- Chinese journal of applied physiology,Zhongguo Yingyong Shenglixue Zazhi Bianjibu,China
- European Journal of Applied Physiology,Springer,Germany.

Web links:

https://ncdc.gov.in/https://www.cdc.gov/globalhealth/countries/india/default.htm

Pedagogy: E-content, Lecture, Power point presentation, Seminar, Assignment, Demonstration

Course designers

- Ms. S.Fathima
- Ms. E.Agalya

SEMESTER – II	NUTRITION FOR FITNESS	HOURS / WEEK – 6	
ELECTIVE COURSE – II. B		CREDIT – 4	
COURSE CODE – 19PFS2EC2B		INTERNAL 25	EXTERNAL 75

Preamble

- To impart knowledge on sports nutrition.
- To enable the students to understand the various diets for sportspersons.
- To help the students to understand the role of ergogenic aids to enhance sports performance.

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1.	List different type of fitness activities	K1
CO2.	Explain the importance of nutrition fitness.	K2
CO3.	Apply the fitness and nutritional assessment techniques among individuals.	K3
CO4.	Determine the nutritional requirements of athletes.	K4
CO5.	Assess the dietary requirements for pre and post events.	K5
CO6.	Develop ergogenic foods for sports individuals.	K6

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1.	S	S	S	S	M
CO2.	S	S	S	S	M
CO3.	S	S	S	S	M
CO4.	S	S	S	S	M
CO5.	S	S	S	S	M
CO6.	S	S	S	S	S

S- Strong; M-Medium

Syllabus

UNITI (18Hours)

a. Understanding Fitness

Definition of fitness, health and related terms, Approaches for keeping fit, Alternative forms of fitness- Yoga, Pilates, Kickboxing, Boot Camps.

b. Importance of Physical activity

Importance and benefits of physical activity, Physical Activity – frequency, intensity, time and type with example, Physical Activity Guidelines and physical activity pyramid.

UNITII (18Hours)

a. Physiology and Biochemistry of Exercise

Physiology and biochemistry of exercise: Muscle contraction; weight and body composition of athletes; adaptation of muscle and body physiology to exercise

b. Effect of Physical fitness on health status

Effects of Physical Exercises on various systems - Circulatory, Muscular, Digestive and Respiratory systems

UNIT III (18 Hours)

a. Assessment of fitness

Anthropometry, assessment of physical and functional

capacity

b. Nutritional Assessment

Measurement of body composition, methods of measuring energy expenditure, Somato typing, #dietary assessment, biochemical assessment, clinical assessment#, body composition and sports performance.

UNITIV (18Hours)

a. Importance of Nutrition

Role of nutrition in fitness, Nutritional guidelines for health and fitness, Nutritional supplements organisations working for sports nutrition#, goals of optimal nutrition for athletes.

b. Nutritional Problems

The female athlete triad, eating disorders, amenorrhea, osteoporosis, travelling athletes, diabetic athletes, GI stress and athletes, cramps and stitches.

UNITV **(18Hours)**

a. Nutritional Requirements

Role of macronutrient on exercise and sports performance, Role of micronutrient on exercise and sports performance, Hydration Assessment and recommendation

b. Principles of diet planning

Principles of diet planning for and different exercise/sports conditions, Pre Game meals, Post Game meals, During meals, On-season and Off-season meals, Ergogenic aids**,** Nutritional Standards – Dietary reference Intake, Probiotics, Exercise and weight management.

#-#: Self Study

TextBooks

S.No.	Author name	Year of Publication	Title of the book	Publishers name
1.	Shubhangini A Joshi	2014	Nutrition and Dietetics with Indian case studies	McGraw Hill Education (India) Private Limited.
2.	B.Srilakshmi, et.al.	2017	Exercise physiology fitness and sports nutrition	New Age International Publishers.

ReferenceBooks

S.No	Author name	Year of publication	Title of the book	Publishers name
1.	L.Kathleen Mahan	2008	Krause's Food & Nutrition Therapy	Sauders Elsevier, canada.
2.	Jose Antonio et al	2009	Essentials of Sports Nutrition and Supplements	Humana Press
3.	Wener W.K. Hoeger, Sharon A. Hoeger	2012	Lifetime Physical Fitness and Wellness: A Personalized Program,	Cengage Learning, Unites States
4.	Jerrold S. Greenberg	2013	Empowering Health Decisions	Jones & Bartlett Publishers, Burlington
5.	Asker Jeukendrup,MichaelGleson	2019	Sport Nutrition	Human Kinetics,United States

Journals:

- JournaloftheInternationalSocietyofSports,NutritionBiomedCentralLtd,United States

Web links:

http://www.sportsauthorityofindia.

nic.in

Pedagogy: E-content, Lecture, Power point presentation, Seminar, Assignment, Demonstration

Course designers

- Ms.S.Fathima