Sadakathullah Appa College

(Autonomous)

(Reaccredited by NAAC at an 'A^{++}' Grade. An ISO 9001:2015 Certified Institution)

Rahmath Nagar, Tirunelveli- 11.

Tamil Nadu.

DEPARTMENT OF NUTRITION AND DIETETICS

MY LORD
VOUCHSAFE ME WISDOM

CBCS SYLLABUS

Learning Outcome-Based Curriculum Framework For

For

M.Sc. NUTRITION AND DIETETICS

(Applicable for students admitted in June 2024 and onwards)

(As per the Resolution of the Academic Council Meetings held on 01.06.2024)

CONTENTS

Sadakathullah Appa College, Rahmath Nagar,
Tirunelveli – 627 011.
Programme Structure & Credits – PG NUTRITION AND DIETETICS
2024 – 2027

Sem	Course Type	Title of the Course	Course Code	H/W	C	Marks		
						I	E	T
I	Core-I	Advanced Food Science	24PCND11	6	5	40	60	100
	Core-II	Applied Human Physiology	24PCND12	5	5	40	60	100
	Core-III	Macro Nutrients	24PCND13	5	4	40	60	100
	Core-P-I	Advanced Food Science Practical's	24PCND1P1	4	2	20	30	50
	Core-P-II	Applied Human Physiology Practical's	24PCND1P2	4	2	20	30	50
	EC-I	A) Food Processing and Technology	24PEND11A	4	3	40	60	100
		B) Hospital Administration	24PEND11B					
		C) Perspective of Home Science	24PEND11C					
	EC-II (IDC-I)	Principles of Menu Planning	24PIND11	2	2	15	35	50
		SOP		-	-			
				30	**23**			**550**
II	Core-IV	Nutritional Biochemistry	24PCND21	5	5	40	60	100
	Core-V	Advanced Dietetics'	24PCND22	5	4	40	60	100
	Core-P-III	Nutritional Biochemistry Practical's	24PCND2P1	4	2	20	30	50
	Core-P-IV	Advanced Dietetics Practicals	24PCND2P2	4	2	20	30	50
	EC-III	A) Performance Nutrition	24PEND21A	4	3	40	60	100
		B) Human Factors and Ergonomics	24PEND21B					
		C) Functional Foods and Health	24PEND21C					
	EC-IV (IDC-II)	Nutrition in Special Conditions	24PIND21	2	2	15	35	50
	SEC-I	Micro Nutrients	24PSND21	4	3	40	60	100
	SEC-II	Skill Enhancement Course-III NPTEL-SWAYAM Online Certification Course (or) Naan Muthalvan : (Choose any one course from the list of courses suggested by TANSCHE)	24PSND22	2	2	-	-	50
		SOP		-	1			100
	Summer – Internship Industry Training during the 1st year vacation - credits be given in the third semester mark statement							
				30	**23+1**			**700**

M.Sc. Programme COURSE OUTCOMEs

PO	Upon completion of M.Sc. Degree Programmes, the graduates will be able to:
PO 1	**Disciplinary Knowledge** • Acquire in-depth scientific knowledge in the core areas of study.
PO 2	**Creative Thinking and Practical Skills / Problem Solving Skills** • Enrich skills of observation to draw logical inferences from scientific experiments /programming and skills of creative thinking to develop novel ideas. • Hone problem solving skills in theoretical, experimental and computational areas and to apply them in real life situations.
PO 3	**Sense of inquiry and Skilled Communicator / Research, Innovation and Entrepreneurship** • Develop the capability for raising appropriate questions relating to the current/emerging issues encountered in the scientific field and to plan, execute and express the results of experiments / investigations through technical writings as well as through oral presentations. • Design innovations for exploring the unexplored areas in diverse fields to accomplish socially relevant and economically beneficial innovative research projects. • Become a skilled entrepreneur for launching start-up / business ventures to improve the economy of the nation.
PO 4	**Ethical Awareness / Team Work / Environmental Conservation and Sustainability** • Equip them for conducting work as an individual / as a member, or as a leader in diverse teams upholding values such as honesty and precision, and thus preventing unethical behaviours such as fabrication, falsification, misrepresentation of data, plagiarism etc. to ensure academic integrity. • Realise that environment and humans are dependent on one another and to know about the responsible management of our ecosystem for survival, and for the well-being of the future generation as well.
PO 5	**Digital Literacy/Self-Directed Learning/Usage of ICT/Lifelong Learning** • Get access to digital resources, to use them judiciously for updating of knowledge and also to engage in remote/ independent learning. • Inculcate the habit of learning continuously through the effective adoption of ICT to update knowledge in the emerging areas in Sciences for inventions/discoveries so that the knowledge transferred from laboratory to land would yield fruitful results for the betterment of global society.

Programme Specific Outcomes (PSO)

PSO	Upon completion of M.Sc. Nutrition and Dietetics Programmes, the students will be able to:	PLOs Mapped
PSO-1	Apply the knowledge of food science to describe the various functions of ingredients in food and summarize the chemistry of the properties of various food components	PLO-1
PSO-2	Recognize the dietary requirements of individuals of various ages and devise an appropriate meal plan.	PLO-2,3,4
PSO-3	Develop skills in food, nutrition, textiles, housing, product making, communication technologies and human development.	PLO-1,5
PSO-4	Accurately interpret data and research literature to solve complex problems. Thereby, developing and validating environmentally friendly, novel food products.	PLO-2,3,5
PSO-5	Understand and appreciate the role of interdisciplinary sciences in the development and well- being of individuals, families and communities.	PLO-1,4

Semester - I	ADVANCED FOOD SCIENCE		24PCND11			
Core – I			L	T	P	C
Hrs./Week: 6	Hrs./Semester : 90	Marks :100	5	1	-	5

GENERAL OBJECTIVES

To enable the students

1. Gain knowledge on the source and properties of food
2. Familiarize students with changes occurring in various food stuffs as a result of processing and cooking.
3. Enable students to use theoretical knowledge in various applications and food preparations.

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	Overview the relationship between the chemical structure and the properties of the main components in foods like starch
LO-2	Understand the Composition and characteristics of various food commodities like proteins and enzymes
LO-3	Explain the cooking quality of foods and apply food science knowledge in food industries
LO-4	Identify and understand the nutrients like fats oils and sugars and functions of foods in maintaining health
LO-5	Analyze the proper use of food colors and food additives in safe food preparation.

UNIT : 1 PROPERTIES OF FOOD AND STARCH

Properties of food-Food nutrients, solids, solutions and colloids, Solutions-Physical properties of solutions, classification of foods based on viscosity characteristics. Solutes- chemical properties, Food dispersion: Colloids- Types of colloid and properties of colloids and rheology of food dispersions; Structure, formation and stability of gels, sols, emulsion and foams.

Starch - Sources, Structure and composition of starch; Properties and characteristics of food starches; Modified food starches-Structure and composition, Effect of heat on food starch properties, gluten formation in wheat flour, influencing factors[gluten], gelatinization, gelation and retro gradation, dextrinization and factors affecting gelatinization.

UNIT : 2 PROTEINS AND ENZYMES

Proteins-Structure and composition, Classification and properties of proteins; Effect of heat on physio-chemical properties of proteins; Role of proteins in food products; Texturized vegetable protein, protein concentrates.

Enzymes: Classification and its nature; Mechanism of action; Factors influencing enzyme activity; Role of enzymes in food products; Immobilized enzymes and its application in food industries.

UNIT : 3 FATS, OILS AND SUGARS

Fats and oil -Structure, composition and properties of fats and oil; storage of fat, characteristics [shortening, plasticity, flavor, retention of moisture, meltingpoint, optical activity, color, specific gravity], Hydrogenation, winterization, flavor reversion, smoking point, Rancidity-Types, Mechanismand prevention; Roleoffat / oil in food products; Fat substitutes.

Sugar and sugar products-Types of sugar, Types of granulated sugar, Physical and chemical properties, Sugar products -Types of honey, Jaggery, corn syrup, various forms of sugar used in cookery and Crystallization of sugar.

UNIT : 4 MILK AND EGG

Milk components- water, carbohydrate, milk fat, milk protein, minerals and other components in milk, Physiochemical properties of milk, Effect of physical and chemical factors on milk components [Effect of heat, protein, factors affecting coagulation, casein coagulation, minerals, Non-enzymatic browning], [Effects of acid], Effects of enzymes-renin, fermented and non- fermented milk products

Egg-proteins in Egg, microscopic structure of egg, characteristics [color, size], Nutritional qualities, quality check, functional properties- foaming, factors affecting foam formation.

UNIT : 5 FOOD ADDDITIVES AND SWEETNERS

Food additives-Definition, different food additives and Need for food additives. Flavour compounds in vegetables, fruits and spices; Effect of processing on food flavours; Role of colours and flavours in food products.

Sweeteners-Properties, Artificial and Natural sweeteners and role of sweeteners in food industry.

TEXT BOOKS

1. Avantina Sharma (2017). Text book of food science and Technology.CBS Publishers and distributes ltd. 3rd Edition.
2. Reddy S.M. (2015). Basic Food science and technology. New Age International publishers.
3. Serpil Sahin and Servet Gulum Sumnu.(2006).Physical properties of Foods. Springer publications
4. Srilakshmi B.(2015).Food Science. New Age International (P)Ltd. Publishers.
5. Swaminathan A.(2018).Handbook of Food and Nutrition, Bangalore press.

REFERENCES

1. Eskein. (2012).Biochemistry of Food. Elsievier publications.
2. GerardL.Hasenhuettl,Richard W.Hartel.(2019). Food Emulsifiers and Their Applications. Springer publications. 3rd edition.
3. Janet D.Wardand Larry Ward.(2006).Principles of Food Science. Stem Publishers.4thEdition.
4. Lyn Obrien Nabors.(2001).Alternative Sweeteners. Taylor and Francis publications.
5. Swaminathan. M. 2015). Advanced textbook of Food and Nutrition. Volume-2. Bapco publications.
6. Vickie.A.Vaciavik.(2021).Essentials of Food Science. Springer publications. 5th edition

LEARNING RESOURCES

1. www.fao.orgwww.wfp.org
2. www.foodrisk.org.
3. http://www.fsis.usda.gov/
4. https://www.fda.gov/food

COURSE OUTCOMES

CO	Up on completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Overview the relationship between the chemical structure and the properties of the main components in food like starch, protein and lipids.	1,3,4,5	K1
CO-2	Understand the Composition and characteristics of various food commodities.	1,3,5	K1
CO-3	Explain the cooking quality of foods and apply food science knowledge in food industries	2,3,4,5	K5
CO-4	Identify and understand the nutrients and functions of foods in maintaining health	2,3,4,5	K3
CO-5	Analyze the proper use of food colors and food additives in safe food preparation.	3,4,5	K4

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course				Hours	Credits			
I	24PCND11	Advanced Food Science				90	5			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	3	1	1	1	3	-	3	1	1
CO-2	3	3	3	1	1	3	-	3	-	2
CO-3	2	3	3	3	3	-	3	2	2	3
CO-4	3	3	3	2	-	-	3	2	2	3
CO-5	-	3	3	3	3	-	-	3	2	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Mrs.V.Angel Mary
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - I	APPLIED HUMAN PHYSIOLOGY		24PCND12			
Core – II			L	T	P	C
Hrs./Week: 5	Hrs./Semester : 75	Marks :100	5	-	-	5

GENERAL OBJECTIVES

Enable the students to understand the integrated function of the human body and the body organs.

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	Understand the current state of knowledge about the functional organization of Human Cell and Histology.
LO-2	Understand the structural and functional organization of Blood and Cardiac System
LO-3	Understand the structural and functional organization of Respiration, Immunity and Endocrine GIT and Urinary System
LO-4	Comprehend the structural and functional organization Digestive System and Reproductive System
LO-5	Understand the structural and functional organization of Skin, Nervous and Excretory system

UNIT-1 CELLS AND TISSUES

Structural and Function of cells, Transportation across cell membrane. Cell theory and Cycle. Difference between –Meiotic and Mitotic cell. Stem cells – types and functional. Tissue structure and function.

UNIT-2 BLOOD AND HEART

Blood composition and functions- Blood groups –ABO System and Rh factor. Blood coagulation. Heart structure and function of Heart Blood Vessels.- Systemic and Pulmonary Circulation. Cardiac cycle and Conduction – Heart and Cardiac output. ECG, Blood pressure and their regulations.

UNIT-3 RESPIRATORY AND ENDOCRINE SYSTEM

Respiratory System: Structure and Function-as law pertaining to Gas Exchange (meaning only)- Henry's Law of Partial Pressure, Boyle –Mariotte's Law of Volume and Pressure. Dalton's Law of partial Pressure. Charles's Law of Ideal Gas Equation and Fick's Law of Diffusion. Mechanism of respiration. Circulation and Exchange of Respiratory Gases. Internal and External Respiration. Chloride shift. Definitions of Lung volumes and Lung capacities Ventilation and Artificial Respiration. **Immunity** Definition and types innate and acquire immunity**. Endocrine System** Hormones and its types . Syndromes resulting from hypo and hyperactivity of pituitary. Thyroid, Adrenals and Pancreases.

UNIT-4 GASTRO INTESTINAL SYSTEM AND REPRODUCTIVE SYSTEM

Gastrointestinal System structure and function of Gl tract and its accessory organs, Digestion and absorption of Carbohydrates. Proteins and Fats. Reproductive systems. Role of hormones in reproduction and lactation. Menstrual Cycle and Menopause. Invitro(IV) fertilization-spermatogenesis.

UNIT-5 NERVOUS AND EXCRETORY SYSTEM

Nervous System: Structure and Function of Neuron. Afferent and Efferent Nerves. Conduction of Nerve Impulse-synapses, Neurotransmitters, Summation and Action Potential. Sympathetic and Parasympathetic Nervous System. Cerebrospinal (CSF)-composition and function. Blood-brain barrier(BBB). Electroencephalogram (EEG).

Excretory System-Renal System: Organ in the Urinary System. Uxtaglomerular Cell. Mechanism of formation of urine. Role of Kidney to regulate Blood pressure. Water Electrolytes and Acid-Base Balance**. Skin Structure** and Function. Regulation of temperature of the body

TEXTBOOKS

1. Chatterjee C C (2020).Human Physiology.CBS publishers.13ed.
2. InduKhurana (2020). Medical Physiology for Undergraduate Students. Elsevier Publication. 2 Edition.
3. Pal G.K. (2019).Textbook of human physiology, Elsevier publications. 3edition.
4. Sembulingam and Prema Sembulingam (2019),Essentials of Medical Physiology. Jaypee publications. Eighth edition.
5. Waugh A, Rossand Wilson(2018). Anatomy and Physiology in Health and Illness. Elsevier publications. 13th edition.

REFERENCE BOOKS

1. Guyton, A.G. and Hall, J.B.(2005):TextBook of Medical Physiology.
2. W.B.Sanders Company, Prism Books (Pvt.) Ltd., Bangalore. 9th Edition.
3. Wilson,K.J. Wand Waugh,A.(2003):Ross and Wilson Anatomy and Physiology in Heath and Illness. Churchill Livingstone. 8th Edition.
4. Jain,A.K.:Textbook of Physiology. Avichal Publishing Co., NewDelhi. Vol.I and II.
5. McArdle, W.D., Katch, F.I. and Katch V.L(2001): Exercise Physiology. Energy, Nutrition and Human Performance. Williams and Wilkins, Baltimore. 4th Edition.
6. Ganong, W.F. (1985): Review of Medical Physiology. lange Medical Publication. , 12th Edition.
7. Moran Campell E.J., Dickinson, C.J., Slater, J.D., Edwards. C.R.W. and Sikora, K. (1984): Clinical Physiology. ELBS, Blackwell Scientific Publications. , 5th Edition.
8. McArdle, W.D., Katch, F.1. and Katch, V.L. (1996): Exercise Physiology. Energy, Nutrition and Human Performance, Williams and Wilkins,

Baltimore. 4th Edition.
9. Jain, A.K.: Textbook of Physiology. Avichal Publishing Co., New Delhi. Vol. I and II.
10. Winword. Sear's Anatomy and Physiology for nurses. London, Edward Arnell. Chatterjee ChandiCharan :TextBook of Medical Physiology, LondonW.B.

COURSE OUTCOME

LO	Up on completion the students will be able to	PSOs Addressed	Cognitive Level
LO-1	Develop insight of normal functioning of all the organ systems of the body and their interaction. Understand the current state of knowledge about the functional organization of Human Cell and Histology.	1	K2
LO-2	Understand the structural and functional organization of Blood and Cardiac System	3,4	K3
LO-3	Understand the structural and functional organization of Respiration, Immunity and Endocrine GIT and Urinary System	3,5	K4
LO-4	Comprehend the structural and functional organization Digestive System and Reproductive System	1,4,5	K5
LO-5	Understand the structural and functional organization of Skin, Nervous and Excretory system	1,5	K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course				Hours	Credits			
I	24PCND12	APPLIED HUMAN PHYSIOLOGY				75	5			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	2	1	1	1	3	-	3	1	1
CO-2	3	3	3	1	1		-	3	-	2
CO-3	2	3	3	3	3	3	2	2	2	3
CO-4	3	3	2	2	-	-	3	2	2	3
CO-5	-	3	3	3	3	-	-	3	2	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Mr.S.M. Prasad
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - I	MACRO NUTRIENTS		24PCND13			
Core – III			L	T	P	C
Hrs./Week: 5	Hrs./Semester : 75	Marks :100	4	1	-	4

GENERAL OBJECTIVES

To enable the students

1. To understand the relationship between lipid, carbohydrate, protein and mineral metabolism.
2. To learn about the therapeutic uses of carbohydrates protein and fat in prevention of non-communicable disease.
3. To get insights in the inborn errors of metabolism

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	Understand the essentials of nutrients in energy balance, growth and development of humans
LO-2	The importance of carbohydrates in maintaining human health and leading active lifestyle
LO-3	The enhancement of role of protein in the diet
LO-4	Identify the various types of lipids and the method of prevention of diseases
LO-5	The role of water in health and diseases.

UNIT : 1 ENERGY

Energy content of foods, physiological fuel value, Estimation of total energy requirements (BMR, REE and physical cost of activities) TEE, Energy balance, Basal metabolic rate, Total Energy requirements, BMR & RMR, Factors affecting BMR, Thermic effect of food. Changes in body weight and body composition with the changing energy balance, Regulation of food intake- role of hunger and satiety centers. Energy balance and obesity.

UNIT : 2 CARBOHYDRATES

Classification, Therapeutic uses of carbohydrates, sugars in parenteral nutrition. Glycemic index of foods and its uses. Toxic effects of fructose, xylitol and galactose. Sugar alternatives, Role of dietary fiber in health and disease. Role of carbohydrates in health and disease

UNIT : 3 PROTEINS

Historical review of protein metabolism, Amino acid patterns in protein and of animals and vegetable origin, critical study of methods of assessment of protein quality. Physiological functions of proteins. Essential Amino Acids, amino acid

balance and imbalance, Role of protein in health and disease. Supplementation of individual amino acid.

UNIT : 4 LIPIDS

Concepts of visible and invisible fats, EFA, SFA, MUFA, PUFA, omega–6 to omega–3 ratios. – Sources and physiological functions and their role in health and disease. Adipose tissue – Lipogenesis and Lipolysis, lipoproteins – types and health implication. Storage of body fat, Effects of deficiency. Fat substitutes, Hypocholesterolaemic foods – garlic, fiber and plant proteins.

UNIT : 5 WATER

WATER – Sources, Function, Requirement, Distribution of water in the body and Factors influencing distribution of body fluid. Exchange of water in the body. Water imbalance – dehydration- water intoxication, water and electrolyte mechanism – ADH,

TEXT BOOKS

1. Mahan, L.K., & Stump, S.E. (2002). Krause's Food Nutrition and Diet Therapy. W.B. Saunder's company, Philadelphia. 10th edition.
2. Satyanarayana, U., & Chakrapani, U. (2013). Biochemistry, Book and Allied Pvt. *Ltd., Kolkata*.
3. Shils, M. E., Olson, J. A., &Shike, M. (2000). Modern nutrition in health and disease. Modern Nutrition in Health and Disease . Vol I and II. Lea and Febiger Philadelphia, A Waverly Company. Eighth edition.
4. Sizer, F., Whitney, E., & Webb, F. (2003). Nutrition Concepts and Controversy, Thomas Wadsworth, Australia. 9th edition.
5. Wardlaw, G. M., Byrd-Bredbenner, C., Moe, G., Berning, J. R., & Kelley, D. S. (2013). *Wardlaw's perspectives in nutrition*. McGraw-Hill.
6. Williams, S. R. (2004). Nutrition and diet therapy. Nutrition and diet therapy.

REFERENCES

1. Bogert, J.G.V., Briggs, D.H., & Calloway, (2000). Nutrition and physical fitness. W.B. Saunders Co., Philadelphia, London, Toronto. 11th edition.
2. Brown, J.E., (2002). Nutrition Now. Wadsworth Thomson Learning New York. 3rd edition.
3. Guthire, H.A., (2001). Introductory Nutrition. C.V. Mosby Company, St. Louis. Tenth edition.
4. Jain, J.L., Jain, S., & Jain, N., (2005). Fundamentals of Biochemistry. S. Chand and Company Ltd. Ram nagar, New Delhi-110 055. 6th revised edition.
5. Swaminathan, M., (2002). Principles of Nutrition and Dietetics. BAPPCO, 88, Mysore Road. Bangalore – 560 018.
6. Toteja, G. S. (2004). *Micronutrient profile of Indian population*. Indian Council of Medical Research Publication, New Delhi.

COURSE OUTCOME

CO	Up on completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Interpret the significance of Macro Nutrients	1	K2
CO-2	Determining the energy value of Foods using different equipments.	1,2	K3
CO-3	Discuss the significance of protein in health and disease	1,2,5	K4
CO-4	Assess the role of lipids in metabolism	1,2,5	K5
CO-5	Discuss the distribution of fluid in our body.	1,2	K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course				Hours				Credits
I	24PCND13	MACRO NUTRIENTS				75				4
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	3	1	1	1	3	-	3	1	1
CO-2	3	3	2	1	1	3	-	3	-	2
CO-3	2	3	3	2	3	-	3	2	2	2
CO-4	3	3	2	2		-	3	2	2	3
CO-5	-	2	3	3	3	-	-	3	2	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Mrs.M.Vadivel Devi
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - I	ADVANCED FOOD SCIENCE PRACTICALS		24PCND1P1			
Core – P-I			L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :50	-	-	4	2

GENERAL OBJECTIVES

To enable the students

1. Comprehend the knowledge gained on characteristics and properties of foods during cooking
2. Apply the properties of food in various food processing and preparations
3. Analyze the factors affecting cooking quality of foods
4. Create appropriate food preparation and processing methods to ensure quality standards.

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	Overview the relationship between the chemical structure and the properties of the main components in foods like starch
LO-2	Understand the Composition and characteristics of various food commodities like proteins and enzymes
LO-3	Explain the cooking quality of foods and apply food science knowledge in food industries
LO-4	Identify and understand the nutrients like fats oils and sugars and functions of foods in maintaining health
LO-5	Analyze the proper use of food colors and food additives in safe food preparation.

UNIT : 1 PROPERTIES OF FOOD AND STARCH

1. Analysis of taste sensitivity-Threshold test Duo–trio test, Multiple sample difference
2. Microscopic structure and gelatinization.
3. Factors affecting gelatinization–sag test.
4. Gluten formation

UNIT : 2 PROTEINS AND ENZYMES

1. Factors affecting cooking quality
2. Enzymatic browning
3. Pectin test Firmness of gel

UNIT : 3 FATS, OILS AND SUGARS

1. Relativesweetnessofsugar-sucrose,maltose,lactose,fructose,dextrose,glucose,artificial sweeteners
2. Stages of sugar cookery
3. Effect of dextrose, jaggery, honey and cream of tartar on sucrose
4. Smoking point–Groundnut oil, coconut oil, Gingelly oil, Olive oil, Vanaspati, Ghee, Refined Sunflower oil, Rice bran oil.

5. Cooking temperature and fat absorption—Groundnut oil, coconut oil, Gingelly oil, Refined Sunflower oil, Rice bran oil.

UNIT : 4 MILK AND EGG

1. Various method of cooking fat soluble and water-soluble pigment.
2. Detecting the presence of starch, soda, starch, urea in milk sample. Ph of milk sample.
3. Effect of acid on milk Maillard reaction

UNIT : 5 FOOD ADDDITIVES AND SWEETNERS

1. **Physical Properties of Food Thousand grain weight**-Thousand grain volume-Hydration capacity-Hydration index-Swelling capacity-Specific gravity-Seed displacement test-Viscosity-Line spread test, Viscometer.
2. Adulteration

TEXT BOOKS

1. Srilakshmi B.(2015).Food Science, New Age International(P)Ltd. Publishers.
2. Potter N. and Hotchkiss J.H.(1996).Food Science, Fifth ed., CBS Publishers and Distributors, New Delhi
3. Avantina Sharma (2017).Textbook of food science and Technology. CBS Publishers and distributes ltd. 3rd Edition.
4. ReddySM.(2015).Basic Food science and technology. New Age International publishers. 2ND edition.

REFERENCES

1. Bennion, Marion and O. Hughes (2001).Introductory Foods. Edi: macmillian N. Y.1stedition.
2. Eskein. (2012). Biochemistry of Food. Elsievier publications Desrosier, N.W. and Jame N 2007).Technology of food preservation. AVI Publishers.
3. Manay,S. and Shadaksharamasamy, (2004).Food:Facts and Principles, New Age International Publishers, New Delhi. 1st edition.
4. Swaminathan A(1979).Food Science And Experimental Foods, Ganesh And Company Madras. 3rd edition.

LEARNING RESOURCES

http://www.fao.org/3/V5030E/V5030E00.htmhttps://fmtmagazine.in/fruits-vegetables-processing-technologies/www.fao.orgwww.wfp.org

COURSE OUTCOMES

CO	Upon completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Gain knowledge on sensory analysis and cereal cookery concept	1,2,3,4,5	K2
CO-2	Understand the properties of various foods.	1,2,3,4,5	K3
CO-3	Analyze the cooking quality of foods and apply knowledge in food industries.	1,2,3,4,5	K4
CO-4	Identify and understand the Physical characteristics.	1,2,3,4,5	K5
CO-5	Revise appropriate food preparation and processing methods to ensure standards in food industry.	1,2,3,4,5	K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
I	24PCND1P1	ADVANCED FOOD SCIENCE PRACTICALS	60	2

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	3	3	3	2	3	2	2	3	3
CO-2	3	3	3	3	2	3	2	2	3	3
CO-3	3	3	3	3	2	3	2	2	3	3
CO-4	3	3	3	3	2	3	2	2	3	3
CO-5	3	3	3	3	2	3	2	2	3	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Mrs.V.Angel Mary
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - I	APPLIED HUMAN PHYSIOLOGY PRACTICALS		24PCND1P2			
Core – P-II			L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :50	-	-	4	2

GENERAL OBJECTIVES

To understand the basic practical exposure on chemical examination, blood grouping and learning microscopic structure of various human body organs

UNIT : 1 CELLS AND TISSUES

1. Microscopic study of tissues-epithelial, connective and muscular.

UNIT : 2 BLOOD AND HEART

2. Microscopic structure of heart
3. Separation of blood components (Centrifugation).
4. Estimation of hemoglobin-Sahli'sAcidhematin method.
5. Determination of Hematocrit (Wintrobemethod).
6. Preparation and examination of stained bloods mear (Wedgeorglassslide method).
7. Determination of Erythrocyte Sedimentation Rate (Wintrobe method).
8. Determination of blood group.
9. Determination of bleeding time (Duke method) and coagulation time (Capillary tube method).
10. Platelet count (Rees Ecker method by hemocytometry).
11. Clinical examination of radial pulse (pulserate).

UNIT : 3 RESPIRATORY SYSTEM AND ENDOCRINE SYSTEM

12. Measurement of blood pressure (Sphygmomanometer).
13. Effectofexercise on blood pressure and heartrate.

UNIT : 4 GASTROINTESTINAL SYSTEM AND REPRODUCTIVE SYSYTEM

14. Microscopic structure of digestive system

UNIT : 5 NERVOUS SYSTEM AND EXCRETORY SYSTEM

15. Microscopic structure of kidney.
16. Microscopic structure of reproductive organs-ovary, uterus, mammary glands and testis.
17. Microscopic structure of endocrine glands-thyroid, pituitary and adrenal.

TEXT BOOKS

1. Avantinasharma (2017).Textbook of food science and Technology. CBS Publishers and distributes ltd. 3rd Edition.
2. Potter N. and Hotchkiss J.H.(1996). Food Science, Fifthed., CBS Publishers and Distributors, New Delhi
3. Reddy SM.(2015). Basic Food science and technology. New Age International publishers. 2ND edition.
4. Srilakshmi B.(2015).Food Science, New Age International (P)Ltd. Publishers.

REFERENCES

1. Bennion, Marionand O. Hughes (2001). Introductory Foods.Edi: macmillian N. Y. 1st edition.
2. Eskein . (2012). Biochemistry of Food. Elsievier publications Desrosier, N.W. and James N.(2007). Technology of food preservation. AVIPublishers.
3. Manay,S. and Shadaksharamasamy, (2004). Food: Facts and Principles, New Age International Publishers, New Delhi. 1st edition.
4. Swaminathan A (1979). Food Science and Experimental Foods, Ganesh And Company Madras. 3rd edition.

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO-1	Understand the current state of knowledge about the functional organization of Human Cell and Histology.	1	K2
CO-2	Understand the structural and functional organization of Blood and Cardiac System	3,4	K3
CO-3	Understand the structural and functional organization of Respiration and Endocrine System	3,5	K4
CO-4	Comprehend the structural and functional organization Digestive System	1,4,5	K5
CO-5	Understand the structural and functional organization of Nervous and Excretory system	1,5	K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
I	**24PCND1P2**	**ADVANCED HUMAN PHYSIOLOGY PRACTICALS**	**60**	**2**

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO-1	3	2	1	1	1	3		3	1	1
CO-2	3	3	3	1	1			3		2
CO-3	2	3	3	3	3	3	2	2	2	3
CO-4	3	3	2	2			3	2	2	3
CO-5		3	3	3	3			3	2	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Dr.A.Sumaya
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - I	FOOD PROCESSING AND TECHNOLOGY		24PEND11A			
EC-IA			L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :100	3	1	-	3

GENERAL OBJECTIVES

1. Understand the science behind processing of foods and its impact on nutritive value of food stuffs.
2. Acquire in-depth knowledge on production of processed food products and the waste utilization techniques.

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	The concepts and principles of food processing.
LO-2	The various processed food products from plant and animal sources.
LO-3	The by-products utilization from food processing.
LO-4	The systematic knowledge of basic and applied aspects in food processing and technology.
LO-5	The various post-harvest technologies for different food products

UNIT : 1 PROCESSING OF FOODS

Processing of foods: Primary, secondary and tertiary processing, historical perspective, traditional technologies used in food processing. Effects of processing on components, properties and nutritional value of foods.

Enzymes in Food Processing: Enzyme- Review of classification, enzyme inhibitors, enzymatic browning.

UNIT : 2 RICE CEREAL PRODUCTS MILLING PROCESS

Rice: parboiling, milling and pearling; Processing and milling of wheat, maize, barley, oats and rye.

Millets: processing of millets;

Cereal Products: Flours and its quality; Processed products of rice, wheat and maize; By products utilization; breakfast cereals and extrusion; Effect of processing on nutritive value of cereals; changes in physiochemical properties of cereal starch and protein due to processing.

Milling process: Complete milling process, break rolls, reduction rolls, milled products and their nutritive value and applications

UNIT : 3 PULSE NUTS AND VEGETABLE PROCESSING

Pulse Processing and Technology:

Dals, flours, protein concentrates, isolates and hydrolysates; Byproducts utilization; Effect of processing on nutritive value and physiochemical properties of pulses.

Nuts and Oil Seeds Processing and Technology:

Nuts Processing methods, Oil seeds processing: Oil extraction methods and refining process; byproducts utilization; Effect of processing on nutritive value and physiochemical properties of vegetable oils.

Vegetables Processing and Technology:

Pigments: Classification, effects on processing of vegetables; Preliminary processing of vegetables;

Vegetable products: Fermented and nonfermented and its shelf life; Vegetable waste utilization; Effect of processing on nutritive value and physiochemical properties of vegetable

Fruits Processing and Technology:

Concept of maturity, ripening and senescence; Methods of fruit processing technologies: traditional and new methods.

Fruit products: fermented and nonfermented; Effect of processing on nutritive value and physiochemical properties of fruits;

Browning reactions: types and mechanism; prevention methods; Fruit waste utilization.

Milk Processing and Technology:

Milk types, composition, physiochemical properties; Milk processing- Separation, centrifugal process, natural creaming, pasteurization, sterilization, homogenization. Milk storage; Effects of processing on nutritive value and physicochemical properties of milk

UNIT : 4 EGG AND MEAT PROCESSING

Egg Processing and Technology:

Egg processing and storage; Effect of processing on nutritive value and physiochemical properties of eggs; changes in egg quality during storage and preservation methods.

Meat Processing and Technology:

Meat processing and storage; Factors influencing meat quality; Ageing and tenderization of meat.

Poultry: Processing and storage of poultry meat; Preservation methods for poultry.

Fish: Processing and storage; Preservation methods for fish. Effect of processing on nutritive value and physiochemical properties of meat, poultry and fish.

UNIT : 5 INTRODUCTION OF POST HARVEST TECHNOLOGY

Introduction of post-harvest technology

Introduction to post-harvest technology of agricultural produce; Status of Production, Losses, Need, Scope and Importance.

Post-Harvest Loss- Definition, Factors contributing to Post-harvest Loss; and Technologies and Practices to reduce Post-harvest Losses.

TEXT BOOKS

1. Avantina Sharma. (2017).Text book of food science and Technology. CBS Publisheres and distributes ltd. 3rd edition.
2. B Srilakshmi (2015)Food science. New Age Publishers. 6th edition. Fellows P.(2000). Food Processing Technology, 2nd Edition.
3. Roday S. (2011) .Food Science. Oxford publication . 1st edition.
4. Shakuntala Manay N ShadakCheraswamyM . (2004) Food Facts and Principles. New age publisher . 2nd edition.
5. Woodhead Publishing Limited and CRC Press LLC. 1st edition.

REFERENCES

1. Eskein .(2012). Biochemistry of Food. Elsievier publications. 1st edition.
2. Janet D Ward and Larry Ward.(2006). Principles of Food Science .Stem Publishers. 4th edition.
3. Microbiology and HACCP. GaitersburgMaryland Aspen.
4. Raocg . (2006).Essentials of food process engineering . PHI learning private ltd.
5. Srivastava R P and Kumar S. (2006) Fruits and Vegetables Preservation-Principles and Practices. International Book Distributing Co. 3rd edition.
6. W B Crusess.(2004). Commercial Unit and Vegetable Products. W.V. Special Indian Edition, Pub AgrobiosIndia . 2nd edition. Forsythe S J and Hayes P R (1998). Food Hygiene,

LEARNING RESOURCES

1. http://www.fao.org/3/V5030E/V5030E00.htm
2. https://fmtmagazine.in/fruits-vegetables-processing-technologies/
3. https://www.actioncontrelafaim.org/wp-content/uploads/2018/01/technical_paper_phl.pdf
4. https://www.nutsforlife.com.au/resource/nuts-and-processing/
5. https://www.fssai.gov.in/

COURSE OUTCOME

CO	Up on completion the students will be able to learn	POs Addressed	Cognitive Level
CO-1	The concepts and principles of food processing	1	K1, K2
CO-2	The various processed food products from plant sources and their by product utilization through processing	1,2	K2. K3
CO-3	The by-products utilization from food processing. composition, Pre-processing, Processing and storage of perishable and semi perishable materials	3	K3, K6
CO-4	The systematic knowledge of basic and applied aspects in food processing and technology. Analyze Production and utilization of animal products	3,4	K4, K6
CO-5	The various post-harvest technologies for different food products and their scope, need in industries	4	K1, K2

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
I	24PEND11A	FOOD PROCESSING AND TECHNOLOGY	60	3

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	2	-	-	-	2	3	-	-	-
CO-2	3	3	2	-	-	2	3	3	-	-
CO-3	2	2	3	-	-	2	2	2	3	-
CO-4	-	-	3	3	-	2	2	2	3	3
CO-5	-	-	2	3	-	2	2	2	2	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Dr.S.Rama Jeba
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - I	HOSPITAL ADMINISTRATION		24PEND11B			
EC-IB			L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :100	3	1	-	3

GENERAL OBJECTIVES

- Learn about the different types of hospitals and their administration
- Gain knowledge about the ethics and standards followed in hospitals
- Get familiar with healthcare policies and community heal the management

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	Distinguish between the types of hospitals and the departments and their organizational structure
LO-2	Describe the code of ethics followed in hospitals and Explain the roles and responsibilities of health professionals
LO-3	Recall legal laws and identify medical malpractices and Evaluate the quality and safety in hospitals through use of appropriate measures
LO-4	Analyze the budgeting and fund flow management in hospitals
LO-5	Discuss the National Health policy and community based health development in rural areas

UNIT : 1 Introduction to Hospital Administration

Concept of Hospitals-Different types of Hospitals- Problems and constraints in different type of Hospitals-History of Hospital Development- Departmentation and organization structure of different types of hospitals.

UNIT : 2 Code of Ethics:

Duties of Health care professionals - Doctors, Nurses, Nutritionists and Dietitians (in brief) to their patients, profession at large, and profession in consultation and to the community–Breach of ethics and code of conduct.

UNIT : 3 Legal frame work in Hospitals:

Patient "srights & provider"s responsibility-Medical Malpractices.

Disciplinary Action; Management of Hazard and Safety in a Hospital Setup. Bio-Medical Waste Management–Benefits of Health Insurance and Managing Health Care - Medical audit to meet legal requirements of Hospitals

UNIT : 4 Accounting and financial Management in Hospitals:

Principles, analysis and interpretation of financial reports. Preparation and use of budgets.

Capital budgeting, Fund flow management and budgetary control

UNIT : 5 Health Planning & Management

National Health Policy – Provision of medical care–Primary healthcare– Health for All. Encouragement of indigenous systems of medicine- Process of health planning in India.

TEXT BOOKS

1. Griffith, J. R., & White, K. R. (2019). The Well-Managed Healthcare Organization (9th ed.). Health Administration Press.
2. Buchbinder, S. B., & Shanks, N. H. (2020). Introduction to Health Care Management (4th ed.). Jones & Bartlett Learning.
3. McConnell, C. R. (2021). The Effective Health Care Supervisor (9th ed.). Jones & Bartlett Learning.
4. Dunn, R. T. (2016). Haimann's Healthcare Management (10th ed.). Cengage Learning.
5. Riegelman, R. K., & Kirkwood, B. T. (2018). Public Health 101: Healthy People—Healthy Populations (3rd ed.). Jones & Bartlett Learning.

REFERENCE BOOKS

1. Ginter, P. M., Duncan, W. J., & Swayne, L. E. (2018). *Strategic Management of Health Care Organizations* (8th ed.). Wiley.
2. Fried, B. J., & Fottler, M. D. (2018). *Human Resources in Healthcare: Managing for Success* (5th ed.). Health Administration Press.
3. Johnson, J. A., & Rossow, C. C. (2019). *The Health Care Manager's Legal Guide* (3rd ed.). Jones & Bartlett Learning.
4. Rakich, J. S., Longest, B. B., & Darr, K. (2019). *Cases in Health Services Management* (6th ed.). Health Administration Press.
5. Shi, L., & Singh, D. A. (2021). *Essentials of the U.S. Health Care System* (5th ed.). Jones & Bartlett Learning.

LEARNING RESOURCES

- www.ingenta.connect.com-FoodandFoodways.
- www.fda.gov/search.html
- www.wodswrth.com/nutrition
- www.elsevier.com-Indian Journal of Nutrition and food microbiology.

COURSE OUTCOME

CO	Up on completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Distinguish between the types of hospitals and the departments and their organizational structure	1	K2
CO-2	Describe the code of ethics followed in hospitals and Explain the roles and responsibilities of health professionals	1,2	K2,K3
CO-3	Recall legal laws and identify medical malpractices and Evaluate the quality and safety in hospitals through use of appropriate measures	3	K3
CO-4	Analyze the budgeting and fund flow management in hospitals	3,4	K3,K4
CO-5	Discuss the National Health policy and community based health development in rural areas	4,5	K4,K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course				Hours	Credits			
I	24PEND11B	HOSPITAL ADMINISTARTION				60	3			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	3	3	1	1	3	3	3	3	3
CO-2	3	2	2	3	2	3	2	2	1	1
CO-3	3	3	2	3	1	2	2	1	1	1
CO-4	3	3	2	3	1	3	2	2	3	1
CO-5	3	2	2	3	1	3	3	3	2	2

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Mrs.V.Angel Mary
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - I	PERSPECTIVES OF HOME SCIENCE		24PEND11C			
EC-IC			L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :100	3	1	-	3

GENERAL OBJECTIVES

1. To describe the importance of each branch of Home Science
2. To understand the essence of each subject
3. To prepare them for UGC NET, SLET and ASRB

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	Understand the concept of Extension Education and its importance
LO-2	Comprehend the key aspects of human growth and development and realize the importance of mastering developmental tasks of each life span stage
LO-3	Understand the basic concepts of Textile and Clothing
LO-4	List personal goals and values, set living standards
LO-5	Understand the meaning of Guidance and Counseling and Career perspectives in Home Science

UNIT : 1 EXTENSIN EDUCATION

Meaning, Definition, objectives, characteristics, principles-Extension teaching methods- types and methodsQualities of a good Extension Worker-Communication, Innovation and Social change

UNIT : 2 HUMAN DEVELOPMENT

Growth, Development, Maturation and Learning-Principles and Developmental stages &Task-Parental Disciplinary Techniques – merits and demerits-Early Childhood Education – Objectives. Types of Nursery Schools.-Exceptional children – Deaf, Blindness, Physical Impairment, Mental Retarded and Giftedness. Rehabilitation.

UNIT : 3 TEXTILES

Classification and General properties textile fibres.-Processing and manufacture of Cotton, Silk, Wool and Rayon fibres.-Yarn: Classification.-Fabric construction - woven, non-woven and knitted fabric-Clothing: selection for the family.

UNIT : 4 FAMILY RESOURCE MANAGEMENT

Home Management – Meaning, objectives and process-Resources - Classification and characteristics-Time, Money and Energy management-Decision making - Steps and Methods of resolving conflicts-Work simplification - Importance of work simplification. Mundel's classes of Change-Principles and Elements of Interior design, Various colours and colour schemes.

UNIT : 5 GUIDANCE AND COUNSELING

Meaning, nature, types and scope of guidance and counseling-Various steps and techniques of Guidance and counseling-Need and importance of educational guidance.

TEXT BOOKS

1. Jha, J.K. (2002). Encyclopaedia of Teaching of Home Science, Vol.I,II and III . New Delhi: Anmol Publications.
2. Suriakanthi.A.,(2002).Child Development-Introduction Gandhigram: Kavitha Publications.
3. Srilakshmi.B. (2015). Food Science. New Delhi. New Age International Pvt.Ltd.
4. Premlata Mullick (2016), 4TH edition, Kalyani Publishers.

REFERENCES

1. Serene and Ahlawat Santos Shekhar (2013), Textbook of Home Science Extension Education.
2. Tami James Moore and Sylvia M.Asay (2008), Family Resource Management, Sage Publications.
3. Diane E. Papalia (2004), 9th edition, Human Development, McGraw Hill India.
4. Rani K. Sudha and Srivastava Sushila, Textbook of Human Development: A lifespan development approach, S. Chand & Co Ltd.

COURSE OUTCOME

LO	Up on completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Understand the concept of Extension Education and its importance	1,2	K2
CO-2	Comprehend the key aspects of human growth and development and realize the importance of mastering developmental tasks of each life span stage	1,2,3	K2,K3
CO-3	Understand the basic concepts of Textile and Clothing	2,3,4	K3,K4
CO-4	List personal goals and values, set living standards	3,4,5	K3,K4,K5
CO-5	Understand the meaning of Guidance and Counseling and Career perspectives in Home Science	4,5	K4,K5

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
I	24PEND11C	PERSPECTIVES OF HOME SCIENCE	60	3

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	2	3	1	1	3	3	2	3	3
CO-2	3	3	2	3	2	3	2	3	1	1
CO-3	3	3	2	3	1	2	2	1	1	1
CO-4	3	3	3	3	1	3	2	1	1	1
CO-5	3	2	3	3	1	3	3	2	3	2

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Mrs.C.Aruna Sundari
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - I	PRINCIPLES OF MENU PLANNING		24PIND11			
EC-II-IDC			L	T	P	C
Hrs./Week: 2	Hrs./Semester : 30	Marks :50	2	-	-	2

GENERAL OBJECTIVES

Understand the importance of nutrition and health to obtain knowledge on the nutritional needs pertaining to different stages of life

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	To acquire knowledge about RDA and different stages of Development
LO-2	To understand the nutritional concerns of pre-school children and school going children
LO-3	To analyze the nutritional needs of adolescents and adults
LO-4	To apply the eating patterns, nutritional problems and nutritional needs of expectant and lactation mothers.
LO-5	To create the nutritional allowances of Infants and aged people

UNIT : 1 RDA AND CONCEPT OF GROWTH

RDA for Indian basis for requirement, computation of allowance based on energy expenditure, components of energy expenditure. General concepts about growth and development through different stages of life.

UNIT : 2 PRESCHOOL AND SCHOOL GOING

Preschool, Food habits and nutrient in take of preschool children. Dietary allowances and supplementary foods. School going age, Nutritional status of school children, school lunch program, factors to be considered in planning a menu, food habits and nutritional requirement, packed lunch

UNIT : 3 ADOLESCENCE

Adolescence: Changes of growth characteristics of adolescents. Nutritional needs of the adolescents. Adults: Nutrition for adults. Basis for requirement. Nutrition and work efficiency

UNIT : 4 ICMR

ICMR Nutrient allowances, Dietary guidelines. Common nutrition related problem of pregnancy and Lactation.

UNIT : 5 OLD AGE AND INFANCY

Geriatric -Nutrition allowances - Dietary Guidelines -- psycho social and economic factors affecting eating behavior**.**

Infant -Rate of growth, weight as the indicator, Nutrition allowances for the infants. Breast feeding. Weaning foods suitable for infants. Premature infant and their feeding infant formulas

REFERENCES BOOKS

1. Aleta L. Meyer and Thomas P. Gullotta., Physical Activity across the Lifespan: Prevention and Treatment for Health and Well-Being (Issues in Children's and Families' Lives), 2012, Springer.
2. Antia,F.P., 1992, Clinical Dietetics and Nutrition Oxford University Press, New Delhi.
3. Balasubramanian et al., 1998, Dietary guidelines for Indians, ICMR, New Delhi. Passmore, A Hand Adams,A.A.,1990, Clinical assessment of nutritional status–A working manual, Will and Wilson Publishing, London.
4. Bamji et al(1996), Textbook of Human Nutrition Oxford and IBH Publishing co. Pvt. Ltd. Delhi.
5. Corinne,R.H.,1996, Normal and therapeutic nutrition, Mcmallian Co., NewYork. Davidson, S.R. and Passmore J.F., 1989, Human Nutrition and Dietetics, ELBS
6. Jacalyn J. McComb, Reid Norman, et al., The Active Female: Health Issues Throughout London.
7. Mahan,K.L.,andStump,S.E.,1996,Krauses Food, Nutrition and Diet therapy M.B. Saunders Co., USA.
8. Mahan, K.L., and Stump, S.E., 1996, Krauses Food, Nutrition and Diet therapy M.B. Saunders Co., USA.
9. Nix .S 2016, Williams' Basic Nutrition & Diet Therapy, Fifteenth Edition, Elsevier. Simon Langley Evans,2015 Nutrition, Health and Disease: A Life span Approach 2nd Edition, Wiley Blackwell.
10. Shils.E.M,Shike .M,Ross. A.C, Cabellero.Band Cousins.R.J (2011) Modern Nutrition in Health and Disease, Eleventh Edition, Lippincott Williams and Wilkins, Philadelphia.

LEARNING RESOURCES

- www.four-h.purdue.edu
- www.ingenta.connect.com
- nal.usda.gov/fnic/lifecycle

COURSE OUTCOME

CO	Upon completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Outline the RDA and assess the different stages of Development	2,3	K2
CO-2	Apply the nutritional support of pre-school children and school going children	1,2	K3
CO-3	Analyze the nutritional needs and dietary guidelines for adolescents and adults.	1,2,5	K4
CO-4	Develop menu and dietary guidelines for expectant and lactating mothers	1,2,5	K5
CO-5	Formulate diet chart for aged people and create feeding methods for infants.	1,2,5	K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
I	24PIND11	PRINCIPLES OF MENU PLANNING	30	2

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	3	1	1	1	3	-	3	1	1
CO-2	3	3	3	1	1	3	-	3	-	2
CO-3	2	3	3	3	3	-	3	2	2	3
CO-4	3	3	3	2		-	3	2	2	3
CO-5	-	3	3	3	3	-	-	3	2	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Mrs.M.Vadivel Devi
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - II	NUTRITIONAL BIOCHEMISTRY		24PCND21			
Core-IV			L	T	P	C
Hrs./Week: 5	Hrs./Semester : 75	Marks :100	5	-	-	5

GENERAL OBJECTIVES

1. Understand the need for the study of biochemistry as the basis for nutritional sciences.
2. Make students aware of metabolism of proximate principles and others.
3. Abasic understanding of the functions of biological systems in relation to Nutritional biochemistry.

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	Understand the role of enzymes and coenzymes in biological oxidation.
LO-2	Gain knowledge on metabolism and regulation of carbohydrate.
LO-3	Understand the concept of metabolism and bioenergetics of lipids.
LO-4	Discuss the classification, structure, organization and metabolic pathway of protein.
LO-5	Comprehend the biological metabolism and functions of nucleic acid and understand recent concepts in biochemistry.

UNIT : 1 BIOLOGICAL OXIDATION AND ENZYMES

Biological oxidation, Electron transport chain and Oxidative Phosphorylation. Enzymes –Definition, Types, mechanism of action, factors affecting enzyme activity, coenzyme, roles of vitamin as coenzyme.

UNIT : 2 METABOLISM OF CARBOHYDRATES

Glycolysis, The Citric Acid Cycle glycogenesis, glycogenolysis, gluconeogenesis, The Hexose Monophosphate Shunt and bioenergetics. Hormonal regulations of blood glucose .Homeostasis

UNIT : 3 PROTEINAND AMINO ACID METABOLISM

Classification of aminoacids, Oxidative Deamination, decarboxylation, transamination and trans methylation of amino acids, urea cycle, biosynthesis of non-essential amino acids, catabolism of essential amino acids. Protein biosynthesis.

UNIT : 4 METABOISM OF LIPIDS

Classification of fatty acid, Biosynthesis of fatty acids, beta oxidation of fatty acids and ketone bodies. Essential fatty acids – types and functions. Metabolism of phospholipids, and cholesterol. Lipo proteins – classification and function.

UNIT : 5

Overview of intermediary metabolism of carbohydrates, protein and lipid. Structural components and functions of nucleic acid, Structure of DNA, DNA Replication, RNA synthesis–types. Recombinant DN technology, Metabolism of Xenobiotics, Nutrigenomic.

TEXT BOOKS

1. Jain, J.L., Jain, S., & Jain, N., (2005). Fundamentals of Biochemistry. S. Chand Company Private Ltd. Ram nagar, New Delhi-110 055. 6th revised edition.
2. Bettelheim, F. A., Brown, W. H., Campbell, M. K., & Farrell, S. O. (2009). General, Organic & Biochemistry. Brooks/Cole Cengage Learning.
3. Champe ,P.C., Harvey, R.A., & Ferrier,D.R. (2005). Biochemistry. Lippincott Williams & Wilkins, 6th Edition, Wolters Kluwer, London.
4. Talwar,G.P., & Srivastava,L.M.(2002).Textbook of biochemistry and human biology. PHI Learning Pvt. Ltd..
5. Murray, R.K.,Granner, D.K., Mayes, P.A. and Rodwell, V.W.(2000):25th Ed. Harpers Biochemistry. Macmillan worth publishers.

REFERENCES

1. Albanese,A. (Ed.).(2012). Newer methods of nutritional biochemistry V3: With applications and interpretations. Elsevier.
2. Bender, D.A.(2003). Nutritional biochemistry of the vitamins. Cambridge university press.
3. Champe, P.C., Harvey, R.A., & Ferrier, D.R. (2005). Biochemistry. Lippincott
4. Lieberman, M., & Ricer, R.E.(2009). Lippincott's Illustrated Q & A Review of Biochemistry. Lippincott Williams & Wilkins.
5. Marshall, W. J., Lapsley, M., Day, A., &Ayling, R. (2014). Clinical BiochemistryE- Book: Metabolic and Clinical Aspects. Elsevier Health Sciences.Williams & Wilkins.

LEARNING RESOURCES

1. https://www.udemy.com/share/1027yA/
2. https://www.classcentral.com/course/swayam-biochemistry-5229
3. https://www.classcentral.com/course/edx-biochemistry-biomolecules-methods-and-mechanisms-12585
4. https://www.classcentral.com/course/swayam-experimental-biochemistry-12909
5. https://youtu.be/y6YGZfcAegw

COURSE OUTCOMES

CO	Up on completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Overview the relationship between the chemical structure and the properties of biological reaction	1,2,3	K2
CO-2	Understand the metabolism and mechanism of carbohydrates	1,2,3	K2,K3
CO-3	Gaining knowledge about the Transportation of amino acid and Metabolic pathway of Proteins	1,3	K2,K3
CO-4	Distinguish Transportation and Metabolism of lipids, Oxidation of fatty acids, etc	3,4	K3,K4
CO-5	Propose the structural and functional Harmone classification in mechanism of actions, and Basic concepts of nutrigenomics and nutrigenetics	1,4,5	K2,K4,K5

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course				Hours				Credits
II	24PCND21	NUTRITIONAL BIOCHEMISTRY				75				5
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	3	1	1	1	3	3	3	1	1
CO-2	3	3	3	1	1	3	3	3	1	2
CO-3	2	3	3	3	3	3	2	3	2	2
CO-4	3	3	3	2		1	2	3	3	2
CO-5	2	3	3	3	3	3	2	2	3	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Dr.S.Rama Jeba
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - II	ADVANCED DIETETICS		24PCND22			
Core-V			L	T	P	C
Hrs./Week: 5	Hrs./Semester : 75	Marks :100	5	-	-	4

GENERAL OBJECTIVES

To enable the students

1. Acquire Knowledge regarding the effect of various diseases on nutritional status and nutrient requirement
2. Understand the modifications in nutrients and dietary requirements for therapeutic condition.
3. Learn recent concepts in dietary management of different diseases

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	To acquire Knowledge regarding the effect of various diseases on nutritional status and nutrient requirement
LO-2	To understand the modifications in nutrients and dietary requirements for therapeutic condition.
LO-3	To Learn recent concepts in dietary management of different diseases.
LO-4	To recommend and provide appropriate nutritional care for various diseases
LO-5	To gain knowledge on the prevention and treatment of various diseases

UNIT : 1

Nutritional Screening, Nutritional care process, Nutritional Assessment, Nutritional diagnosis, Nutritional Intervention, Monitoring and evaluation.

Basic concepts of diet therapy–Therapeutic adaptations of Normaldiet, Principles and classification of therapeutic diets. Routine Hospital diets – Regular, soft, fluid diet.

Nutritional Management in critical care-Nutritional screening and Nutritional status assessment of critically ill, Nutritional requirement according to the critical condition.

Nutritional supportsy stems: Enteral and parenteral nutrition support-Types, composition and complications.

UNIT : 2

Medical Nutrition therapy for gastrointestinal and liver disorders**:** Upper Gastrointestinal Tract Diseases – Nutritional care and diet therapy in Diseases of esophagus-Esophagitis, Gastroesophageal reflux disease [GERD] and Hiatushernia.

Disorders of stomach: Indigestion, Gastritis, Gastric and duodenalulcers, anddumping syndrome.

Lower gastrointestinal tract Diseases/Disorders-Common Symptoms of Intestinal dysfunction-Flatulence, constipation, haemorhoids, diarrhoea, steatorrhoea, Diseases of the large Intestine-Diverticular disease, Irritable bowel syndrome, inflammatory bowel disease.

Diseases of Small Intestine-Celiacdisease, tropicalsprue, intestinal brush border enzyme deficiencies.

Diseases of the Liver-hepatitis, hepatic coma, cirrhosis, cholecystitis, cholelithiasis and pancreatitis, Zollinger Ellison syndrome and Biliary dyskinesia.

UNIT : 3

Medical Nutrition therapy for PulmonaryDiseases -Effect of Malnutrition on pulmonary system, effect of pulmonary disease on nutritional status, chronic pulmonary diseases- Asthma, cystic fibrosis, chronic obstructive pulmonary disease and Pneumonia- Pathophysiology and dietary management.

Medical Nutrition therapy for Rheumatic disease- Etiology, Pathophysiology of Inflammation of Rheumatic diseases, Rheumatoid Arthritis, Osteoarthritis and sjogren syndrome.

Nutritional management of physiological stress- Classification, Complications, Metabolic changes in protein and electrolytes and Dietary management of burns, dietary management of trauma and stress.

UNIT : 4

Nutritional Management on Weight imbalance -Regulation of food intake and pathogenesis ofobesityand malnutrition and starvation; Weight Imbalance: prevalence and classification.

Underweight -Etiology and Dietary management**;** Obesity-Etiology, classification, Energy balance, dietary modifications and Bariatric surgery-

types and dietary modifications of pre and post bariatric surgery.

Nutritional Management in metabolic disorders- Prevalence, Etiology, risk factors, complications and dietary modifications of diabetes mellitus.

UNIT : 5

Nutritional management of cardiovascular diseases-etiology, risk factors, clinical features and dietary modifications of Dyslipidemias, Atherosclerosis, Hypertension, Ischemic heart disease, Congestive cardiac failure.

Nutrition Management of Renal Disease -Etiology, Clinical and metabolic manifestations, Diagnostic tests, Types-Glomerulonephritis, Nephrotic syndrome, Renal Failure: Acute and chronic, ESRD, Nephrolithiasis and Dietary modifications.

Nutritional management incancer-Pathogenesis and progression of cancer, types Symptoms and Dietary management.

TEXT BOOKS

Antia F.P. And Philip Abraham.(2001).Clinical Nutrition and Dietetics. Ox Publishing Company.

B. Srilakshmi. (2007).Dietetics. K.K. Gupta For New age International Pvt. New Delhi Publisher.

Mahan L.K., Sylvia Escott-Stump.(2000). Krause"s Food Nutrition and Therapy.W.B. Saunders Company London. 10th edition.

Passmore P.And M.A.East Wood. (Digitised in 2010). Human Nutrition Dietetics. Churchill Living Stone.

Robinson Ch., M.B.Lawlea,W.L.,Chenoweth, AndA.E.,Carwick.(1990).B Nutrition and Diet therapy, Macmillan Publishing Company.

S.R.Mudambi.M.K.Rajagopal.(2009).Fundamentals, Food Nutritionand therapy. New Age Publishers. 5th edition.

REFERENCES

- Garrow JS, James WPT, Ralph A.(2000). Human Nutrition and Dietetics. Churchill Livingstone, NY. 10th edition.
- Groff L James, Gropper S Sareen. (2000). Advanced Nutrition and Human Metabolism. West / Wadsworth, UK. 3rd edition.

- Sue Rodwell Williams. (1993). Nutrition, Diet Therapy. W.B. Saunders Company London. 7th edition.
- Whitney, E.N. and C.B.. Cataldo. (1983). Understanding Normal and Clinical Nutrition. West Pub. S1. Paul.

LEARNING RESOURCES

www.nutrition.gov-ServiceofNational agriculturallibrary,USDA.

www.nal.usda.gov/fnic-FoodandNutritioninformationcentre.

www.healthyeating.org.

www.eatrightpro.org.https://www.globalhealthlearning.org.

COURSE OUTCOMES

CO	Upon completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Critique the Nutritional screening technique	1,2,3,	K2,K3
CO-2	Comprehend the current concepts of therapeutic diets for critically ill patients	1,2,3,5	K2, K3, K4
CO-3	Implement the dietary principles on various disorders.	2,3,4,5	K2, K3, K4
CO-4	Acquire the knowledge of diet counseling skills.	2,3,4,5	K2, K3, K4, K5
CO-5	Apply the dietary principles to manage the lifestyle disorders in the society	2,3,4,5	K2, K3, K4, K5 K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course				Hours	Credits			
II	24PCND22	ADVANCED DIETETICS				75	4			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	3	1	1	1	3	3	3	1	1
CO-2	3	3	3	1	1	3	2	3	-	2
CO-3	2	3	3	3	3	-	3	2	2	3
CO-4	3	3	3	2	-	-	3	2	2	3
CO-5	-	3	3	3	3	-	3	3	2	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Mrs.M.Vadivel Devi
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - II	NUTRITIONAL BIOCHEMISTRY		24PCND2P1			
Core-P-III	PRACTICALS		L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :50	-	-	4	2

GENERAL OBJECTIVES

1. To enable students to understand the role of nutrients in the body.
2. To understand the different biochemical parameters

.

I. Analysis of Blood/Serum

1. Blood Glucose
2. Serum Iron
3. Serum Cholesterol
4. Serum Protein
5. Blood Haemoglobin

II. Analysis of urine

1. Creatinine
2. Urea
3. Total Nitrogen
4. Calcium
5. Phosphor US

III. Qualitative Analysis

A. **Qualitative analysis of sugars**

1. Reactions of Monosaccharide (Glucose, fructose, Galactose, Mannose and Ribose
2. Reactions of Disaccharides (Maltose and Lactose)
3. Reactions of Polysaccharides (Starch and Dextrin)
4. Analysis of Unknown Sugar

IV. Qualitative analysis of aminoacids

1. Reactions of individual Amino acids (Tyrosine, tryptophan, Arginine, Histidine, Cystine and Methionine)
2. Analysis of unknown Aminoacids

TEXTBOOKS

1. Jain, J.L., Jain, S., & Jain, N., (2005). Fundamentals of Biochemistry. S.Chand Company Private Ltd. Ram nagar, New Delhi-110 055. 6th revised edition.
2. Bettelheim, F. A., Brown, W. H., Campbell, M. K., & Farrell, S. O. 2009). General, Organic & Biochemistry. Brooks/Cole Cengage Learning.

3. Champe ,P.C., Harvey, R.A., & Ferrier, D.R. (2005). Biochemistry. Lippincott Williams &Wilkins, 6th Edition, Wolters Kluwer, London.
4. Talwar,G.P., & Srivastava, L.M.(2002). Textbook of biochemistry and human biology. PHI Learning Pvt. Ltd..
5. Murray, R.K.,Granner, D.K., Mayes, P.A. and Rodwell, V.W.(2000):25th Ed.Harpers Biochemistry. Macmillan worth publishers.

REFERENCES

1. Albanese,A. (Ed.).(2012). Newer methods of nutritional biochemistry V3:With applications and interpretations. Elsevier.
2. Bender, D.A.(2003). Nutritional biochemistry of the vitamins. Cambridge university press.
3. Champe, P.C.,Harvey,R.A.,& Ferrier, D.R. (2005). Biochemistry. Lippincott
4. Lieberman, M., & Ricer, R.E.(2009). Lippincott's Illustrated Q & A Review of Biochemistry. Lippincott Williams & Wilkins.
5. Marshall,W.J.,Lapsley,M.,Day,A.,&Ayling,R.(2014). Clinical BiochemistryE-Book: Metabolic and Clinical Aspects. Elsevier Health Sciences. Williams & Wilkins.

COURSE OUTCOMES

CO	Up on completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Acquires kills to analyse various blood parameters Using different methods	1,2,3	K2
CO-2	Ability to relate the theoretical knowledge with the biomarkers for CVD & diabetes.	1,2,3	K2,K3
CO-3	Ability to relate the theoretical knowledge with the biomarkers forliver & kidney functions	1,3	K2,K3
CO-4	Apply the techniques to estimate the urine for various parameters	3,4	K3,K4
CO-5	Understand and examine the urine by qualitative methods	1,4,5	K2,K4,K5

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
II	24PCND2P1	NUTRITIONAL BIOCHEMISTRY PRACTICALS	60	2

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	3	1	1	1	3	3	3	1	1
CO-2	3	3	3	1	1	3	3	3	1	2
CO-3	2	3	3	3	3	3	2	3	2	2
CO-4	3	3	3	2		1	2	3	3	2
CO-5	2	3	3	3	3	3	2	2	3	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Dr.S.Rama Jeba
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - II	ADVANCED DIETETICS PRACICALS		24PCND2P2			
Core-P-IV			L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :50	-	-	4	2

GENERAL OBJECTIVES

To enable the students

- Acquire Knowledge in planning diets for various disorders
- Gain knowledge in diet counseling and educating patients.
- Understand the therapeutic modifications of diet.

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	To acquire Knowledge in planning diets for various disorders
LO-2	To gain knowledge in diet counseling and educating patients.
LO-3	To understand the therapeutic modifications of diet.
LO-4	Counsel on the dietary management of cancer different diseases
LO-5	Develop skill in nutritional diagnosis, planning and providing suitable preventive/ therapeutic diets for various diseases / disorders

UNIT : 1

- Routinehospital diet:Regulardiet, Clearliquid, Softdiet, Full liquid diet and Planning and preparing Enteral feed plan

UNIT : 2

- Assessing and planning diets for the following conditions
  - ✓ Celiac disease
  - ✓ Lactose intolerance.
  - ✓ GERD
  - ✓ Peptic ulcer
  - ✓ Hepatitis
  - ✓ Cirrhosis

UNIT : 3

- Planning and preparing diet for Pneumonia
- Planning and preparing diet for Rheumatic arthritis

UNIT : 4

- Assessing requirements and planning diet for obese and underweight individual
- Planning and preparing diet for Diabetes Mellitus [IDDM and NIDDM]

UNIT : 5

- Planning and preparation of diet for Atherosclerosis with hypertension
- Planning and preparation of diet for cancer according to the condition.
- Planning and Preparing diet for pre and post Bariatric surgery patients.
- Assessment and planning diet for post burn condition

TEXT BOOKS

1. Mahan LK, Stump SE and Raymond JL(2012). Krause's Food and Nutrition Care Process.Elsevier aunders.Missouri.13th edition.
2. Stump SE.(2012).Nutrition and diagnosis related care. Lippincott Williams and Wilkins. Canada.7th edition.
3. The Nutrition Society Textbook.Wiley Blackwell Publishers.2nd edition. Mitch, W. and Ikizler, Alp(2010). Handbook of Nutrition and the Kidney.Lippincott Williams and Wilkins, New Delhi.6th edition.
4. Whitney EN and RolfesSR.(2002). Understanding Nutrition, 9th edition, West/Wordsworth.
5. Guthrie H(2002). Introductory Nutrition. CV Mosby Co.St. Louis. Elia M, Ljunggvist O, Stratton RJ, Lanham SA(2013). Clinical Nutrition.
6. Width.M and Reinhardt.T. (2018).The Essential Pocket Guide for Clinical Nutrition.Wolters Kluwer Publishers. 2nd edition.

REFERENCES

- Clinical Dietetics Manual.(2018). Indian Dietetic Association. 2nd edition. Peggy Stanfield.Y.H.Hui.(2010). Nutrition and Diet therapy. Jones and Bartlett publishers.
- Gopalan C., Ram Sastri B.V. And BalSubramaniam S.C. (2006). Nutritive Value of Indian Foods. Hydrabad, National Institute of Nutrition. Indian Council of Medical Research.
- William's. (2012).Basic Nutrition and Diet therapy.14th Edition

LEARNING RESOURCES

- **www.nutrition.gov** - Service of National agricultural library, USDA.
- **www.nal.usda.gov/fnic -Food and Nutrition information centre.**
- **www.healthyeating.org.**
- **www.eatrightpro.org.**
- **https://www.globalhealthlearning.org.**

COURSE OUTCOME

CO	Upon completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Evaluate various therapeutic diets	1,3,4,5	K3, K4, K5
CO-2	Identify the requirements for disease conditions and critically ill patients.	1,3,5	K3, K4
CO-3	Assess and plan the diets for various disease conditions.	2,3,4,5	K4, K5, K6
CO-4	Create Knowledge in nutrient calculations and dietary principles.	2,3,4,5	K4, K5, K6
CO-5	Design the personalized diets for different individuals in the society	3,4,5	K4, K5, K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
II	24PCND2P2	ADVANCED DIETETICS PRACICALS	60	2

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	3	1	1	1	3	-	3	1	1
CO-2	3	3	3	1	1	3	-	3	-	2
CO-3	2	3	3	3	3	-	3	2	2	3
CO-4	3	3	3	2	-	-	3	2	2	3
CO-5	-	3	3	3	3	-	-	3	2	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Mrs.M.Vadivel Devi
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - II	PERFORMANCE NUTRITION		24PEND21A			
EC-IIIA			L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :100	3	1	-	3

GENERAL OBJECTIVES

1. To understand and evaluating the nutritional performance
2. To Design Individualized Nutrition Plans Promoting Long-term Health

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	Learn about the role of nutrients in enhancing Sports Performance. Understand the fundamentals of planning diet for different sports.
LO-2	Know about the different types of sports supplements and nutrition for special athletes.
LO-3	Emphasize the role of nutrition in competitive performance and for special needs.
LO-4	Retrieving the various sports supplements and Ergogenic aids for the athletes.
LO-5	Emphasize the role of nutrition in competitive performance and for special needs.

UNIT : 1

Nutritional assessment for athletes-assessment of body composition, techniques of measuring body composition, surface anthropometry, Biochemical, clinical and dietary assessment, Body composition and sports performance. Energy requirements for optimal athletic performance- Energy production, Energy metabolism in Athletes, Fatigue and exercise, energy requirements of athletes, factors affecting energy requirements of athletes.

UNIT : 2

Carbohydrates in sports performance- Carbohydrate types, Glycaemic index and Glycaemic load, carbohydrate utilization during exercise, carbohydrate loading, fuelling before during and after exercise, carbohydrate requirements for athletes.Protein and fat requirement for sports performance -protein and exercise, requirements of protein and fat for athletes, factors affecting protein requirements, protein needs and vegetarian athletes.

UNIT : 3

Micronutrients in sports- vitamins and mineral requirements in athletes, sports anaemia, antioxidants and exercise induced free radicals.Hydration for athletes- Fluid balance and thermoregulation, fluid and electrolyte

requirements for athletes, Effects of dehydration, factors affecting fluid intake, gastric emptying and fluid delivery to working muscles, Fluid intake before, during and after exercise.

UNIT : 4

Nutrition for competition performance-Nutrient timing, pre-competition nutritional guidelines, nutrition during exercise and nutrition after exercise, nutrition plan for specific sports events.Ergogenic aids- Categories of Ergogenic aids and Ergolytics.Sports foods-sports drinks, sports gels, Sports energy bars and sports gels.

UNIT : 5

Nutrition for athletes with special dietary needs- Nutrition for special population like children, young and older athlete, Female athlete triad, weight loss and weight gain in athletes, vegetarian athlete, diabetic athlete, athletes with disabilities, factors affecting nutritional needs for travel athlete, GI stress and athletes.

COURSE OUTCOME

CO	Up on completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Analyze and assess the body composition of athlete.	12	K2
CO-2	Comprehend the role of Macro and micronutrients towards athletic performance	1,2,3	K2,K3
CO-3	Emphasize the role of nutrition in competitive performance and for special needs.	1,2,3,4,	K2,K3
CO-4	Retrieving the various sports supplements and Ergogenic aids for the athletes.	3,4,5	K3,K4
CO-5	Apply personalized nutrition guidance in the area of sports nutrition.	2,3,4,5	K2,K4,K5

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course				Hours	Credits			
II	24PEND21A	PERFORMANCE NUTRITION				60	3			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	2	3	3	3	1	3	3	3	1	1
CO-2	2	2	2	3	1	3	3	3	1	2
CO-3	2	3	3	3	1	3	2	3	2	2
CO-4	3	3	3	3	1	1	2	3	3	2
CO-5	2	2	3	3	2	3	2	2	3	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Miss.F.Fathima Farzana
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - II	HUMAN FACTOR AND ERGONOMICS		24PEND21B			
EC-IIIB			L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :100	3	1	-	3

GENERAL OBJECTIVES

1. To be come aware of the role of ergonomics in work effectiveness and efficiency
2. To understand the environmental factors contributing to productivity, safety, control and well -beingof individual performingthe work.

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	Explain the psychology of human behavior as it relates to workplace safety
LO-2	Identify ergonomic hazards; recommend appropriate controls.
LO-3	Relate the human and workplace factors which contribute to ergonomic hazards.
LO-4	Explain and apply human factors engineering concepts in both evaluation of existing systems and design of new systems.
LO-5	Acknowledge the impact of work place design and environment on productivity.

UNIT : 1

Introduction to Ergonomics - Definition, History and evolution. Scope of Ergonomics in home and otheroccupations, Nature of work in household and other occupations, Human Body and Work: Physiology ofNeuro-muscular function in relation to occupational ergonomics; Physiological factors in muscle work; Physical work capacity; Energy requirement for muscular work; Energy expenditure for different activities; Endurance and muscular strength.

UNIT : 2

Job Analysis - Significance of job analysis for occupational ergonomics, Fundamental elements of job analysis. Anthropometry in relation to occupational ergonomics. Postures-Definition and Scope.

UNIT : 3

Application of Ergonomic Principles in: Tool Evaluation and Design**;** Work Station Evaluation and Design; Maintenance of Postures. Identifying types of postures assumed during work, analysis and interpretation, Effect of wrong postures on cardio-vascular and muscular skeletal system, Correct techniques of lifting and carrying weights

UNIT : 4

Physiological Aspects of Work, Structure and Function of the muscles, Biochemistry of muscle work. Physiological factors involved in muscular work. Carbohydrates, fats and protein, Oxygen, Cardio-Vascular and Respiratory system, Thermo- regulatory system, Endurance and muscular strength, Skill, Maximal work,Speed, Factors affecting physiological reactions doing work, Workload and posture

UNIT : 5

Cardio-Respiratory Fitness- Anthropometric measurements and Physical Fitness Index, Body composition - body fat % , Body surface area, lean body mass by skin fold method and Somato typing. Maximum aerobic capacity using modified Harvard test (Queens college test), Determination of workload using heart rate and oxygen consumption-Tread mill, steps tool, Heart rate and oxygen consumption, Pulserate, Time and motion study. Energy cost. Assessment of Physical work capacity(PWC)

TEXT BOOKS

1. Sanders, M. S., & McCormick, E. J. (1993). Human factors in engineering and design (7th ed.). McGraw-Hill.Wickens,
2. D., Gordon, S. E., & Liu, Y. (2003). An introduction to human factors engineering (2nd ed.). Pearson Education.
3. Tillman, B., Tillman, P. M., & Tillman, T. A. (2016). Human factors and ergonomics design handbook (3rd ed.).
4. McGraw-Hill Education. Kroemer, K. H. E., Kroemer, H. J., & Kroemer-Elbert, K. E. (2001). Ergonomics: How to design for ease and efficiency (2nd ed.). Prentice Hall.
5. Proctor, R. W., & Van Zandt, T. (2018). Human factors in simple and complex systems (3rd ed.). CRC Press.

REFERENCES

1. Astrand P .O.and Radahl K. :Textbook of Work Physiology, McGraw New.
2. Davies D.R.and Shakleton V.J. :Physiology of work, Motunen & Co.Ltd.
3. Oborne David : Ergonomicsat work, John Wileyand sons, New York.
4. Dul Jan and Weedmester Bernard: Ergonomics for Beginners, Tylor and Francis, London.
5. Wilson J.R. and Corlett N.: Evaluation of Human Work. A Practical Ergonomics Methodology. Tylor and Francis, London.
6. Pheasan Stephan : Body space, Anthropometry , Ergonomics and the Designs at work, Taylor & Francis, London.

COURSE OUTCOME

CO	Up on completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Explain the psychology of human behavior as it relates to workplace safety	12	K2
CO-2	Identify ergonomic hazards; recommend appropriate controls.	1,2,3	K2,K3
CO-3	Relate the human and workplace factors which contribute to ergonomic hazards.	1,2,3,4,	K2,K3
CO-4	Explain and apply human factors engineering concepts in both evaluation of existing systems and design of new systems.	3,4,5	K3,K4
CO-5	Acknowledge the impact of work place design and environment on productivity.	2,3,4,5	K2,K4,K5

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
II	24PEND21B	HUMAN FACTOR AND ERGONOMICS	60	3

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	1	2	3	4	5	1	2	3	4	5
CO-2	3	3	3	3	2	3	3	3	3	3
CO-3	3	3	3	3	2	3	3	2	3	3
CO-4	3	3	3	3	1	3	3	2	3	3
CO-5	3	3	3	3	2	3	3	1	3	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Miss.F.Fathima Farzana
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - II	FUNCTIONAL FOODS AND HEALTH		24PEND21C			
EC-IIIC			L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :100	3	1	-	3

GENERAL OBJECTIVES

1. To recognize the impact of functional foods and nutraceuticals on health and wellness.
2. To compare and contrast the methods of classification, identification, extraction and characterization of functional foods and nutraceuticals.

COURSE OBJECTIVES

LO	The learners will be able to
LO-1	To understand the concept of functional foods
LO-2	To know the classification and components in functional foods
LO-3	To address the concept of functional foods in health and diseases
LO-4	To understand the concept of functional foods and its toxic reactions
LO-5	To Know the legal issues in functional food packaging

UNIT : 1 CONCEPT OF FUNCTIONAL FOODS

Background: Historical perspective and evolution of health care and functional foods; Concept and Definition; relationship between functional foods, nutraceuticals, health and disease. Effect of processing on functional fooding redients. Classification: Dietary Fiber, Fatty Acids, Herbals And Botanicals, Soy Components, Vitamins and Minerals, Phytochemicals, Probiotics. Prebiotics and Synbiotics

UNIT : 2 NUTRACEUTICALS AS A SCIENCE

Introduction: Definition, Classification of Nutraceuticals based on chemical nature, structure; food source; amount of nutraceutical substance and mechanismofaction. Phytochemicals as Nutraceuticals: Identification and extraction of bioactive components from microbes, plant and animal sources.

UNIT : 3 FUNCTIONAL FOODS, NUTRACEUTICAL AND HEALTH

Use of functional foods and nutraceuticals in the treatment of colonic health, cardiovascular health; cancer prevention; weight management. Use of Functional foods and Nutraceuticals in the treatment bone health; mental health; respiratory health and oral health. Use of Functional foods and Nutraceuticals in the treatment women's health and enhancement of sporting performance.

UNIT : 4 EFFICACY,SAFETY AND TOXIC INTERACTIONS

Efficacy and Safety: Metabolism and bioavailability of Nutraceuticals; Meta-analyses; and systematic reviews of Nutraceutical clinical trials, Safety and beneficial interactions Nutraceutical interactions: Toxic contamination of nutraceuticals and fooding redient, interactions between Nutraceuticals / nutrients and Therapeutic drugs, herb and drug interactions

UNIT : 5 REGULATIONS GOVERNING FUNCTIONAL FOODS AND NUTRACEUTICALS HEALTH CLAIMS

Nutraceuticals and Functional Foods FSSAI regulations- Food Safety and Standards Health Supplements, Nutraceuticals, Food for Special Dietary Use, Food for Special Medical Purpose, Functional Food, and Novel Food) Regulations, 2016 and Amendments. DISHA, Foods with Nutritional Function Claims (FNFC).

TEXT BOOKS

1. Wildman, R. E. C. (Ed.). (2016). Handbook of Nutraceuticals and Functional Foods (2nd ed.). CRC Press.
2. Bagchi, D., & Nair, S. (Eds.). (2016). Developing New Functional Food and Nutraceutical Products. CRC Press.
3. Shahidi, F. (Ed.). (2017). Functional Foods of the East. Springer.
4. Hasler, C. M. (Ed.). (2018). Regulation of Functional Foods and Nutraceuticals: A Global Perspective. Wiley-Blackwell.
5. Betoret, N., & Betoret, E. (Eds.). (2020). Functional Foods and Nutraceuticals: Source, Chemistry, Function, and Applications. Wiley-Blackwell.

REFERENCE BOOKS

1. Watson, R. R., & Preedy, V. R. (Eds.). (2017). Bioactive Foods in Promoting Health: Fruits and Vegetables. Academic Press.
2. Martirosyan, D. M. (Ed.). (2020). Functional Foods: Biochemical and Processing Aspects. CRC Press.
3. Pathak, Y. V. (Ed.). (2019). Handbook of Nutraceuticals: Volume I - Ingredients, Formulations, and Applications. CRC Press.
4. Zhao, Y., & Ju, Y. H. (Eds.). (2019). Functional Foods and Nutraceuticals: Bioactive Components, Formulations and Innovations. Wiley-Blackwell.
5. Ghosh, D. (Ed.). (2018). Applications of Nutraceuticals and Functional Foods in Human Health. CRC Press.

COURSE OUTCOME

CO	Up on completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Asses the physiological condition during space nutrition	1	K2
CO-2	Understand different techniques of maintain health in extreme condition	1,2	K3
CO-3	Plan a balanced diet for polar , hot and sea voyage condition	3	K6
CO-4	Comprehend the dietary requirements of various military condition	3,4	K6
CO-5	Design a food in disaster nutrition	4	K2

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course				Hours	Credits			
II	24PEND21C	FUNCTIONAL FOODS AND HEALTH				60	3			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	3	1	1	1	3		3	1	1
CO-2	3	3	3	1	1	3		3		2
CO-3	2	3	3	3	3		3	2	2	3
CO-4	3	3	3	2			3	2	2	3
CO-5		3	3	3	3			3	2	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Mr. S.M.Prasad
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - II	NUTRITION IN SPECIAL CONDITION		24PIND21			
EC-IV -IDC			L	T	P	C
Hrs./Week: 2	Hrs./Semester : 30	Marks :50	2	-	-	2

GENERAL OBJECTIVES

1. To acquire knowledge on physiological changes during extreme climatic changes.
2. To understand the diet pattern and food choice in special condition
3. To develop the skill of planning menu for military ration.

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	Asses the physiological condition during space nutrition
LO-2	Understand different techniques of maintain health in extreme condition
LO-3	Plan a balanced diet for polar , hot and sea voyage condition
LO-4	Comprehend the dietary requirements of various military condition
LO-5	Design a food in disaster nutrition

UNIT : 1 SPACE NUTRITION

Physiological changes during space flight, types of space food, essential quality and criteria required for space food

UNIT : 2 NUTRITION IN EXTREME CONDITION

Physiological changes, Nutritional requirement in cold polar and hot environment, food supplements.

UNIT : 3 SEA VOYAGE

Stress in daily life aboard, Legal background for catering , cause of malnutrition in sea voyage, Limitation in food choice and diet pattern.

UNIT : 4 MILITARY NUTRTITION

Dietary guidelines, Food choice, nutrient supplements and ration developed in military

UNIT : 5 NUTRITION IN DISASTER

Dietary guidelines , Food choice, nutrient supplements and disaster condition

TEXTBOOKS

1. Mahan, L. K., & Raymond, J. L. (2016). Krause's food & the nutrition care process (14th ed.). Elsevier.
2. Stover, P. J., & McCormick, D. B. (2018). Present knowledge in nutrition (11th ed.). Academic Press.
3. Shils, M. E., Shike, M., Ross, A. C., Caballero, B., & Cousins, R. J. (2006). Modern nutrition in health and disease (10th ed.).
4. Lippincott Williams & Wilkins.Lutz, C. A., Mazur, E. E., & Litch, N. (2019). Nutrition and diet therapy (7th ed.).
5. F.A. Davis Company.Escott-Stump, S. (2011). Nutrition and diagnosis-related care (7th ed.). Lippincott Williams & Wilkins.
6. Nelms, M., Sucher, K. P., Lacey, K., & Roth, S. L. (2016). Nutrition therapy and pathophysiology (3rd ed.). Cengage Learning.
7. Whitney, E., & Rolfes, S. R. (2018). Understanding nutrition (15th ed.).
8. Cengage Learning. Gropper, S. S., Smith, J. L., & Carr, T. P. (2017). Advanced nutrition and human metabolism (7th ed.). Cengage Learning.

REFERENCES

1. Jacalyn J. McComb, Reid Norman, et al.,The Active Female: Health Issues Throughout the Lifespan 2010, Human press.
2. Aleta L. Meyer and Thomas P. Gullotta., Physical Activity Across the Lifespan: Prevention and Treatment for Health and Well-Being (Issues in Children's and Families' Lives), 2012, Springer.
3. Antia, F.P., 1992, Clinical Dietetics and Nutrition Oxford University Press, New Delhi.
4. Corinne, R.H., 1996, Normal and therapeutic nutrition, Mcmallian Co., New York.

COURSE OUTCOME

CO	Up on completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Asses the physiological condition during space nutrition	1	K2
CO-2	Understand different techniques of maintain health in extreme condition	1,2	K3
CO-3	Plan a balanced diet for polar, hot and seavoyage condition	3	K6
CO-4	Comprehend the dietary requirements of various military condition	3,4	K6
CO-5	Design a food in disaster nutrition	4	K2

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
II	24PIND21	NUTRITION IN SPECIAL CONDITION	30	2

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	3	1	1	1	3		3	1	1
CO-2	3	3	3	1	1	3		3		2
CO-3	2	3	3	3	3		3	2	2	3
CO-4	3	3	3	2			3	2	2	3
CO-5		3	3	3	3			3	2	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Mrs.V.Angel Mary
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department

Semester - II	MICRO NUTRIENTS		24PSND21			
SEC-I			L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :100	3	1	-	3

GENERAL OBJECTIVES

1. To enable the students to learn the functions, deficiency symptoms, food sources and requirements of the different micro nutrients.
2. To Gain knowledge of nutrient requirement and management of micronutrients during various stages of life and disease
3. To gain insight about recent concept and findings in field of nutrition and application of the same to prevent disease

LEARNING OBJECTIVES

LO	The learners will be able to
LO-1	Evaluate the specific role of functional foods and nutraceuticals in prevention of degenerative disease.
LO-2	Understand the importance of micronutrients in growth and development of humans.
LO-3	Analyse the importance of diet in maintaining human health to combat nutrient deficiency in the community
LO-4	Gain in-depth knowledge of the physiological and metabolic functions of vitamins and minerals and their implications
LO-5	Analyse the recent advances in the field of micronutrient and research for the welfare of the community

UNIT : 1

Distribution in the body; functions, effects of deficiency, food sources, requirement and recent research of macro minerals - Calcium, Phosporous, Magnesium, Potassium, Sodium and Chloride.

UNIT : 2

Distribution in the body, functions, food sources, requirement deficiency, toxicity and recent research of micro minerals and trace minerals. Micro minerals - – iron, zinc, fluoride, copper, iodine and manganese. Trace Minerals -Selenium, cobalt, chromium, silicon, boron and nickel

Selenium and Vitamin E relationship, Chromium and glucose tolerance factor.

UNIT : 3

Distribution in the body, functions, food sources, requirement deficiency, toxicity and recent research of Fat Soluble Vitamins A,D,E and K

UNIT : 4

Distribution in the body, functions, food sources, requirement deficiency, toxicity and recent research of Water soluble vitamins – Water soluble vitamins: vitamin C, Thiamine, Riboflavin, niacin, pantothenic acid, biotin, folic acid, vitamin B12, vitamin B 6, choline and inositol.

UNIT : 5

Immuno-nutrients and Antioxidants Definition, Classification and function of functional food and nutraceuticals. Antinutrients present in various food groups – Cereals , legumes and nuts and oilseeds Food and drug interaction.

TEXT BOOKS

1. Guthrie, H.A. (2001) – "Introductory Nutrition", Tenth edition, C.V. Mosby Company, St. Louis.
2. Bogert, J.G.V., Briggs,D.H, Calloway, (2000). " Nutrition and physical fitness", 11th edition W.B. Saunders Co., Philadelphia, London, Toronto.
3. Wardlaw, G.M and Kessel, M, (2002) " Perespective in Nutrition", 5thedition, Mc Graw Hill, New York, New Delhi.
4. Willium, S. R. (2000), " Nutrition and Diet Therapy", Mosby Co., St. Louis.
5. Sizer, F.S and Whitney E. R. (2003), " Nutrition , Concepts and Controversies" 9th edition, Thomas Wadsworth, Australia.

REFERENCES

1. Brown, J.E. (2002), "Nutrition Now", 3rd edition, Wadsworth Thomson Learning New York.
2. Maurice, E. Shils, James A. Obson, Moshe shike, (2000), " Modern Nutrition in Health and Disease", 8th Edition, Vol I and II, Lea &Febiger Philadelphia, A Waverly Company.
3. Mahan L.K. and Stamp, S.E (2000), "Krause's Food Nutrition and Diet Therapy", 11th edition, W.B. saunder's Company, Philadelphia.
4. Toteja, G.S and Singh P (2004), " Micronutrient Profile of Indian Population", ICMR Publication, New Delhi.
5. D. M. Swaminathan (2002), " Principles of Nutrition and Dietetics", BAPPCO, 88, Mysore Road Bangalore – 560 018.

LEARNING RESOURCES

1. https://www.udemy.com/share/1027yA/
2. WHO | The e-learning platform Nutrition Knowledge Hub launchWFP Nutrition's Learning Platform - UN World Food ProgrammeNutrition Online Courses | Coursera
3. E-Learning Programs (nestlenutrition-institute.org)
4. WFP Nutrition's Learning Platform | Humanitarian Library

COURSE OUTCOMES

CO	Upon completion the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Evaluate the specific role of functional foods and nutraceuticals in prevention of degenerative disease.	1	K2
CO-2	Understand the importance of micronutrients in growth and development of humans.	1,2	K3
CO-3	Analyse the importance of diet in maintaining human health to combat nutrient deficiency in the community	1,2,5	K4
CO-4	Gain in-depth knowledge of the physiological and metabolic functions of vitamins and minerals and their implications	1,2,5	K5
CO-5	Analyse the recent advances in the field of micronutrient and research for the welfare of the community	1,2	K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course				Hours		Credits		
II	24PSND21	MICRO NUTRIENTS				60		3		
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	2	3	1	1	1	3	-	3	2	1
CO-2	3	3	3	1	1	3	-	3	-	2
CO-3	2	3	3	3	2	-	3	3	3	3
CO-4	3	3	3	2	-	-	3	2	2	2
CO-5	-	3	3	3	3	-	-	2	2	3

STRONG (3), MEDIUM (2) and LOW (1)

Prepared by Name: Mrs.C.Aruna Sundari
Assistant Professor

Checked by: Mr.S.M. Prasad
Head of the Department