FATIMA COLLEGE (AUTONOMOUS)

Re-Accredited with "A++" Grade by NAAC (Cycle - IV)

Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT: RESEARCH CENTRE OF HOME SCIENCE

NAME OF THE PROGRAMME : HUMAN NUTRITION & NUTRACEUTICALS

PROGRAMME CODE : PSNN

ACADEMIC YEAR : 2023-2024

Minutes of the Board of Studies - Upgradation of syllabus of the Research Centre of Home Science B.Sc Home Science with Food Biotechnology

To be implemented from the academic year 2023-2024 onwards.

Venue: Smart room.

Convened on: 05.04.2023 Convened at: 2pm.

Members present

1. Dr. Vasantha Esther Rani.	Vasantha E Rani 05/04/2023 Head, The Research Centre of Home Science.
2. Dr U. Ramesh. Asst. Prof & Head i/c Dept. of Molecular Biology School of Biological Sciences Madurai Kamaraj University Madurai - 21.	05/04/23 University Nominee.
3. Dr. P. C. Jemina Rani Asst. Prof, Dept. of Costume Design & Fashion, Chikanna Govt. Arts. College, Tirupur - 2.	P.C. 5.4.23 Subject Expert
4. Dr. K. Devi Asst. Prof. Dept. of Food Science & Nutrition Avinashilingam Institute of Home Science & Higher Education for Women, Coimbatore.	Absent Subject Expert.

5. MR. S. V. SURAJ SUNDARA SHANKAR.
MANAGING PARTNER,
SVS FOODS, MADURAI.

INDUSTRIALIST.

6. MS. K. SUSHEELA
AVP. CORPORATE PARTNERSHIPS.
CACCIDUS SOCIAL ENTRERPRISES
BANGALORE.

K. Susheela 5/04/23
ALUMNAC

7. DR. A. RAJESWARI
ASST. PROFESSOR
DEPT. OF CHEMISTRY

DEAN OF SCIENCE.

8. DR. S. SANTHI
ASSOCIATE PROFESSOR

STAFF MEMBER

9. DR. K. KARTHIGA.
ASST. PROFESSOR.

STAFF MEMBER

10. DR. P. MAGDALENE VIRJINI
ASST. PROFESSOR,

STAFF MEMBER

11. DR. C. HELEN.
ASST. PROFESSOR.

STAFF MEMBER

12. MS. D. MOUNA.
ASST. PROFESSOR

STAFF MEMBER

13. DR. C. PRIYALATHA.
ASST. PROFESSOR

STAFF MEMBER

14. Ms. J. Josephine Jecintha
Asst. Professor.
J Josphin Jecintha
STAFF MEMBER

15. Ms. K. Nandini Priya
Asst. Professor.
K. Nandipriya.
STAFF MEMBER.

16. Ms. A. Mabel Esther Paripurna.
A. Mabel Esther Paripurna.
FDGC - STAF MEMBER

17. Ms. R. Bhavani
R. Bhavani.
FGDC - STAFF MEMBER

Action Taken Report.

S.No.	Common Suggestions offered in the previous Board.	Action Taken for the Academic Year 2022-2023.
1.	The self learning inter-disciplinary courses for IV semester were suggested.	Two self-learning courses. - Public Health's Hygiene 22UG4SLZ - Textile Coloration - 22UG4SLN were implemented
2.	The skill embedded crash course and certificate course were proposed.	The crash course - Apparel making 22UGVACN1 and the certified course - Surface Ornamentation - 22UGVACN2 have been introduced.

Change of Course Title

NA.

Change of Course Code.

Code of Baking Food Preservation & adulteration offered in sixth semester is changed to 23N6SB3,

as there was a 40%. revision in the syllabus.

NEW COURSES INTRODUCED.

S.No.	Course Code	Course Title with Semster.	Relevance To				Scope For			Need for Introduction
			L	R	N	G	EMP	ENTR	SD	
1.	22UG4SLZ	PUBLIC HEACTH & HYGIENE				G			SD	HELPS STUDENTS TO SEEK JOBS AS HEALTH INSPECTOR & SANITATION OFFICER.
2.	22UG4SLN	TEXTILE COLORATION				G			SD	PAVES WAY FOR STUDENTS TO FIND JOBS IN TEXTILE INDUSTRIES & TO BECOME ENTREPRENEURS TO DO BATIK PRINT TIE & DYE ETC.
3.	22UGVACN1	APPAREL MAKING - CRASH COURSE			G				SD	GAINING EXPERTISE IN APPAREL MAKING WILL FETCH JOBS.
4.	22UGVACN2	SURFACE ORNAMENTATION & APPAREL MAKING			G				SD	PAVES WAY FOR SELF EMPLOYMENT

REVISED COURSES:

S.NO.	COURSE CODE	COURSE TITLE	NO & TITLE OF UNITS REVISED	% OF REVISION	NEED FOR REVISION	RELEVANCE TO	SCOPE FOR
1.	19NICC2	PHYSIOLOGY	IN UNIT V, MUSCULO SKELOTAL SYSTEM HAS INCLUDED	10%	INCLUSION OF THIS SYSTEM MAKE PHYSIOLOGY COMPLETE	G	EMP.
2.	19NICC5	FOOD SCIENCE	IN UNIT IV, FACTORS AFFECTING COAGULATION, TESTING FRESHNESS IN EGG, FERMENTED NON-FERMENTED PRODUCTS. IN UNIT I DESIGNER FOODS INCLUDED.	10%	KNOWLEDGE OF COAGULATION, TESTING THE FRESHNESS OF EGG, FERMENTED NON-FERMENTED PRODUCTS. DESIGNER FOODS IS ESSENTIAL.	G.	EMP & SD.
3.	AN3CC7	EXTENSION EDUCATION & COMMUNICATION	NATIONAL WELFARE PROGRAMS FOR WOMEN INCLUDED	10%	ESSENTIAL INFORMATION	N	EMP
4.	AN4AC4	FOOD PRODUCTION & SERVICE LABS.	IN UNIT I, II, III & IV, INDIAN CONTINENTAL, ORIENTAL CUISINE INCLUDED. COURSE MENU Specified as 3, 5 & 7 COURSE & BANQUET INCLUDED.	10%	INDEPTH KNOWLEDGE OF DIFFERENT TYPES OF CUISINE	G.	EMP.

5.	PN6CC13	CRECHE & PRESCHOOL MANAGEMENT	IN UNIT II, ROLE OF CARETAKER, PLANNING, ACTIVITIES FOR CHILDREN - WAS CHANGED TO SPECIFIC AGE GROUP, IN UNIT IV, PRESCHOOL PROGRAM, TYPES OF PLAY WAS ADDED.	5%	CHILDREN, IN GENERAL WAS MADE SPECIFIC TO STUDY PLAY IN A DEEPER SENSE	G	E
6.						N	ENTR EMP
6.	PN5SB3	ENTREPRENEURIAL SKILLS - BAKING, FOOD PRESERVATION & ADULTERATION	IN UNIT I, INTRODUCTION TO BAKERY & BAKERY TECHNICS ROLE OF INGREDIENTS IN BAKING INCLUDED	5%	KNOWLEDGE OF THE ROLE OF INGREDIENTS IS ESSENTIAL.	N	SD
			IN UNIT III, METHODS OF PRESERVATION TOMATO KETUP WAS INCLUDED	5%	SKILL IN PREPARING KETCHUP IS PROFITABLE.	N	SD
7.	19N6CC19	CLINICAL NUTRITION & DIETETICS	IN UNIT II, DIET THERAPY - TYPES/GRADES OF OBESITY INCLUDED. IN DIABETES MELLITUS TYPES OF DM, DIAGNOSIS INCLUDED.	10%	KNOWLEDGE OF OBESITY & DIABETES MELLITUS IS ESSENTIAL TO BECOME AN IDEAL DIETETIAN	G	EMP

8. 19N6SB5	ENTREPRENEURIAL SKILLS - NUTRITION COUNSELING.	IN UNIT IV - COUNSELING CENTRE - TEACHING AIDS USED BY DIETETICIAN INTRODUCED.	10%	SKILL IN PREPARING TEACHING AIDS IS OF UTMOST IMPORTANCE	N	SD.

UPDATION OF OPEN EDUCATIONAL RESOURCES.

NA.

REVISION OF COURSES.

1. 19N6CC18	RESOURCE MANAGEMENT LAB.	In Unit III, Asanayamat of Bouquet is added.	5%	Skill in Bouquet making can help students become entrepreneurs.	N	Entre
		In Unit V, applications of work simplification techniques is added.	5%	Work simplification can help them to play the dual role of a home maker + career woman.	N.	Emp.

2.	19N6CC2a	CLINICAL NUTRITION & DIETETICS LAB.	In Unit II, Planning meals for a pregnant work was made specifies moderate worker For a lactating mother, it was specified as sedentary worker. In Unit III, For an adult women lady teacher, it was specified as sedentary work For an adult man - hard working man, it was specified as heavy work.	10/	When the type of activity is specified, it will facilate the students while doing their menu planning.	9
3.	19N4CC11	CLOTHING & FASHION	In Unit IV, Haute couture, designer wear, street fashion		Enable students to develop fashion	Enable

		more added In Unit IV, Fashion illustration, Basics of illustration: Block figures - 8 Head theory - 10 Head theory - 12 Head theory were added.	10%	sketching skills.	G	Emp Enthe
4.	19N3CC9	BASICS OF CLOTHING CONSTRUCTION LAB	In Unit IV, Sleeves & Collar were introduced	10%	To impart skill in constructing sleeve's collars	G	Emp SD.
5.	19N4SB2	Entrepreneurship skills - CAD	In Unit II, Elements of Design and Principles of Design were introduced	10%	To train students in drawing basic silhouettes	G	Emp SD.
6.	19N4AC3	FOOD PRODUCTION & SERVICE	In Unit III, Constitution & writing of menu was included In Unit IV, Queridon, self-service - cafeteria was added.	5% 5%	In catering service, menu planning & constitution are essential. These additional service are requisites for a catering person.	G	Emp SD

7.	19N3CC8	FIBER TO FABRIC	In Unit III, Satin weave, sateen weave & basket weave Rib weave are added. In Unit III, weft knitting warp knitting are added. Lacing, Netting, Braiding mentioned.	10%	Enable students to understand basic & functional finishes	G	E S
8.	19N6ME3	FAMILY DYNAMICS	In Unit III, Family conflicts Parent-child conflict inter-parental conflict, inter-generational family problems were added	10%	TO update the students knowledge on contemporary problems in the family	G	E S

NEW COURSES INTRODUCED

S.NO.	COURCE CODE	COURSE TITLE	RELEVANCE	SCOPE	NEED FOR INTRODUCTION
1.	21UG6SLN	HOSPITAL MANAGEMENT SELF LEARNING COURSE.	G.	Emp	PAVES WAY FOR A CAREER AS DIETETICIAN & HOSPITAL ADMINISTRATOR.

INTRODUCTION OF SKILL EMBEDDED CERTIFICATE / DIPLOMA / ADVANCED DIPLOMA / VALUE ADDED COURCES.

NA.

RUBERICS FOR INTERNSHIPS / PROJECTS.

NA.

COMMENTS:

The alumnae appreciated the courses, especially mentioning communication being offered in many courses.

Minutes of the Board of Studies - Upgradation of syllabus for M.Sc HUMAN NUTRITION AND NUTRACEUTICALS.

VENUE : SMART ROOM.

CONVENED ON : 05.04.2023 CONVENED AT : 2 pm.

ACTION TAKEN REPORT.

S. No.	COMMON SUGGESTIONS OFFERED IN THE PREVIOUS BOARD.	ACTION TAKEN FOR THE ACADEMIC YEAR 2022-2023.
1.	Introducing the self-learning Course Geriatric Science for II semester and Sports Nutrition for IV semester.	As suggested the PG students were offered Geriatric Science in second semester and Sports Nutrition in the fourth semester as self learning papers.

REVISED COURSES.

COURSE CODE	COURSE TITLE	UNIT TO BE REVISED.	% OF REVISION	NEED FOR REVISION	RELEVANCE	SCOPE
19PGIN1	ADVANCED HUMAN NUTRITION	In Unit V, nutrient interaction was elaborated	10%	Facilitates students to learn better.	G1.	Emp
19PGIN3	APPLIED PHYSIOLOGY.	In Unit V, Reproductive system was made more elaborate.	10%	In depth knowledge of male & female system.	G1	Emp

3. 19PG3 N11	FUNCTIONAL FOODS & NUTRACEUTICALS IN PREVENTIVE DIETETICS.	In Unit III, FFN for Bone & Reproductive Health – FFN PCOS added.	10%	Recend Trend in Female Reproductive Health.	G.	Emp.
4. 19PG3 N12	COMMUNITY NUTRITION	In Unit III – Nutrition Programs For Anemia, Vit A deficiency, Iodine deficiency, Poshan Abiyaan was added.	10%	Unit III & IV were made more specific	N	Emp.
		In Unit IV, Assessment of Nutritional status was classified as Direct & Indirect Methods.				
5. 19PG3 NE2	INSTITUTIONAL MANAGEMENT	In Unit II, specific subheadings were given & elaborated.	10%	Indepth knowledge can be imparted to PG students	G	Emp.

REVISION OF COURSES

1. 19PG2NB	RESEARCH METHODOLOGY	In Unit II, Simple random sampling, Cluster sampling.				

			systematic sampling, stratified sampling, Non-random sampling, convenient sampling was specified In Unit III, case study method, precautions while using secondary data were included In Unit V, types of Plagiarism was specified	10%	Specific subheadings were added to give indepth knowledge of the students.	G
2.	19PG3N14.	COMMUNITY NUTRITION LAB.	In Unit I, use and interpretation of growth charts was introduced In Unit IV, Planning nutrition education for individuals	10%	To facilitate nutritional assessment and to interpret with the standards.	

		with different physiological conditions was introduced				
3.	19PS4N19.	FOOD MICROBIOLOGY LAB.	In Unit V, Methods to detect microbial quality by Reductase Test was included.	5%	To detect the quality of milk.	G	Emp. SD.
4.	19PS4N18.	ADVANCED FOOD SCIENCE AND PROCESSING TECHNIQUES	In Unit IV, clarification pasteurisation homogenisation were included. Factors determining the quality of egg was added.	10%	The unit was made more specific.	G	Emp.
5.	19PS4NE3	FOOD SAFETY & QUALITY CONTROL.	In Unit I, Food Quality Management, Definition, Tenets of TQM, Benefits of TQM was introduced	10%	TQM concept has to be understood by students, in order to have a better understanding of FSQC.		

NEW COURSES INTRODUCED.

NA

INTRODUCTION OF PURELY SKILL EMBEDDED CERTIFICATE / DIPLOMA / ADVANCED DIPLOMA VALUE ADDED COURSE.

NA.

APPROVAL OF PH.D. COURSE SYLLABUS

NA.

RUBERICS FOR INTERNSHIP. / PROJECT.

NA.

DETAILS OF MoUs SIGNED.

MoU with ICAR KRISHI VIGYAN KENDRA, CENDECT, KAMATCHIPURAM, THENI.

OTHER SUGGESTIONS:

The University nominee offered to give exposure to staff and students about Bonsai growing techniques.

He also offered to help students in microbiological assays.

Minutes of the Board of Studies - Upgradation of syllabus for B.Sc Home Science with Food Biotechnology - TANSCHE GRID - I YEAR - UG.

COURSES INTRODUCED (PART A)

S.No	Cource Code	Course Title with Semester.	Relevance	Scope	Need for Introduction:
1.	CC1	Human Physiology	G.	Emp.	As the anatomy and functions of various human systems forms the basis for learning other courses which comes under Home Science.
2.	CC2	Food Science	G	Emp.	Enables students to be introduced to the basics of foods Food groups, Food pyramids, their functions and sources.
3.	CC3	Basic Cookery Practicals	G	Emp & SD	Enables students to have hands on experience in preparation & service of innovative recipes for various food groups.

S.No.	Course Code	Course Title	Relevance	Scope	Need for Introduction
4	ECI	Generic - Fundamental of Art and Design.	G	Emp & SD.	Overview of principles of design and their application in day-to-day l
5.	SECI	NME - Women Health And Wellness	G	Emp.	To instill in students the need to prioritise Healt and Wellness to carry out Thei daily activities
6.	FC Foundation Cource.	Basics of Home Science & Lifespan Development	G.	Emp.	Understand the concept, scope & philosophy of Home Science. To learn the developmental tasks of diffe stages from infancy to old

7.	CC4	HUMAN DEVELOPMENT	G	Emp.	To understand the developmental changes in the life span of an individual.
8.	CC5.	HOMAN NUTRITION	G.	Emp.	To help students understand the various nutrients present in food, their action, interaction, metabolism and food sources, effects of deficiency.
9.	CC6	NUTRITION PRACTICALS	G	SD	To have hands on training in estimating nutrients qualitatively and quantitatively.
10.	EC2.	GENERIC NUTRITION FOR HEALTH AND PHYSICAL FITNESS	G.	Emp.	The knowledge of Health and Physical fitness will help students enjoy ideal health and nutrition.
11.	SEC2	NME - WOMEN HEALTH & WELLNESS	G	SD.	Knowledge about Health and Wellness

12.	SEC3	GENERIC GARMENT EMBELLISHMENT TECHNIQUES	G.	Entre + SD.	Acquire knowledge about hand and machine embroidery stitch types.

[redacted] HUMAN NUTRITION AND NUTRACEUTICALS.

[redacted] G.

COURSES INTRODUCED (PART A).

S. No.	Course Code	Course Title	Relevance	Scope	Need For Introduction
1.	CC1	ADVANCED DIETETICS	G	EMP.	To identify the nutritional needs through life cycle. Knowledge on appropriate nutritional management for various diseases.
2.	CC2.	ADVANCED HUMAN NUTRITION	G	Emp	To gain indepth knowledge on classification, functions, metabolism & deficiency of macro & micronutrients
3.	CC3	DIETETICS LAB	G.	EMP & SD.	HANDS ON EXPERIENCE IN PLANNING & PREPARATION OF NORMAL & THERAPEUTIC DIETS.

4.	EC1	ELECTIVE APPLIED PHYSIOLOGY	G.	Emp.	Knowledge on the anatomy & functions of various body systems
5.	EC2.	ADVANCED FOOD SCIENCE & PROCESSING TECHNIQUES	G.	Emp	To provide in depth knowledge on production of processed food products. To understand the science behind processing of foods.
6.	SEC-1	SKILL ENHANCEMENT. CLINICAL LABORATORY TECHNIQUES	G.	SD.	To understand the techniques of qualitative and quantitative analysis of body fluids.
7	AECC1	SOFT SKILLS			
8.	CC4	CLINICAL NUTRITION & DIET THERAPY.	G	Emp.	Gain knowledge on appropriate nutritional management of various disease conditions
9	CC5	NUTRITIONAL BIOCHEMISTRY	G.	Emp	Understand the application of biochemistry in the field of foods and nutrition

10.	CC6.	CNDT LAB	G.	SD.	To estimate the nutritional requirements and plan diets
11.	EC3.	SPORTS NUTRITION	G.	Emp.	To gain knowledge in nutritional demands and management of sports personnel.
12.	EC4	RESEARCH METHODOLOGY	G.	Emp.	Gain knowledge to frame an experimental design to carry out research
13.	SEC 2.	EDC - NUTRITION & DIETETICS	G.	Emp.	Understand the nutritional scenario and role of dietetician in planning therapeutic diets.

OTHER SUGGESTIONS:

- The Board members suggested that two students, presently studying the course, should be present for the BoS meeting.
- The industrialist suggested that a meeting could be arranged, inviting all the food industrialists to have an idea about their expectations & opportunities available for internships & career
- The University nominee appreciated all the courses offered under Home Science and commented that

the courses are life-oriented and appropriate for students of this generation.

1. HEAD OF THE DEPT : 05/04/2023
(DR. VASANTHA ESTHER RANI)

2. UNIVERSITY NOMINEE : 5.4.23
(DR. U. RAMESH)

3. SUBJECT EXPERT : 5.4.23
(DR. P.C. JEMINA.)

4. INDUSTRIACIST : 5/4/23
(MR. SURAJ SUNDARA SHANKAR)

5. ALUMNAE : K. Suseela 5/4/23
(Ms. K. SUSHEELA).

6. DEAN OF SCIENCE : 5/4/23
(DR. A. RAJESWARI).

7. STAFF MEMBER : 5/4/23
(DR. S. SANTHI)

8. STAFF MEMBER : K. Karthiga 5/4/23
(DR. K. KARTHIGA).

9. STAFF MEMBER : 5/4/23
(DR. MAGDELENE VIRJINI).

10. STAFF MEMBER : C. priyalatha 5/4/23
(DR. C. PRIYALATHA)

11. STAFF MEMBER : C.H 5/4/23
(DR. C. HELEN)

12. STAFF MEMBER : D. Mouna 5/4/23
(Ms. D. MOUNA)

13 STAFF MEMBER : J. Joseph Jesintha 5/4/23
(MS. J. JOSEPHINE JESINTHA).

14 STAFF MEMBER : K. Nandipriya 5/4/23
(MS. K. NANDINI PRIYA)

15. STAFF MEMBER : A. Mabel Esther Paripurna. 5/4/23
(MS. A. MABEL PARIPURNA ESTHER)

16. STAFF MEMBER : R. Bhavani. 5/4/23
(MS. R. BHAVANI).

17. PRINCIPAL

VISION OF THE DEPARTMENT

To empower the potential home makers and home scientists with life management skills to face the multidimensional challenges and contribute towards the progress of home and nation.

MISSION OF THE DEPARTMENT

- To empower today's women with entrepreneurial skills to face the challenges of life effectively.
- To make them self-reliant.
- To explore ways and means to strengthen the industry-institution tie-up in order to prepare the students to meet the industrial expectations through internship in hospitals and industries.
- To kindle the scientific approach of the students towards research.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1	Ourgraduateswillbeacademic,digitalandinformationliterates;creative, inquisitive, innovative and committed researchers who wouldbedesirousforthe"more"inallaspects
PEO 2	Theywillbeefficientindividualandteamperformerswho wouldddeliverexcellentprofessionalserviceexhibitingprogress,flexibility,transparency,accountabilityandintakingupinitiativesintheirprofessionalwork

PEO 3	The graduates will be effective managers of all sorts of real – life andprofessionalcircumstances,makingethicaldecisions,pursuingexcellencewithin thetimeframeworkanddemonstrating atleadershipskills
PEO 4	Theywillengagelocallyandglobally evincing social andenvironmentalstewardshipdemonstratingcivicresponsibilitiesandemployingr ightskillsattherightmoment.

GRADUATE ATTRIBUTES (GA)

Fatima College empowers her women graduates holistically. A Fatimite achieves all-round empowerment by acquiring Social, Professional and Ethical competencies. A graduate would sustain and nurture the following attributes:

I. SOCIAL COMPETENCE	
GA 1	Deep disciplinary expertise with a wide range of academic and digital literacy
GA 2	Hone creativity, passion for innovation and aspire excellence
GA 3	Enthusiasm towards emancipation and empowerment of humanity
GA 4	Potentials of being independent
GA 5	Intellectual competence and inquisitiveness with problem solving abilities befitting the field of research

GA 6	Effectiveness in different forms of communications to be employed in personal and professional environments through varied platforms
GA 7	Communicative competence with civic, professional and cyber dignity and decorum
GA 8	Integrity respecting the diversity and pluralism in societies, cultures and religions
GA 9	All – inclusive skill sets to interpret, analyse and solve social and environmental issues in diverse environments
GA 10	Self awareness that would enable them to recognise their uniqueness through continuous self-assessment in order to face and make changes building on their strengths and improving their weaknesses
GA 11	Finesse to co-operate exhibiting team-spirit while working in groups to achieve goals
GA 12	Dexterity in self-management to control their selves in attaining the kind of life that they dream for
GA 13	Resilience to rise up instantly from their intimidating setbacks
GA 14	Virtuosity to use their personal and intellectual autonomy in being life-long learners
GA 15	Digital learning and research attributes
GA 16	Cyber security competence reflecting compassion, care and concern towards the marginalised
GA 17	Rectitude to use digital technology reflecting civic and social responsibilities in local, national and global scenario

PROFESSIONAL COMPETENCE	
GA 18	Optimism, flexibility and diligence that would make them professionally competent
GA 19	Prowess to be successful entrepreuners and become employees of trans-national societies
GA 20	Excellence in Local and Global Job Markets
GA 21	Effectiveness in Time Management
GA 22	Efficiency in taking up Initiatives
GA 23	Eagerness to deliver excellent service
GA 24	Managerial Skills to Identify, Commend and tap Potentials
II. ETHICAL COMPETENCE	
GA 25	Integrity and be disciplined in bringing stability leading a systematic life promoting good human behaviour to build better society
GA 26	Honesty in words and deeds
GA 27	Transparency revealing one's own character as well as self-esteem to lead a genuine and authentic life
GA 28	Social and Environmental Stewardship
GA 29	Readiness to make ethical decisions consistently from the galore of conflicting choices paying heed to their conscience
GA 30	Right life skills at the right moment

PROGRAMME OUTCOMES (PO)

On completion of M. Sc Programme, the graduates would be able to

PO 1	Apply acquired scientific knowledge to solve major complex issues in the society/industry.
PO 2	Attain research skills to solve complex cultural, societal and environmental issues.
PO 3	Employ latest and updated tools and technologies to solve complex issues.
PO 4	Demonstrate Professional Ethics that foster Community, Nation and Environment Building Initiatives.

PROGRAMME SPECIFIC OUTCOMES (PSO)

On completion of M.Sc. Human Nutrition and Nutraceuticals programme, the graduates would be able to

PSO 1	Attain enhanced scientific knowledge about the physiology of the human body.
PSO 2	Gain advanced scientific knowledge in foods, functional foods, nutrition and nutraceuticals
PSO 3	Obtain professional competence in planning diet for normal & therapeutic conditions and diet counseling.
PSO 4	Acquire advanced knowledge and understanding on the preventive and therapeutic role of functional foods.
PSO 5	Develop understanding on the perspectives of research and formulate research designs.
PSO 6	Integrate the basic principles of community nutrition processes to address the major health related concerns of the population.
PSO 7	Imbibe scientific knowledge on the principles, instrumentation techniques and applications of different hi-tech analytical instruments.

PSO 8	Acquire skills in analyzing food components and blood constituents
PSO 9	Demonstrate the knowledge of the scientific basis available to develop innovative value added food products
PSO 10	Achieve professional competence in implementing nutrition care during critical illness and disasters.
PSO 11	Acquire knowledge and understanding the concepts of microbiology in the diverse areas such as food, environment and health.
PSO 12	Attain enhanced knowledge and understanding of the bio molecules and its vital processes in human body.
PSO 13	Advanced scientific knowledge and skill in the maintenance and monitoring of food safety and quality assurance.
PSO 14	Demonstrate the knowledge and skill gained in the management of food service institutions.
PSO 15	Acquire in-depth knowledge on production of processed food products.

FATIMA COLLEGE (AUTONOMOUS), MADURAI-18

RESEARCH CENTRE OF HOME SCIENCE

M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

For those who joined in June 2023 onwards

PROGRAMME CODE: PSNN

Semester-I

	Courses	**Credit**	**Hours per Week(L/T/P)**
Part A	**Core Courses:** 23PG1N1- Macronutrients	5	6
	23PG1N2- Advanced Dietetics	5	6
	23PG1N3- Advanced Dietetics Practical	4	6
	Elective Courses (Generic / Discipline Specific): 23PG1NE1 – Functional Foods and Nutraceuticals/ 23PG1NE2 – Nutrition in Critical Care & Disasters	3	5
	23PG1NE3 - Advanced Human Physiology/ 23PG1NE4 - Food Biotechnology	3	5
	23PG1NAE - Nutrition & Dietetics	1	2
		21	**30**

Semester-II

	Courses	**Credit**	**Hours per Week(L/T/P)**
Part A	23PG2N4 - Advanced Food Science	5	6
	23PG2N5 - Analytical Instrumentation	5	6
	23PG2N6 - Techniques in Food Analysis Practical	4	6
	Elective Course(Generic / Discipline Specific): 23PG2NE5 - Food Safety & Quality Control / 23PG2NE6 - Performance Nutrition	3	4

	23PG2NE7 - Food Microbiology / 23PG2NE8 - Nutritional Assessment & Surveillance	3	4
Part B	**Skill Enhancement Course:** 23PG2NAE - Food Preservation	2	4
		22	**30**

100% EMPLOYABILITY

I M.Sc.,HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –I

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSNN	23PG1N1	Macro Nutrients	Major Core	6	4

COURSE DESCRIPTION

The course provides the knowledge on classification, functions, metabolism and deficiency of macro and micronutrients and its interrelationship.

COURSE OBJECTIVES

- Gain in depth knowledge in the study of major and minor nutrients.
- Understand the recent trends in the study of nutrients
- Develop competence for undertaking nutritional investigations.

UNITS

UNIT I:

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 II:

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 III:

PROTEIN – Historical review of protein metabolism, Amino acid patterns in protein & 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 IV:

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 V:

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,

BOOK REFERENCES:

1. Brown,M.L.(1990). *Present knowledge in Nutrition,* VI Edition, International Life Science Institute, Nutrition Foundation, Washington.
2. Gruff, J.L., Gropper, S.S, & Hunt, S.M (1995).*Advanced Nutrition and Human metabolism,* West Publishing Company, Minneapolis.
3. Helen, A. Guthrie. (1989). *Introductory Nutrition*, VII edition, Mosby College Publishing Col, Toranto.
4. Mahtab S. Bamji, Palhad Rao R, &Vinodhini Reddy, (1998). *Text book of Human Nutrition*,Oxford and IBH publishing co., Pvt.Ltd., New Delhi.
5. Sith K.L& Dekker M. (1990) .*Trace Minerals in Foods*, Inc., New York.

JOURNAL REFERENCES:

1. British journal of nutrition, Cambridge University Press, London.
2. Nutrition news, Nutrition Institute of Nutrition, Hyderabad.
3. Nutrition reviews, the Nutrient Foundation, Inc., New York.
4. Nutrition and food science- incorporating home economics and technology, Pvt. Ltd., England.
5. The journal of nutrition, Cambridge University Press, London.
6. World review of Nutrition and Dietetics- all volumes.

Open Educational Resources:

1) https://en.wikibooks.org/wiki/Fundamentals_of_Human_Nutrition

2) http://pressbooks.oer.hawaii.edu/humannutrition/

3) https://www.youtube.com/watch?v=sorIaN6vRBI

4) http://pressbooks.oer.hawaii.edu/humannutrition2/

5)https://oer.galileo.usg.edu/cgi/viewcontent.cgi?article=1006&context=health-textbooks

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
		UNIT -1	**ENERGY**	
1.1	Energy content of foods, physiological fuel value	4	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Videos
1.2	Estimation of total energy requirements (BMR, REE and physical cost of activities) TEE	2	Chalk & Talk, Lecture, Seminar	Black/white Board,PPT,Videos
1.3	Energy balance, Basal metabolic rate, total energy requirements, BMR& RMR	4	Chalk & Talk, Lecture, Seminar	PPT & White board
1.4	Factors affecting BMR, Thermic effect of food	3	Lecture, Discussion	PPT & White board,Videos
1.5	Changes in body weight and body composition with the	2	Lecture	Black/white Board

	changing energy balance			
1.6	Regulation of food intake- role of hunger and satiety centers. Energy balance and obesity	3	Lecture, Group Discussion, Seminar	PPT & White board,Videos
UNIT -2 CARBOHYDRATES				
2.1	Classification , Therapeutic uses of carbohydrates, sugars in parenteral nutrition	3	Lecture, Group Discussion	PPT & White board
2.2	Glycemic index of foods and its uses	3	Chalk & Talk, Lecture, Demo	Black/white Board, PPT
2.3	Toxic effects of fructose, xylitol and galactose	3	Chalk & Talk, Lecture, seminar	Black/white Board, PPT
2.4	Sugar alternatives	3	Lecture	Black/White board
2.5	Role of dietary fiber in health and disease	3	Chalk & Talk, Lecture, seminar	Black/white Board, PPT
2.6	Role of carbohydrates in health and disease	3	Chalk & Talk, Lecture, seminar	Black/white Board, PPT

UNIT-3 PROTEIN				
3.1	Historical review of protein metabolism	3	Lecture, Group Discussion	PPT & White board
3.2	Amino acid patterns in protein & of animals and vegetable origin	3	Chalk & Talk, Lecture, seminar	Black/white Board, PPT
3.3	Critical study of methods of assessment of protein quality	3	Chalk & Talk, Lecture, Seminar	Black Board, PPT, Videos
3.4	Physiological functions of proteins	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Videos
3.5	Essential Amino Acids, amino acid balance and imbalance	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Videos
3.6	Role of protein in health and disease. Supplementation of individual amino acid	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Videos
UNIT – 4 LIPIDS ..				
4.1	Concepts of visible and invisible fats,	3	Lecture, Seminar	Black Board,PPT

	EFA, SFA, MUFA, PUFA			
4.2	Omega–6 to omega–3 ratios. – sources and physiological functions and their role in health and disease	3	Lecture, Seminar	Black Board,PPT
4.3	Adipose tissue – Lipogenesis and Lipolysis	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Video
4.4	Lipoproteins – types and health implication	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Video
4.5	Storage of body fat, Effects of deficiency	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Video
4.6	Fat substitutes, Hypocholesterol aemic foods – garlic, fiber and plant proteins	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Vides
UNIT – 5 WATER				
5.1	Sources, Function, Requirement	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT

5.2	Distribution of water in the body	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT
5.3	Factors influencing distribution of body fluid	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT
5.4	Exchange of water in the body	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT
5.5	Water imbalance – dehydration-water intoxication	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT
5.6	Water and electrolyte mechanism – ADH	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT

CIA	
Scholastic	**23**
Non Scholastic	**2**
	25

EVALUATION PATTERN

SCHOLASTIC	NON - SCHOLASTIC	MARKS

C1	C2	C3	C4	C5	CIA	ESE	Total
15		3	5	2	25	75	100

PG CIA Components

			Nos		
C1	-	Test (CIA 1)	1**	-	15 Mks
C2	-	Test (CIA 2)	1**	-	15 Mks
C3	-	Assignment	1	-	3 Mks
C4	-	Seminar	2 *	-	5 Mks
C5	-	Attendance		-	2 Mks

***** Average of C1 and C2 will be taken.***
****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED

CO 1	Explain the functions,digestion, absorption, deficiency,sources& requirements of Macronutrients and water	K2	PSO1, PSO2,PSO3,PSO8 & PSO12
CO 2	Elaborate the energy value of foods by using different Calorimetric methods	K2	PSO1, PSO2,PSO3,PSO8 &PSO12
CO 3	Identify the functions, digestion, absorption, deficiency,sources& requirements of Minerals	K3	PSO1,PSO2, PSO3,PSO8 & PSO12
CO 4	Analyze the functions, digestion, absorption, deficiency,sources& requirements of Vitamins	K4	PSO1,PSO2, PSO3,PSO8 & PSO12
CO 5	Explain the knowledge on nutrient-nutrient and nutrient- drug interrelationship	K5	PSO1,PSO2, PSO3,PSO8 & PSO12

Mapping of COs with PSOs

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15

CO1	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1
CO2	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1
CO3	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1
CO4	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1
CO5	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	2	2	1	1
CO2	2	2	1	1
CO3	2	2	1	1
CO4	2	2	1	1
CO5	2	2	1	1

Note: Strongly Correlated – 3 ¨ Moderately Correlated – 2 ¨ Weakly Correlated -1

COURSE DESIGNER:

1. Ms.D.MOUNA

Forwarded By

(Dr.S.Santhi)

100% EMPLOYABILITY

I M.Sc., HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –I

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSNN	23PG1N2	Advanced Dietetics	Major Core	6	5

COURSE DESCRIPTION

The course provides a comprehensive knowledge required for the prevention and treatment of various diseases.

COURSE OBJECTIVES

- To identify and describe various disease conditions.
- To gain knowledge on appropriate nutritional management.
- To develop the attitude and capacity for taking up dietetics as a profession.

UNITS

UNIT –I NUTRITIONAL SCREENING & THERAPEUTIC NUTRITION (18Hrs)

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

Basic concepts of diet therapy – Therapeutic adaptations of Normal diet, 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 support systems: Enteral and parenteral nutrition support- Types, composition and complications.

UNIT –II MEDICAL NUTRITIONAL THERAPY FOR GASTROINTESTINAL DISEASES (18Hrs)

Upper Gastrointestinal tract Diseases – Nutritional care and diet therapy in Diseases of oesophagus - Oesophagitis, Gastro esophagealrefluxdisease [GERD] and Hiatus hernia.

Disorders of stomach: Indigestion, Gastritis, Gastric and duodenal ulcers, and dumping 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-Celiac disease, tropical sprue, intestinal brush border enzyme deficiencies, diseases of the Liver-hepatitis, hepatic coma, cirrhosis,cholecystits, cholelithiasis and pancreatitis, Zollinger Ellison syndrome and Biliary dyskinesia.

UNIT –III MEDICAL NUTRITIONAL THERAPY FOR PULMONARY, RHEUMATIC DISEASES &PHYSIOLOGICAL STRESS(18Hrs)

Medical Nutrition therapy for Pulmonary disease-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 –IV MEDICAL NUTRITIONAL THERAPY FOR WEIGHT IMBALANCE & METABOLIC DISORDERS

(18Hrs)

Nutritional Management on Weight imbalance -Regulation of food intake and pathogenesis of obesity and 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 bariatricsurgery.

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

UNIT –V MEDICAL NUTRITIONAL THERAPY FOR CARDIOVASCULAR, RENAL DISEASES & CANCER **(18Hrs)**

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

BOOK REFERENCES:

1. Cornnie H. Robinson and Emena S. Weighly, (1989). *Basic Nutrition and Diet Therapy*, 3nd .Ed, Macmillan Publishing Company, New York.
2. Davidson, S.S. Passmore, P. Brack, J.F. (1993). *Human Nutrition and Dietetics*, 9th Ed, F&S, Lingstone Ltd., Edinburgh and London,
3. Garrow.J.S, W.P.T. James, 9th Ed 1993, *Human Nutrition and Dietetics*, Churchill Livingstone.
4. Kathleen Mahan.L , 13th Ed, (2011), Sylvia Escott-Stump, Janice L Raymond *Krause's Food & Nutrition Therapy*, Elsevier Publications,.
5. Robinson CH (1994), *Normal and Therapeutic Nutrition*, 18th Ed, Macmillan Publishers Company, NewYork.
6. Srilakshmi.B, *Dietetics,* 1995, New Age International Private Ltd., New Delhi.
7. Sue Rodwell Williams, 2001, *Basic Nutrition and Diet therapy*, Mosby publications.

JOURNAL REFERENCES:

1. Food and Nutrition Bulletin, United Nations University Press, Japan.
2. Journal of American Dietetic Association, American Dietetic Association, Mount Marris, Illinois, 61054, USA.
3. Nutrition Abstracts and Reviews, CBB International, UK
4. Nutrition

5. Reviews, Nutrition Foundation, Washington, DC.
6. The American Journal of Clinical Nutrition, Waverfy Press, USA.
7. The Indian Journal of Medical Research, Indian Council of Medical Research, New Delhi.
8. The Indian Journal of Nutrition and Dietetics, Sri Avinashilingam Deemed University, Coimbatore.

OPEN EDUCATIONAL RESOURCES:

1.https://pressbooks.oer.hawaii.edu/humannutrition2/chapter/2-the-endocrine-system/

2.https://clinical-nutrition.imedpub.com/

3.https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4597475/

4.https://nephcure.org/livingwithkidneydisease/diet-and-nutrition/renal-diet/

5.https://sa1s3.patientpop.com/assets/docs/36223.pdf

6.https://www.cancer.org/treatment/survivorship-during-and-after-treatment/staying-active/nutrition-and-physical-activity-during-and-after-cancer-treatment.html

7.https://www.thewellproject.org/hiv-information/nutrition-and-hiv

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 NUTRITIONAL SCREENING & THERAPEUTIC NUTRITION				
1.1	NutritionalscreeningNutritionalcareprocessNutritionalAssessmentNutritionaldiagnosis NutritionalIntervention Monitoring and evaluation.	4	Lecture	PPT
1.2	Basic concepts of diet therapy – Therapeutic adaptations of Normal diet, Principles and classification of therapeutic diets. Routine Hospital diets – Regular, soft, fluid diet	4	Chalk & Talk Demonstration	Black Board Charts& Models
1.3	Nutritional Management in critical care -Nutritional screening and nutritional Status assessment of critically ill, Nutritional requirement according to the critical condition	4	Discussion	Case Study Report
1.5	Nutritional support systems: Enteral and parenteral nutrition support- Types, composition and complications.	3	Lecture	PPT
UNIT-2 MEDICAL NUTRITIONAL THERAPY FOR GASTROINTESTINAL DISEASES				
2.1	Upper Gastrointestinal tract Diseases – Nutritional care and diet therapy in Diseases of	6	Lecture	PPT, Videos

	oesophagus - Oesophagitis, Gastro esophagealrefluxdisease [GERD] and Hiatus hernia.			
2.2	Disorders of stomach: Indigestion, Gastritis, Gastric and duodenal ulcers, and dumping syndrome	4	Chalk & Talk	Black Board
2.3	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.	4	Lecture	PPT
2.4	Diseases of Small intestine-Celiac disease, tropical sprue, intestinal brush border enzyme deficiencies, diseases of the Liver-hepatitis, hepatic coma, cirrhosis,cholecystits, cholelithiasis and pancreatitis, Zollinger Ellison syndrome and Biliary dyskinesia.	4	Chalk & Talk	Black Board
UNIT-3 MEDICAL NUTRITIONAL THERAPY FOR PULMONARY, RHEUMATIC DISEASES &PHYSIOLOGICAL STRESS				
3.1	Medical Nutrition therapy for Pulmonary disease-Effect of Malnutrition on pulmonary system, effect of pulmonary disease on nutritional status, chronic pulmonary diseases-	5	Lecture	PPT

3.2	Asthma, cystic fibrosis, chronic obstructive pulmonary disease and Pneumonia- Pathophysiology and dietary management.	5	Chalk & Talk	Black Board
3.3	Medical Nutrition therapy for Rheumatic disease- Etiology, Pathophysiology of Inflammation of Rheumatic diseases, Rheumatoid Arthritis, Osteoarthritis and sjogren syndrome.	3	Demonstration	Model
3.4	Nutritional management of physiological stress- Classification, Complications, Metabolic changes in protein and electrolytes, Dietary management of burns, dietary management of trauma and stress.	5	Lecture	PPT
UNIT-4 MEDICAL NUTRITIONAL THERAPY FOR WEIGHT IMBALANCE & METABOLIC DISORDERS				
4.1	Nutritional Management on Weight imbalance -Regulation of food intake and pathogenesis of obesity and malnutrition and starvation; Weight Imbalance: prevalence and classification.	5	Lecture	PPT, Videos
4.2	Underweight -Etiology and Dietary management.	4	Lecture	PPT, Videos
4.3	Obesity-Etiology, classification, Energy balance, dietary modifications	5	Chalk & Talk	Black Board

4.4	Bariatric surgery- types and dietary modifications of pre and post bariatricsurgery.	2	Lecture	PPT
4.5	Nutritional Management in metabolic disorders- Prevalence, Etiology, risk factors, complications and dietary modifications of diabetes mellitus.	2	Chalk & Talk	Black Board
UNIT -5 MEDICAL NUTRITIONAL THERAPY FOR CARDIOVASCULAR, RENAL DISEASES & CANCER				
5.1	Nutritional management of cardiovascular diseases-etiology, risk factors, clinical features and dietary modifications of Dyslipidemias, Atherosclerosis , Hypertension, Ischemic heart disease, Congestive cardiac failure.	5	Chalk & Talk	Black Board
5.2	Nutrition Management of Renal Disease -Etiology, Clinical and metabolic manifestations, Diagnostic tests	3	Chalk & Talk	Black Board
5.3	Types-Glomerulonephritis, Nephrotic syndrome , Renal Failure:	4	Lecture	PPT, Videos

5.4	Acute and chronic, ESRD, Nephrolithiasis and Dietary modifications.	3	Lecture	PPT & White board
5.5	Nutritional management in cancer- Pathogenesis and progression of cancer, types, Symptoms and Dietary management.	3	Chalk & Talk	Black Board

CIA	
Scholastic	**23**
Non Scholastic	**2**
	25

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**CIA**	**ESE**	**Total**
15		**3**	**5**	**2**	**25**	**75**	**100**

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1**	-	15Mks
C2	-	Test (CIA 2)	1**	-	15Mks
C3	-	Assignment	1	-	3Mks
C4	-	Quiz	2 *	-	5 Mks
C5	-	Attendance		-	2Mks

***** Average of C1 and C2 will be taken.***

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Discuss the Nutritionalscreeningcareprocess,assessmentintervention,monitoring and evaluation.	K2	PSO3
CO 2	Describe the medical nutritional management of gastrointestinal diseases.	K2	PSO3
CO 3	Plan diets for the management of pulmonary, rheumatic and physiological stress.	K3	PSO3
CO 4	Categorize the foods used in the treatment of weight imbalance and metabolic disorders.	K4	PSO3
CO 5	Explain the treatment strategies for cardiovascular, renal diseases & cancer.	K5	PSO3

Mapping of COs with PSOs

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15
CO1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1
CO2	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1
CO3	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1
CO4	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1
CO5	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	2	1	1	1
CO2	1	1	1	1
CO3	2	1	1	1
CO4	3	1	1	1
CO5	3	1	1	1

Note: Strongly Correlated – 3 ¨ Moderately Correlated – 2 ¨ Weakly Correlated -1

COURSE DESIGNER:

1. **Mrs.P.MadaleneVirjini**
2. **Dr.K.Karthiga**

Forwarded By

(Dr.S. Santhi)

100% EMPLOYABILITY

I M.Sc.,HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –I

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSNN	23PG1N3	Advanced Dietetics Practical	Lab	6	4

COURSE DESCRIPTION

The practical course offers hands-on experience in the planning, preparation and calculation of nutrients for the menu planned for various stages of normal life cycle, deficiency disorders, hospital diets, sports and space nutrition.

COURSE OBJECTIVES

- To develop skills in planning and preparing diets for weight imbalance
- To get expertise in planning and preparing diets for various diseases
- To plan diets for cancer, bariatric surgery and burns

UNITS

UNIT I PLANNING & PREPARING DIET FOR WEIGHT BALANCE

Assessing requirements and planning diet for obese and underweight individual.

[18Hrs]

UNIT II PLANNING & PREPARING DIET FOR METABOLIC & CARDIOVASCULAR DISEASES

Planning and preparing diet for Diabetes Mellitus[IDDM and NIDDM] and Atherosclerosis with Hypertension. **[18Hrs]**

UNIT III PLANNING & PREPARING DIET GASTROINTESTINAL DISORDERS[18Hrs]

Assessing and planning diets for the following conditions

Celiac disease, Peptic Ulcer, Lactose intolerance, Hepatitis, Cirrhosis

UNIT IV PLANNING & PREPARING DIET FOR PULMONARY, RENAL & RHEUMATICS [18Hrs]

Planning and preparing diet for Pneumonia, Rheumatic arthritis and Glomerulonephritis

UNIT V PLANNING & PREPARING DIET FOR CANCER, BARIATRIC & BURNS

[18Hrs]

Planning and preparing diet for cancer, pre and post Bariatric surgery patients and post burn condition.

REFERENCES

1. Cornnie H. Robinson &Emena S. Weighly.(1989).*Basic Nutrition and Diet Therapy*, (6th ed), Macmillan Publishing Company, New York.
2. Kathleen Mahan. L. Sylvia Escott-Stump, Janice L Raymond& Krause (2011) .*Food & Nutrition Therapy,* (13th ed), Elsevier Publications.

2. Robinson CH.(1994) . *Normal & Therapeutic Nutrition* XVIII Edition, Macmillan Publishers Company, New York.
3. Srilakshmi.B (1995). *Dietetics,* New Age International Private Ltd., New Delhi.
4. Sue Rodwell Williams. (2001). *Basic Nutrition and Diet therapy*, Mosby publications .

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 PLANNING& PREPARING DIET FOR WEIGHT BALANCE				
1.1	Assessing requirements and planning diet for underweight individual.	9	Demonstration	Cook wares & Utensils
1.2	Assessing requirements and planning diet for obese.	9	Demonstration	Cook wares & Utensils
UNIT -2 PLANNING& PREPARING DIET FOR METABOLIC & CARDIOVASCULAR DISEASES				
2.1	Planning and preparing diet for Diabetes Mellitus[IDDM and NIDDM].	6	Demonstration	Cook wares & Utensils
2.2	Planning and preparing diet for Atherosclerosis.	6	Demonstration	Cook wares & Utensils
2.3	Planning and preparing diet for Hypertension.	6	Demonstration	Cook wares & Utensils
UNIT -3 PLANNING& PREPARING DIET GASTROINTESTINAL DISORDERS				

3.1	Assessing and planning diets for Celiac disease, Peptic Ulcer	6	Demonstration	Cook wares & Utensils
3.2	Assessing and planning diets forLactose intolerance,	6	Demonstration	Cook wares & Utensils
3.3	Assessing and planning diets for Hepatitis, Cirrhosis	6	Demonstration	Cook wares & Utensils
UNIT -5 PLANNING& PREPARING DIET FOR PULMONARY, RENAL & RHEUMATICS				
4.1	Planning and preparing diet for Pneumonia	6	Demonstration	Cook wares & Utensils
4.2	Planning and preparing diet Rheumatic arthritis	6	Demonstration	Cook wares & Utensils
4.3	Planning and preparing diet Glomerulonephritis	6	Demonstration	Cook wares & Utensils
UNIT -5 PLANNING& PREPARING DIET FOR CANCER, BARIATRIC & BURNS				
5.1	Planning and preparing diet for cancer.	6	Demonstration	Cook wares & Utensils

5.2	Planning and preparing diet pre and post Bariatric surgery patients.	6	Demonstration	Cook wares & Utensils
5.3	Planning and preparing diet for post burn condition.	6	Demonstration	Cook wares & Utensils

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC		MARKS	
C 1	**C2**	**C3**	**C4**	**C5**	**CIA**	**ESE**	**Total**
15		**3**	**5**	**2**	**25**	**75**	**100**

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1**	-	15Mks
C2	-	Test (CIA 2)	1**	-	15Mks
C3	-	Assignment	1	-	3Mks
C4	-	Quiz	2 *	-	5 Mks
C5	-	Attendance		-	2Mks

***** Average of C1 and C2 will be taken.***

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Discuss and plandietforweight imbalance.	K2	PSO2 & PSO3
CO 2	Plan and prepare diet for Diabetes Mellitus[IDDM and NIDDM] and Atherosclerosis with Hypertension	K2	PSO2 & PSO3
CO 3	Assess and plan diets for Analyse the diet for Celiac disease, Peptic Ulcer, Lactose intolerance, Hepatitis and Cirrhosis.	K3	PSO2 & PSO3
CO 4	Pneumonia, Rheumatic arthritis and Glomerulonephritis	K4	PSO2 & PSO3
CO 5	Recommenddiet for cancer, pre and post Bariatric surgery patients and post burn condition.	K5	PSO2 & PSO3

Mapping of C0s with PSOs

CO PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15

CO1	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1
CO2	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1
CO3	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1
CO4	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1
CO5	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1

Mapping of C0s with POs

	PO1	PO2	PO3	PO4
1	2	1	1	11
2	1	11	11	1
3	1	1	1	11
4	1	1	1	1
5	2	1	1	1

Note: ¨ Strongly Correlated – 3 ¨ Moderately Correlated – 2 Weakly Correlated -1

COURSE DESIGNER:

1. **Dr.K.Karthiga**
2. **Mrs.D.Mouna**

Forwarded By

(Dr.S. Santhi)

100% SKILL DEVELOPMENT

I M.Sc.,HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –I

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSNN	23PG1NE1	Functional Foods and Nutraceuticals	Elective	5	3

COURSE DESCRIPTION

The course contents are an eye opener to students on the terminologies, importance, therapeutic applications of nutraceuticals from sources through plant, animal and microbes.

COURSE OBJECTIVES

- To enable students to understand the relation between Functional Foods, Nutraceuticals to Food and Drugs
- To introduce them to various functional food groups and products
- To enable students understand the regulatory aspects of Functional Foods and nutracueticals

UNITS

UNIT– I INTRODUCTION TO FUNCTIONAL FOODS & NUTRACEUTICALS

(18 HRS.)

Functional foods and Nutraceuticals – Definition and history.

Teleology – definition, primary and secondary metabolites.

Organisational Models for Nutraceuticals - a) Food Sources b) Mechanism of Action c) Chemical Nature

Consumer Marketing - Factors for marketing functional foods and nutraceuticals.

UNIT –II FUNCTIONAL COMPONENTS FROM PLANT SOURCES (18 HRS.)

(i) Nutrient Molecules: a) Phospholipids b) Vitamin K c) Carbohydrate Derivatives- Dietary fiber - Types and sources, Physical and Physiological properties d) Minerals – Zinc, Selenium.

(ii) Non Nutrient Molecules: a) Phenolic compounds – Phytoestrogens (Isoflavones, Lignans) Flavonoids – Quercetin, kempferol, Flavones – limonene, Flavols – Catechin, Phenolic acid – Ellagic acid, Caffeic acid b) Phytosterols and phytostenols c) Saponins d) Tannins
e) Carotenoids - Lycopene, Beta-carotene, Lutein and zeaxanthin

UNIT–III FUNCTIONAL COMPONENTS FROM ANIMAL SOURCES(18 HRS.)

(i) Major and minor components in cow's Milk and Human Milk
Proteins – lactalbumin, lactoglobulin, lactoferrin, immunoglobulins,
Derived peptides – casein phospho peptides, glycomacro peptides,
Lactose. Fat. Mineral – zinc, selenium, Calcium

(ii) Dietary lipids - Conjugated Linolenic Acid, linoleic acid, oleic acid, GLA

(iii) Omega 3 and Omega 6 Fatty Acids

UNIT –IV MICROBES AS FUNCTIONAL FOODS (18 HRS.)

General Functions of Intestinal Microflora

Prebiotics - Definition, role of prebiotic as functional ingredient, examples.

Probiotics - Definition, role of prebiotic as functional ingredient, examples.

Symbiotics - Definition, functions, examples.

UNIT –V HERBS AND FLOWERS AS FUNCTIONAL FOODS (18 HRS.)

Action of Herbs and Efficacy on:

a) Nervous System-Ginseng, St.John's wort, Ginkgo biloba, Bacopa Monnieri&Centalla asiatica

b) Heart and Circulatory System-Hawthorn plant

c) Immune System -Echinacea

d) Digestive System-Ginger valerian root fennel

e) Respiratory System-Licorice root, kava kava

f) Urinary System-Cranberry, Saw palmetto

g) Musculoskeletal System-Fever few

Flowers

Medicinal values, nutritional importance, culinary uses, effect of cooking of

Edible flowers – Drumstick, Neem, Agathi, Plantain

Ornamental edible flowers – Hibiscus, lotus, rose

BOOK REFERENCES:

1. Chatwick. R. (2003), Functional Foods Springer.
2. David H Watson (2001), Performance Functional Foods, Culinary and Hospitality Industry Publications.
3. Israel Goldberg (2001), Functional Foods Designer Foods Pharma Food,Nutraceuticals ,Culinary and Hospitality Industry Publications.
4. Mary K Schmidl and Theodore P.Labuza, (2000), Essentials of Functional Foods, Culinary and Hospitality Industry Publications Services.
5. Mazza G. (1998), Functonal Foods Biochemical Processing Aspects, Culinary and Hospitality Industry Publications.
6. Robert E C Wildman (2001), Handbook of Nutraceuticals and Functional Foods ,Culinary and Hospitality Industry Publications.

JOURNAL REFERENCES:

1. Journal of Functional Foods
2. Nutraceuticals World Magazine - Exclusives, Markts, Health,Jobs, Events
3. The American Journal of Clinical Nutrition, Waverfy Press, USA.
4. The Indian Journal of Medical Research, The Indian Council of Medical Research, New Delhi.

Open Educational Resources:

1. **https://search.proquest.com/openview/18c319d200432644bfd72f1cb4a1f812/1?pq-origsite=gscholar&cbl=1976406**
2. **https://www.healthline.com/nutrition/functional-foods#bottom-line**
3. **https://www.spinacafarms.com/blog/nutraceuticals-vs-supplements-and-functional-foods-whats-the-difference-anyways#:~:text=Functional%20foods%20look%20like%20food%20and%20are%20modified%20for%20greater,whole%20foods%20to%20augment%20health.**
4. **http://egyankosh.ac.in/bitstream/123456789/38355/1/Uint-9.pdf**
5. **https://chiro.org/nutrition/FULL/Functional_Foods.shtml**
6. **https://fac.ksu.edu.sa/sites/default/files/lectute_1_457_0.pdf**
7. **https://www.researchgate.net/publication/328415909_Traditional_Foods_Functional_Foods_and_Nutraceuticals**

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION TO FUNCTIONAL FOODS AND NUTRACEUTICALS				
1.1	Functional foods and Nutraceuticals – Definition and history.	4	Chalk & Talk	PPT & White board
1.2	Teleology – definition, primary and secondary metabolites.	5	Chalk & Talk	PPT & White board

1.3	Organisational Models for Nutraceuticals - a) Food Sources b) Mechanism of Action: c) Chemical Nature	5	Lecture	PPT & White board
1.4	Consumer Marketing - Factors for marketing functional foods and nutraceuticls.	4	Lecture	Black Board
UNIT -2 FUNCTIONAL COMPONENTS FROM PLANT SOURCES				
2.1	Nutrient Molecules: a) Phospholipids b) Vitamin K	3	Lecture	PPT & White board
2.2	c) Carbohydrate Derivatives- Dietary fiber - Types and sources, Physical and Physiological properties	3	Discussio n	Black Board
2.3	Non Nutrient Molecules: a) Phenolic compounds – Phytoestrogens (Isoflavones, Lignans) Flavonoids – Quercetin, kempferol,	3	Lecture	PPT & White board
2.4	Flavones – limonene, Flavols – Catechin, Phenolic acid – Ellagic acid, Caffeic acid	3	Lecture	LCD
2.5	b) Phytosterols and phytostenols c) Saponins d) Tannins	3	Lecture	PPT & White board

2.6	e) Carotenoids - Lycopene, Beta-carotene, Lutein and zeaxanthin	3	Discussion	Black Board
UNIT -3 FUNCTIONAL COMPONENTS FROM ANIMAL SOURCES				
3.1	Major and minor components in cow's Milk and Human Milk	3	Discussion	Black Board
3.2	Proteins – lactalbumin, lactoglobulin, lactoferrin, immunoglobulins, Derived peptides – casein phospho peptides, glycomacro peptides,	4	Lecture	Black Board
3.3	Lactose. Fat. Mineral – zinc, selenium, Calcium	3	Chalk & Talk	Black Board
3.4	Dietary lipids - Conjugated Linolenic Acid, linoleic acid, oleic acid, GLA	4	Discussion	Black Board
3.5	Omega 3 and Omega 6 Fatty Acids	4	Lecture	Black Board
UNIT -4 MICROBES AS FUNCTIONAL FOODS				
4.1	General Functions of Intestinal Microflora	4	Chalk & Talk	Black Board
4.2	Prebiotics - Definition, role of prebiotic as functional ingredient, examples.	5	Lecture	PPT & White board

4.3	Probiotics - Definition, role of prebiotic as functional ingredient, examples.	5	Lecture	PPT & White board
4.4	Symbiotics - Definition, functions, examples.	4	Lecture	PPT & White board
UNIT -5 HERBS AND FLOWERS AS FUNCTIONAL FOODS				
5.1	a) Nervous System-Ginseng, St.John's wort, Ginkgo biloba, Bacopa Monnieri&Centalla asiatica	3	Chalk & Talk	Black Board
5.2	b) Heart and Circulatory System-Hawthorn plant c) Immune System -Echinacea	3	Lecture	PPT & White board
5.3	d) Digestive System-Ginger valerian root fennel e) Respiratory System-Licorice root, kava kava	3	Lecture	LCD
5.4	f) Urinary System-Cranberry, Saw palmetto g) Musculoskeletal System-Fever few	3	Lecture	PPT & White board
5.5	Medicinal values, nutritional importance, culinary uses, effect of cooking of Edible flowers – Drumstick, Neem, Agathi, Plantain	3	Discussio n	Black Board

5.6	Medicinal values, nutritional importance, culinary uses, effect of cooking of Ornamental edible flowers – Hibiscus, lotus, rose	3	Chalk & Talk	Black Board

CIA	
Scholastic	**23**
Non Scholastic	**2**
	25

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
15		3	5	2	25	75	100

PG CIA Components

				Nos		
C1	-	Test (CIA 1)		1**	-	15 Mks
C2	-	Test (CIA 2)		1**	-	15 Mks
C3	-	Assignment		1	-	3 Mks
C4	-	Seminar		2 *	-	5 Mks
C5	-	Attendance			-	2 Mks

***** Average of C1 and C2 will be taken.***

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Discuss and understand the concepts of functional foods.	K2	PSO2 & PSO4
CO 2	Classify the bioactive components of functional foods.	K2	PSO2 & PSO4
CO 3	Identify the role of prebiotics, probiotics &synbiotics as functional ingredients.	K3	PSO2 & PSO4
CO 4	Discover the efficacy of herbs and flowers as functional foods	K4	PSO2 & PSO4
CO 5	Explain the role of Nutraceuticals in treating diseases	K5	PSO2 & PSO4

Mapping of C0s with PSOs

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15
CO1	1	3	2	3	1	1	1	1	3	1	1	1	1	1	2
CO2	1	3	2	3	1	1	1	1	2	1	1	1	1	1	1

CO3	1	3	2	3	1	1	1	1	1	1	1	1	1	1	1
CO4	1	3	1	3	1	1	1	1	2	1	1	1	1	1	2
CO5	1	3	3	3	1	1	1	1	2	1	1	1	1	1	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	1	1	1	2
CO2	1	2	2	1
CO3	1	1	1	1
CO4	1	1	1	1
CO5	2	1	2	1

Note: ¨ Strongly Correlated – 3 ¨ Moderately Correlated – 2 Weakly Correlated -1

COURSE DESIGNER:

Mrs. D.Mouna

Forwarded By

(Dr.S.Santhi)

100% SKILL DEVELOPMENT

I M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS SEMESTER –IV

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSNN	23PG1NE2	NUTRITION IN CRITICAL CARE AND DISASTERS	Elective	5	3

COURSE DESCRIPTION

The course offers comprehensive knowledge on the assessment and management of nutritional support systems for critically ill.

COURSE OBJECTIVES

- To understand the physiology, metabolism and special nutritional requirements of the critically ill.
- To be familiar with special nutritional support techniques and feeding formulations to meet their nutritional requirements.

UNITS

UNIT –I NUTRITIONAL SCREENING AND ASSESSMENT FOR THE CRITICALLY ILL (12 HRS.)

Nutritional screening and nutritional status assessment of the critically ill. Nutritional support system and other life saving measures for the critically ill.

UNIT –II IMMUNO ENHANCERS AND SPECIAL DIETS IN CRITICAL CARE (12 HRS.)

Role of immuno enhancers, conditionally essential nutrients, immuno suppressants and special diets in critical care.

UNIT –III SPECIAL NUTRITIONAL THERAPY IN CRITICAL ILLNESSES –BURNS, CV AND KIDNEY (12 HRS.)

Patho physiological, clinical and metabolic aspects, understanding the special nutritional requirements, nutritional goals and monitoring the therapy in critical illnesses like stress, trauma, sepsis, burns, CV complications and surgery, dialysis, transplant, multiple organ failure.

UNIT –IV SPECIAL NUTRITIONAL THERAPY IN CRITICAL ILLNESSES –GI AND LIVER (12 HRS.)

Patho physiological, clinical and metabolic aspects, understanding the special nutritional requirements, nutritional goals and monitoring the therapy in critical illnesses like
GI tract surgery, hepatic transplants.

UNIT –V REFEEDING SYNDROME AND ETHICAL ISSUES IN TERMINALLY ILL (12 HRS.)

Complications of nutritional support system including refeeding syndrome
Diet related ethical issues in the terminally ill.

REFERENCES:

1. Escott – Stump.S. (2000), *Krause's food Nutrition and Diet Therapy*, 10th Ed.W.S.Saunders Ltd.
2. Shields, R. (1992), *Bailliere's Clinical Gastroentrology*, Baillere Tindall London.
3. Shikora, S.A. and Blackburn. G.L. (1999). Nutritional Support – Theory and Therapeutics, Chapman and Hall, ITP (International Thompson Publishing).

JOURNAL REFERENCES:

1. Indian Journal of Critical Care Medicine.
2. Journal of Parenteral and Enteral Nutrition
3. Journal of American Dietetic Association, American Dietetic Association, Mount Marris, Illinois, 61054, USA.
4. The American Journal of Clinical Nutrition, Waverfy Press, USA.

5. The Indian Journal of Medical Research, Indian Council of Medical Research, New Delhi

OPEN EDUCATIONAL RESOURCES:

1https://scholar.google.co.in/scholar?q=oer+nutritional+support+for+

2.https://www.sciencedirect.com/science/article/abs/pii/S0899900704001649

3.https://www.sciencedirect.com/science/article/abs/pii/S0012369215321097

4.https://www.nejm.org/

5.https://aspenjournals.onlinelibrary.wiley.com/doi/abs/10.1177/0148607103027005355

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 NUTRITIONAL SCREENING AND ASSESSMENT FOR THE CRITICALLY ILL				
1.1	Nutritional screening and nutritional status assessment of the critically ill.	6	Lecture	PPT
1.2	Nutritional support system and other life saving measures for the critically ill.	6	Chalk & Talk Demonstration	Black Board Models
UNIT -2 IMMUNO ENHANCERS AND SPECIAL DIETS IN CRITICAL CARE				
2.1	Role of immuno enhancers, conditionally essential nutrients in critical care.	6	Lecture	PPT

2.2	Role of immuno suppressants and special diets in critical care.	6	Lecture	PPT
UNIT -3 SPECIAL NUTRITIONAL THERAPY IN CRITICAL ILLNESSES –BURNS, CV AND KIDNEY				
3.1	Patho physiological, clinical and metabolic aspects, understanding the special nutritional requirements, nutritional goals and monitoring the therapy in critical illnesses like stress, trauma, sepsis, burns.	4	Lecture	PPT
3.2	Patho physiological, clinical and metabolic aspects, understanding the special nutritional requirements, nutritional goals and monitoring the therapy in critical illnesses like CV complications and surgery.	4	Chalk & Talk	Black Board
3.3	Patho physiological, clinical and metabolic aspects, understanding the special nutritional requirements, nutritional goals and monitoring the therapy in critical illnesses like dialysis, transplant, multiple organ failure.	4	Demonstration	Model
UNIT -4 SPECIAL NUTRITIONAL THERAPY IN CRITICAL ILLNESSES –GI AND LIVER				

4.1	Patho physiological, clinical and metabolic aspects, understanding the special nutritional requirements, nutritional goals and monitoring the therapy in critical illnesses like GI tract surgery.	6	Lecture	PPT
4.2	Patho physiological, clinical and metabolic aspects, understanding the special nutritional requirements, nutritional goals and monitoring the therapy in critical illnesses like hepatic transplants.	6	Lecture	PPT
UNIT -5 REFEEDING SYNDROME AND ETHICAL ISSUES IN TERMINALLY ILL				
5.1	Complications of nutritional support system including refeeding syndrome.	6	Lecture	PPT
5.2	Diet related ethical issues in the terminally ill.	6	Chalk & Talk	Black Board

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.
K2	4	4	-	-	-	8	-	8
K3	2	2	-	5	-	9	-	9
K4	2	2	-	-	5	9	-	9
K5	2	2	5	-	-	9	-	9
Non Scholastic	-	-	-	-	-		5	5
Total	10	10	5	5	5	35	5	40

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

- **All the course outcomes are to be assessed in the various CIA components.**
- **The levels of CIA Assessment based on Revised Bloom's Taxonomy for PG are :**

K2-Understand, **K3**-Apply, **K4**-Analyse, **K5**-Evaluate

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

C1 – Internal Test-1

C2 – Internal Test-2

C3 - Seminar

C4 – Assignment

C5 - OBT/PPT

C6 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Explain nutritional screening, assessment and support system for critically ill	K2	PSO10
CO 2	Discuss the role of immuno-enhancers and special diets in critical care	K2	PSO10
CO 3	Plan special nutrition therapy in critical illness - stress, burns, cardiovascular and kidney	K3	PSO10
CO 4	Examine the special nutrition therapy in gastrointestinal tract surgery and hepatic transplant	K4	PSO10
CO 5	Determine the refeeding syndrome and ethical issues in terminally ill	K5	PSO10

Mapping of C0s with PSOs

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15
CO1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1
CO2	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1
CO3	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1
CO4	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1
CO5	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	22	1	1	1
CO2	2	1	1	1
CO3	1	1	2	1
CO4	1	1	2	1
CO5	1	1	1	3

Note: Strongly Correlated – 3 ¨ Moderately Correlated – 2 ¨ Weakly Correlated -1

COURSE DESIGNER:
Dr.Vasantha Esther Rani

Forwarded By

(Dr.S.Santhi)

100% SKILL DEVELOPMENT

I M.Sc., HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –I

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSNN	23PG1NE3	Advanced Human Physiology	Major Core	5	3

COURSE DESCRIPTION

The course provides a detailed insight on the anatomy and functions of the various systems of the human body.

COURSE OBJECTIVES

- Organs of the bod
- y and their functions
- Different systems of the body, their functions with special reference to the control and feedback mechanisms
- Physiological changes at different stages of life.

UNITS

UNIT –I (18 HRS.)

Cell

- Structure and Function.
- Transportation across cell membrane.
- Cell theory and Cycle. Difference between Meiotic and Mitotic cell.

- Stem cells- types and functions.

Tissue

- Structure and Function.

UNIT –II CIRCULATORY SYSTEM (18 HRS.)

Blood

- Composition& Functions
- Blood Group – ABO System &Rh factor.
- Blood Coagulation.

Heart

- Structure &Function of Heart and Blood Vessels.
- Systemic &Pulmonary circulation
- Cardiac cycle and Conduction.
- Heart rate and Cardiac output. ECG.
- Blood pressure & their regulations.

UNIT –III (18 HRS.)

Respiratory System

- Structure and function.
- Gas Laws 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 type.
- Syndromes resulting from hypo and hyperactivity of Pituitary, Thyroid, Adrenals and Pancreas.

UNIT –IV (18 HRS.)

Gastrointestinal System

- Structure and function of GI tract and its accessory organs.
- Digestion and absorption of Carbohydrates, Proteins and Fats.

Reproductive System

- Roll of hormones in reproduction and Lactation.
- Menstrual Cycle and Menopause.
- Invitro (I V) fertilization
- Spermatogenesis.

UNIT –V (18 HRS.)

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 fluid (CSF) – composition and function.

- Blood-brain barrier (BBB).
- Electroencephalogram (EEG)

EXCRETORY SYSTEMS

Renal system

- Organs in the Urinary System.
- Structure and functions of Nephron.
- Juxtaglomerular 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.

BOOK REFERENCES:

1. Best and Taylor, The Living Body, Chapman and Hall ltd., London.
2. Chatterji (1999).*Human Physiology*, Roy Publications
3. Gitanjali Chatterjee (1999) *Handbook of Food and Nutrition*, Rajat Publications.
4. Guyton, A.C& Hall J.B (1996):*Textbook of Medical Physiology*,9th edition W.B Sanders Company, Prism Books (Pvt) Ltd,Bangalore.
5. Kamala Krishnaswami (2000) *Nutrition Research-Current Scenerio and future trends,* Oxford and IBH Publishing Co.Pvt.ltd.,
6. LraineM.Summerfield (2000).*Nutrition ,exercise and behaviour an integrated approach to Weight management* ,Thomson learning,
7. Mahtab S. Bamji, Pralhad& Rao VinodhiniReddy.(1996) *Textbook of Human Nutrition,* Oxford, IBH publishing Co. pvt ltd.,
8. Margaret McWilliams (1994).*Experimental Food laboratory Manual*,Surjeet Publications,

9. Mickael J.Gibney,IanA.Macdonald& Helen M.Roche (2004),*Nutrition and metabolism* Blackwell Publications,.
10. Mike Epsy (2001) *Nutrition Eating for good health*,SurbhiPublications,Jaipur,.
11. Sembulingam&PremaSembulingam (2006), *Essentials of Medical Physiology*, Yaypee Brothers, Medical Publishers (p) Ltd, New Delhi.
12. Vijay Kamshik (2000).*Food science and nutrition,* Mangal Deep Publications. Jaipur

JOURNAL REFERENCES:

1. Journal of Applied Physiology
2. Journal of General Physiology
3. BMC Physiology
4. Physiological Reviews
5. International Journal of Basic & Applied Physiology

Open Educational Resources

1. https://journals.physiology.org/doi/full/10.1152/japplphysiol.00711.2011
2. https://www.springer.com/journal/421
3. https://opentextbooks.concordia.ca/oerbydiscipline/chapter/kinesiology-2/
4. https://publons.com/journal/39067/european-journal-of-applied-physiology-and-occupat/
5. https://openstax.org/details/books/anatomy-and-physiology

E LEARNING CONTENT

https://youtu.be/MZDy0RvA52Y-Osmosishttps://youtu.be/TgcyiVQnVBs-Respiratory system https://youtu.be/44B0ms3XPKU-nervous

system

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 CELL AND TISSUES				
1.1	Cell - Structure and Function	3	Chalk & Talk	Black Board
1.2	Structure and function of cell	3	Chalk & Talk	Black Board
1.3	Cell theory and Cycle.	3	Lecture	PPT & Videos
1.4	Difference between Meiotic and Mitotic cell	3	Lecture	Black Board
1.5	Stem cells- types and functions	3	Demonstration	Blood coagulation and grouping kits
1.6	Structure and function of tissues	3	Lecture	PPT
UNIT -2 BLOOD AND CIRCULATORY SYSTEM				
2.1	Composition of blood	2	Lecture	Model
2.2	Functions of blood	2	Chalk & Talk	Black Board
2.3	Blood Group – ABO System	2	Lecture	PPT
2.5	Rh factor	2	Lecture	Smart Board

2.6	Blood Coagulation	2	Lecture	Videos
	Structure &Function of Heart	2	Lecture	Model
	Blood Vessels	2	Lecture	PPT
	Systemic &Pulmonary circulation	1	Chalk & Talk	Black Board
	Cardiac cycle and Conduction	1	Lecture	Smart class
	Heart rate and Cardiac output. ECG	2	Discussion	Black Board
	Blood pressure & their regulations	1	Lecture	PPT
UNIT -3	**RESPIRATORY AND ENDOCRINE SYSTEM**			
3.1	Structure and function of respiratory system	2	Lecture	Smart class
3.2	Gas Laws pertaining to Gas Exchange	2	Chalk & Talk	Black Board
3.3	Henry's Law of Partial Pressure	1	Lecture	PPT
3.4	Boyle - Mariotte's Law of Volume and Pressure	1	Lecture	PPT
3.5	Dalton's Law of Partial Pressure	3	Lecture	Smart class
3.6	Charles's Law of Ideal Gas Equation	2	Lecture	Smart class
3.7	Fick's Law of Diffusion	2	Lecture	PPT

3.8	Mechanism of respiration	2	Lecture	PPT
3.9	Circulation and Exchange of respiratory gases. Internal and External Respiration. Chloride shift	2	Lecture	PPT
3.10	Definitions of Lung volumes and Lung capacities, Ventilation and Artificial Respiration, Immunity, Endocrine system	1	Lecture	PPT
UNIT -4	**GASTROINTESTINAL ANDREPRODUCTIVE SYSTEM**			
4.1	Structure and function of GI tract	2	Lecture	PPT
4.2	Structure and function accessory organ	2	Lecture	PPT
4.3	Digestion and absorption of Carbohydrates	2	Lecture	PPT
4.4	Digestion and absorption of protein	2	Lecture	PPT
4.5	Digestion and absorption of fat	2	Lecture	PPT
4.6	Role of hormones in reproduction and Lactation	2	Lecture	PPT
4.7	Menstrual Cycle and Menopause	2	Lecture	PPT

4.8	Invitro (I V) fertilization	2	Lecture	PPT
4.9	Spermatogenesis	2	Lecture	PPT
UNIT -5	**NERVOUS SYSTEM AND EXCRETORY SYSTEM**			
5.1	Structure and Function of Neuron	2	Chalk & Talk	Black Board
5.2	Afferent and Efferent Nerves	3	Lecture	PPT
5.3	Conduction of Nerve Impulse	2	Chalk & Talk	Black Board
5.4	Sympathetic and Parasympathetic nervous System	2	Lecture	Smart class
5.5	Cerebrospinal fluid (CSF) – composition and function	1	Discussion	Videos
5.6	Blood-brain barrier (BBB)	1	Lecture	PPT
5.7	Electroencephalogram	1	Chalk & Talk	Black Board
5.8	Organs in the Urinary System	2	Lecture	Smart class
5.9	Structure and functions of Nephron	1	Chalk & Talk	Black Board
5.10	Juxtaglomerular Cell, Mechanism of formation of urine	1	Discussion	Black Board

5.11	Role of kidney to regulate Blood pressure, Water, Electrolytes and Acid Base Balance	1	Discussion	Black Board
5.12	Structure and function of skin. Regulation of temperature	1	Discussion	Black Board

CIA	
Scholastic	**23**
Non Scholastic	**2**
	25

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
15		3	5	2	25	75	100

PG CIA Components

			Nos		
C1	-	Test (CIA 1)	1**	-	15 Mks
C2	-	Test (CIA 2)	1**	-	15 Mks
C3	-	Assignment	1	-	3 Mks
C4	-	Seminar	2 *	-	5 Mks
C5	-	Attendance		-	2 Mks

***** Average of C1 and C2 will be taken.***

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Describe the functions of blood and endocrine system	K2	PSO1
CO 2	Illustrate the anatomy and functions of circulatory system	K2	PSO1
CO 3	Identify the role of digestive and excretory systems	K3	PSO1
CO 4	Analyse the mechanism of musculoskeletal and respiratory systems	K4	PSO1
CO 5	Explain the structure and functions of nervous and reproductive systems	K5	PSO1

Mapping of COs with PSOs

CO PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15
CO1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CO2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CO3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CO4	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CO5	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Mapping of C0s with POs

	PO1	PO2	PO3	PO4
01	2	1	1	1
02	1	1	1	1
03	1	1	1	1
04	1	1	1	1
05	2	1	1	1

Note: Strongly Correlated – 3 ¨ Moderately Correlated – 2 ¨ Weakly Correlated -1

COURSE DESIGNER:
Dr.C.Helen

Forwarded By

(Dr.S.Santhi)

100% SKILL DEVELOPMENT

I M.Sc.,HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –I

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSNN	23PG1NE4	Food Biotechnology	Elective	5	3

COURSE DESCRIPTION

The course offers knowledge on the scope, importance and the basic aspects of biotechnology relating to foods

COURSE OBJECTIVES

- To enlighten the students on role of enzymes in food industries.
- To create awareness on biotechnological aspects of food additives
- To gain knowledge in plant and animal biotechnology

UNITS

UNIT –I ENZYMES **(15HRS.)**

Definition, Properties of enzymes, Microorganisms producing enzymes, Methods of enzyme production, Self study : Enzymes produced - ∝-amylases, lipases, proteases, Use of enzymes in food industry – Proteases, glucose oxidase, catalase, lactase.

UNIT –II ENZYMES IN FRUIT JUICES AND BREWING (15 HRS.)

INDUSTRY

Enzymes used in the production of fruit juices, beer and distilled alcoholic drinks, processing steps of wine and beer.

UNIT –III FOOD ADDITIVES **(15HRS.)**

Organic acids – Production of citric acid, acetic acid, lactic acid

Sweeteners - Production of HFCS and glucose syrup
Microbial colour, Microbial flavours

Modification of starch and Oilseeds

UNIT –IV FOOD AND PLANT, ANIMAL BIOTECHNOLOGY (15HRS.)

Application of Plant and Animal Biotechnology in the Food industry.

Regulations and Oversight of Biotechnology

Fruits and Vegetables, Milled Corn Product and Milled Soy Products,

Golden rice, Vegetable oil.

Fish, Meat, Milk and Milk products

UNIT –V GENETICALLY MODIFIED FOODS (15HRS.)

Basic concepts of DNA structure, definition of Genetically modified foods, types and techniques of Genetically modified foods, health and safety concerns of Genetically modified foods for human consumption

Advantages and disadvantages of Genetically modified foods

Ethical issues of Genetically modified foods

REFERENCES:

1. Dubey, R.C.(1996) *A textbook of Biotechnology*, S. Chand and company ltd., New Delhi

2. Gupta, K. (1995). *Elements of Biotechnology*, Rastogi Publications, Meerut.

3. Sriram Sridhar. (2005) *Enzyme Biotechnology*, Dominant Publishers and Distributors, New Delhi

4. Rita Singh. (2004) *Food Biotechnology*, Global Vision Publishing House, Delhi.

5. Trevor Palmer. (2004). *Enzymes: Biochemistry, Biotechnology and Clinical chemistry;* Affiliated East West press pvt ltd., New Delhi.

OPEN EDUCATIONAL REFERNCES:

1. http://www.businessdictionary.com/definition/food-biotechnology.html

2. http://www.mrothery.co.uk/genetech/genetechnotes.htm

3. http://www.wpi.edu/Pubs/E-project/Available/E-project-031405-135846/unrestricted/IQP.pdf

4. http://oer.funai.edu.ng/wp-content/uploads/2017/10/BTG-307-Food-Biotechnology-I-Definition-and-Scope-of-Food-Biotechnology-By-Dr.-Friday-Nwalo.ppt

5. https://www.ncbi.nlm.nih.gov/books/NBK235032/

6. https://actascientific.com/ASAG/pdf/ASAG-03-0438.pdf

7. https://www.researchgate.net/publication/312875936_Applications_of_Food_Biotechnology

COURSE CONTENTS & LECTURE SCHEDULE:

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**ENZYMES**			
1.1	Enzymes – Definition, Properties of enzymes	2	Chalk & Talk	Black Board
1.2	Microorganisms producing enzymes	2	Chalk & Talk	LCD
1.3	Methods of enzyme production	4	Lecture	PPT & White board
1.4	Enzymes produced - ∝-amylases, lipases, proteases,.	3	Lecture	Smart Board
1.5	Use of enzymes in food industry – Proteases, glucose oxidase, catalase, lactase	4	Lecture	Black Board

UNIT -2 ENZYMES IN FRUIT JUICES AND BREWING INDUSTRY				
2.1	Enzymes used in the production of fruit juices	3	Lecture	Black Board
2.2	Enzymes used in the production of beer and distilled alcoholic drinks	4	Chalk & Talk	LCD
2.3	processing steps of wine	4	Lecture	PPT & White board
2.4	processing steps of beer.	4	Lecture	Smart Board
UNIT -3FOOD ADDITIVES				
3.1	Organic acids – Production of citric acid, acetic acid, lactic acid	4	Lecture	Black Board
3.2	Sweeteners - Production of HFCS and glucose syrup	4	Lecture	PPT & White board
3.3	Microbial colour	2	Lecture	Smart Board
3.4	Microbial flavours	3	Chalk & Talk	LCD
3.5	Modification of starch and Oilseeds	2	Lecture	PPT & White board
UNIT -4 FOOD AND PLANT BIOTECHNOLOGY				
4.1	Application of Plant Biotechnology in Food industry	2	Lecture	PPT & White board

4.2	Fruits and Vegetables	3	Chalk & Talk	LCD
4.3	Milled Corn Products	3	Chalk & Talk	LCD
4.4	Milled Soy Products	2	Lecture	Black Board
4.5	Golden rice	3	Lecture	PPT & White board
4.6	Vegetable oil	2	Lecture	PPT & White board
UNIT -5FOOD AND ANIMAL BIOTECHNOLOGY				
5.1	Application of Animal Biotechnology in Food industry	2	Lecture	PPT & White board
5.2	fish, meat	3	Lecture	PPT & White board
5.3	milk and milk products	4	Chalk & Talk	LCD
5.4	Advantagesand disadvantages of genetically modified foods	2	Chalk & Talk	LCD
5,5	Ethical issues ofgenetically modified foods	4	Lecture	Black Board

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session -wise Average 5 Mks.	Better of W1, W2 5 Mks	M1+M2 5+5=10 Mks.	MID-SEM TEST 15 Mks	35 Mks.	5 Mks.	40Mks.	
K1	5	-	-	2 ½	7.5	-	7.5	18.75 %
K2	-	5	4	2 ½	11.5	-	11.5	28.75 %
K3	-	-	3	5	8	-	8	20 %
K4	-	-	3	5	8	-	8	20 %
Non Scholastic	-	-	-	-		5	5	12.5 %
Total	5	5	10	15	35	5	40	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **All the course outcomes are to be assessed in the various CIA components.**

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy for I UG are :**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse

✔ **The I UG course teachers are requested to start conducting S1, W1, M1, in due intervals of time.**

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
5	10	15	5	5	40	60	100

C1 – Average of Two Session Wise Tests

C2 – Average of Two Monthly Tests

C3 - Mid Sem Test

C4 – Best of Two Weekly Tests

C5 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Describe the techniques in enzymes production and its application	K1	PSO3& PSO5
CO 2	Infer the process distilled alcoholic beverages	K4	PSO3& PSO5

CO 3	Classify the types of food additives of microorganism origin	K2	PSO5
CO 4	Compute the concept of transgenic plants and its application in food industry	K3	PSO5
CO 5	Interpret genetically modified foods and its application in food industry	K5	PSO5

Mapping of COs with PSOs

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12
CO1			3		3							
CO2			3		3							
CO3			3		3							
CO4			3		3							
CO5			3		3							
CO/ PSO	PSO 13	PSO 14	PSO 15	PSO 16	PSO 17	PSO 18	PSO 19	PSO 20	PSO 21	PSO 22	PSO 23	
CO1									1			
CO2									1			
CO3									1			
CO4									1			
CO5									1			

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	1	3
CO2	3	3	3	1	3
CO3	3	3	3	1	3
CO4	3	3	3	1	3
CO5	**3**	**3**	**3**	1	3

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2** ♦ Weakly Correlated -**1**

COURSE DESIGNER:
1Mrs..J. JosephineJesintha

Forwarded By

(Dr.S.Santhi)

100% EMPLOYABILITY

I M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSNN	23PG1NAE	Nutrition & Dietetics	EDC	2	1

COURSE DESCRIPTION

This course offers scientific understanding of the role of nutrition in health diseases.

COURSE OBJECTIVES

- To understand the basics of nutrition.
- To learn the menu planning methods for family members.
- To learn the clinical aspects of disease conditions and diet therapy.

UNITS

UNIT –I INTRODUCTION TO NUTRITION (12 Hrs)

Nutrition – definition, nutritional status, nutrients and their function, relationship of food and health – Characteristics of good nutrition – balanced diet – BMI, IBW, Dietary guidelines-basic food groups, food pyramid

UNIT –II MACRO NUTRIENTS (12 Hrs)

Classification, functions, sources, deficiency of carbohydrates, protein, lipids.

UNIT –III MICRO NUTRIENTS (12 Hrs)

Functions, sources, deficiency disorders of Vitamins – Fat soluble vitamins A, D, E, K; Water Soluble vitamins – B1, B2, Niacin, B6, B12, Folic acid.

Minerals – Ca, P. Zn, Fe, I, Fl.

UNIT –IV NUTRITION FOR DEVELOPMENTAL MILESTONES (12 Hrs)

Menu planning, Principles of planning meals,

Nutritional importance of pregnancy, changes incurred and complications

Nutritional importance of lactation

Nutrition during infancy – growth and development, advantages of breast feeding and bottle feeding, formulation criteria for bottle milk. Supplementary foods.

Nutritional importance for adolescence.

UNIT –V PRINCIPLE OF DIET THERAPY (12 Hrs)

Definition of Diet therapy, Foods to be included and avoided – obesity and underweight, diabetes mellitus, typhoid, peptic ulcer, anaemia, CVD.

BOOK REFERENCES:

1. Srilakshmi B (2012) *Dietetics*,New Age International Publishers,
2. Antia F.P. (1989) *Nutrition Dietetics*, Oxford University Press
3. Swaminathan M (1988) *Advanced textbook on Food and Nutrition*, Vol I and Vol II, The Bangalore Printing and Publishing Co., Ltd.

JOURNAL REFERENCES:

1. The Indian Journal of Nutrition & Dietetics.
2. Clinical Journal of Nutrition & Dietetics

OPEN EDUCATIONAL RESOURCES:

1. **https://open.umn.edu/opentextbooks/textbooks/622**
2. **https://pressbooks.oer.hawaii.edu/humannutrition/**
3. https://en.wikibooks.org/wiki/Fundamentals_of_Human_Nutrition
4. https://www.youtube.com/watch?v=sorIaN6vRBI
5. https://oer.galileo.usg.edu/cgi/viewcontent.cgi?article=1006&context=health-textbooks

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION TO NUTRITION				
1.1	Nutrition – definition, nutritional status, nutrients and their function, relationship of food and health.	6	Lecture	PPT
1.2	Characteristics of good nutrition – balanced diet – BMI, IBW, Dietary guidelines-basic food groups, food pyramid	6	Chalk & Talk	Black Board
UNIT -2 MACRO NUTRIENTS				
2.1	Classification, functions, sources, deficiency of carbohydrates.	4	Lecture	PPT
2.2	Classification, functions, sources, deficiency of protein.	4	Chalk & Talk	Black Board
2.3	Classification, functions, sources, deficiency of lipids.	4	Lecture	PPT
UNIT -3 MICRO NUTRIENTS				

3.1	Functions, sources, deficiency disorders of Vitamins – Fat soluble vitamins A, D,.	3	Lecture	PPT
3.2	Functions, sources, deficiency disorders of E, K; Water Soluble vitamins – B1, B2.	2	Chalk & Talk	Black Board
3.3	Functions, sources, deficiency disorders of Water Soluble vitamins –Niacin, B6, B12, Folic acid.	3	Chalk & Talk	Black Board
3.4	Functions, sources, deficiency disorders of Minerals – Ca, P. Zn	2	Lecture	PPT
3.5	Functions, sources, deficiency disorders of Minerals – Fe, I, Fl.	2	Chalk & Talk	Black Board
UNIT -4 NUTRITION FOR DEVELOPMENTAL MILESTONES				
4.1	Menu planning, Principles of planning meals, Nutritional importance of pregnancy, changes incurred and complications Nutritional importance of lactation.	4	Lecture	PPT

4.2	Nutrition during infancy – growth and development, advantages of breast feeding and bottle feeding, formulation criteria for bottle milk. supplementary foods.	4	Lecture	PPT
4.3	Nutritional importance for adolescence.	4	Chalk & Talk	Black Board
UNIT -5 PRINCIPLE OF DIET THERAPY				
5.1	Definition of Diet therapy, Foods to be included and avoided – obesity and underweight, diabetes mellitus, typhoid.	4	Chalk & Talk	Black Board
5.2	Definition of Diet therapy, Foods to be included and avoided-diabetes mellitus, typhoid.	4	Chalk & Talk	Black Board
5.3	Definition of Diet therapy, Foods to be included and avoided- peptic ulcer, anaemia, CVD.	4	Lecture	PPT & White board

CIA	
Scholastic	**23**
Non Scholastic	**2**
	25

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**CIA**	**ESE**	**Total**
15		**3**	**5**	**2**	**25**	**75**	**100**

UG CIA Components

				Nos		
C1	-	Test (CIA 1)		1**	-	15Mks
C2	-	Test (CIA 2)		1**	-	15Mks
C3	-	Assignment		1	-	3Mks
C4	-	Quiz		2 *	-	5 Mks
C5	-	Attendance			-	2Mks

***** Average of C1 and C2 will be taken.***
****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Describe different nutrition terms and concepts of food and nutrition.	K2	PSO2
CO 2	Explain the role of macro and micronutrients in human nutrition.	K2	PSO2
CO 3	Estimate the functions and deficiency effects of micronutrients.	K3	PSO2
CO 4	Determine the importance of nutrition in the different stages of lifespan.	K3	PSO3
CO 5	Analyze the principles of diet therapy in the management of diseases.	K4	PSO3

Mapping of C0s with PSOs

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15
CO1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1
CO2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1
CO3	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1
CO4	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1
CO5	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	1	1	1
CO2	2	1	1	1
CO3	2	2	2	1
CO4	2	1	1	1
CO5	2	1	1	1

COURSE DESIGNER:

1. **Mrs. P.MagdaleneVirjini**
2. **Mrs. D. Mouna**

Forwarded By

(Dr.S.Santhi)

100% SKILL DEVELOPMENT

I M.Sc., HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –I

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSNN	23PG2N4	Advanced Food Science	Major Core	6	5

COURSE DESCRIPTION

The course provides a detailed insight on food science.

COURSE OBJECTIVES

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

UNITS

UNIT –I **(18 HRS.)**

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 retrogradation, dextrinization and factors affecting gelatinization.

UNIT –II **(18 HRS.)**

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 –III **(18 HRS.)**

Fats and oil -Structure, composition and properties of fats and oil; storage of fat, characteristics [shortening, plasticity, flavor, retention of moisture, melting point, optical activity, color, specific gravity], Hydrogenation, winterization, flavor reversion, smoking point, Rancidity-
Types, Mechanism and prevention; Role of fat/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 –IV **(18 HRS.)**

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 –V **(18 HRS.)**

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 sweetners in food industry.

TEXT BOOKS:

Srilakshmi B. (2015). Food Science.New Age International (P) Ltd.Publishers.

S.M. Reddy (2015). Basic Food science and technology. New Age International publishers.AvantinaSharma (2017).Text book of food science and Technology. CBS Publisheres and distributes ltd. 3rd Edition.

Swaminathan A.(2018) . Handbook of Food and Nutrition, Bangalore press.

Serpil Sahin and ServetGulumSumnu.(2006).Physical properties of Foods.

Springer publications

REFERENCES:

Gerard L. Hasenhuettl , Richard W. Hartel. (2019).Food Emulsifiers and Their Applications.Springer publications. 3rd edition.

Vickie.A. Vaciavik. (2021). Essentials of Food science. Springer publications. 5th edition.

Dr.M.Swaminathan.(2015). Advanced text book of Food and Nutrition. volume-2.Bapco publications.

Eskein.(2012). Biochemistry of Food. Elsievier publications.

Lyn O brienNabors.(2001).Alternative Sweetners. Taylor and Francis publications.

Janet D. Ward and Larry Ward.(2006). Principles of Food Science. Stem Publishers. 4th Edition.

JOURNAL REFERENCES:

1. Journal of Applied Physiology
2. Journal of General Physiology
3. BMC Physiology
4. Physiological Reviews
5. International Journal of Basic & Applied Physiology

Open Educational Resources

1. https://journals.physiology.org/doi/full/10.1152/japplphysiol.00711.2011
2. https://www.springer.com/journal/421
3. https://opentextbooks.concordia.ca/oerbydiscipline/chapter/kinesiology-2/
4. https://publons.com/journal/39067/european-journal-of-applied-physiology-and-occupat/
5. https://openstax.org/details/books/anatomy-and-physiology

ELEARNING RESOURCES:

www.fao.orgwww.wfp.org

www.foodrisk.org.

http://www.fsis.usda.gov/

https://www.fda.gov/food

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1				
1.1	Properties of food- Food nutrients, solids, solutions and colloids, Solutions- Physical properties of solutions, classification	3	Chalk & Talk	Black Board

	of foods based on viscosity characteristics.			
1.2	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	3	Chalk & Talk	Black Board
1.3	Starch - Sources, Structure and composition of starch; Properties and characteristics of food starches	3	Lecture	PPT & Videos
1.4	Modified food starches-Structure and composition	3	Lecture	Black Board
1.5	Effect of heat on food starch properties, gluten formation in wheat flour	3	Demonstration	Blood coagulation and grouping kits
1.6	Gelatinization, gelation and retrogradation, dextrinization and factors affecting gelatinization	3	Lecture	PPT
UNIT -2				

2.1	Proteins-Structure and composition	2	Lecture	Model
2.2	Classification and properties of proteins	2	Chalk & Talk	Black Board
2.3	Effect of heat on physio-chemical properties of proteins	2	Lecture	PPT
2.5	Role of proteins in food products; Texturized vegetable protein, protein concentrates	3	Lecture	Smart Board
2.6	Enzymes: Classification and its nature; Mechanism of action	3	Lecture	Videos
2.7	Factors influencing enzyme activity; Role of enzymes in food products	2	Lecture	Model
2.8	Immobilized enzymes and its application in food industries	2	Lecture	PPT
UNIT -3				
3.1	Fats and oil -Structure, composition and properties of fats and oil	2	Lecture	Smart class
3.2	Storage of fat, characteristics [shortening, plasticity, flavor, retention of moisture, melting point,	2	Chalk & Talk	Black Board

	optical activity, color, specific gravity],			
3.3	Hydrogenation, winterization, flavor reversion, smoking point	1	Lecture	PPT
3.4	Rancidity-Types, Mechanism and prevention; Role of fat/oil in food products; Fat substitutes	1	Lecture	PPT
3.5	Sugar and sugar products-Types of sugar	3	Lecture	Smart class
3.6	Types of granulated sugar	2	Lecture	Smart class
3.7	Physical and chemical properties	2	Lecture	PPT
3.8	Sugar products -Types of honey, Jaggery, corn syrup	2	Lecture	PPT
3.9	Various forms of sugar used in cookery and	2	Lecture	PPT
3.10	Crystallization of sugar	1	Lecture	PPT
UNIT -4				
4.1	Milk components-water, carbohydrate, milk fat, milk protein, minerals and other components in milk	2	Lecture	PPT
4.2	Physiochemical properties of milk,	2	Lecture	PPT

	Effect of physical and chemical factors on milk components			
4.3	Factors affecting coagulation, casein coagulation, minerals	2	Lecture	PPT
4.4	Effects of enzymes-renin, fermented and non-fermented milk products	3	Lecture	PPT
4.5	Egg-proteins in Egg, microscopic structure of egg, characteristics	3	Lecture	PPT
4.6	Nutritional qualities, quality check, functional properties	3	Lecture	PPT
4.7	- foaming, factors affecting foam formation	3	Lecture	PPT
UNIT -5				
5.1	Foodadditives- Definition	2	Chalk & Talk	Black Board
5.2	Different food additives	3	Lecture	PPT
5.3	Need for food additives	2	Chalk & Talk	Black Board
5.4	Flavour compounds in vegetables, fruits and spices	3	Lecture	Smart class

5.5	Effect of processing on food flavours	2	Discussion	Videos
5.6	Role of colours and flavours in food products.	2	Lecture	PPT
5.7	Sweetners- Properties, Artificial and Natural sweetners	2	Chalk & Talk	Black Board
5.8	Role of sweetners in food industry	2	Lecture	Smart class

CIA	
Scholastic	**23**
Non Scholastic	**2**
	25

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**CIA**	**ESE**	**Total**
15		**3**	**5**	**2**	**25**	**75**	**100**

PG CIA Components

			Nos		
C1	-	Test (CIA 1)	1**	-	15 Mks
C2	-	Test (CIA 2)	1**	-	15 Mks
C3	-	Assignment	1	-	3 Mks
C4	-	Seminar	2 *	-	5 Mks
C5	-	Attendance		-	2 Mks

***** Average of C1 and C2 will be taken.***

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Describe the relationship between the chemical structure and the properties of the main components in food	K2	PSO1
CO 2	Illustrate the Composition and characteristics of various food commodities.	K2	PSO1
CO 3	Identify the role cooking quality of foods and apply food science	K3	PSO1

	knowledge in food industries		
CO 4	Analyse the nutrients and functions of foods in maintaining health	K4	PSO1
CO 5	Explain the proper use of food colors and food additives in safe food preparation.	K5	PSO1

Mapping of C0s with PSOs

CO PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15
CO1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CO2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CO3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CO4	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CO5	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Mapping of C0s with POs

	PO1	PO2	PO3	PO4
01	2	1	1	1
02	1	1	1	1
03	1	1	1	1
04	1	1	1	1
05	2	1	1	1

Note: Strongly Correlated – 3 ¨ Moderately Correlated – 2 ¨ Weakly Correlated -1

COURSE DESIGNER:
Dr.C.Helen

Forwarded By

(Dr.S.Santhi)

100% SKILL DEVELOPMENT

I M.Sc., HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSNN	23PG2N5	Analytical Instrumentation	Major Core	6	5

COURSE DESCRIPTION

The course offers the understanding of the principles, instrumentation and analytical techniques of food

COURSE OBJECTIVES

- To understand the principle and instrumentation of hi-tech analytical techniques.
- To gain knowledge on applications of different analytical instruments.

UNITS

UNIT –I CHROMATOGRAPHY (18HRS.)

Meaning – Types of Chromatography – principles, components and applications of

i. Paper Chromatography – Ascending and descending – One and two dimensional
ii. Thin Layer Chromatography
iii. Gas Chromatography
iv. Ion exchange
v. Gel filtration
vi. High Performance Liquid Chromatography

UNIT –II ELECTROPHORESIS (18 HRS.)

Meaning –Types –Paper, Starch, Gel, Agar-gel, Poly Acrylamide gel, Moving boundary Electrophoresis, Immuno electrophoresis – Principle – components – Applications.

UNIT –III COLORIMETRY, FLUORIMETRY AND CENTRIFUGATION (18 HRS.)

Photoelectric Colorimeters, Fluorimeters –Principle -Applications.

CENTRIFUGATION:

Types of Centrifuge – Ordinary and Ultracentrifuge - Principle and applications.

MICROBIOLOGICAL ASSAYS

Types of Assays -Principle - Requirements for the conduct of Microbiological assays –Applications.

UNIT –IV SPECTROSCOPY (18 HRS.)

SPECTROSCOPY:

Spectrophotometry – Spectrophotometers – Atomic Absorption Spectrophotometry & ICP.

Spectrophotometers –Principle – Applications.

NMR and NIR:

Nuclear Magnetic Resonance- Application and principle

Near Infra Red -Principle and Application

UNIT –V ISOTOPES (18 HRS.)

Types – Stable and Radioactive, Units of radio-activity – Uses in biological investigations - Geiger Muller Counter and Scintillation Counter –Effects of ionizing radiation-hazards and prevention - Applications.

pH and Buffer:

pH meter –measurement of pH, Buffer – Definition – Types – Buffer system with special reference to living body

BOOK REFERENCES:

1. Ewing. W.W. (1970). *Instrumental Methods of Chemical Analysis.* McGraw Hill Book Company, New Delhi.
2. Mahinder Singh,(2003). *Analytical Chemistry – Instrumental Techniques.* Dominant Publishers and Distributors, New Delhi.
3. Nikelal, (1973). *Experimental methods in Biophysical Chemistry*. John Wiley Publishers.
4. Yadav M.S (2001). *Instrumental Methods of Chemical Analysis*. Campus Books Internationals, New Delhi.

Open Educational Resources:

1.https://microbenotes.com/types-of-chromatography/
2.https://www.slideshare.net/BlueRose9/electrophoresis-78994484
3.https://study.com/academy/lesson/spectrophotometer-definition-uses-parts.html
4.https://www.thermofisher.com/in/en/home/industrial/spectroscopy-elemental-isotope-analysis/spectroscopy-elemental-isotope-analysis-learning-center/molecular-spectroscopy-information/nmr-information/nmr-applications-process-control.html
5.https://dlc.dcccd.edu/biology1-2/ph-and-buffers

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**CHROMOTOGRAPHY**			
1.1	Meaning, – principles, components and applications	2	Chalk & Talk	Black Board
1.2	Paper Chromatography – Ascending and descending – One and two dimensional	5	Chalk & Talk	LCD
1.3	Thin Layer Chromatography	3	Seminar	PPT & White board
1.4	Gas Chromatography	2	Seminar	Smart Board
1.5	Ion exchange Chromatography	2	Seminar	Black Board
1.6	Gel filtration Chromatography	2	Chalk & Talk	LCD
1.7	High Performance Liquid Chromatography	2	Chalk & Talk	LCD

UNIT -2	**ELECTROPHORESIS**			
2.1	Meaning –Types of Electrophoresis	2	Lecture	Black Board
2.2	Pape Electrophoresis	2	Chalk & Talk	LCD
2.3	Starch Electrophoresis	2	Seminar	PPT & White board
2.4	Gel, Agar-gel Electrophoresis	4	Seminar	Smart Board
2.5	Poly Acrylamide gel	3	Seminar	Black Board
2.6	Moving boundary Electrophoresis	2	Chalk & Talk	LCD
2.7	Immuno electrophoresis	3	Chalk & Talk	LCD
UNIT 3	**COLORIMETRY, FLUORIMETRY AND CENTRIFUGATION**			
3.1	Photoelectric Colorimeters, Principle -Applications.	3	Lecture	Black Board
3.2	Fluorimeters –Principle -Applications.	3	Seminar	Smart Board
3.3	Types of Centrifuge – Ordinary Centrifuge -Principle and applications.	3	Seminar	Black Board
3.4	Types of Centrifuge – Ultra Centrifuge -Principle and applications.	3	Chalk & Talk	LCD

3.5	Types of Assays -Principle	3	Chalk & Talk	LCD
3.6	Requirements for the conduct of Microbiological assays	2	Seminar	LCD
3.7	Applications of Microbiological assays	1	Chalk &Talk	LCD
UNIT 4 SPECTROSCOPY				
4.1	Spectrophotometry – Principle – Applications.	4	Seminar	LCD
4.2	Atomic Absorption Spectrophotometers - Principle – Applications.	5	Chalk & Talk	LCD
4.3	Nuclear Magnetic Resonance- Application and principle	5	Seminar	LCD
4.4	Near Infra Red -Principle and Application	4	Seminar	Smart Board
UNIT 5 ISOTOPES				
5.1	Types – Stable and Radioactive Isotopes	2	Seminar	LCD
5.2	Units of radio-activity	1	Chalk & Talk	LCD
5.3	Uses in biological investigations	2	Seminar	Smart Board
5.4	Geiger Muller Counter and Scintillation Counter	3	Seminar	LCD
5.5	Effects of ionizing radiation-hazards and prevention - Applications.	3	Seminar	Black Board

5.6	pH meter –measurement of pH	3	Seminar	LCD
5.7	Buffer – Definition – Types	1	Lecture	Black Board
5.8	Buffer system with special reference to living body.	2	Seminar	Smart Board

CIA	
Scholastic	**23**
Non Scholastic	**2**
	25

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
15		3	5	2	25	75	100

UG CIA Components

				Nos		
C1	-	Test (CIA 1)		1**	-	15Mks
C2	-	Test (CIA 2)		1**	-	15Mks
C3	-	Assignment		1	-	3Mks
C4	-	Seminar		2 *	-	5 Mks

C5 - Attendance - 2Mks

***** Average of C1 and C2 will be taken.***
****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Explain the principle and instrumentation of chromatography	K2	PSO7
CO 2	Summarize the working procedure of electrophoresis	K2	PSO7
CO 3	Apply the principle, procedure and application of Photoelectric Colorimeters, Fluorimeters and Microbiological assays	K3	PSO7
CO 4	Analyze the types of Spectrophotometry its principle, procedure and application	K4	PSO7
CO 5	Explain the different types of pH isotopes, buffers and its application	K5	PSO7

Mapping of C0s with PSOs

PS O	PSO1	SO2	SO3	SO4	SO5	SO6	SO7	SO8	SO9	SO10	SO11	PSO12	PSO13	PSO14	PSO15
O1	1	1	1	1	1	1	3	2	1	1	1	1	1	1	1
O2	1	1	1	1	1	1	3	2	1	1	1	1	1	1	1
O3	1	1	1	1	1	1	3	2	1	1	1	1	1	1	1
O4	1	1	1	1	1	1	3	2	1	1	1	1	1	1	1
O5	1	1	1	1	1	1	3	2	1	1	1	1	1	1	1

Mapping of C0s with POs

O/ PSO	PO1	PO2	PO3	PO4
CO1	2	1	3	3
CO2	2	1	3	3
CO3	3	2	3	3
CO4	3	1	1	1
CO5	2	1	1	1

Note: Strongly Correlated – 3 Moderately Correlated – 2 Weakly Correlated -1

COURSE DESIGNERS:

1. Dr.K.Karthiga

2. Mrs. J.JosephineJesintha

Forwarded By

(Dr.S.Santhi)

100% SKILL DEVELOPMENT

I M.Sc., HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSNN	**23PG2N6**	**Techniques in Food Analysis**	**Major Core**	**6**	**4**

COURSE DESCRIPTION

The practical course provides hands –on training in the use of hi-tech precision equipments to identify and analyze the various nutrients present in the food.

COURSE OBJECTIVES

- Learn the techniques of estimating the quantity of different nutrients present in food.
- To enable the students to get practical experience in the laboratory and develop the skills to undertake research work

UNITS

UNIT –I INTRODUCTION TO LABORATORY PRACTICES(18HRS.)

Instrumental Techniques

- Autoclave
- Hot Air Oven
- pH Meter
- Electronic Weighing Balance
- Centrifuges
- Hot Plate
- Spectrophotometer
- Water Bath
- Muffle Furnace
- Viscometer
- IR Moisture Analyzer
- Colorimeter

UNIT –II PREPARATION AND STANDARDISATION OF SOLUTION (18HRS.)

UNIT –III ASHING OF FOOD (Thermogravimetric Method**) and PREPARATION OF ASH SOLUTION(18HRS.)**

UNIT –IV FOOD ANALYSIS EXPERIMENTS(18HRS.)

Estimation of –

- Moisture Content – Thermogravimetric Analysis -Air Oven Method and Infrared Radiation(IR) Moisture Analyzer Method
- Crude Fibre–Gravimetric Method
- Iodine Number of oils – Wij's Method
- Acid Number of oils - Titrimetric Method
- Peroxide Value of oils - Titrimetric Method
- Ascorbic Acid – 2, 6- Dichloroindophenol Titrimetric Method
- Calcium -Precipitation Titrimetric Method
- Iron – Wong's Method
- Phosphorus–Colorimetric Method

UNIT –V DEMONSTRATION EXPERIMENTS(18HRS.)

- Estimation of protein content in food by Kjeldahl method
- Estimation of fat content in food by Soxhlet method
- Pigment Analysis by Paper Chromatography Techniques

REFERENCES:

1. Berwal. J.S,.GrewalR.B,.Kapoor C.M &.Garg M.R (2004).*Practical Methods in Food Analysis*. Agrotech Publishing Academy, Udaipur.
2. Horwitz W.,(2000).*Official Methods of Analysis of AOAC International*.AOAC International publishers,Rockville,Mary Land.
3. Jayaraman J. (1996), *Laboratory Manual in Biochemistry*. New Age International Ltd. New Delhi.
4. Ranganna S. **(**1986), *Hand Book of Analysis and Quality Control for fruits and Vegetable Products*. Tata Mc Graw –Hill Publishing Company Limited, New Delhi.
5. Sadasivam S. & Manickam A. **(**1991), *Biochemical Methods*. New Age International Pvt.Ltd.,New Delhi.

6. Swaminathan.G&George.M (2002). *Laboratory Chemical Methods in Food Analysis*.Margham Publications, Chennai.
7. Yeshajahu Pomeranz & Clifton E. Meloan,(2004), *Food Analysis –Theory and Practice*. CBS Publishers and Distributors, New Delhi.

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION TO LABORATORY PRACTICES (18HRS.)				
1.1	Autoclave Hot Air Oven PH Meter Electronic Weighing Balance Centrifuge Hot Plate Spectrophotometer	9	Chalk & Talk, Demonstration	Glasswares, Equipment
1.2	Water bath Muffle Furnace Viscometer IR Moisture Analyzer Colorimeter	9	Chalk & Talk, Demonstration	Glasswares, Equipment
UNIT -2 PREPARATION AND STANDARDISATION OF SOLUTION (18HRS.)				
2.1	**Preparation and Standardisation of Solution**	18	Chalk & Talk, Demonstration	Glasswares, Equipment
UNIT -3 ASHING OF FOOD (Thermogravimetric Method**) and PREPARATION OF ASH SOLUTION (18HRS.)**				
3.1	**Ashing of Food and Preparation of Ash Solution**	18	Chalk & Talk, Demonstration	Glasswares
UNIT -4 FOOD ANALYSIS EXPERIMENTS (18HRS.)				

4.1	Moisture Content – Thermogravimetric Analysis -Air Oven Method and Infrared Radiation (IR) Moisture Analyzer Method Crude Fibre – Gravimetric Method Iodine Number-Wiji's Method Acid Number of oils	9	Chalk & Talk, Demonstration	Glasswares
4.2	Peroxide Value of Oils Ascorbic Acid Calcium Iron Phosphorous	9		
UNIT -5 DEMONSTRATION EXPERIMENTS (18HRS.)				
5.1	Estimation of Protein Estimation of fat Pigment analysis	18	Chalk & Talk, Demonstration	Glasswares, Equipment

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
10	10	10	5	5	40	60	100

C1 – Internal Test - 1

C2 – Internal Test - 2

C3 – Model Practical Exam

C4 – Record

C5 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Explain the principle and instrumentation of chromatography	K2	PSO7
CO 2	Summarize the working procedure of electrophoresis	K2	PSO7
CO 3	Apply the principle, procedure and application of Photoelectric Colorimeters, Fluorimeters and Microbiological assays	K3	PSO7
CO 4	Analyze the types of Spectrophotometry its principle, procedure and application	K4	PSO7
CO 5	Explain the different types of pH isotopes, buffers and its application	K5	PSO7

Mapping of C0s with PSOs

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15
CO1	1	1	1	1	1	1	3	3	1	1	1	1	1	1	1
CO2	1	3	2	1	1	2	1	3	1	1	1	1	1	1	1
CO3	1	3	2	1	1	2	1	3	1	1	1	1	1	1	1
CO4	1	3	2	1	1	2	1	3	1	1	1	1	1	1	1
CO5	1	3	2	1	1	2	1	3	1	1	1	1	1	1	1

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	3	2	1
CO2	3	3	2	1
CO3	3	3	2	2
CO4	3	3	1	2
CO5	3	3	2	1

Note: Strongly Correlated – 3 ¨ Moderately Correlated – 2 ¨ Weakly Correlated -1

COURSE DESIGNER:

1. Dr.K.KARTHIGA
2. Mrs. J.JOSEPHINE JESINTHA

Forwarded By

100% SKILL DEVELOPMENT

I M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSNN	23PG2NE5	FOOD SAFETY AND QUALITY CONTROL	Major Elective 3	3	4

COURSE DESCRIPTION

The course provides an outline on the standards, tools and techniques to ensure safety and integrity of foods in food preparation and processing.

COURSE OBJECTIVES

- To develop approaches to identify food safety hazards in food processing.
- To apply preventive measures and control methods to minimize microbiological hazards and maintain quality of foods.
- To identify the wide variety of parameters affecting food quality.
- To develop quality control strategies.

UNITS

UNIT –I BASIC CONCEPTS OF FOOD SAFETY AND FOOD LAWS (12 Hrs.)

Food and its safety concerns, Importance of safe food, Factors affecting food safety, Threats to safety of food supply, Principles of food quality.

Food Quality management- Definition, Tenets of TQM, Benefits of TQM.

Food Laws: PFA, Essential Commodity Act, Standards of Weights and measures Act, Export Act.

Voluntary Laws: BIS, AGMARK, Consumer Protection Act, FSSAI

International Laws: Codex Alimentarius. Code India, ISO, FAO, WHO.

UNIT –II NATURAL TOXINS IN FOOD (12 Hrs.)

Toxicants in animal foods – Shellfish

Toxicants in plant foods - Favism, Gossypol, Toxic amino acids, Toxic alkaloids, Cyanogens, Lima beans, Mushroom poisoning.

Antinutritional factors – Protease inhibitors, Trypsin inhibitors, Haemagglutanins, Phytates, Tannins, Oxalates, Goitrogens

Environmental Toxins - Mercury; Polybrominated biphenyl (PBB); Polychlorinated biphenyl (PCB); Lead; Cadmium; Pesticide residues; Contaminants from plastics

. **UNIT – III FOOD ADDITIVES (12 Hrs.)**

Definition, Importance of use in foods, Classification, Types - Preservatives, antioxidants, artificial colours, Flavour enhancers, bleaching agents, nutrient additives, Thickening and stabilizing agents, anticaking, antifoaming, sequestrants sweetening agents, GRAS - Generally Recommended As Safe (GRAS).

UNIT – IV QUALITY ASSURANCE IN FOOD (12 Hrs.)

HACCP – Definition, principles, Guidelines for application of HACCP principles.

ISO 22000, Halal

UNIT – V FOOD PACKAGING (12 Hrs.)

Definition, Functions of Packaging, Classification of Packaging materials, Packaging methods, Moisture Sorption Properties of foods and selection of packaging materials,

Interaction between packaging and foods.

Nutrition labeling and nutrition claims.

REFERENCES:

1. Judith E. Brown, (2002), 3rd Ed, Nutrition Now, Wadsworth, London.
2. Pomeranz Y and Meloan CE (1996), *Food Analysis : Theory and Practice*, CBS Publishers and Distributors, New Delhi.
3. Shirley J. Van Grade, Margy Woodburn. (1999), "*Food Preservation and Safety Principles & Practice"*; Surabhi Publications.
4. Subbulakshmi.G; Shobha.A.Udipi, (2001), "*Food Processing and Preservation*", New Age International Publishers.

JOURNAL REFERENCES:

1. Journal of Food Quality Hazards Control
2. Journal of Food Safety

3. International Journal of Food Safety and Public Health

OPEN EDUCATION RESOURCES:

1. **https://old.fssai.gov.in/Portals/0/Training_Manual/Presentation%20on%20concepts%20of%20Food%20Safety%20and%20Quality%20Management%20Systems**
2. **https://www.ag.ndsu.edu/foodlaw/overview/introhaccp**
3. **https://www.sesotec.com/apac/en/resources/blog/what-is-food-safety**
4. **https://ncert.nic.in/textbook/pdf/lehe106.pdf**
5. **https://www.who.int/news-room/fact-sheets/detail/natural-toxins-in-food#:~:text=Cassava%2C%20sorghum%2C%20stone%20fruits%2C,important%20foods%20containing%20cyanogenic%20glycosides.**
6. **https://www.cfs.gov.hk/english/multimedia/multimedia_pub/multimedia_pub_fsf_11_02.html**
7. **https://www.who.int/news-room/fact-sheets/detail/food-additives**
8. **https://foodinsight.org/food-additives-and-ingredients-resources-you-can-use/**
9. **https://fssai.gov.in/upload/uploadfiles/files/Chapter1.pdf**
10. **https://fssai.gov.in/upload/uploadfiles/files/FSSAI-regulations.pdf**

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 BASIC CONCEPTS OF FOOD SAFETY AND FOOD LAWS				
1.1	Food and its safety concerns, Importance of safe food, Factors affecting food safety, Threats to safety of food supply, Principles of food quality.	3	Chalk & Talk	Black Board
1.2	Food Laws: PFA, Essential Commodity Act, Standards of Weights and measures Act, Export Act.	3	Lecture	PPT

1.3	Voluntary Laws: BIS, AGMARK, Consumer Protection Act, FSSA.	3	Lecture	PPT
1.4	International Laws: Codex Alimentarius. Code India, ISO, FAO, WHO.	3	Lecture	PPT
UNIT -2 NATURAL TOXINS IN FOOD				
2.1	Toxicants in animal foods – Shellfish.	3	Lecture	PPT
2.2	Toxicants in plant foods - Favism, Gossypol, Toxic amino acids, Toxic alkaloids, Cyanogens, Lima beans, Mushroom poisoning.	3	Lecture	PPT, Video
2.3	Antinutritional factors – Protease inhibitors, Trypsin inhibitors, Haemagglutanins, Phytates, Tannins, Oxalates, Goitrogens.	3	Lecture	PPT
2.4	Environmental Toxins - Mercury; Polybrominated biphenyl (PBB); Polychlorinated biphenyl (PCB); Lead; Cadmium;	3	Lecture	PPT

	Pesticide residues; Contaminants from plastics.			
UNIT -3 FOOD ADDITIVES				
3.1	Definition, Importance of use in foods, Classification.	3	Chalk & Talk	Black Board
3.2	Types - Preservatives, antioxidants, artificial colours, Flavour enhancers, bleaching agents, nutrient additives.	3	Lecture	PPT, Samples
3.3	Thickening and stabilizing agents, anticaking, antifoaming, sequestrants sweetening agents.	3	Lecture	PPT, Samples
3.4	GRAS - Generally Recommended As Safe (GRAS).	3	Chalk & Talk	Black Board
UNIT -4 QUALITY ASSURANCE IN FOOD				
4.1	HACCP – Definition, principles, Guidelines for application of HACCP principles. ISO 22000, Halal	6	Lecture	PPT
4.2	ISO 22000, Halal	6	Lecture	PPT
UNIT -5 FOOD PACKAGING				

5.1	Definition, Functions of Packaging, Classification of Packaging materials,	6	Lecture	PPT
5.2	Packaging methods, Moisture Sorption Properties of foods and selection of packaging materials,	6	Chalk & Talk	Black Board

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.
K2	4	4	-	-	-	8	-	8
K3	2	2	-	5	-	9	-	9
K4	2	2	-	-	5	9	-	9
K5	2	2	5	-	-	9	-	9
Non Scholastic	-	-	-	-	-		5	5
Total	10	10	5	5	5	35	5	40

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

- **All the course outcomes are to be assessed in the various CIA components.**
- **The levels of CIA Assessment based on Revised Bloom's Taxonomy for PG are :**

  K2-Understand**,** **K3-**Apply**,** **K4-**Analyse, **K5-**Evaluate

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

C1 – Internal Test-1

C2 – Internal Test-2

C3 - Seminar

C4 – Assignment

C5 - OBT/PPT

C6 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Outline the concept of food safety and food laws.	K2	PSO13
CO 2	Explain the toxicants in animal and plant foods.	K2	PSO13
CO 3	Identify food additives	K3	PSO13
CO 4	Examine the various quality assurance systems in food industries.	K4	PSO13
CO 5	Determine the functions, methods and properties of packaging and its materials.	K5	PSO13

Mapping of C0s with PSOs

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15
CO1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1
CO2	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1
CO3	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1
CO4	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1
CO5	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	2	1	1	1
CO2	2	1	1	1
CO3	1	2	1	1
CO4	1	2	1	1
CO5	2	1	1	1
CO6	11	11	2	1

Note: Strongly Correlated – 3 ¨ Moderately Correlated – 2 ¨ Weakly Correlated -1

COURSE DESIGNER:
1. Mrs.P.MagdaleneVirjini

Forwarded By

(Dr.S. Santhi)

100% EMPLOYABILITY

I M.Sc.,HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSNN	23PG2NE6	Performance Nutrition	Elective	4	3

COURSE DESCRIPTION

The course explains the medical nutrition therapy for sports personnel, common diseases, and special conditions like sports related disease conditions.

COURSE OBJECTIVES

- To identify and describe the nutritional needs of normal & sports personnel.
- To identify and describe various sports related disease conditions.
- To gain knowledge on appropriate medical nutritional therapy for sports injury, sports anaemia, dehydration, gut disorders & allergies.
- To develop the attitude and capacity for taking up sport nutrition counselling as a profession.

Units

Unit-I Introduction to Health & Exercise:

Concept of health, Wellness, Wellbeing . Specific fitness and health status. Physical Activities & Fitness: Concept to Fitness, Exercise -Definition, components of fitness, energy system – aerobic & anaerobic, nutritional demands of sports and dietary recommendations – objectives, nutritional requirements, dietary guidelines-

Unit-II Holistic approach to the management of fitness and health:

Energy input and output. Diet and Exercise Effect of specific nutrients on work performance and physical fitness. Nutrition, exercise, Physical fitness and health – inter-relationship.

Unit III Nutrition in Sports:

Sports specific requirement, Diet manipulation - Pre-game and post game meals. Assessment of different nutragenic aids and commercial supplements. Diets for persons with high energy requirements, stress, fracture and injury.

Unit IV Medical nutrition therapy (MNT):

MNT for athletes with Nutrition related disorders; Diabetes and Cardiovascular disease: Physiological effect of exercise; Physical activity. Effects of long-term physical activity; Acute effects of exercise; Dietary guidelines and Nutrient timing; type of carbohydrate and timing; Pre and post event carbohydrate loading and fluids; Osteoporosis: Causes and consequences; Physiological effects of exercise; Sports Anaemia: Causes and consequences; .Physiological effects of exercise

Unit V Sports Nutritional Therapy for Gut disorders:

Athletes with gastrointestinal disorders: food allergies and food intolerance; GI disturbance; Excessive flatulence; Abdominal distention; Intermittent diarrhoea; Constipation; Food related adverse reactions (FRAR). Fluid intake- Water and electrolyte balance, losses and their replenishments during exercise and sports events, dehydration and its effects.

References:

1.Fitness and Wellness" : Warner W. K Hoeger and Sharvon A. Hoegor.
2."Fitness & Wellness concepts": Charles B. Corbina & Ruth Lindsey.
3. "Lifetime Fitness & Wellness - A personal choice": Melvin H. Williams
4. Oxford Textbook of Public Health, Helen Liepman. ·Sunderlal, Aadarsh, Pankaj, 2007.
5.Textbook of Community Medicine, CBS Publishers & Distributors. · Kirch, Wilhelm, 2008.
6.Encyclopedia of Public Health, Volume 1 & 2, Kluwer Academic Publishers.
7. Mary -Jane Schneider and Henrey Schneider, 2006 (2nd edition), Introduction to Public Health, Jones and Bartlett Publishers.
8.Kathleen Mahan. L. Sylvia Escott-Stump, Janice L Raymond& Krause (2011) .*Food & Nutrition Therapy,* (13th ed), Elsevier Publications.
9.Robinson CH.(1994) . *Normal & Therapeutic Nutrition* XVIII Edition, Macmillan Publishers Company, New York.
10.Srilakshmi.B (1995). *Dietetics,* New Age International Private Ltd., New Delhi.
11.Sue Rodwell Williams. (2001). *Basic Nutrition and Diet therapy*, Mosby publications.

JOURNAL REFERENCES:

1. Food and Nutrition Bulletin United Nations University Press, Japan.
2. Journal of American Dietetic Association, The American Dietetic Association, Mount Marris, Illinois, 61054, USA.
3. Nutrition Abstracts and Reviews, CBB International, UK.
4. Nutrition Reviews, Nutrition Foundation, Washington, DC..
5. The Indian Journal of Medical Research, The Indian Council of Medical Research, New Delhi.

WEB REFERENCES:

1. www.faseb.org/asns
2. www.nutritionfoundation in org
3. www.lifelines.com/ntnlnk.html
4. www.diabetes.org
5. www.americanheart.org
6. www.cancer.org
7. www.pugmarks.cons/aims
8. www.eatright.org/
9. www.sea&airtravelnutrition.org

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
5	10	15	5	5	40	60	100

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Concept of health and wellness Physical activity and fitness	K2	PSO 1
CO 2	AnalyzeEnergy input and output. Physical fitness and health – inter-relationship.	K2, K3	PSO 1
CO 3	Summarize the concepts of Nutrition in sports	K2, K4	PSO 1 & PSO 2
CO 4	Build knowledge on Medical Nutrition Therapy	K2	PSO 3 & PSO 4
CO 5	Identify the sports nutrition therapy for gut disorders	K3& K5	PSO 2

Mapping of C0s with PSOs

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15
CO1	**3**		**3**	**3**											
CO2	**2**		**3**	**3**		**2**									
CO3	**3**	2	**2**	**2**		2									
CO4	**2**		**3**	**3**		**2**									
CO5	**2**	2	**3**	**3**		**2**									

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3		2
CO2	3	2	2		
CO3	3	3			
CO4	3	3			2
CO5	3	2			

Note: Strongly Correlated – 3 ¨ Moderately Correlated – 2
¨ Weakly Correlated -1

COURSE DESIGNERS:

Ms.P. Magdalene Virjini

Forwarded By

(Dr.S.Santhi)

100% SKILL DEVELOPMENT

I M.Sc., HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSNN	23PG2NE7	Food Microbiology	Major Core	4	3

COURSE DESCRIPTION

The course outlines the role of micro-organism in food spoilage, preservation and processing.

COURSE OBJECTIVES

- To gain knowledge of role of micro-organisms in humans and environment
- To understand the importance of micro-organisms in food spoilage and to learn advanced, techniques used in food preservation.
- To understand the latest procedures adopted in various food operations to prevent food-borne disorders and legal aspects involved in these areas.

UNITS

UNIT –I FOOD AND MICROORGANISMS (18 HRS.)

Food Microbiology – Definition, Basic concept, History of Food Microbiology

Food as substrate for microorganisms – Hydrogen ion concentration, Water activity, Oxidation-Reduction potential, Nutrient content.

Microorganisms important in Food – Industrial importance of Mold, Yeast and Bacteria.

UNIT –II FOOD BORNE INFECTIONS (18 HRS.)

Classification of Food borne diseases

Food infection – Definition, Classification, Types – Salmonellosis, *Clostridium perfringes* Gastroenteritis, *Bacillus cereus* Gastroenteritis, E.coli infection, Shigellosis

UNIT–III FOOD BORNE INTOXICATION (18 HRS.)

Food Intoxication – Bacterial food intoxication – Botulism, Staphyloccocal gastroenteritis, Mycotoxins – Definition, Types – Ochratoxin, Aflatoxin, Patulin.

Identification and Enumeration of Microbes in food – Preparation and Distribution of Culture Media, Inoculation of Culture media, Examination of Organisms, Plating techniques.

UNIT–IV CONTAMINATION, SPOILAGE AND PRESERVATION OF FOODS

(18 HRS.)

Contamination, Spoilage and Preservation - Cereals, Vegetables, Fruits, Meat, Fish, Egg, Poultry, Milk and its products, Canned foods.

General Principles of Food Preservation; Methods of Food Preservation- Asepsis, Removal of microorganisms, Maintenance of anaerobic conditions, Use of high temperature, Use of low temperature, Use of chemicals, Drying, Use of Radiation, Non thermal methods – Ohmic heating, High Pressure Processing, Cold Plasma Processing, Pulsed electric field.

UNIT –V WATER MICROBIOLOGY (18 HRS.)

Microbial analysis of water- Sanitary tests for coliforms, MPN of coliforms

Water borne diseases – Definition – common microorganism involved in water borne diseases.

Typhoid - Causes- incubation period – clinical symptoms – mode of transmission – prevention and control.

Diarrhoea- Causes- incubation period – clinical symptoms – mode of transmission- prevention and control.

Cholera – Causes- incubation period – clinical symptoms – mode of transmission- prevention and control.

REFERENCES:

1. Adams M.R.andM.O.Moss (2005), *Food Microbiology*, New Age International (P) Ltd., Publishers, New Delhi.
2. FrazierW.C, (2000), *Food Microbiology*, New Age International (P) Ltd., Publishers, New Delhi.
3. George J.Banwart (2004), *Basic Food Microbiology*, S.K.Jain for CBS Publishers and Distributors, New Delhi.

4. James.M.Jay, (1996), *Modern Food Microbiology*, S.K.Jain for CBS Publishers and Distributors ,4596/1A,11 Darya Ganj,New Delhi- 110 002,.
5. Pelczar.J, Jr.E.C.S.Chan, Noel R.Kieg, (1993), 5th edition *Microbiology*, Tata McGraw Hill Publishing Co., New Delhi,.
6. Rao A.S., (1998), *Introduction to Microbiology*, Asoke K, Ghosh, Pentice-Hall of India Pvt., New Delhi-110 001,
7. Sharma.P.D, (1996), *Microbiology*, Rakesh Kumar Rastogi for rastogi Publications "Gangotri" Shivaji road, Meerut.

JOURNAL REFERENCES:

1. International Journal of Food Microbiology.
2. Frontiers in Microbiology.
3. Annals of Microbiology.
4. Indian Journal of Microbiology.
5. Applied Microbiology and Biotechnology.

OPEN EDUCATION RESOURCES

1. https://mediahub.unl.edu/media/9239#:~:text=This%20lecture%20provides%20an%20overview,affect%20bacterial%20growth%20and%20survival.
2. https://www.researchgate.net/publication/285514362_Basic_Food_Microbiology
3. https://www.frontiersin.org/articles/10.3389/fmicb.2020.00237/full4
4. https://courses.lumenlearning.com/boundless-microbiology/chapter/food-preservation/#:~:text=Preservation%20usually%20involves%20preventing%20the,or%20otherwise%20reduce%20food%20spoilage.
5. https://food.unl.edu/food-poisoning-foodborne-illness

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 FOOD AND MICROORGANISMS				
1.1	Food Microbiology – Definition, Basic concept	2	Chalk & Talk	Black Board

1.2	History of Food Microbiology	4	Lecture	PPT
1.3	Food as substrate for microorganisms – Hydrogen ion concentration, Water activity, Oxidation-Reduction potential, Nutrient content	4	Lecture	PPT
1.4	Industrial importance of Mold, Yeast	5	Lecture	Videos
1.5	Industrial importance of bacteria	3	Chalk & Talk	Black Board
UNIT -2 FOOD BORNE INFECTIONS				
2.1	Classification of Food borne diseases Food infection – Definition, types	4	Chalk & Talk	Black Board
2.2	Salmonellosis, Clostridium Perfringes	5	Chalk & Talk	Black Board
2.3	Gastroenteritis, Bacillus cereus gastroenteritis	5	Lecture	PPT
2.4	E.coli infection, Shigellosis	4	Lecture	PPT
UNIT -3 FOOD BORNE INTOXICATIONS				
3.1	Food Intoxication – Bacterial food intoxication – Botulism,	4	Lecture	PPT

	Staphyloccocal gastroenteritis,			
3.2	Mycotoxins – Definition, Types – Ochratoxin, Aflatoxin, Patulin.	4	Lecture	PPT
3.3	Identification and Enumeration of Microbes in food – Preparation and Distribution of Culture Media, Inoculation of Culture media	5	Lecture cum demonstration	Hands on training
3.4	Examination of Organisms, Plating techniques.	5	Lecture cum demonstration	Hands on training
UNIT -4 CONTAMINATION, SPOILAGE AND PRESERVATION OF FOODS				
4.1	Contamination, Spoilage and Preservation - Cereals, Vegetables, Fruits	3	Lecture	PPT
4.2	Contamination, Spoilage & Preservation - Meat, Fish	2	Lecture	PPT
4.3	Contamination, Spoilage & Preservation - Egg, Poultry	3	Lecture	PPT
4.4	Contamination, Spoilage & Preservation - Milk and its products, Canned foods	2	Lecture	Smart Board

4.5	General Principles of Food Preservation; Methods of Food Preservation- Asepsis, Removal of microorganisms, Maintenance of anaerobic conditions	2	Lecture	Videos
4.6	Use of high temperature, Use of low temperature, Use of chemicals, Drying, Use of Radiation	3	Lecture	Videos
4.7	Non thermal methods – Ohmic heating, High Pressure Processing, Cold Plasma Processing, Pulsed electric field	3	Chalk & Talk	Black Board
UNIT -5 WATER MICROBIOLOGY				
5.1	Microbial analysis of water- Sanitary tests for coliforms, MPN of coliforms	4	Chalk & Talk	Black Board
5.2	Water borne diseases – Definition – common microorganism involved in water borne diseases	3	Lecture	PPT
5.3	Typhoid - Causes- incubation period –	4	Chalk & Talk	Black Board

	clinical symptoms – mode of transmission – prevention and control			
5.4	Diarrhoea- Causes- incubation period – clinical symptoms – mode of transmission- prevention and control	4	Discussion	Videos
5.5	Cholera – Causes- incubation period – clinical symptoms – mode of transmission- prevention and control	3	Lecture	PPT

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	4	4	-	-	-	8	-	8	20 %
K3	2	2	-	5	-	9	-	9	22.5 %
K4	2	2	-	-	5	9	-	9	22.5 %

K5	**2**	**2**	**5**	**-**	**-**	**9**	**-**	**9**	22.5 %
Non Scholastic	**-**	**-**	**-**	**-**	**-**		**5**	**5**	12.5 %
Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
Total	**40**

- ✔ **All the course outcomes are to be assessed in the various CIA components.**
- ✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy for I PG are :**

K2-Understand, **K3**-Apply, **K4**-Analyse, **K5**- Evaluate

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

C1 – Internal Test-1

C2 – Internal Test-2

C3 - Seminar

C4 – Assignment

C5 - OBT/PPT

C6 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Discuss the basic concepts of food microbiology	K2	PSO11
CO 2	Describe food borne infections	K2	PSO11
CO 3	Identify food borne intoxications	K3	PSO11
CO 4	Analyze the contamination, spoilage and food preservation of foods	K4	PSO11
CO 5	Assess the water quality and explain water borne diseases	K5	PSO11

Mapping of COs with PSOs

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15
CO1	1	1	1	1	1	1	1	1	1	1	3	1	2	1	1
CO2	1	1	1	1	1	1	1	1	1	1	3	1	2	1	2
CO3	1	1	1	1	1	1	1	1	1	1	3	1	2	1	1
CO4	1	1	1	1	1	1	1	1	1	1	3	1	2	1	2
CO5	1	1	1	1	1	1	1	1	1	1	3	1	2	1	1

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	2	1
CO2	3	2	2	2
CO3	1	1	1	1
CO4	3	2	1	3
CO5	2	2	2	3

Note: Strongly Correlated – 3 ¨ Moderately Correlated – 2 ¨ Weakly Correlated -1

COURSE DESIGNER:

1. Mrs. C.Helen

Forwarded By

(Dr.S. Santhi)

I M.Sc.,HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSNN	23PG2NE8	Nutritional Assessment and Surveillance	Elective	4	3

COURSE DESCRIPTION

The course provides an overview of nutritional surveillance and assessment methods, emphasizing the importance of accurate data collection and analysis in public health nutrition

COURSE OBJECTIVES

1.Understand the principles of nutritional surveillance and assessment.
2. Learn methods for collecting and analyzing nutritional data.
3. Apply nutritional assessment techniques to real-world scenarios.
4. Interpret and communicate nutritional surveillance data effectively.

UNITS

Unit 1: Introduction to Nutritional Surveillance and Assessment:

Definition and importance of nutritional surveillance and assessment, Historical development of nutritional surveillance and assessment, Key concepts and terminology.

Unit 2: Methods of Nutritional Surveillance:

Types of nutritional surveillance systems, Data collection methods (e.g., dietary surveys, anthropometric measurements), Data analysis and interpretation techniques.

Unit 3: Nutritional Assessment Techniques:

Dietary assessment methods (e.g., 24-hour recall, food frequency questionnaire), Anthropometric assessment techniques (e.g., height, weight, body mass index), Biochemical assessment methods (e.g., blood tests, urine analysis).

Unit 4: Application of Nutritional Surveillance and Assessment:

Case studies of nutritional surveillance and assessment in different settings (e.g., community, hospital, school), Designing and implementing nutritional surveillance systems, Challenges and limitations of nutritional surveillance and assessment.

Unit 5: Communication and Reporting of Nutritional Surveillance Data:

Effective communication of nutritional surveillance data to different audiences (e.g., policymakers, healthcare professionals, community leaders), Reporting and presenting nutritional surveillance data, Using nutritional surveillance data for policy and program development.

BOOK REFERENCES:

1. Gibson, R. S. (2005). Principles of Nutritional Assessment. Oxford University Press.
2. Coates, J., & Fiedler, J. L. (2018). The Role of Food and Nutrition in the Prevention of Chronic Diseases. Academic Press.
3. Mahan, L. K., & Escott-Stump, S. (2019). Krause's Food and the Nutrition Care Process. Elsevier.
4. Semba, R. D., & Bloem, M. W. (2018). Nutrition and Health in Developing Countries. Springer.
5. Webb, P., & Rogers, B. L. (2003). Addressing Malnutrition Multisectorally: What Have We Learned? International Food Policy Research Institute.

Open Educational Resources:

1. https://www.sciencedirect.com/topics/medicine-and-dentistry/nutrition-surveillance
2. https://pmc.ncbi.nlm.nih.gov/articles/PMC4797352/
3. https://www.revistanutricion.org/articles/interpreting-nutrition-through-assessment-techniques-105957.html
4. https://egyankosh.ac.in/bitstream/123456789/33460/1/Unit-9.pdf

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 Introduction to Nutritional Surveillance and Assessment				
1.1	Definition of nutritional surveillance and assessment	4	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Videos
1.2	importance of nutritional surveillance and assessment	2	Chalk & Talk, Lecture, Seminar	Black/white Board,PPT,Videos
1.3	Historical development of nutritional surveillance and assessment	3	Lecture, Discussion	PPT & White board,Videos
1.4	Key concepts and terminology.	2	Lecture	Black/white Board
UNIT -2 Methods of Nutritional Surveillance				
2.1	Types of nutritional surveillance systems,	3	Lecture, Group Discussion	PPT & White board

2.2	, Data collection methods (e.g., dietary surveys	3	Chalk & Talk, Lecture, Demo	Black/white Board, PPT
2.3	Data analysis	3	Chalk & Talk, Lecture, seminar	Black/white Board, PPT
2.4	interpretation techniques.	3	Lecture	Black/White board
2.5	anthropometric measurements	3	Chalk & Talk, Lecture, seminar	Black/white Board, PPT
UNIT-3 Nutritional Assessment Techniques				
3.1	Dietary assessment methods (e.g., 24-hour recall, food frequency questionnaire),	3	Lecture, Group Discussion	PPT & White board
3.2	Dietary assessment methods (e.g., food frequency questionnaire),	3	Chalk & Talk, Lecture, seminar	Black/white Board, PPT
3.3	Anthropometric assessment techniques (e.g., height, weight, body mass index),	3	Chalk & Talk, Lecture, Seminar	Black Board, PPT, Videos
3.4	Biochemical assessment	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Videos

	methods (e.g., blood tests			
3.5	, Biochemical assessment methods (e.g., blood tests urine analysis).	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Videos
UNIT – 4 Application of Nutritional Surveillance and Assessment ..				
4.1	Case studies of nutritional surveillance and assessment in different settings (e.g., community,	3	Lecture, Seminar	Black Board,PPT
4.2	Case studies of nutritional surveillance and assessment in different settings hospital, school	3	Lecture, Seminar	Black Board,PPT
4.3	Designing and implementing nutritional surveillance systems,	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Video
4.4	Challenges and limitations of nutritional	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT,Video

	surveillance and assessment			
UNIT – 5 Communication and Reporting of Nutritional Surveillance Data				
5.1	Effective communication of nutritional surveillance data to different audiences (e.g., policymakers,	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT
5.2	Effective communication of nutritional surveillance data to different audiences (healthcare professionals, community leaders),	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT
5.3	Reporting and presenting nutritional surveillance data,	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT
5.4	Using nutritional surveillance data for policy and program development	3	Chalk & Talk, Lecture, Seminar	Black Board,PPT

CIA	
Scholastic	**23**
Non Scholastic	**2**
	25

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
15		3	5	2	25	75	100

PG CIA Components

			Nos		
C1	-	Test (CIA 1)	1**	-	15 Mks
C2	-	Test (CIA 2)	1**	-	15 Mks
C3	-	Assignment	1	-	3 Mks
C4	-	Seminar	2 *	-	5 Mks
C5	-	Attendance		-	2 Mks

***** Average of C1 and C2 will be taken.***
****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Analyze and assess the importance of nutritonal surveillance and assessment,	K2	PSO1, PSO2,PSO3,PSO8 & PSO12
CO 2	Comprehend the types of nutritional surveillance systems,	K2	PSO1, PSO2,PSO3,PSO8 &PSO12
CO 3	Emphasize the role of nutritional assessment techniques	K3	PSO1,PSO2, PSO3,PSO8 & PSO12
CO 4	Retrieving theapplication of nutritional surveillance and assessment.	K4	PSO1,PSO2, PSO3,PSO8 & PSO12
CO 5	Apply the effective communication of nutritional surveillance data	K5	PSO1,PSO2, PSO3,PSO8 & PSO12

Mapping of C0s with PSOs

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15
CO1	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1
CO2	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1
CO3	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1
CO4	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1
CO5	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	2	2	1	1
CO2	2	2	1	1
CO3	2	2	1	1
CO4	2	2	1	1
CO5	2	2	1	1

Note: Strongly Correlated – 3 ¨ Moderately Correlated – 2 ¨

Weakly Correlated -1

COURSE DESIGNER:

Ms.J.Josephine Jesintha

100% EMPLOYABILITY

I M.Sc., HUMAN NUTRITION AND NUTRACEUTICALS

SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSNN	23PG2NSE1	FOOD PRESERVATION	Skill Enhancement Course EDC	4	2

COURSE DESCRIPTION

The course outlines the importance of food preservation, different methods of food preservation.

COURSE OBJECTIVES

- Describe the basic concepts and principles of Food Preservation
- Identify the best methods of storage of different foods based on their shelf life. Recommend appropriate postharvest technology procedures that increase shelf life of food
- Analyze the use of low and high temperature to preserve food and identify the appropriate method to preserve different foods
- Discuss the use and effects of different preservatives on the quality of foods
- Appreciate the use of modern technology in food preservation and managing food wastage.

UNITS

UNIT –I INTRODUCTION TO FOOD PRESERVATION (12 HRS.)

Concept, the importance of food preservation., Common terms used in food preservation.Different methods and Principles of preservation.

UNIT –II PRESERVATION BY LOW TEMPERATURE (12 HRS.)

Use of Cold and Refrigerated Storage,Use of Freezing temperatures: Slow and fast freezing of foods and Cryogenic freezing of foods, dehydro freezing,Frozen storage and thawing of foods

UNIT–III PRESERVATION BY HIGH TEMPERATURE (12 HRS.)

Preservation of foods by high temperatures. Blanching, Pasteurization and Sterilization of foods. General process of caning of foods

UNIT–IV PRESERVATION BY DRYING (12 HRS.)

Principles and application of drying and dehydration of foods Different types of drying and dryers.

UNIT–V PRESERVATION BY CHEMICALS (12 HRS.)

Introduction, Classification and use of preservatives

TEXTBOOK:

1. Dearosier. N.N(1975). *The Technology of Food Preservation.*

REFERENCE BOOKS:

1. Lai G. Sideleappa G.B. (1987), *Preservation of Fruits and Vegetables* ICAR, New Delhi.
2. Parvinder S. Bali (2009). *Food Production Operations*, Oxford University Press, New Delhi.
3. Srilakshmi. B, (2008), *Food science,* New age international publishers.
4. Sudesh Jood&Neelani (2002) *Food Preservation.*
5. Thangam E. Philip, (1981). *Modern Cookery*, Vol I, Orient Longman, Mumbai.

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT 1 – INTRODUCTION TO FOOD PRESERVATION				
1.1	Concept, the importance of food preservation.,	4	Chalk & Talk	Black Board
1.2	Common terms used in food preservation.	4	Chalk & Talk	LCD

1.3	Different methods and Principles of preservation.	4	Lecture	PPT & White board
UNIT -2 PRESERVATION BY LOW TEMPERATURE				
2.1	Use of Cold and Refrigerated Storage	1	Lecture	LCD
2.2	Use of Freezing temperatures: Slow and fast freezing of Use of Freezing temperatures	4	Chalk & Talk	LCD
2.3	Slow and fast freezing	3	Lecture	PPT & White board
2.4	Use of Cold	2	Discussion	PPT
2.5	Refrigerated Storage	2	Lecture	Black board
UNIT -3 PRESERVATION BY HIGH TEMPERATURE				
3.1	Preservation of foods by high temperatures	3	Lecture	Black board
3.2	Blanching	3	Lecture	LCD
3.3	Pasteurization	3	Chalk & Talk	LCD
3.4	Sterilization	3	Lecture	PPT & White board
3.5	General process of caning of foods	3	Lecture	PPT & White board
UNIT -4 PRESERVATION BY DRYING				
4.1	Principles and application of drying	3	Lecture	LCD

4.2	Dehydration of foods	3	Chalk & Talk	LCD
4.3	Different types of drying	3	Lecture	PPT & White board
4.4	Dryers	3	Lecture	PPT & White board
	UNIT -5 PRESERVATION BY CHEMICALS			
5.1	Introduction	4	Lecture	LCD
5.2	Classification	4	Chalk & Talk	LCD
5.3	Use of preservatives	4	Lecture	PPT & White board

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.
K2	**4**	**4**	**-**	**-**	**-**	**8**	-	**8**
K3	**2**	**2**	**-**	**5**	**-**	**9**	-	**9**
K4	**2**	**2**	**-**	**-**	**5**	**9**	-	**9**
K5	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**
Non Scholastic	**-**	**-**	**-**	**-**	-		**5**	**5**
Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**

CIA	
Scholastic	**35**
Non Scholastic	**5**
	40

- ✔ **All the course outcomes are to be assessed in the various CIA components.**
- ✔ **The levels of CIA Assessment based on Revised Bloom's**

K2-Understand**,** **K3**-Apply**,** **K4**-Analyze, **K5**- Evaluate

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS	
C1	C2	C3	C4	C5	C6	CIA	ESE
10	10	5	5	5	5	40	60

C1 – Internal Test-1

C2 – Internal Test-2

C3 - Seminar

C4 – Assignment

C5 - OBT/PPT

C6 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Describe the basic concepts and principles of Food Preservation	K2	PSO1, PSO2,PSO3,PSO8 & PSO12
CO 2	Identify the best methods of storage of different foods based on their shelf life. Recommend appropriate postharvest technology procedures that increase shelf life of food	K2	PSO1, PSO2,PSO3,PSO8 &PSO12
CO 3	Analyze the use of low and high temperature to preserve food and identify the appropriate method to preserve different foods	K3	PSO1,PSO2, PSO3,PSO8 & PSO12
CO 4	Discuss the use and effects of different preservatives on the quality of foods	K4	PSO1,PSO2, PSO3,PSO8 & PSO12

CO 5	Appreciate the use of modern technology in food preservation and managing food wastage.	K5	PSO1,PSO2, PSO3,PSO8 & PSO12

Mapping of C0s with PSOs

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12	PSO 13	PSO 14	PSO 15
CO1	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1
CO2	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1
CO3	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1
CO4	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1
CO5	3	3	3	1	1	1	1	3	1	1	1	3	1	1	1

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	2	2	1	1	1
CO2	2	2	1	1	1
CO3	2	2	1	1	1
CO4	2	2	1	1	1
CO5	2	2	1	1	1

Note: Strongly Correlated – 3 ¨ Moderately Correlated – 2 ¨ Weakly Correlated -1

COURSE DESIGNER:
1. Dr. C.HELEN

Forwarded By

(Dr.S.Santhi)