



V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

(Belonging to Virudhunagar Hindu Nadars)

An Autonomous Institution Affiliated to Madurai Kamaraj University, Madurai

Reaccredited with 'A++' Grade (4th Cycle) by NAAC

VIRUDHUNAGAR

Quality Education with Wisdom and Values

OUTCOME BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM REGULATIONS AND SYLLABUS (with effect from Academic Year 2025 - 2026)

V.V.Vanniaperumal College for Women, Virudhunagar, established in 1962, offers 13 UG Programmes (Aided), 13 UG Programmes (SF), 13 PG Programmes and 6 Ph.D. Programmes. The curricula for all these Programmes, except Ph.D. Programmes, have been framed as per the guidelines given by the University Grants Commission (UGC) & Tamil Nadu State Council for Higher Education (TANSCH) under Choice Based Credit System (CBCS) and the guidelines for Outcome Based Education (OBE).

The Departments of Commerce, English, History, Mathematics, Biochemistry and Tamil upgraded as Research Centres offer Ph.D. Programmes as per the norms and regulations of Madurai Kamaraj University, Madurai and do not come under the purview of CBCS.

A. CHOICE BASED CREDIT SYSTEM (CBCS)

The CBCS provides an opportunity for the students to choose Courses from the prescribed Courses. The CBCS is followed as per the guidelines formulated by the UGC. The performance of students is evaluated based on the uniform grading system. Computation of the Cumulative Grade Point Average (CGPA) is made to ensure uniformity in evaluation system.

List of Programmes in which CBCS/Elective Course System is implemented

UG PROGRAMMES

Arts & Humanities	:	History (E.M. & T.M.), English, Tamil
Physical & Life Sciences	:	Mathematics, Zoology, Chemistry, Physics, Biochemistry, Home Science - Nutrition and Dietetics, Costume Design and Fashion, Microbiology, Biotechnology, Computer Science, Information Technology, Data Science, Computer Applications and Computer Applications - Graphic Design
Commerce & Management	:	Commerce, Commerce (Computer Applications), Commerce (Professional Accounting), Business Administration

PG PROGRAMMES

Arts & Humanities	:	History, English, Tamil
Physical & Life Sciences	:	Mathematics, Physics, Chemistry, Biochemistry, Home Science - Nutrition and Dietetics, Biotechnology, Computer Science and Computer Applications (MCA) *
Commerce & Management	:	Commerce, Business Administration (MBA) *

* AICTE approved Programmes

OUTLINE OF CHOICE BASED CREDIT SYSTEM – UG

1. Core Courses
2. Elective Courses
 - Generic Elective Courses
 - Discipline Specific Elective Courses (DSEC)
 - Non Major Elective Courses (NMEC)
3. Skill Enhancement Courses (SEC)
4. Environmental Studies (EVS)
5. Value Education
6. Self-Study Courses (Online)
7. Extra Credit Courses (Self Study Courses) (Optional)

List of Non Major Elective Courses (NME)
(2024-2025 onwards)

UG PROGRAMMES

Name of the Course	Course Code	Semester	Department	
			Offered by	Offered for
Introduction to Tourism	24UHIN11	I	History (E.M)	Students other than B.A.
Indian Constitution	24UHIN21	II		
சுற்றுலா ஓர் அறிமுகம்	24UHIN11	I	History (T.M)	History Discipline
இந்திய அரசியலமைப்பு	24UHIN21	II		
Popular Literature and Culture	24UENN11	I	English	Students other than B.A. English Discipline
Philosophy for Literature	24UENN21	II		
அடிப்படைத் தமிழ் இலக்கணம் - I எழுத்தறிதல்	24UBTN11	I	Tamil	Students who have chosen Part I Hindi
அடிப்படைத்தமிழ் -II மொழித் திறனறிதல்	24UBTN21	II		
பேச்சுக்கலைத்திறன்	24UTAN11	I	Tamil	Students other than B.A. Tamil Discipline
பயன்முறைத் தமிழ்		II		

Basic Hindi - I	24UBHN11	I	Hindi	All Discipline students
Basic Hindi - II	24UBHN21	II		
Everyday Banking/ Practical Banking	24UCON11N/ 24UCON11	I	Commerce (Aided)	Students other than Commerce Discipline
Basic Accounting Principles	24UCON21	II		
Everyday Banking	24UCON11N	I	Commerce (Self)	
Emotional Intelligence	24UCON21N	II		
Everyday Banking/Self- Employment and Startup Business	24UCON11N/	I	Commerce C.A.(Self)	
Fundamentals of Marketing	24UCCN21	II		
Everyday Banking/ Practical Banking	24UCPN11N/ 24UCPN12N	I	Commerce	
Basic Accounting Principles	24UCPN21N	II	Professional Accounting	
Basics of Event Management	24UBAN11	I	Business Administration	Students other than B.B.A. Discipline
Managerial Skill Development	24UBAN21	II		
Quantitative Aptitude -I	24UMTN11	I	Mathematics	Students other than B.Sc. Mathematics Discipline
Quantitative Aptitude – II	24UMTN21	II		
Physics for EveryDay Life	24UPHN11	I	Physics	Students other than B.Sc. Physics Discipline
Astrophysics	24UPHN21	II		
Food Chemistry	24UCHN11	I	Chemistry	Students other than B.Sc. Chemistry Discipline
Dairy Chemistry	24UCHN21	II		
Ornamental fish farming and Management	24UZYN11	I	Zoology	Students other than B.Sc. Zoology Discipline
Biocomposting for Entrepreneurship	24UZYN21	II		
Foundations of Baking and Confectionery	24UHSN11	I	Home Science – Nutrition and Dietetics	Students other than B.Sc. Home Science – Nutrition and Dietetics Discipline
Women’s Health and Wellness	24UHSN21	II		
Nutrition and Health	24UBCN11	I	Biochemistry	Students other than B.Sc. Biochemistry Discipline
Life Style Diseases	24UBCN21	II		

Social and Preventive Medicine	24UMBN11	I	Microbiology	Students other than B.Sc. Microbiology Discipline
Nutrition and Health Hygiene	24UMBN21	II		
Herbal Medicine	24UBON11	I	Biotechnology	Students other than B.Sc. Biotechnology Discipline
Organic Farming and Health Management	24UBON21	II		
Basics of Fashion	24UCFN11	I	Costume Design And Fashion	Students other than B.Sc. Costume Design And Fashion
Interior Designing	24UCFN21	II		
Introduction to HTML	24UCSN11N	I	Computer Science	Students other than Computer Science Discipline
Office Automation	24UCSN21N	II		
Basics of Internet	24UITN11N	I	Information Technology	
Data Analysis using Spreadsheet	24UITN21N	II		
Fundamentals of Information Technology	24UDSN11	I	Data Science	
Computer Fundamentals	24UDSN21	II		
Web Designing	24UCAN11N	I	B.C.A.	
Fundamentals of Computers	24UCAN21N	II		
Organic Farming	24UBYN11	I	Botany	All Discipline students
Nursery and Landscaping	24UBYN12	I		
Mushroom Cultivation	24UBYN21	II	Botany	
Medicinal Botany	24UBYN22	II		
Library and Information Science - I	24ULSN11	I	Library Science	All Discipline students
Library and Information Science - II	24ULSN21	II		
Cadet Corps for Career Development I	24UNCN11	I	National Cadet Corps	students who have chosen NCC as Part V course
Cadet Corps for Career Development II	24UNCN21	II		

B. OUTCOME BASED EDUCATION (OBE) FRAMEWORK

The core philosophy of Outcome Based Education rests in employing a student - centric learning approach to measure the performance of students based on a set of pre-determined outcomes. The significant advantage of OBE is that it enables a revamp of the curriculum based on the learning outcomes, upgrade of academic resources, quality enhancement in research and integration of technology in the teaching –learning process. It also helps in bringing clarity among students as to what is expected of them after completion of the Programme in general and the Course in particular. The OBE directs the teachers to channelize their teaching

methodologies and evaluation strategies to attain the PEOs and fulfill the Vision and Mission of the Institution.

Vision of the Institution

The founding vision of the Institution is to impart Quality Education to the rural womenfolk and to empower them with knowledge and leadership quality.

Mission of the Institution

The mission of the Institution is to impart liberal education committed to quality and excellence. Its quest is to mould learners into globally competent individuals instilling in them life-oriented skills, personal integrity, leadership qualities and service mindedness.

B.1 Programme Educational Objectives, Programme Outcomes and Programme Specific Outcomes

It is imperative for the institution to set the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Course Outcomes (COs), consistent with its Vision and Mission statements. The PEOs and the POs should be driven by the mission of the institution and should provide distinctive paths to achieve the stated goals. The PEOs for each Programme have to fulfill the Vision and Mission of the Department offering the Programme.

Vision of the Department of Home Science

To develop scientific, technical, research and entrepreneurial skills to uphold professionalism and ethics for bringing out successful professionals and contribute for the betterment of family and community in the contemporary world.

Mission of the Department of Home Science

To empower the students by providing quality education through scientific aspects of Home Science and ensure health for the family, community and nation.

B.1.1 Programme Educational Objectives (PEOs)

PEOs are broad statements that describe the career and professional achievements that the Programme is preparing the graduates to achieve within the first few years after graduation. PEOs are framed for each Programme and should be consistent with the mission of the Institution.

Programme Educational Objectives (PEOs) of B.Sc. Home Science - Nutrition and Dietetics Programme

The students will be able to

- become professionally competent nutritionist, dieticians, health care workers in hospitals, health departments, speciality clinics, fitness centres, hospitality industries, Social welfare organizations and public health agencies or member of teaching faculty in higher education or become self-employed.

- employ their culinary skills, artistic skills, interpersonal skills and technical skills both in career and home for holistic living.
- follow professional ethics and provide feasible solutions for health related problems in social, cultural and environmental issues.

Key Components of the Mission Statement	PEO1	PEO2	PEO3
prepare the students in becoming self-reliant	√	√	√
establish of an entrepreneur in any of the varied fields of Home Science	√	√	√
uphold professionalism and ethics for improving their quality of living	√	√	√

B.1.2 Programme Outcomes (POs)

POs shall be based on Graduate Attributes (GAs) of the Programme. The GAs are the attributes expected of a graduate from a Programme in terms of knowledge, skills, attitude and values. The Graduate Attributes include Disciplinary Knowledge, Communication Skills, Critical Thinking, Problem Solving, Analytical Reasoning, Research Related Skills, Co-operation/Team Work, Scientific Reasoning, Reflective Thinking, Information/Digital Literacy, Multicultural Competence, Moral and Ethical Awareness/Reasoning, Leadership Qualities and Lifelong Learning

On successful completion of the Programme, the students will be able to

- 1 apply effectively the acquired knowledge and skill in the field of Arts, Physical Science, Life Science, Computer Science, Commerce and Management for higher studies and employment. (*Disciplinary Knowledge*)
- 2 articulate innovative thoughts and ideas proficiently in both in spoken and written forms. (*Communication Skills*)
- 3 identify, formulate and solve problems in real life situations scientifically / systematically by adapting updated skills in using modern tools and techniques. (*Scientific Reasoning and Problem Solving*)
- 4 critically analyse, synthesize and evaluate data, theories and ideas to provide valid suggestions through assignments, case studies, Internship and projects for the fulfillment of the local, national and global developmental needs. (*Critical Thinking and Analytical Reasoning*)
- 5 use ICT in a variety of self-directed lifelong learning activities to face career challenges in the changing environment. (*Digital Literacy, Self - directed and Lifelong Learning*)

- 6 self-manage and function efficiently as a member or a leader in diverse teams in a multicultural society for nation building. (*Co-operation/Team Work and Multicultural Competence*)
- 7 uphold the imbibed ethical and moral values in personal, professional and social life for sustainable environment. (*Moral and Ethical Awareness*)

B.1.3 Programme Specific Outcomes (PSOs)

Based on the Programme Outcomes, Programme Specific Outcomes are framed for each UG Programme. Programme Specific Outcomes denote what the students would be able to do at the time of graduation. They are Programme specific. It is mandatory that each PO should be mapped to the respective PSO.

On completion of B.Sc. Home Science – Nutrition and Dietetics Programme, the students will be able to

PO 1: *Disciplinary Knowledge*

PSO1.a: apply the knowledge of the basic principles involved in various branches of Home Science incorporated with knowledge in related courses in higher studies.
 PSO1.b: apply their professional and entrepreneurial skills in the areas such as Food Science, Nutrition Science, Dietetics, Human Development, Textiles and Clothing, Family Resource Management, Food Service Management, Community Nutrition, Family Dynamics, Extension Education and Computer for establishing a career in food and hospitality industries and other allied organizations leading to economic empowerment.

PO 2: *Communication Skills*

PSO 2.a: use appropriate communication strategies to deliver the learnt concepts effectively to peer groups, job providers and common people in relevant situations.
 PSO 2.b: hone communication skills in effective presentation of curricular ideas, concept and scientific principles in various circumstances particularly for placement.

PO 3: *Scientific Reasoning and Problem Solving*

PSO 3 identify the prevalent demands for Home Science related issues in the contemporary society and formulate new methods through research activities to fulfil them with the best possible service for human upliftment through research.

PO 4: Critical thinking and Analytical Reasoning

PSO 4.a: evaluate the practices in cookery, diet planning, diet counselling, food analysis, food preservation, food safety and quality control, bakery and confectionary, Human Development, pre-school management, textiles and clothing, resource management, interior decoration, housekeeping and arrive at a conclusion to instill a health culture in the community through outreach programmes.

PSO 4.b : analyse critically the current situation of the society in human health related issues and find out the solutions from acquired practical skills gained in the laboratory.

PO 5: Digital Literacy, Self - directed and Lifelong learning

PSO 5: upgrade their learning skills in their field of interest through ICT to meet the challenges in competitive examinations and grab more career opportunities as entrepreneurs.

PO 6: Cooperation/Team Work and Multi-Cultural Competence

PSO 6: maintain a harmonious interpersonal relationship as member or leader in team works and their wholesome personality, to attain a goal.

PO 7: Moral and Ethical awareness

PSO 7: practice the inculcated moral values and ethics for promoting sound health and holistic living by considering about environmental issues.

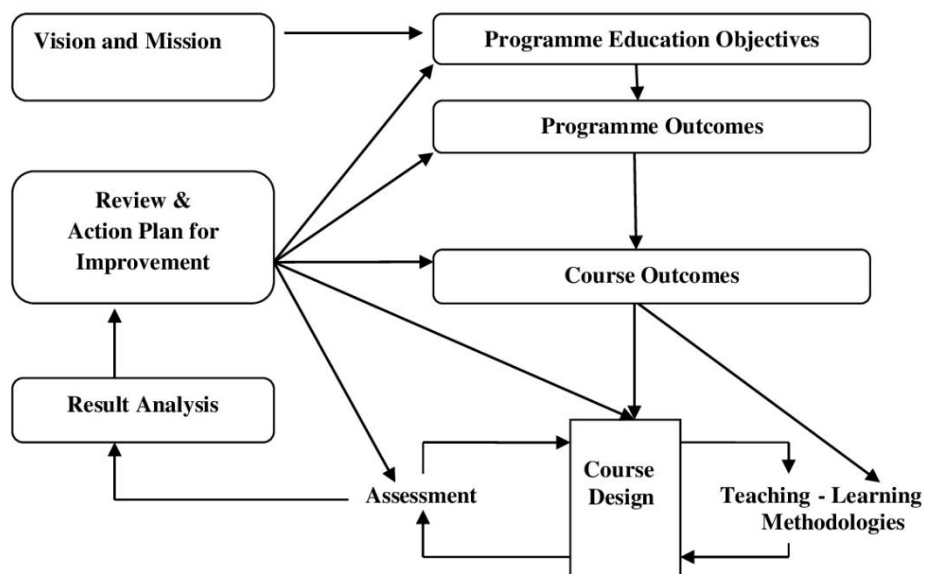
PO-PEO Mapping Matrix

Attainment of PEOs can be measured by a PO-PEO matrix. PEOs should evolve through constant feedback from alumnae, students, industry, management, *etc.* It is mandatory that each PEO should be mapped to at least one of the POs.

PEOs POs/PSOs	PEO1	PEO2	PEO3
PO1/PSO1.a	-	✓	✓
PO1/PSO1.b	✓	✓	✓
PO2/PSO2.a	✓	✓	-
PO2/PSO2.b	✓	✓	-
PO3/PSO3	-	✓	✓
PO4/PSO4.a	-	✓	✓
PO4/PSO4.b	✓	✓	-
PO5/PSO5	✓	✓	-
PO6/PSO6	-	✓	✓
PO7/PSO7	-	-	✓

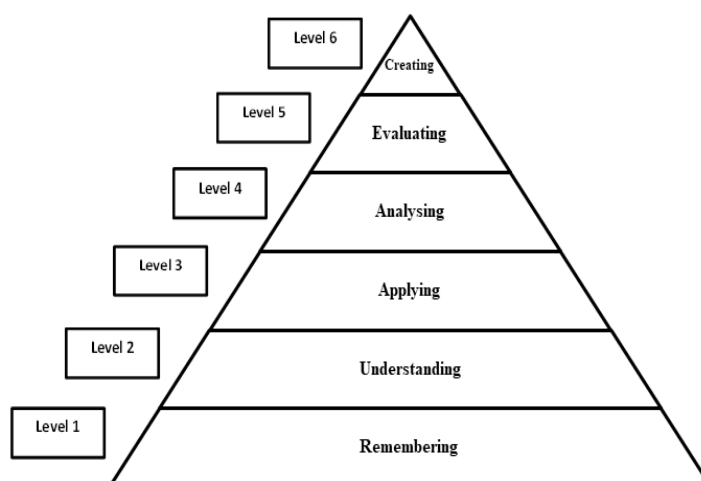
B.1.4 Course Outcomes (COs)

Course Outcomes are narrow statements restricted to the Course contents given in five units. Course Outcomes describe what students would be capable of, after learning the contents of the Course. They reflect the level of knowledge gained, skills acquired and attributes developed by the students after learning of Course contents. COs are measurable, attainable and manageable in number. COs contribute to attain POs in such a way that each CO addresses at least one of the POs and also each PO is reasonably addressed by adequate number of COs.



It is important to determine the methods of assessment. A comprehensive assessment strategy may be outlined using the revised Bloom's Taxonomy levels.

BLOOM'S TAXONOMY



CO – PO Mapping of Courses

After framing the CO statements, the COs framed for each Course is mapped with POs based on the relationship that exists between them. The COs which are not related to any of the POs is indicated with (-), signifying Nil. Measurement Mapping is based on Four Points Scale [High (H), Medium (M), Low (L) and Nil (-)]. For calculating weighted percentage of contribution of each Course in the attainment of the respective POs, the weights assigned for H, M and L are 3, 2 and 1 respectively.

CO-PO/PSO Mapping Table (Course Articulation Matrix)

PO/PSOs COs Cos	PO1/ PSO1	PO2/ PSO2	PO3/ PSO3	PO4/ PSO4	PO5/ PSO5	PO6/ PSO6	PO7/ PSO7
CO1							
CO2							
CO3							
CO4							
CO5							

ELIGIBILITY FOR ADMISSION

The Candidates should have passed the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Tamilnadu or any other Examination accepted by Academic Council with any Science / Home Science / Nursing Vocational group in Higher Secondary Examination.

DURATION OF THE PROGRAMME

The candidates shall undergo the prescribed Programme of study for a period of three academic years (six semesters).

MEDIUM OF INSTRUCTION

English

COURSES OFFERED

Part I	:	Tamil/Hindi Course
Part II	:	English
Part III	:	Core Courses
		Elective Courses • Generic Elective Courses • Discipline Specific Elective Courses
		Self-Study Course - online
Part IV	:	Skill Enhancement Courses (SEC)
		Elective Course (NMEC)
		Environmental Studies Value Education
		Internship/ Industrial Training

		Self-Study Course - online
Part V	:	National Service Scheme/ Physical Education/ Youth Red Cross Society/ Red Ribbon Club/ Science Forum/ Eco Club/ Library and Information Science/ Consumer Club/ Health and Fitness Club/ National Cadet Corps/ Rotaract Club

B.2 EVALUATION SCHEME

B.2.1.PART II

Components	Internal Assessment Marks	Summative Examination Marks	Total Marks
Theory	15	60	100
Practical	5	15	
Assignment	5	-	

Three Periodic Tests - Average of the best two will be considered.

B.2.2.Part I & PART III - Core Courses, Elective Courses (Generic, DSEC)

Components	Internal Assessment Marks	External Examination Marks	Total Marks
Theory	25	75	100

INTERNAL ASSESSMENT

Distribution of Marks

Theory

Mode of Evaluation		Marks
Periodic Test		: 15
Assignment	K3 Level	: 5
Quiz	K1 Level	: 5
Total		: 25

Three Periodic Tests - Average of the best two will be considered

Two Assignments - Better of the two will be considered

Three Quiz Tests - Best of the three will be considered

Practical

Mode of Evaluation		Marks
Practical Test*		: 30
Record & Performance		: 10
Total		: 40

*Average of the two practical tests will be considered

Question Pattern for Internal Tests**Duration: 2 Hours**

Section	Q. No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 4	Multiple Choice	4	4	1	4
B	5 -6	Internal Choice - Either ... or Type	3	3	7	21
C	8 -9	Internal Choice - Either... or Type	2	2	10	20
Total						45*

*The total marks obtained in the Periodic Test will be calculated for 15 marks

SUMMATIVE EXAMINATION**Question Pattern****Duration: 3 Hours**

Section	Q. No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 -10	Multiple Choice	10	10	1	10
B	11 - 15	Internal Choice – Either ...or Type	5	5	7	35
C	16 - 18	Internal Choice – Either... or Type	3	3	10	30
Total						75

PROJECT**Assessment by Internal Examiner Only****Internal Assessment****Distribution of Marks**

Mode of Evaluation	:	Marks
Project work and Report	:	60
Presentation and Viva –Voce	:	40
Total	:	100

B.2.3 PART IV - Skill Enhancement Courses, Non Major Elective Courses and Foundation Course

B.2.3.1 FOUNDATION COURSE

INTERNAL ASSESSMENT

Distribution of Marks

Theory

Mode of Evaluation			Marks
Periodic Test			15
Assignment	K2 Level	:	5
Quiz	K1 Level	:	5
Total			25

Three Periodic Tests - Average of the best two will be considered

Two Assignments - Better of the two will be considered

Three Quiz Tests - Best of the three will be considered

Question Pattern for Periodic Tests

Duration: 1 Hour

Section	Q.No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 3	Internal Choice - Either ...or Type	3	3	5	15
B	4	Internal Choice – Either ...or Type	1	1	10	10
Total						25*

*The total marks obtained in the Periodic Test will be calculated for 15 marks

SUMMATIVE EXAMINATION

Mode of Evaluation			Marks
Summative Examination			50
Online Quiz (Multiple Choice Questions - K2 Level)			25
Total			75

Question Pattern

Duration: 2 Hours

Section	Q.No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 5	Internal Choice - Either ... or Type	5	5	6	30
B	6 - 7	Internal Choice - Either... or Type	2	2	10	20
Total						50

B.2.3.2 Skill Enhancement Course - Entrepreneurial skills**INTERNAL ASSESSMENT ONLY****Distribution of Marks**

Mode of Evaluation		Marks
Periodic Test	:	15
Assignment	:	5
Quiz	:	5
Model Examinations	:	60
Online Quiz (Multiple Choice Questions - K2 Level)	:	15
Total		100

Question Pattern for Periodic Tests**Duration: 1 Hour**

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1- 3)	Internal Choice – Either Or Type	3	3	5	15
B Q. No.(4)	Internal Choice – Either Or Type	1	1	10	10
Total					25

*The total marks obtained in the Periodic Test will be calculated for 15 marks

Two Periodic Tests - Better of the two will be considered

Two Assignments - Better of the two will be considered

Two Quiz Tests - Better of the two will be considered

Question Pattern for Model Examination**Duration: 2 Hours**

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1-5)	Internal Choice – Either Or Type	5	5	6	30
B Q. No.(6- 8)	Internal Choice – Either Or Type	3	3	10	30
Total					60

B.2.3.3 Skill Enhancement Courses/ Non Major Elective Courses**INTERNAL ASSESSMENT****Distribution of Marks****Theory**

Mode of Evaluation			Marks
Periodic Test			15
Assignment	K3 Level	:	5
Quiz	K2 Level	:	5
Total			25

Three Periodic Tests - Average of the best two will be considered

Two Assignments - Better of the two will be considered

Three Quiz Tests - Best of the three will be considered

Question Pattern for Periodic Tests**Duration: 1 Hour**

Section	Q.No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 3	Internal Choice - Either ...or Type	3	3	5	15
B	4	Internal Choice – Either ...or Type	1	1	10	10
Total						25*

*The total marks obtained in the Periodic Test will be calculated for 15 marks

SUMMATIVE EXAMINATION

Mode of Evaluation			Marks
Summative Examination			50
Online Quiz (Multiple Choice Questions - K2 Level)			25
Total			75

Question Pattern**Duration: 2 Hours**

Section	Q.No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 5	Internal Choice - Either ... or Type	5	5	6	30
B	6 - 7	Internal Choice – Either... or Type	2	2	10	20
Total						50

B.2.4 PART IV- ENVIRONMENTAL STUDIES / VALUE EDUCATION**INTERNAL ASSESSMENT ONLY****Evaluation Pattern**

Mode of Evaluation		Marks
Periodic Test	:	15
Assignment - K3 Level	:	10
Online Quiz (Multiple Choice Questions - K2 Level)	:	25
Poster Presentation - K3 Level		10
Report - K3 Level		10
Model Examination	:	30
Total	:	100

Three Assignment - Best of the three will be considered

Question Pattern for Periodic Tests**Duration: 1 Hour**

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1- 3)	Internal Choice – Either Or Type	3	3	6	18
B Q. No.(4)	Internal Choice – Either Or Type	1	1	12	12
Total					30

Two Periodic tests - Better of the two will be considered

*The total marks obtained in the Periodic Test will be calculated for 15 marks

Question Pattern for Model Examination**Duration: 2½ Hours**

Section	Q.No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 5	Internal Choice - Either ... or Type	5	5	6	30
B	6 - 8	Internal Choice – Either... or Type	3	3	10	30
Total						60*

*The total marks obtained in the Model Examination will be calculated for 30 marks

B. 2. 5 PART IV- Internship / Industrial Training

Internship / Industrial Training is mandatory for all the Students

- **Internship:** Students have to involve in a designated activity, working in an organization under the guidance of an identified mentor for a period of 30 days.
- **Industrial Training:** Student has to undertake in-plant training in industries individually or in group for a period of 30 days.
- Internship / Industrial Training must be done during the fourth semester holidays.
- **Internal Assessment only.**

Mode of Evaluation		Marks
Onsite Learning/Survey	:	50
Report	:	25
Viva-Voce	:	25
Total		100

B.2.5 SELF STUDY COURSE**B.2.5.1 PART III – Discipline Specific Quiz – Online**

- Assessment by Internal Examiner only
- Question Bank is prepared by the Faculty Members of the Departments for all the Core and Elective Courses offered in all the Semesters.
- No. of Questions to be taken 700.
- Multiple Choice Question pattern is followed.
- Online Test will be conducted in VI Semester for 100 Marks.
- Model Examination is conducted after two periodic tests.

Distribution of Marks

Mode of Evaluation		Marks
Periodic Test	:	25
Model Examination	:	75
Total	:	100

Two Periodic Tests - Better of the two will be considered

B.2.5.2 PART IV - Practice for Competitive Examinations – Online

Assessment by Internal Examiner only

- Question Bank prepared by the Faculty Members of the respective Departments will be followed.
- Multiple Choice Question pattern is followed.
- Online Test will be conducted in V Semester for 100 Marks.
- Model Examination is conducted after two periodic tests.

Subject wise Allotment of Marks

Subject		Marks
Tamil	:	10
English	:	10
History	:	10
Mathematics	:	10
Current affairs	:	10
Commerce, Law & Economics	:	10
Physical Sciences	:	10
Life Sciences	:	15
Computer Science	:	5
Food and Nutrition	:	5
Sports and Games	:	5
Total	:	100

Distribution of Marks

Mode of Evaluation		Marks
Periodic Test	:	25
Model Examination	:	75
Total	:	100

Two Periodic Tests - Better of the two will be considered

B.2.6. Part V – Extension Activities**INTERNAL ASSESSMENT ONLY****Distribution of Marks**

Mode of Evaluation		Marks
Attendance	:	5
Performance	:	10
Report/Assignment/Project/Camp/Practical	:	10
Total	:	25*

*The marks obtained will be calculated for 100 marks

B.2.7 Transfer of credits earned through MOOC (UGC recognized Courses)

- Students can opt for minimum of
 - 12 weeks Courses for Core Courses
 - 8 weeks Courses for Elective Courses
 - 4 weeks Courses for Skill Enhancement Course
- The Online Courses opted by the students will be verified and approved by the Head of the Department and forwarded to the Controller of Examinations through the Principal.
- Students are required to register for the equivalent Online Courses through the Institution's SWAYAM-NPTEL Local Chapter after submitting a Permission letter to the Head of the Department.

- The Course should be completed before the beginning of that particular Semester in which the selected Course is offered.
- The student should submit the Course Completion Certificate immediately after receiving it, to the Department.
- The Head of the Department has to send the list of the students and their Course Completion Certificates to the Controller of Examinations through the Principal.
- The students who have submitted the Completion Certificate are exempted from appearing the Periodic Tests and Summative Examinations of the respective course but without any exemption for class attendance.
- Credits allotted for the particular Course in the Curriculum will be transferred after the completion of the Online Course
- Students can earn up to 10 credits within the mandatory credits requirements of the Degree Programme by completing UGC recognised Online Courses.

B.2.8 EXTRA CREDIT COURSES (OPTIONAL)

2.8.1 Extra Credit Course offered by the Department.

Assessment by Internal Examiner Only (To be conducted along with the III Periodic Test)

Distribution of Marks

Mode of Evaluation	Marks
Quiz (Multiple Choice Questions) :	25
Model Examination :	75
Total :	100

Question Pattern for Model Examination

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q.No.(1-5)	Internal Choice- Either or Type	5	5	7	35
B Q.No.(6-9)	Internal Choice- Either or Type	4	4	10	40
				Total	75

2.8.2 Extra credit Course offered by MOOC (Massive Open Online Course)

- The Courses shall be completed within the first V Semesters of the Programme.
- The allotment of credits is as follows (**Maximum of 10 credits**)

4weeks Course	- 1 credit
8 weeks Course	- 2 credits
12 weeks Course	- 3 credits

ELIGIBILITY FOR THE DEGREE

- The candidate will not be eligible for the Degree without completing the prescribed Courses of study, lab work, *etc.*, and a minimum Pass marks in all the Courses.
- No Pass minimum for Internal Assessment.
- Pass minimum for External Examination is 27 marks out of 75 marks for Core Courses, Elective Courses (Generic Elective, DSEC Courses)
- Pass minimum for External Examination is 18 marks out of 50 marks for Skill Enhancement Courses and Non Major Elective Courses (NMEC).
- The aggregate minimum pass percentage is 40 marks for all Courses.
- Pass minimum for External Practical Examination is 21 marks out of 60 marks.

Attendance

- The students who have attended the classes for 76 days (85%) and above are permitted to appear for the Summative Examinations without any condition.
- The students who have only 60-75 days (66% - 84%) of attendance are permitted to appear for the Summative Examinations after paying the required fine amount and fulfilling other conditions according to the respective cases.
- The students who have attended the classes for 59 days and less - up to 45 days (50%- 65%) can appear for the Summative Examinations only after getting special permission from the Principal.
- The students who have attended the classes for 44 days or less (<50%) cannot appear for the Summative Examinations and have to repeat the whole semester.
- For Part V in UG Programmes, the students require 75 % of attendance to get a credit.

- For Certificate, Diploma, Advanced Diploma and Post Graduate Diploma Programmes, the students require 75% of attendance to appear for the Theory/Practical Examinations.

B.3 ASSESSMENT MANAGEMENT PLAN

An Assessment Management Plan that details the assessment strategy both at the Programme and the Course levels is prepared. The continuous assessment is implemented using an assessment rubric to interpret and grade students.

B.3.1 Assessment Process for CO Attainment

Assessment is one or more processes carried out by the institution that identify, collect and prepare data to evaluate the achievement of Course Outcomes and Programme Outcomes. Course Outcome is evaluated based on the performance of students in the Continuous Internal Assessments and in End Semester Examination of a Course. Target levels of attainment shall be fixed by the Course teacher and Heads of the respective departments.

Direct Assessment (rubric based)-Conventional assessment tools such as Term Test, Assignment, Quiz and End Semester Summative Examination are used.

Indirect Assessment –Done through Course Exit Survey.

CO Assessment Rubrics

For the evaluation and assessment of COs and POs, rubrics are used. Internal assessment contributes 40% and End Semester assessment contributes 60% to the total attainment of a CO for the theory Courses. For the practical Courses, internal assessment contributes 50% and Semester assessment contributes 50% to the total attainment of a CO. Once the Course Outcome is measured, the PO can be measured using a CO-PO matrix.

CO Attainment

Direct CO Attainment

Course outcomes of all Courses are assessed and the CO – wise marks obtained by all the students are recorded for all the assessment tools. The respective CO attainment level is evaluated based on set attainment rubrics.

Target Setting for Assessment Method

For setting up the target of internal assessment tools, 55% of the maximum mark is fixed as target. For setting up the target of End Semester Examination, the average mark of the class shall be set as target.

Formula for Attainment for each CO

Attainment = Percentage of students who have scored more than the target marks

$$\text{Percentage of Attainment} = \frac{\text{Number of Students who Scored more than the Target}}{\text{Total Number of Students}} \times 100$$

Attainment Levels of COs

Assessment Methods	Attainment Levels	
Internal Assessment	Level 1	50% of students scoring more than set target marks in Internal Assessment tools
	Level 2	55% of students scoring more than set target marks in Internal Assessment tools
	Level 3	60% of students scoring more than set target marks in internal Assessment tools
End Semester Summative Examination	Level 1	50% of students scoring more than average marks in End Semester Summative Examination
	Level 2	55% of students scoring more than average marks in End Semester Summative Examination
	Level 3	60% of students scoring more than average marks in End Semester Summative Examination

Indirect CO Attainment

At the end of each Course, an exit survey is conducted to collect the opinion of the students on attainment of Course Outcomes. A questionnaire is designed to reflect the views of the students about the Course outcomes.

Overall CO Attainment=75% of Direct CO Attainment + 25 % of Indirect CO Attainment

In each Course, the level of attainment of each CO is compared with the predefined targets. If the target is not reached, the Course teacher takes necessary steps for the improvement to reach the target.

For continuous improvement, if the target is reached, the Course teacher can set the target as a value greater than the CO attainment of the previous year.

B.3.2 Assessment Process for Overall PO Attainment

With the help of CO-PO mapping, the PO attainment is calculated. PO assessment is done by giving 75% weightage to direct assessment and 25% weightage to indirect assessment. Direct assessment is based on CO attainment, where 75% weightage is given to attainment through End Semester Examination and 25% weightage is given to attainment through Internal assessments. Indirect assessment is done through Graduate Exit Survey and participation of students in Co-curricular/Extra-curricular activities.

PO Assessment Tools

Mode of Assessment	Assessment Tool	Description
Direct Attainment (Weightage -75%)	CO Assessment	This is computed from the calculated CO Attainment value for each Course
Indirect Attainment (Weightage - 25%)	Graduate Exit Survey 10%	At the end of the Programme, Graduate Exit Survey is collected from the graduates and it gives the opinion of the graduates on attainment of Programme Outcomes
	Co-curricular / Extracurricular activities 15%	For participation in Co-curricular / Extracurricular activities during the period of their study.

Programme Articulation Matrix (PAM)

Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
Average Direct PO Attainment									
Direct PO Attainment in percentage									

Indirect Attainment of POs for all Courses

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
Graduate Exit Survey								
Indirect PO Attainment								

Attainments of POs for all Courses

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
Direct Attainment (Weightage - 75%)								
Indirect Attainment (Weightage - 25%)								
Overall PO Attainment								

**Overall PO Attainment= 75% of Direct PO Attainment +
25% of Indirect PO Attainment (Graduate Exit Survey
& Participation in Co- curricular and
Extracurricular Activities)**

Expected Level of Attainment for each of the Programme Outcomes

POs	Level of Attainment
Attainment Value $\geq 70\%$	Excellent
$60\% \leq \text{Attainment Value} < 70\%$	Very Good
$50\% \leq \text{Attainment Value} < 60\%$	Good
$40\% \leq \text{Attainment Value} < 50\%$	Satisfactory
Attainment Value $< 40\%$	Not Satisfactory

Level of PO attainment

Graduation Batch	Overall PO Attainment (in percentage)	Whether expected level of PO is achieved? (Yes/No)

B.3.3 Assessment Process for PEOs

The curriculum is designed so that all the courses contribute to the achievement of PEOs. The attainment of PEOs is measured after 5 years of completion of the programme only through Indirect methods.

Target for PEO Attainment

Assessment Criteria	Target (UG)	Target (PG)
Record of Employment	15% of the class strength	30% of the class strength
Progression to Higher Education	50% of the class strength	5% of the class strength
Record of Entrepreneurship	2% of the class strength	5% of the class strength

Attainment of PEOs

Assessment Criteria & Tool	Weightage
Record of Employment	10
Progression to Higher Education	20
Record of Entrepreneurship	10
Feedback from Alumnae	30
Feedback from Parents	10
Feedback from Employers	20
Total Attainment	100

$$\begin{aligned} \text{Percentage of PEO Attainment from Employment} &= \frac{\text{Number of Students who have got Employment}}{\text{Target}} \times 100 \\ \text{Percentage of PEO Attainment from Higher Education} &= \frac{\text{Number of Students who pursue Higher Education}}{\text{Target}} \times 100 \\ \text{Percentage of PEO Attainment from Entrepreneurship} &= \frac{\text{Number of Students who have become Entrepreneurs}}{\text{Target}} \times 100 \end{aligned}$$

Expected Level of Attainment for each of the Programme Educational Objectives

POs	Level of Attainment
Attainment Value $\geq 70\%$	Excellent
$60\% \leq \text{Attainment Value} < 70\%$	Very Good
$50\% \leq \text{Attainment Value} < 60\%$	Good
$40\% \leq \text{Attainment Value} < 50\%$	Satisfactory
Attainment Value $< 40\%$	Not Satisfactory

Level of PEO Attainment

Graduation Batch	Overall PEO Attainment (in percentage)	Whether expected level of PEO is achieved? (Yes/No)

C. PROCESS OF REDEFINING THE PROGRAMME EDUCATIONAL OBJECTIVES

The College has always been involving the key stakeholders in collecting information and suggestions with regard to curriculum development and curriculum revision. Based on the information collected the objectives of the Programme are defined, refined and are inscribed in the form of PEOs. The level of attainment of PEOs defined earlier will be analyzed and will identify the need for redefining PEOs. Based on identified changes in terms of curriculum, regulations and PEOs, the administrative system like Board of Studies, Academic Council and Governing Body may recommend appropriate actions. As per the Outcome Based Education Framework implemented from the Academic Year 2020 -2021, the following are the Programme Structure, the Programme Contents and the Course Contents B.Sc. Home Science – Nutrition and Dietetics Programme.



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BACHELOR OF SCIENCE

HOME SCIENCE – NUTRITION AND DIETETICS (2028)

Outcome Based Education with Choice Based Credit System

Programme Structure - Allotment of Hours and Credits

For those who join in the Academic Year 2024-2025

Components	Semester						Total Number of Hours (Credits)
	I	II	III	IV	V	VI	
Part I: Tamil/Hindi	6 (3)	6 (3)	6 (3)	6 (3)	-	-	24 (12)
Part II: English	6 (3)	6(3)	6 (3)	6 (3)	-	-	24 (12)
Part III: Core Courses, Elective Courses, and Self-Study Course.							
Core Course	5(5)	4(4)	5 (5)	4(3)	5 (5)	5 (4)	28 (26)
Core Course	-	4(3)	-	3(3)	5 (5)	5 (4)	17(15)
Core Course	-	-	-	-	5 (4)	5 (4)	10 (8)
Core Course	-	-	-	-	-	4(4)	4(4)
Core Course Practical	3(2)	-	3(2)	-	3 (2)	-	9 (6)
Core Course Project	-	-	-	-	1(1)	-	1(1)
Elective Course (DSEC)	-	-	-	-	5 (4)	5 (5)	10 (9)
Elective Course (DSEC)	-	-	-	-	4(3)	4(3)	8(6)
Elective Course I	4 (3)	4(3)	-	-	-	-	8(6)
Elective Course Practical I(Allied)	2(1)	2(1)	-	-	-	-	4(2)
Elective Course II	-	-	6(4)	6(4)	-	-	12 (8)
Elective Course Practical II(Allied)	-	-	-	-	-	-	-
Self-Study Course	-	-	-	-	-	0 (1)	0 (1)
Part IV: Skill Enhancement Courses, Non Major Elective Courses, Ability Enhancement Compulsory Courses, Generic Elective Courses, Self-Study Course and Internship/Industrial Training							
SEC	2 (2)	-	1 (1)	2 (2)	-	-	5(5)
SEC	-	2 (2)	2 (2)	2 (2)	-	2 (2)	8(8)
Elective Course (NME)	2 (2)	2 (2)	-	-	-	-	4 (4)
AECC-Value Education	-	-	-	-	2 (2)	-	2 (2)
AECC - Environmental Studies	-	-	1(0)	1(2)	-	-	2 (2)
Self-Study Course	-	-	-	-	0(1)	-	0 (1)
Internship/Industrial Training	-	-	-	-	0 (1)	-	0 (1)
Part V: Extension Activities	-	-	-	-	-	0 (1)	0 (1)
Total	30 (21)	30 (21)	30 (20)	30 (22)	30 (28)	30(28)	180 (140)
Extra Credit Course(Self Study Course)					0(2)		0(2)



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B.Sc. Home Science – Nutrition and Dietetics - 2028 PROGRAMME CONTENT SEMESTER I (for those who join in 2024- 2025)

S. No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.	Part I		Tamil/Hindi	24UTAG11/ 24UHDG11	6	3	3	25	75	100
2.	Part II		English	24UENG11	6	3	3	25	75	100
3.	Part III	Core Course -1	Food Science	24UHSC11	5	5	3	25	75	100
4.		Core Course -2 Practical - I	Basic Cookery Practical	24UHSC11P	3	2	3	40	60	100
5.		Elective Course -I	Chemistry for Biological Sciences - I	24UCHA11	4	3	3	25	75	100
6.		Elective Course I Practical I	Chemistry Practical for Biological Sciences - I	24UCHA11P	2	1	3	40	60	100
7	Part IV	NME-1	Foundations of Baking and Confectionery	24UHSN11	2	2	2	25	75	100
8		SEC- 1 Foundation Course	Introduction to Home Science	24UHSE11	2	2	2	25	75	100
Total					30	21				800



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B.Sc. Home Science – Nutrition and Dietetics SEMESTER II

S.No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam Hours	Marks		
								Int.	Ext.	Total
1.	Part I		Tamil/Hindi	24UTAG21/ 24UHDG21	6	3	3	25	75	100
2.	Part II		English	24UENG21	6	3	3	25	75	100
3.	Part III	Core Course - 3	Human Physiology	24UHSC21	4	4	3	25	75	100
4.		Core Course - 4	Basics of Food Microbiology	24UHSC22	4	3	3	25	75	100
5.		Elective Course -I	Chemistry for Biological Sciences - II	24UCHA21	4	3	3	25	75	100
6.		Elective Course -I Practical -II	Chemistry Practical for Biological Sciences - II	24UCHA21P	2	1	3	40	60	100
7.		NME-2	Women's Health and Wellness	24UHSN21	2	2	2	25	75	100
8.		SEC -2	Family Dynamics	24UHSS21	2	2	2	25	75	100
Total					30	21				800



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SEMESTER III (2024-2025 onwards)

S. No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.	Part I		Tamil/ Hindi	24UTAG31/ 24UHDG31	6	3	3	25	75	100
2.	Part II		English	24UENG31	6	3	3	25	75	100
3.	Part III	Core Course -5	Human Nutrition	24UHSC31	5	5	3	25	75	100
4.		Core Course -6 Practical-II	Nutrition Practical	24UHSC31P	3	2	3	40	60	100
5.		Elective Course -2	Principles of Resource Management	24UHSA31	6	4	3	25	75	100
6.	Part IV	Skill Enhancement Course -3 Practical	Food Product Development Practical	24UHSS31P	1	1	2	100	-	100
7.		Skill Enhancement Course -4	Changing Trends in Extension Education	24UHSS32	2	2	2	25	75	100
8.			Environmental Studies	24UGES41	1	-	-	-		
Total					30	20				700

B.Sc. Home Science – Nutrition and Dietetics**SEMESTER IV (2024-2025 onwards)**

S. No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam Hours	Marks		
								Int.	Ext.	Total
1	Part I		Tamil/ Hindi	24UTAG41/ 24UHDG41	6	3	3	25	75	100
2	Part II		English	24UENG41	6	3	3	25	75	100
3.	Part III	Core Course -7	Human Development	24UHSC41	4	3	3	25	75	100
4.		Core Course -8	Nutrition Through the Lifecycle - Theory and Practical	24UHSC42	3	3	3	25	75	100
5.		Elective Course -3	Nutritional Biochemistry - Theory and Practical	24UHSA41	6	4	3	25	75	100
6.	Part IV	SEC- 5	Computer Applications in Home Science	24UHSS41	2	2	2	25	75	100
7.		SEC- 6	Fundamentals of Art and Design	24UHSS42	2	2	2	25	75	100
8.			Environmental Studies	24UGES41	1	2	2	100	-	100
Total					30	22				800

B.Sc. Home Science – Nutrition and Dietetics**SEMESTER V (2024-2025 onwards)**

S. No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.	Part III	Core Course -9	Dietetics	24UHSC51	5	5	3	25	75	100
2.		Core Course -10	Nutrition Education and Communication	24UHSC52	5	5	3	25	75	100
3.		Core Course -11	Fibre to Fabric	24UHSC53	5	4	3	25	75	100
4.		Core Course -12 Practical-III	Dietetics Practical	24UHSC51P	3	2	3	40	60	100
5.		Core Course Project-13	Project	24UHSC54PR	1	1	-	100	-	100
6.		Elective Course DSEC-1	Quantity Food Production and Service – Theory and Practical / House Keeping	24UHSE51/ 24UHSE52	5	4	3	25	75	100
7.		Elective Course DSEC-2	Landscape Design and Ornamental Gardening / Fundamentals of Research in Nutritional Sciences	24UHSE53/ 24UHSE54	4	3	3	25	75	100
8.	Part IV		Value Education	24UGVE51	2	2	2	100	-	100
9.		Self Study Course	Practice for Competitive Examinations - Online	24UGCE51	-	1	-	100	-	100
10.		Internship/ Industrial Training	Internship	24UHSI51	-	1	-	100	-	100
Total					30	28				1000

Extra Credit Course – (Self-Study Course)	Community Nutrition	24UHSO51	-	2	3	100	-	100
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B.Sc. Home Science – Nutrition and Dietetics**SEMESTER VI (2024-2025 onwards)**

S. No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.		Core Course -14	Clinical Nutrition – Theory and Practical	24UHSC61	5	4	3	25	75	100
2.		Core Course -15	Food Safety and Quality Control	24UHSC62	5	4	3	25	75	100
3.		Core Course -16	Functional Foods for Chronic Diseases	24UHSC63	5	4	3	25	75	100
4.	Part III	Core Course -17	Foundations of Entrepreneurship	24UHSC64	4	4	3	25	75	100
5.		Elective Course DSEC-3	Food Preservation- Theory and Practical/ Front office Management	24UHSE61/ 24UHSE62	5	5	3	25	75	100
6.		Elective Course DSEC-4	Concepts in Apparel Designing/ Life Skill Strategies and Techniques	24UHSE63/ 24UHSE64	4	3	3	25	75	100
7.		Self-Study Course	Core Course Quiz - Online	24UHSQ61	-	1	-	100	-	100
8.	Part IV	SEC-7	Aptitude and Reasoning Skills for Competitive Examinations	24UHSS61	2	2	2	25	75	100
9.	Part V		Extension Activities		-	1	-	100	-	100
Total					30	28				900



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Semester I	FOOD SCIENCE	Hours/Week: 5	
Core Course – 1		Credits: 5	
Course Code 24UHSC11		Internal 25	External 75

COURSE OUTCOMES

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

CO1: describe the concept of food, cooking, food groups, cooking methods, classification and structure of various foods and list their uses and abuses [K1]

CO2: describe the nutritive value, selection, processing, storage and preservation of various Foods [K2]

CO3: trace the merits and demerits of different methods of cooking and select the best method suited for cooking different foods and find the adulterants in food [K2]

CO4: find the changes that occur during cooking and processing of different foods and apply the techniques involved in cooking in day today life [K3]

CO5: determine the factors influencing the palatability, acceptability and nutritive value of various foods [K3]

UNIT I

Nutrient content of foods and cooking methods - classification of foods according to nutrient content. Food groups for balanced diets. Study of the different cooking methods - dry heat, moist and combination methods, solar cooking, microwave cooking - merits and demerits, dishes prepared by these methods.

Cereals

Classification of cereals, Structure, nutrient composition, storage, processing, milling, parboiling, scientific methods of preparation and cooking, acceptability and palatability of rice, wheat, maize and millets. Cooking of starches- Dextrinization and gelatinization, retrogradation and resistant starch. (15 hours)

UNIT II

Pulses, Legumes, Nuts, Fats and Oils

Pulses and legumes - Types, nutritive value, methods of cooking, effect of soaking and germination, judicious combination of cereals and pulses- complementary effect, soya beans, fava beans and kesari dhal- methods to inactivate /remove toxins; storage.

Nuts - types, composition, market forms, roasting, steaming of nuts, nuts butters; uses in sweets, baking, and confectionery; Storage.

Oilseeds - types, methods of processing, uses and shelf life

Fats and Oils

Types, sources-animal fats and vegetable fats, functions, processing- difference between cold pressed and regular cooking oils, hydrogenated fat, emulsification, rancidity, smoking point.

Factors affecting absorption of oils while frying foods, harmful effects of reheated oils.

(15 hours)

UNIT III

Vegetables and Fruits

Vegetables

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

Fruits

Classification, nutritive value, changes during ripening, enzymatic browning, uses, preservation.

(15 hours)

UNIT IV

Flesh foods, Eggs, and Milk

Meats – structure, nutritive value, selection of meat, postmortem changes in meat, ageing, factors affecting tenderness of meat, methods of cooking and storage.

Poultry-types, nutritive value, selection and cooking

Fish - classification, nutritive value, selection, storage, cooking and preservation.

Eggs - Structure, nutritive value, methods of cooking, storage, preservation and uses in cookery; foam formation and factors affecting foam formation

Milk and milk products - Nutritive value, kinds of milk, pasteurization, and homogenization, coagulation of milk, fermentation of milk; milk products - whole and skimmed milk, milk powders and yogurt, ghee, butter, cheese. Storage and preservation.

(15 hours)

UNIT V

Sugars, Food Adjuncts and Beverages

Sugars - Types and market forms of sugars; stages of sugar cookery, crystallization, factors affecting crystallization, uses in confectionery.

Food adjuncts and food additives - Spices and condiments: classification, source, use in food preparation, Leavening agents, stabilizers, thickeners, anticaking agents, enzymes, shortenings, stabilizers, flavouring agents, colouring agents, sweeteners-use and abuse.

Food adulteration - Definition, common adulterants in food

Beverages - Classification - fruit based beverages; milk - based beverages nutritive value and uses, alcoholic beverages, coffee, tea and cocoa, malted beverages. Sources, manufacture, processing, and service; methods of preparation of coffee and tea. (15 hours)

PRACTICAL

1. Cereal and Pulse - Experimental Cookery, gelatinization, Dextrinisation
2. Vegetable and Fruit - Experimental Cookery, enzymatic browning.
3. Meat, Egg and Milk- Experimental Cookery; whipping quality of eggs
4. Study of the smoking temperature of Fats
5. Stages of Sugar cookery, factors affecting crystallization
6. Preparation of coffee and tea by different methods.

Preparation of one dish each applying the different cooking methods

Self-study

Improving the nutritional quality of food – enrichment and fortification of foods.

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12. Vaclavik, V.A. and Elizabeth, W.C. (2013) *Essentials of Food Science*. 2nd ed. Springer Publication, New Delhi

Course Code 24UHSC11	PO1		PO2		PO 3	PO4		PO 5	PO 6	PO 7
	PSO 1. a	PSO 1. b	PSO 2. a	PSO 2. b	PSO 3	PSO 4. a	PSO 4. b	PSO 5	PSO 6	PSO7
CO1	3	3	2	3	-	-	-	1	-	-
CO2	3	3	2	3	-	-	-	3	-	-
CO3	3	3	3	3	-	-	-	3	-	-
CO4	3	3	3	3	3	3	3	3	-	-
CO5	3	3	3	3	3	3	3	3	-	1

Strong (3) Medium (2) Low (1)

Dr.D.Vijayarani
Head of the Department

Dr.D.Vijayarani
Course Designer



V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics (2024- 2025 onwards)

Semester I	BASIC COOKERY PRACTICAL	Hours/Week: 3	
Core Course – 2 Practical I		Credits: 2	
Course Code 24UHSC11P		Internal 40	External 60

Course Outcomes

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

CO1: select the appropriate methods for weighing dry and wet food ingredients and trace the structure of starches.[K2]

CO2: explain the suitable method and technique involved to prepare various foods. [K2]

CO3: apply the principles of cooking, cooking techniques and suitable ingredients in preparing dishes and prepare the record.[K3]

CO4: find the reasons behind the changes that occur during food preparation.[K3]

CO5: choose the best preparation and cooking methods for acceptability and retention of nutrients in different dishes.[K3]

UNIT I

Introduction to Basic Cooking Skills

Introduction to different cooking methods, cooking terminology; equipment and techniques used for pre-preparation and for different cooking methods.

Methods of measuring and weighing liquids and dry ingredients. The use and care of simple kitchen equipment.

Introduction to food safety, sanitation and hygiene in the kitchen, Safe practices in handling knives, sharp instruments and materials at high temperature. (9 Hours)

UNIT II

Cereals, Millets and pulses

Cereals and Millets: Methods of combining fine and course cereal with Liquid (eg.Ragiporridge,ravaupma)

Method of cooking cereals and factors influencing texture and nutritive value- cooking rice by boiling and straining, absorption method, steaming, pressure cooking, microwave cooking; Gelatinization and dextrinization

Preparation of recipes using rice - puttu, dosai, idli/idiappam, lemon rice, curd rice, coconut rice, fried rice, tamarind rice, tomato rice, mint pulao- a few

Wheat and Millet preparations - Kesari, Phulka, poori, paratha, naan, ragi adai, samaicurd rice, thinaiuppuma, -a few

Pulses: Factors influencing texture, digestibility and nutritive value of whole gram/legumes and pulses - soaking, addition of soda bicarbonate, addition of salt, water quality- hard and soft water, pressure cooking, boiling and straining.

Pulse preparations- Sundal, sambhar, sprouted green gram patchadi, Vadai, pongal, ompodi, green gram payasam, masala vadai, medhuvadai-a few (9 Hours)

UNIT III

Vegetables and Fruits

Vegetables: Basic cuts of vegetables-Slice and mince (onions) Shred (cabbage, spinach), dice (carrot), chop (tomato), grating (beetroot), and their uses in dishes. Changes in colour and texture of vegetables and nutritive value due to different methods of cooking, cooking medium and addition of acid/alkali.

Vegetable preparations – Poriyal, Aloo methi curry, vegetable cutlet, thoran, vegetable kurma, avial, keeraimaseal, vegetable salad, vegetable soup, vegetable sandwich, kootu, mint chutney and carrot halwa.

Fruits: Enzymatic browning in fruits and methods to prevent it. Fruit preparations- stewed apple, banana fritters, fruit salad, fruit punch, fruit yoghurt and fruit smoothie, preserve/jam.

(9 Hours)

UNIT IV

Eggs, milk and milk products, meat and fish:

Egg Cookery:

Boiling of eggs-hard and soft boiled eggs. Best method of boiling eggs. Prevention of Ferrous sulphide formation on the yolk. Poaching and frying. Coagulation of egg protein-stirred and baked custard

Egg preparations - egg curry, omelet, French toast, caramel custard (steamed), scrambled eggs and fried eggs- a few Factors affecting whipping quality of egg white – effect of salt, sugar, vinegar, fat and milk, type of container used and beaters, Stages of foam formation in whipped egg whites and their uses in cookery.

Milk and milk products

Curdling of milk using lime juice, buttermilk, tomato juice,

Milk preparations

Cream of tomato soup, paneer masala, payasam, patchadi, thayirvadai, morkulumbu, basundhi, lassi, spiced buttermilk and baked macaroni and cheese. (9 Hours)

Meat and Fish

Methods of tenderizing meat-Pounding, mincing addition of acids like curd/lime juice in marinade, addition of proteolytic enzymes-raw papaya Effect of different methods of cooking on flavour, texture and appearance of meat and fish.

Meat preparations - mutton ball curry, mutton vindaloo, mutton keema, liver fry, chicken spring roll, chicken sweet corn soup, chicken biriyani. Sea food preparations- fish fry, fish moilee, fish cutlet, sweet and sour prawns. (9 Hours)

UNIT V

Sugar cookery, Fats and oils food additives and raising agents Sugar Cookery –

Stages of sugar cookery and uses. Preparations of sweets using different stages of sugar cookery

Fats and oils - Effect of temperature of oil on texture and palatability of foods- Frying pooris at different temperatures

Smoking point of oil - bread cube test.

Emulsions- definition, Preparation of mayonnaise

Food additives and Raising agents

Role of MSG, sodium benzoate and KMS in food preparation and preservation. Natural versus synthetic preservatives - Advantages and limitations use of baking soda, baking powder, yeast in baking and food preparation- Prepare one dish with each of these

Uses of herbs and spices to enhance flavour. (9 Hours)

TEXT BOOK

1. Sri Lakshmi, B. (2020). *Food Science*, 8th edition, New Delhi: New Age International Ltd.

REFERENCE BOOKS

1. Swaminathan, M. (2018). *Essentials of Food and Nutrition*, Vol I & II. Bangalore: The Bangalore printing and Publishing Co Ltd.
2. Bali, P.S (2019). *Theory of Cookery*, New Delhi: Oxford University Press.
3. Manay, S.N. and Shadaksharaswamy, M. (2018). *Foods Facts and Principles*, New Delhi: New Age International Ltd.
4. Sharma, A. (2017). *Textbook of Food Science and Technology*, New Delhi: CBS Publishers and Distributors Pvt Ltd
5. Mudambi, S.R. and Rao, S.M. (2006). *Food Science*, New Delhi: New Age International Ltd.
6. Potter, N.N. and Hotchkiss, J.H. (2006). *Food Science*, New Delhi: CBS Publishers.

Course Code 24UHSC11P	PO1		PO2		PO 3	PO4		PO 5	PO 6	PO 7
	PSO 1. a	PSO 1. b	PSO 2. a	PSO 2. b	PSO 3	PSO 4. a	PSO 4. b	PSO 5	PSO 6	PSO7
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	3	3	3	3	3	3	3	2	1
CO4	3	3	3	3	3	3	3	3	2	1
CO5	3	3	3	3	3	3	3	3	3	2

Strong (3) Medium (2) Low (1)

Dr.D.Vijayarani
Head of the Department

Dr.D.Vijayarani
Dr.S.Mathangi
Course Designers



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VIRUDHUNAGAR - 626 001

B.Sc. Home Science – Nutrition and Dietetics (2024- 2025 onwards)

Semester I	CHEMISTRY FOR BIOLOGICAL SCIENCES - I	Hours/Week: 4	
Elective Course-I		Credits: 3	
Course Code 24UCHA11		Internal 25	External 75

Course Outcomes

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

CO1: know the theories of Chemical bonding, Fuel gases, hybridisation, antibiotics and principles of volumetric analysis. [K1]

CO2: recognize the bonding and antibonding orbitals, Silicones, Polar effect, structure of drugs and uses. [K2]

CO3: explain the nuclear reactions, manufacture of fuel gas, hyperconjugation, artificial sweeteners, distillation and crystallisation. [K2]

CO4: understand the nuclear fission and fusion reactions, fertilizers, geometry of the molecules, and chromatography. [K3]

CO5: identify the applications of radioactive isotopes, NPK fertilizers, types of reactions, organic halogen compounds, and the types of chromatography. [K3]

UNIT I

Chemical Bonding and Nuclear Chemistry

Chemical Bonding: Molecular Orbital Theory-bonding, antibonding and non-bonding orbitals. M.O diagrams for Hydrogen, Helium, Nitrogen; discussion of bond order and magnetic properties.

Nuclear Chemistry: Fundamental particles - Isotopes, Isobars, Isotones and Isomers-Differences between chemical reactions and nuclear reactions- group displacement law. Nuclear binding energy - mass defect - calculations. Nuclear fission and nuclear fusion - differences – Stellar energy. Applications of radioisotopes – carbon dating, rock dating and medicinal applications. (12 Hours)

Unit II

Industrial Chemistry

Fuels: Fuel gases: Natural gas, water gas, semi water gas, carbureted water gas, producer gas, CNG, LPG and oil gas (manufacturing details not required).

Silicones: Synthesis, properties and uses of silicones.

Fertilizers: Urea, ammonium sulphate, potassium nitrate, NPK fertilizer, superphosphate, triple superphosphate. (12 Hours)

UNIT III

Fundamental Concepts in Organic Chemistry

Hybridization: Orbital overlap hybridization and geometry of CH_4 , C_2H_4 , C_2H_2 and C_6H_6 .

Polar effects: Inductive effect and consequences on K_a and K_b of organic acids and bases, electromeric, mesomeric, hyper conjugation and steric-examples and explanation.

Reaction mechanisms: Types of reactions- aromaticity-aromatic electrophilic substitution; nitration, halogenation, Friedel-Craft's alkylation and acylation Heterocyclic compounds: Preparation, properties of pyrrole and pyridine. (12 Hours)

UNIT IV

Drugs and Speciality Chemicals

Definition, structure and uses: Antibiotics viz., Penicillin, Chloramphenicol and Streptomycin; Anaesthetics viz., Chloroform and ether; Antipyretics viz., aspirin, paracetamol and ibuprofen;

Artificial Sweeteners viz., saccharin, Aspartame and cyclamate;

Organic Halogen compounds viz., Freon, Teflon. (12 Hours)

UNIT V

Analytical Chemistry

Introduction: qualitative and quantitative analysis. Principles of volumetric analysis. Separation and purification techniques: extraction, distillation and crystallization. Chromatography: principle and application of column, paper and thin layer chromatography. (12 Hours)

TEXT BOOKS

1. V.Veeraiyan, *Textbook of Ancillary Chemistry*; High mountpublishing house, Chennai, first edition,2009.
2. S.Vaithyanathan, *Text book of Ancillary Chemistry*; Priya Publications, Karur,2006.
3. ArunBahl, B.S.Bahl, *Advanced Organic Chemistry*; S.Chand and Company, New Delhi, twenty third edition,2012.
4. P.L.Soni, H.M.Chawla, *Text Book of Inorganic Chemistry*; Sultan Chand & sons, New Delhi, twenty ninth edition, 2007.

REFERENCE BOOKS

1. P.L.Soni, Mohan Katyal, *Text book of Inorganic chemistry*; Sultan Chand and Company, New Delhi, twentieth edition, 2007.
2. B.K,Sharma, *Industrial Chemistry*; GOEL publishing house,Meerut, sixteenth edition, 2014.
3. Jayashree gosh, *Fundamental Concepts of Applied Chemistry*; Sultan & Chand, 1st Edition 2006.

Course Code 24UCHA11	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	1	2	3	2	2	2
CO2	2	2	2	2	2	1	1
CO3	2	1	2	2	1	2	1
CO4	2	1	2	1	1	2	2
CO5	2	1	2	2	2	2	1

Strong (3) Medium (2) Low (1)

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Dr.M.Amutha
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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics (2024- 2025 onwards)

Semester I	CHEMISTRY PRACTICAL FOR BIOLOGICAL SCIENCES - I	Hours/Week: 2	
Elective Course 1 Practical-I		Credit: 1	
CourseCode 24UCHA11P		Internal 40	External 60

Course Outcomes

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

CO1: understand the use of Standard flask, volumetric pipettes and burette. [K2]

CO2: design, carry out and record the results of volumetric titrations. [K2]

CO3: interpret the results of volumetric titrations. [K3]

CO4: apply their skill in the analysis of water hardness. [K3]

CO5: analyse the chemical constituents in allied chemical products. [K3]

VOLUMETRIC ANALYSIS

1. Estimation of sodium hydroxide using standard sodium carbonate.
2. Estimation of hydrochloric acid using standard oxalic acid.
3. Estimation of ferrous sulphate using standard Mohr's salt.
4. Estimation of oxalic acid using standard ferrous sulphate.
5. Estimation of potassium permanganate using standard sodium hydroxide.
6. Estimation of magnesium using EDTA.
7. Estimation of ferrous ion using diphenyl amine as indicator.

REFERENCE BOOK

1. V.Venkateswaran, R.Veerasingam, A.R.Kulandaivelu, *Basic Principles of Practical Chemistry*; Sultan Chand & sons, Second edition, 1997.

Course Code 24UCHA11P	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	1	2	3	2	2	2
CO2	2	2	2	2	1	1	1
CO3	2	1	2	2	1	2	1
CO4	2	1	2	3	1	2	2
CO5	2	1	2	2	2	2	1

Strong (3) Medium (2) Low (1)

Dr.M.Dhanalakshmi
Head of the Department

Dr.J.Kavitha
Course Designer



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics (2024- 2025 onwards)

Semester I	INTRODUCTION TO HOME SCIENCE	Hours/Week: 2	
Skill Enhancement Course –1 Foundation Course		Credits: 2	
Course Code 24UHSF11		Internal 25	External 75

Course Outcomes

On completion of the course, students will be able to

CO1: state the concept, scope and philosophy of Home Science and its branches [K1]

CO2: describe the role of Home Science students and various branches of Home Science and its relation with other disciplines [K1]

CO3: explain the different types of food, nutrients, food service establishment, resources, fibre and various aspects of different branches of Home Science [K2]

CO4: relate the branches of Home Science for the upliftment of human, community and nation [K2]

CO5: trace the career opportunities of various branches of Home Science [K2]

UNIT I

Definition, meaning, Objectives, nature and scope of Home Science, Philosophy of Home Science, Branches of Home Science and its relation with other discipline, Qualities of a good Home Science student.
(6 Hours)

UNIT II

Food Science and Nutrition - Definition – Food, Food Science, Nutrition, Nutrients, Balanced diet and RDA. Functions of food, functions of nutrients. Nutritional status. Food in relation to health. Human Development – Meaning, stages of life span - characteristics, importance of harmonious relationship in the family.

Role and career opportunities.
(6 Hours)

UNIT III

Food Service Management - History, types of establishment. Menu planning – principles and types.

Dietetics – Meaning and role of dietitian.

Role and career opportunities. (6 Hours)

UNIT IV

Family resource management: Resources – meaning, uses, characteristics and types.

Textiles and Clothing: Definition - fibre, yarn, weaving and finishes. Selection of clothing requirements for different age groups, Introduction to fashion design – fashion, style, fad, classic and collection.

Home Science Extension: concept and objectives, qualities of extension workers.

Role and career opportunities. (6 Hours)

UNIT V

Home Science Association of India, Indian Dietetics Association – objectives and role.

Role of Home Science – Women's empowerment, Community service, empowerment of Individual, Family and Society, Youth and Nation Development (6 Hours)

REFERENCES

1. Srilakshmi, B. (2020). *Food Science*, 8th Edition, New Delhi: New Age International Ltd.
2. Swaminathan, M. (2018). *Essentials of Food and Nutrition*, Vol I & II. Bangalore: The Bangalore printing and Publishing Co Ltd.
3. Manay, S.N. and Shadaksharaswamy, M. (2018). *Foods Facts and Principles*, New Delhi: New Age International Ltd.
4. Rajammal P. Devadas and Jaya N. Muthu (2002). *A Textbook of Child Development*, New Delhi: Macmillan Publishers.
5. Srilakshmi B. (2011) *Dietetics*, sixth edition, New age Publishing Press, New Delhi.
6. Rastogi, D., Chopra, S. (2017). *Textile Science*. India: Orient Blackswan Private Limited.
7. Suganthi, V and Premakumari, C. (2017). *Food Service Management*, Dipti Press (OPC) Pvt. Ltd, Chennai.
8. Sethi, Mohini, Malhan, Surjeet. (2015). *Catering Management – An Integrated Approach*, 3rd Edition, New Age International Publishers, New Delhi.

Course Code	PO1		PO2		PO3	PO4		PO5	PO6	PO7
24UHSF11										
	PSO 1. a	PSO 1. b	PSO 2. a	PSO 2. b	PSO 3	PSO 4. a	PSO 4. b	PSO 5	PSO 6	PSO 7
CO1	3	2	3	3	2	3	3	3	1	3
CO2	3	3	3	3	2	3	3	3	1	3
CO3	3	3	3	3	2	3	3	3	2	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	2	3

Strong (3) Medium (2) Low (1)

Dr.D.Vijayarani
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Mrs.S.Balasaraswathi
Dr.S.Mathangi
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B.Sc. Home Science- Nutrition and Dietetics (2024- 2025 onwards)

Semester-II	HUMAN PHYSIOLOGY	Hours/Week:4	
Core Course -3		Credits:4	
Course Code 24UHSC21		Internal 25	External 75

COURSE OUTCOMES

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

CO1: state the structure and functions of a cell and physiological systems such as nervous, respiratory, digestive, endocrine, reproductive systems in the human body. [K1]

CO2: generalize the principal tissue structures in the human body. [K2]

CO3: recognize the knowledge and regulate the body functions based on disorders in the human physiology.[K2]

CO4: identify the composition and mechanism of various organs in the human body.[K3]

CO5: modify the knowledge and appreciation of the human physiology.[K3]

UNIT I

Cell, Tissues and Blood

Cell and tissues-Structure of Cell and functions of different of different organelles.

Classification, structure and functions of tissues. Blood- Constituents of blood- RBC, WBC and Platelets and its functions. Erythropoiesis, Blood clotting, Blood groups and histocompatibility. Immune system- Antigen, Antibody, Cellular and Humoral Immunity (in brief). (12 Hours)

UNIT II

Nervous System and Sense organs

Nervous system – General anatomy of nervous system, functions of the different parts

Sense organs – Structure and functions of Eye, Ear, Skin. Physiology of Taste and Smell-in Brief.

(12 hours)

UNIT III**Heart and circulation, Respiratory system**

Heart and circulation - Anatomy of the heart and blood vessels, properties of cardiac muscle, Origin and conduction of heart beat, cardiac cycle, cardiac output, blood pressure -definition and factors affecting blood pressure, and description of ECG. Respiratory system – Anatomy and physiology of respiratory organs. Gaseous exchange in the lungs and tissues, Mechanism of respiration. (12 Hours)

UNIT IV**Digestive system and Excretory system**

Digestive system – Anatomy of Gastro- intestinal tract, Structure and functions of Liver and Pancreas. Digestion and absorption of carbohydrates, proteins and fats. Excretory system – Structure of kidney, functions of Nephron. (12 Hours)

UNIT V**Endocrine system and Reproductive system**

Endocrine system – Functions of hormones secreted by Pancreas, Pituitary gland, thyroid, parathyroid and adrenal glands. Effects of hypo and hyper secretion of these glands. Reproductive system – Anatomy of male and female reproductive organs, Ovarian and Uterine cycle, influence of hormones on pregnancy and lactation. (12 Hours)

PRACTICAL:

- Microscopic study of different tissues: epithelial, connective, muscular and nervous tissue
- Blood Experiments- Blood Smear, Blood Count and Blood Grouping
- Study of the Structure of Brain using model/ specimen and structure of Eye and Ear using models/charts
- Recording of Blood Pressure
- Study of the structure of Heart Lung using specimen, model/charts/ videos
- Study of the Structure of Liver, Pancreas, Stomach using model /charts /specimen/ videos
- Microscopic study of tissues of the Pituitary, Thyroid, Ovary and Testis
- Study of the structure of the male and female reproductive organs using models/charts/videos

TEXT BOOKS

1. Sampath, T. K. and Uma Maheshwari, B
2. . (2017). Human Anatomy and Physiology, 11th Edition, Mumbai: Birla Publications,

REFERENCE BOOKS

1. Gillian Pocock, Christopher D. Richards, David A. Richards · (2018). *Human Physiology*, Oxford University Press.
2. Saladin, K.S. (1998). *Anatomy Physiology*, New York: MC Grow-hill.
3. Sarada Subramanyam, Madhavan Kutty, K. and Singh, H.D. (1996). *Text Book of Human Physiology*, New Delhi: S.Chand Company.
4. Silverthorn, Dee Unglaub. (2015) *Human physiology*. Jones & Bartlett Publishers.
5. Vidhya, R. (1993). *Hand Book of Physiology*, New Delhi: Medical Publishers (P) Ltd.

Course Code 24UHSC21	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	3	3	3	1	3	2	-	-
CO2	3	3	3	3	3	1	3	2	-	-
CO3	3	3	3	3	3	1	3	2	-	-
CO4	3	3	3	3	3	1	3	2	-	-
CO5	3	3	3	3	3	1	3	2	-	-

Strong (3) Medium (2) Low (1)

Dr.D.Vijayarani
Head of the Department

Mrs.B.Ameena Beebi
Course Designer



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics

(2024- 2025 onwards)

Semester II	BASICS OF FOOD MICROBIOLOGY	Hours/Week: 4	
Core Course -4		Credits: 3	
Course Code 24UHSC22		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1:describe the basic concept of food microbiology, food spoilage, fermented foods, food-borne diseases and control of microbes [K1].

CO2:discuss the types of microbe in food spoilage, food - borne diseases, food fermentation, food preservation and water , soil air, and sewage [K2].

CO3:explain the morphological features of microbes, the factors responsible for food spoilage, fermentation technology and preventive measures to control food - borne disease outbreaks. [K2]

CO4:find the role of microbes in economic development, food fermentation, food spoilage, food - borne diseases, sanitation and write the methods to control microbes in food handling units. [K3]

CO5:identify the microbes in food spoilage, food-borne diseases and choose the suitable methods to prepare fermented foods and preserve various foods. [K3]

UNIT I

Introduction to Microbes in Foods

History and Development of Food Microbiology Classification of microorganisms. General morphological characteristics of bacteria, yeast, algae. mold, virus. Characteristics of predominant microorganisms in food, sources of microorganisms in foods. (12 hours)

UNIT II

Microbial spoilage and contamination of common food

Factors affecting growth of microorganisms- intrinsic and extrinsic. Sources of contamination and spoilage of common foods –Cereal and cereal products, fruits and vegetables, egg, meat and fish, milk and milk products. (12 hours)

UNIT III**Beneficial uses of microorganisms in food and health**

Microorganisms used in fermented products-Alcoholic drinks, Dairy products, Bread, Vinegar, Pickled foods. Single-cell protein Food Bio-preservatives of microbial origin. Intestinal Bacteria and Probiotics. (12 Hours)

UNIT IV**Food poisoning and Food borne disease**

Food poisoning/ intoxication and food infection- definition. Bacterial food poisoning–Staphylococcus aureus, Clostridium botulinum, Clostridium perfringens, Bacillus cereus. Food Infection-Salmonellosis, Shigellosis, Cholera, Gastroenteritis.

Measures to prevent food poisoning and food borne infection. (12 Hours)

UNIT V**Microorganisms found in water, soil, air and sewage**

List of microorganisms and diseases caused; Test for sanitary quality of water, Purification of water

Control of Microorganisms in food

Control of Access of Microorganisms: sanitation, sterilization and disinfection Control by Heat (Thermal Processing), Low Temperature, Reduced Water Activity and Drying, Low pH and Organic Acids, Modified Atmosphere, Reducing O-R Potential) Antimicrobial Preservatives and Bacteriophages Irradiation, Novel Processing Technologies, Combination of Methods (Hurdle Concept) (12 Hours)

PRACTICAL

1. Study of different equipments in a microbiology lab.
2. Safety practices in microbiology laboratory.
3. Microscopy- principles, parts, function and operation.
4. Microscopic structure of algae, molds, yeast, virus and bacteria.
5. Examination of organisms using simple staining technique.
6. Examination of organisms using gram staining technique.
7. Examination of motility of bacteria using hanging drop technique.
8. Demonstration of sterilization of glassware using hot air oven, autoclave.
9. Demonstration of media preparation-Broth, deep, slant and plates.
10. Demonstration of culture techniques-streak, pour plate.
11. Visit (at least one) to food processing units or any other organization dealing with advanced methods in food microbiology.

REFERENCE BOOKS

1. McDonell, G. (2020). *Block's Disinfection, Sterilization and Preservation*. 6th edition. Philadelphia: Lippincott Williams and Wilkins.
2. Satyanarayana, U. (2019). *Biotechnology*. Kolkata: Books and Allied Pvt Ltd.
3. Adams, M.R., & Moss, M.G. (2018). *Food Microbiology*. New Delhi: New Age International Private Ltd.
4. Ananthanarayan, & Paniker. (2017). *Textbook of Microbiology*. 10th Edition. Hyderabad: Orient Longman Limited.
5. Frazier, W.C., & Westhoff, D.C. (2017). *Food Microbiology*. 5th edition. New York: John Wiley and Sons, Inc.
6. Sathyanarayana, U. (2013). *Biotechnology*. Kolkata: Books and Allied Pvt Ltd.
7. Parija, S.C. (2012). *Textbook of Microbiology and Immunology*. 2nd edition. Elsevier India.
8. Sharma, D.K. (2013). *Microbiology*. New Delhi: Narosa Publishing House.
9. Frazier, W.C., & Westhoff, D.C. (2013). *Food Microbiology*. 5th Edition. New Delhi: McGraw Hill.
10. Garbutt, J. (1997). *Essentials of Food Microbiology*. 2nd edition. New York: Arnold Publication.
11. Jay, J.M., Loessner, M.J., & Golden, D.A. (2005). *Modern Food Microbiology*. 7th edition. New Delhi: CBS Publishers and Distributors.
12. Ramesh, V. (2007). *Food Microbiology*. Chennai: MJP Publishers.
13. Arora, B., & Arora, D.R. (2007). *Practical Microbiology*. New Delhi: CBS Publishers.
14. Rajan, S., & Selvichristy, R. (2011). *Experimental Procedures in Life Sciences*. Chennai: Anjanaa Book House.
15. Kalaiselvan, P.T. (2006). *Microbiology and Biotechnology - A Laboratory Manual*. Tamil Nadu: MJP Publishers.
16. Gunasekaran, P. (2005). *Laboratory Manual in Microbiology*. New Delhi: New Age International (P) Limited Publishers.
17. Ananthanarayanan, R., & Panicker, C.K. (2009). *Textbook of Microbiology*. Hyderabad: Universities Press (India) Pvt Ltd.
18. Ray, B. (2001). *Fundamental Food Microbiology*. 2nd edition. Boca Raton, FL: CRC Press.
19. Roday, S. (1999). *Food Hygiene and Sanitation*. New Delhi: Tata McGraw Hill.

e-learning resources

- <http://people.uleth.ca/~selibl/Biol3200/CourseNotes/MicroTaxonomyCh10.pdf>
- <https://www.cdc.gov/vaccines/hcp/conversations/downloads/vacsafe-understand-color-office.pdf>

- <https://www.who.int/news-room/fact-sheets/detail/food-safety>
- <https://epi.dph.ncdhhs.gov/cd/diseases/food.html>
- <http://vikaspedia.in/health/nutrition/food-borne-diseases-or-food-poisoning>
- <https://www.microrao.com/micronotes/sterilization.pdf>
- <https://ehs.colorado.edu/resources/disinfectants-and-sterilization-methods/>

Course Code 24UHSC22	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	3	3	-	-	-	3	-	-
CO2	3	3	3	3	-	-	2	2	-	3
CO3	2	2	1	1	-	-	2	2	-	1
CO4	1	1	1	1	1	2	2	1	-	1
CO5	1	1	1	1	1	1	1	1	-	1

Strong (3) Medium (2) Low (1)

Dr.D.Vijayarani

Head of the Department

Mrs.A.Jeevarathinam

Course Designer



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics

(2024- 2025 onwards)

Semester II	CHEMISTRY FOR BIOLOGICAL SCIENCES - II	Hours/Week: 4	
Elective Course-I		Credits: 3	
Course Code 24UCHA21		Internal 25	External 75

COURSE OUTCOMES

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

CO 1: know the IUPAC name for complexes, different theories to explain the bonding in coordination compounds and water technology. [K1]

CO 2: explain the preparation and property of carbohydrate. [K2]

CO 3: enlighten the biological role of transition metals, amino acids and nucleic acids. [K2]

CO 4: apply the electrochemical principles in corrosion, electroplating and fuel cells. [K3]

CO 5: outline the various type of photochemical processes. [K3]

UNIT I

Co-ordination Chemistry and Water Technology

Co-ordination Chemistry: Definition of terms - IUPAC Nomenclature- Werner's theory - EAN rule - Pauling's theory – Postulates - Applications to $[\text{Ni}(\text{CO})_4]$, $[\text{Ni}(\text{CN})_4]^{2-}$, $[\text{Co}(\text{CN})_6]^{3-}$ Chelation - Biological role of Hemoglobin and Chlorophyll (elementary idea) - Applications in qualitative and quantitative analysis.

Water Technology: Hardness of water, determination of hardness of water using EDTA method, zeolite method-Purification techniques – BOD and COD. (12 Hours)

UNIT II

Carbohydrates

Classification, preparation and properties of glucose and fructose. Discussion of open chain ring structures of glucose and fructose. Glucose-fructose interconversion. Preparation and properties of sucrose, starch and cellulose. (12 Hours)

UNIT III**Amino Acids and Essential elements of biosystem**

Classification - preparation and properties of alanine, preparation of dipeptides using Bergmann method
 - Proteins- classification – structure - Colour reactions – Biological functions – nucleosides -nucleotides
 – RNA and DNA – structure. Essentials of trace metals in biological system-Na, Cu, K, Zn, Fe, Mg.
 (12 Hours)

UNIT IV**Electrochemistry**

Galvanic cells - Standard hydrogen electrode - calomel electrode - standard electrode potentials - electrochemical series. Strong and weak electrolytes - ionic product of water -pH, pKa, pKb. Conductometric titrations - pH determination by colorimetric method – buffer solutions and its biological applications - electroplating - Nickel and chrome plating – Types of cells -fuel cells-corrosion and its prevention.
 (12 Hours)

UNIT V**Photochemistry**

Grothus - Drapper's law and Stark-Einstein's law of photochemical equivalence, Quantum yield - Hydrogen -chloride reaction. Phosphorescence, fluorescence, chemiluminescence and photosensitization and photosynthesis (definition with examples).
 (12 Hours)

TEXT BOOKS

1. Soni P.L.,(2008).*Text book of Organic Chemistry*, Latest Edition.Sultan Chand & Sons.
2. Arun Bahl, Bahl B.S &.Tuli G.D, (2009) *Essentials of Physical chemistry*, S.Chand & Company Ltd., New Delhi.

REFERENCE BOOKS

1. Jain, M.K. & Sharma, S.C. (2016). *Modern Organic Chemistry*, ^{1st} Edition. New Delhi: Vishal Publishing Co.
2. Madan .R.D, *Modern Inorganic Chemistry*, S.Chand & Company Ltd.

Course Code 24UCHA21	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	1	2	3	2	2	2
CO2	2	2	2	2	1	1	1
CO3	2	1	2	2	1	2	1
CO4	2	1	2	3	1	2	2
CO5	2	1	2	2	2	1	1

Strong (3) Medium (2) Low (1)

Dr.M.Dhanalakshmi
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Mrs.R.Nagasathya
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Semester II	CHEMISTRY PRACTICAL FOR BIOLOGICAL SCIENCES - II	Hours/Week: 2	
Elective Course I Practical II		Credit: 1	
Course Code 24UCHA21P		Internal 40	External 60

COURSE OUTCOMES

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

CO1: remember the functional group of organic compounds. [K2]

CO2: carry out the reactions and find out the elements of organic compounds. [K2]

CO3: determine the functional group and distinguish between aliphatic and aromatic compounds. [K3]

CO4: apply the skill in the analysis of functional group of organic compounds. [K3]

CO5: identify the saturated and unsaturated organic compounds. [K3]

SYSTEMATIC ANALYSIS OF ORGANIC COMPOUNDS

The analysis must be carried out as follows:

- Functional group tests [phenol, acids (mono & di) aromatic primary amine, amides (mono & di), ester, aldehyde and glucose].
- Detection of elements (N, S, Halogens).
- To distinguish between aliphatic and aromatic compounds.
- To distinguish – Saturated and unsaturated compounds. **(30 Hours)**

REFERENCE BOOK

- 1.V.Venkateswaran, R.Veerassamy, A.R.Kulandaivelu, *Basic Principles of Practical Chemistry*; Sultan Chand & sons, Second edition, 1997.

Course Code 24UCHA21P	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	1	2	3	2	2	2
CO2	1	2	2	2	1	1	1
CO3	2	1	-	2	1	-	1
CO4	2	1	2	3	1	-	2
CO5	2	1	2	2	2	-	1

Strong (3) Medium (2) Low (1)

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Dr.J.Kavitha
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Semester II	FAMILY DYNAMICS	Hours/Week: 2	
Skill Enhancement Course -2		Credits: 2	
Course Code 24UHSS21		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: state the concept of family, family dynamics, family lifecycle, parent child relationship, marriage, small family norms, family crisis and counselling. [K1]

CO2: explain the types of family, marriage, marital adjustments, parent's nurturance, crisis and counselling. [K1]

CO3: elaborate the characteristics and significance of family and good marital relationship, parenthood and their duties. [K2]

CO4: outline the role of family members in the family and changing trends in family, marriage, family relationships and family crisis.[K2]

CO5: identify the factors responsible for stress, violence, counselling and conflicts in family and develop the skills in handling real life situations.[K3]

UNIT I

Family

Meaning, family as the basic social institution, significance of family, Types, characteristics of family. Family Dynamics–Meaning and Significance. The place of the individual, man, woman and child in the family. Changing trends in India regarding family pattern. Achieving harmonious interpersonal relationship in the family. (6 Hours)

UNIT II

Contemporary Alternative Family Patterns and Relationships

Family lifecycle—stages and sub-stages

Singlehood: Reasons.

Cohabitation: Types.

Single-parent Families: Divorce, binuclear family, Stepfamilies.

Areas of adjustment within the family at different stages of lifecycle. Ways of dealing with adjustment. (6 Hours)

UNIT III

Marriage

Marriage - Meaning, preparation, motives, functions, and types of marriage Characteristics of high-quality marital relationships.

Factors affecting marriage relationship – religion, socio economic status, careers, Social and emotional issues, financial concerns. Marital adjustments – physiological, domestic, social, in-laws relationship, Marital satisfaction and marital stability. Changes and challenges in marriage.

(6 Hours)

UNIT IV

Parent's Nurturance of Children over the Life Course - Parent-Child Relationships in Diverse Contexts—Planned parenthood and duties, styles of parenting, child rearing techniques, small family norms. (6 Hours)

UNIT V

Family Crisis and Counselling

Families with marital disharmony crisis, causal factor responsible for stress and violence in family.

Counselling – meaning, process, skills, importance and types - pre-marital counselling – objectives, benefits, role and challenges, marital counselling – meaning, reasons, techniques and benefits and family counselling - meaning, importance, techniques and benefits. Role of family counselling centres. (6 Hours)

Practicals

- Analysis of various types of family
- Analysis of family lifecycle
- Analysis of various contemporary Family Patterns
- A survey on preferences of adolescents in choosing a life partner.
- Prepare case studies on parent-child relationships in concern with parenting style

REFERENCES

1. Bengston, V. L., Acock, A. C., Allen, K. R., Dilworth-Anderson, P., & Klein, D. M. (Eds.) (2005). *Sourcebook of Family Theory & Research*. New Delhi: Sage.
2. Bretherton, I. (1993). *Theoretical contributions from developmental psychology*. In P.G. Boss, W.J. Doherty, R. LaRossa, W.R. Schumm, & S.K. Steinmetz (Eds.), *Sourcebook of Family Theories and Methods: A Contextual Approach* (pp. 505-524). New York, NY: Plenum.
3. Broderick, C. B. (1993). *Understanding Family Process: Basics of Family Systems Theory*. New York: Sage.
4. Cole, M., & Cole, S. (1993). *The Development of Children*. New York: Scientific American Books.
5. DeLamater, J., & Hyde, J. (2004). *Conceptual and theoretical issues in studying sexuality in close relationships*.
6. Erlbaum Heath, P. (2005). *Parent-Child Relations: History, Theory, Research, and Context*. New Jersey: Prentice-Hall.
7. Ingoldsby, B. B., Smith, S., & Miller, J. E. (2004). *Exploring Family Theories*. Los Angeles: Roxbury.
8. Peterson, G.W., & Bush, K.R. (Eds.). (2002). *Handbook of marriage and the family* (pp. 423-447). New York, NY: Springer.

e- Learning Resources

- https://us.sagepub.com/sites/default/files/upm-assets/109149_book_item_109149.pdf
- https://www.npaonline.org/sites/default/files/6.%20NPA%20Family%20Dynamics%20The%20Good%20The%20Bad%20The%20Ugly_DePasquale.pdf
- https://www.researchgate.net/publication/327078511_Family_Dynamics_and_Intergenerational_Relations_A_psycho-Social_Analysis
- <http://www.familiesandsocieties.eu/wp-content/uploads/2014/12/WP04BernardiEtal2013.pdf>

Course Code 24UHSS21	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	1	1	1	3	-	-	-	1	-	-
CO2	2	2	2	3	-	-	-	2	-	1
CO3	2	2	2	3	-	-	1	2	-	2
CO4	3	3	3	3	3	-	1	3	-	2
CO5	3	3	3	3	3	-	3	3	-	2

Strong (3) Medium (2) Low (1)

Dr.D.Vijayarani
Head of the Department

Dr.D.Vijayarani
Course Designer



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Semester-III	HUMAN NUTRITION	Hours/Week:5	
Core Course- 5		Credits:5	
Course Code 24UHSC31		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: state the basic concept of nutrition, nutritional status, BMR, balanced diet, protein supplements and sources of nutrients, energy and water in human nutrition [K1].

CO2: discuss the different types of macronutrients, micronutrients, malnutrition and nutritional assessment in relation to health [K2].

CO3: write the role, digestion and absorption of carbohydrate, protein, fat, water, minerals, vitamins and energy in maintaining health [K2].

CO4: find the signs, symptoms, consequences of good nutrition, malnutrition and various nutrient deficiency diseases. [K3].

CO5 : identify the nutrient requirements for different age groups, preventive measures of various deficiency diseases , factors affecting BMR, determination of protein quality, and nutritional status of human [K3].

UNIT I

Introduction to nutrition- History of Nutrition – Development of Nutrition as a Science

Food as a source of nutrients, definition of nutrients, Balanced diets and dietary guidelines-current concepts

Signs and symptoms of adequate, optimum and good nutrition, malnutrition (Undernutrition, and over nutrition)

Assessment of Nutritional status- Anthropometric, Biochemical, Clinical and Dietary aspects. (15 hours)

UNIT II

Carbohydrates

Classification, Food Sources, Requirements and Functions of carbohydrates in the body. Digestion, absorption and metabolism.

Physiological significance of Monosaccharides, Disaccharides and Polysaccharides Glycemic Index, Glycemic load of Foods, and factors affecting it, Hormonal control of Blood sugar.

Role of fibre in prevention of non-communicable diseases. (15 hours)

Proteins

Amino acids - Indispensable and dispensable amino acids. Classification, Sources, Requirements and functions of protein. Digestion, absorption and metabolism. Mutual supplementation of proteins.

Protein deficiency-Protein Energy Malnutrition- Kwashiorkor and Marasmus – etiology, clinical features, treatment and prevention Evaluation of protein quality- PER, BV, NPU and NPR, chemical score. Protein Supplements and Novel Protein sources- Benefits and Health concerns. (15 hours)

UNIT III

Lipids- Classification, Sources, Requirements and functions, Essential fatty acids-deficiency, food sources and functions, Digestion, absorption and metabolism. Healthy and Unhealthy Fats in the diets, Dietary lipids and its relation to cardiovascular diseases.

Energy- Determination of energy value of foods using Bomb calorimeter, Physiological value of foods, relation between oxygen used and calorific value.

Direct and Indirect calorimetry direct calorimetry, Respiratory quotient.

Components of Energy expenditure- Basal metabolism, factors affecting BMR, Food related thermogenesis, Physical activity. Energy requirements for different age groups, and for various types of activities. (15 hours)

UNIT IV

Fat Soluble Vitamins

Food sources, Requirements, Functions, Effects of deficiency or Toxicity (wherever applicable).

Water Soluble Vitamins

Food sources, Requirements, Functions, Effects of deficiency. Antioxidant role of certain Vitamins in Health promotion . Digestion, absorption and metabolism. (15 hours)

UNIT V

Macro minerals

Calcium, Phosphorous, Magnesium, Potassium, Sodium and Chloride- Distribution in the body, functions, food sources, requirements, effects of deficiency and toxicity.

Micro/Trace minerals

Iron, Zinc, Iodine, Selenium, Manganese, Chromium, Fluoride and Copper Distribution in the body; functions, effects of deficiency, food sources and requirements, Role of Antioxidant minerals. Digestion, absorption and metabolism.

Water

As a nutrient, functions, sources, requirements. Distribution of water in the body, exchange of water in the body, composition of body fluids.

Water balance, factors regulating it, dehydration, water intoxication. (15 hours)

REFERENCE BOOKS

1. Anderson J. J. B., Root M. M., Garner S. C. (2015) Human Nutrition: Healthy Options for Life. Jones & Bartlett Learning, Massachusetts, USA.
2. Guthrie, H.A. (1989) Introductory Nutrition. 7th ed. Times Mirror / Mosby College Publishing, St. Louis
3. Insel P., Ross D., McMahon K., Bernstein M. (2016) Discovering Nutrition. 5th Ed., Jones & Bartlett Learning, Massachusetts, USA.
4. Mahan K and Sylvia E. Stump (2000) Krause's Food Nutrition and Diet Therapy, Saunders, USA
5. Medeiros D. M., and Wildman R. E. C. (2019) Advanced Human Nutrition. 4th Ed., Jones & Bartlett Learning, Massachusetts, USA.
6. Ross A. C., Caballero B., Cousins R. J., Tucker K. L., Ziegler T. R. (2014) Modern Nutrition in Health and Disease. 11th Ed., Wolters Kluwer | Lippincott Williams & Wilkins, Philadelphia, USA.
- 7.Sizer F. S. and Whitney E. (2014) Nutrition: Concepts & Controversies. 13th Ed., Wadsworth, Cengage Learning, USA.
8. Whitney, E.R. and Rolfes S.R. (1996) Understanding nutrition. 7th Ed., West Publishing Company, USA
9. Srilakshmi, B. (2023). Human Nutrition. 3rd Edition, New age international publishers, New Delhi.

10. Swaminathan, T. (2018). Essential of Food and Nutrition, Bangalore: The Bangalore Press Pvt.
11. Joshi, S.A. (2023). Nutrition and Dietetics. 5th edition, McGraw Hill education private limited: India

e-Learning Resources

- <http://www.merck.com/mmhe/seciz/ch155/ch155a.html>
- <http://www.whereincity/medical/vitamins>

Mapping with Programme Outcomes

Course Code 24UHSC31	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1a	PSO 1b	PSO 2a	PSO 2b	PSO3	PSO 4a	PSO 4b	PSO5	PSO6	PSO7
CO1	3	3	3	3	2	2	2	1	2	1
CO2	3	3	3	3	2	2	2	1	2	1
CO3	3	3	3	3	3	3	3	1	2	3
CO4	3	3	3	3	3	3	3	1	2	1
CO5	3	3	3	3	3	3	3	1	2	3

Strong 3 Medium 2 Low 1

Dr.D.Vijayarani

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Course Designers



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Semester-III	NUTRITION PRACTICAL	Hours/Week:3	
Core Course – 6 Practical -II		Credits:2	
Course Code 24UHSC31P		Internal 40	External 60

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: write the aim and principles of various analytical techniques and equipment used in human nutrition research [K2].

CO2: explain the procedure for various experiments related to food and serum samples [K2].

CO3: find the steps involved in the testing of nutrients in foods and metabolites in serum [K3].

CO4: estimate the quantity of substances in food and serum and interpret the findings with standard values [K3].

CO5: identify the reagents, reactants, equipment and techniques to analyze the food and serum samples [K3].

PRACTICAL:

1. Assessment of Nutritional Status
2. Body Composition parameters
3. Circumference measurements
4. Clinical signs
5. Dietary assessment
6. Ashing of food and preparation of ash solution
7. Estimation of Iron in food
8. Estimation of calcium in food
9. Estimation of Vitamin C by Titrimetric method
10. Estimation of calorific value of food using the Bomb Calorimeter-Demonstration
11. Estimation of protein content in food by the kjeldahl method-Demonstration
12. Estimation of moisture content of food using Infrared moisture balance-Demonstration
13. Estimation of glucose in blood (colorimetric estimation and use of glucometer)
14. Estimation of haemoglobin in blood
15. Determination of plasma cholesterol, Triglycerides, HDL and LDL cholesterol

16. (with the use of the semi auto analyser)
17. Estimation of acid value in oil/fat
18. Visit to a food analytical lab

REFERENCE BOOKS

1. Oser, D.I. (1979) Hawk's Physiological Chemistry. Tata- McGraw Hill Publishing Co., New Delhi
2. Plummer, D.T. (1987) Introduction to Practical Biochemistry. Tata- McGraw Hill Publishing Co., New Delhi
3. Raghuramulu, N., Nair, K.M. and Kalyanasundaram, S. (1983) A Manual of Laboratory
4. Sharma, B.K. (1999). 8th Ed. Instrumental Methods of Chemical Analysis. Gal Publishing House.
5. Srivastava, A.K and Jain, P.C. (1986). 2nd, Ed. Chemical Analysis: An Instrumental Approach. S Chand and Company Ltd. Techniques. NIN, Hyderabad
6. Varley, H.; Gowenlock, A.H. and Bell, M. (1980). 5th ed. Practical Clinical Biochemistry. Heinemann Medical Books Ltd.
7. Winton, A.L. and Winton, K.B. (1999). Techniques of Food Analysis. Allied Scientific
8. Ajay Paul, (2012). Basic and Applied Biochemistry-A practical Manual, Haryana: CCS Haryana University.
9. Sadasivam, S. and Manickam, B. (2022). Biochemical Methods, 4th edition, New Delhi: New Age International Publishers

e-Learning Resources

- <http://www.merck.com/mmhe/seciz/ch155/ch155a.html>
- <http://www.whereincity/medical/vitamins>

Mapping with Programme Outcomes

Course Code 24UHSC31P	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1a	PSO 1b	PSO 2a	PSO 2b	PSO 3	PSO 4a	PSO 4b	PSO 5	PSO 6	PSO 7
CO1	3	3	1	1	3	2	2	3	1	2
CO2	3	3	1	1	3	2	2	3	1	2
CO3	3	3	1	1	3	3	3	3	1	1
CO4	3	3	1	1	3	2	2	3	1	1
CO5	3	3	1	1	3	3	3	3	1	1

Strong 3 Medium 2 Low 1

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Semester III	PRINCIPLES OF RESOURCE MANAGEMENT	Hours/Week: 6	
Elective Course - 2		Credits: 4	
Course Code 24UHSA31		Internal 25	External 75

COURSE OUTCOMES

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

CO1: describe the concept and importance of management, characteristics of home management, motivating factors in management, decision, decision making, resources and resource management. [K1]

CO2: discuss the types of motivating factors in management, decision, resource, efforts in energy management, fatigue, income, budget and saving. [K2]

CO3: explain the process of management and decision making, methods of handling money, time and energy. [K2]

CO4: write the principles of home management, body mechanism in energy management, decision making and budget, techniques involved in work simplification, Mundel's classes of change and Engel's law of consumption. [K3]

CO5: identify the factors influencing the use of resources, time, energy and money for standard of living and determine the motivating factors in management. [K3]

UNIT I

Introduction to Management - Management Concepts - Definition, Concept, Micro and Macro environment. Principles of Management Process - Planning, Controlling, Evaluating. Qualities of a Good Manager. Motivational factors - Values, Goals and Standards. (18 hours)

UNIT II

Resources - Meaning and classification, optimizing the use of familyresources, Factors affecting the use of resources.

Decision making - Meaning and its importance, Types of decisions, Decision making process, Methods of resolving conflicts. (18 hours)

UNIT III

Time Management - Tools in time management - Time norms, Peak loads, Work Curves and rest periods, Time management process - Planning - Steps in making time plans - Controlling the planning action - Evaluation.

Energy Management - The efforts required in home-making activities; Energy required for household activities. (18 hours)

UNIT IV

Work Simplification - Definition, Importance, Techniques – Formal and Informal Techniques - Mundel's Classes of change - Planning efficient work areas in kitchen.

Body Mechanics - Posture, Gravity, Rhythmic movement, Proper use of Muscle and advantage of Momentum.

Fatigue - Concepts, Types - Physiological and Psychological fatigue and Managerial process applied to energy. (18 hours)

UNIT V

Money Management - Family Income - Types, sources and methods of augmenting family income.

Family Expenditure - Budget - Meaning - Types of budgets, Planning a budget for a family of a fixed income, Hotel / Restaurant, advantages of budgeting, Factors affecting family budget, Engel's law of consumption, methods of handling money - Family financial records, Savings-importance and types. (18 hours)

Activity:

Identification of personal and family values and goals – their interrelationship.

List out the resources optimizing the goal.

Preparation of a time schedule and Evaluate time schedule using Gantt chart.

Study on work heights based on anthropometric measurement on vertical and horizontal planes.

Preparation of family budget. Study of a saving institution and its scheme.

REFERENCE BOOKS

1. Bela Bhargava (2005), “Family resource Management & Interior Decoration”, University Book House Pvt Ltd, ISBN-13: 978-8187339229
2. Marion Giordan (2016), “Consumer Education: A handbook for Teachers”, Routledge; 1st edition, ISBN-13: 978-1138839151
3. Nickell & Dorsey (2002), “Management in Family Living”, CBS; 4th edition, ISBN-13: 978-8123908519

4. Pushpa Chakravorty (2007), Home Management, New Delhi: Pointer Publishers.
5. Rao (2020), "Taxmann's Human Resource Management", Taxmann Publications Pvt.Ltd.; 2nd edition, ISBN-13: 978-9390128396
6. Ready GB (2021), "EBC consumer Protection Act", LAW BOOKS, ASIN:B097TQ64QV
7. Steven, D.S, (2016). Consumer Economics: A Practical Overview", New York : Routledge Taylor and Francis group.
8. Sudhir Dixit (2018), "Time Management", Manjul Publishing House, ISBN-13: 978-9388241106

e- Learning Resources

- <http://www.yourarticlelibrary.com/decision-making/decision-making-in-management-definition-and-features-explained/25657/>
- <http://www.familyresourcemanagement.org/services/goals/>
- <http://www.familyresourcemanagement.org/services/standards/>
- [http://www.nios.ac.in/media/documents/sechmscicour/english/home%20science%20\(eng\)%20ch-15.pdf](http://www.nios.ac.in/media/documents/sechmscicour/english/home%20science%20(eng)%20ch-15.pdf)
- <https://books.google.co.in/books?id=NJkrzK3CgisC&pg=PA149&lpg=PA149&pq=dq=time,+energy,+money+as+resource+in+management&source=bl&ots=xmSp-LDkia&sig=57qLKHx2UX3sxnBIJhm>

Mapping with Programme Outcomes

Course Code 24UHSA31	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	2	3	2	1	2	3	-	1
CO2	3	3	2	3	1	2	3	3	-	1
CO3	3	3	2	3	1	2	3	3	-	1
CO4	3	3	2	3	2	2	3	3	-	1
CO5	3	3	2	3	3	3	3	3	-	-

Strong (3) Medium (2) Low (1)

Dr.D.Vijayarani

Head of the Department

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Mrs.R.Subha

Course Designers



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science - Nutrition and Dietetics (2024 - 2025 onwards)

Semester III	FOOD PRODUCT DEVELOPMENT PRACTICAL	Hours/Week: 1
Skill Enhancement Course – 3 Practical		Credit: 1
Course Code 24UHSS31P		Internal 100

COURSE OUTCOMES

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

CO1: trace a questionnaire to survey the contemporary food needs of the consumers.[K2]

CO2: explain the suitable method and technique involved to find the quality of the food product.[K2]

CO3: develop a new food product and standardize it and prepare the record. [K3]

CO4: find the quality parameters of the prepared food products.[K3]

CO5: choose the suitable labelling and packaging method to commercialize the food products to showcase their entrepreneurial skills.[K3]

PRACTICALS

- Survey of types of convenience foods / novel foods in the market or Survey of market trends and consumer behaviour in the food sector.
- Sensory analysis: conduct sensory tests for basic tastes and sensory attributes of products.
- Basic evaluation of shelf -life acceptability and quality of a food product.
- Evaluate consumer responses utilizing prepared food products, analyse and present data on acceptability of product based on sensory evaluation or
- Project Development of a new food product, standardization, selection of suitable packaging and preparing label with product information.
- Visit to food processing industries

Mapping with Programme Outcomes

Course Code 24UHSS31P	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	2	2	2	1	1	1	-	1
CO2	3	3	2	3	2	2	1	2	1	1
CO3	2	3	2	2	1	1	2	2	-	-
CO4	3	3	3	3	3	3	3	3	1	1
CO5	3	3	3	3	3	3	3	3	1	1

Strong (3) Medium (2) Low (1)

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Head of the Department

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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics (2024 - 2025 onwards)

Semester III	CHANGING TRENDS IN EXTENSION EDUCATION	Hours/Week: 2	
Skill Enhancement Course - 4		Credits: 2	
Course Code 24UHSS32		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

- CO1:** state the meaning, scope, objectives and need of extension education, volunteerism, diffusion, adoption of innovations, communication, extension teaching methods, extension teaching aids and current approaches in extension education.[K1]
- CO2:** describe the types of education, teaching methods, audio visual aids, innovation, decision, communication models, rural development problems and theories of communication [K1]
- CO3:** discuss the principles and philosophy of extension education and explain the adoption process, elements of diffusion and also the role of communication, extension methods, audio visual aids, GO's and NGO's. [K2]
- CO4:** write the emergence of Home Science Extension Education in India, techniques of teaching methods, communication and communication skills, advantages and limitations of various methods of teaching aids and activities of various welfare programmes. [K2]
- CO5:** identify the Extension Education as a profession, consequence on innovations, barriers in communication, selection of audio visual aids and suitable extension methods and also write the audio visual aids and various welfare programmes to overcome the community problems.[K3]

UNIT I

Home Science Extension Education

Extension education – meaning, scope, characteristics, objectives, need, principles, process, models and philosophy. Emergence of Home Science Extension Education in India , Extension Education as a profession. Adult education and distance education. (6 hours)

UNIT II

Diffusion and Adoption of Innovations

Innovation decision process - Types of innovation decision, consequence on innovations-desirable or undesirable, direct or indirect, anticipated or unanticipated consequence. Concept of Diffusion and its elements.

Adoption Process-concept of stage, shade of agreement, neglected element. (6 hours)

UNIT III

Communication Process

Communication process – concept, elements and their characteristics Models and theories of communication. Barriers in communication. (6 hours)

UNIT IV

Teaching and Learning

Concept of teaching and learning. Classification of Extension teaching methods and extension teaching aids – selection of appropriate methods, features, advantage, limitation of various methods of teaching (mass, group, individual)

Audio visual aids – planning, selection and types of visual, audio and audio – visual aids.(6 hours)

UNIT V

Current Approaches in Extension Education

Farming situation-based extension, market – led – extension, farm field school, ATIC, Kissan Call Centers, and NAIP.

Problems in Rural Development. Need for Volunteerism in Rural Development, Role of NGO's Assistance available to Voluntary agencies from different ministries/Departments of Govt. of India. - Details of function in the Central/State Social Welfare Board and CAPART Employments Generation Programmes – NREGP, Women Development Programmes – ICDS, Self Help Groups, MSY, RMK. (6 hours)

PRACTICALS

1. Exercises on presentation skills, listening skills, writing skills, exercises on distortion of communication message.
2. Designing and Preparation of low-cost charts, posters, flash cards, pamphlet, leaflet etc
3. Visit to Gram Panchayat to study on-going rural development programmes, visit to KVK, NGO and extension centers of State Agricultural University and State Departments, bottom-up planning, report preparation and presentations.

REFERENCE BOOKS

1. Albrechts, H. et al (1989): *Rural Development Series*, Agricultural Extension, Vol I & II, Basic concepts and methods, Wiley Eastern Limited, New Delhi.
2. Chaubey, B.K. (1979): *A Hand Book of Education Extension*, Jyoti Prakashan, Allahabad.
3. *Extension Education in Community Development* (1981): Ministry of Food and Agriculture, Government of India, New Delhi.
4. Pankajam, G. (2000): *Extension – Third Dimension of Education*, Gyan Publishing House, New Delhi.
5. Reddy, A. (1999): *Extension Education*, Sree Lakshmi Press, Bapatla.
6. Waghmare, S.K. (1989): *Exploring of Extension Excellence*, Multi Tech. Pub. Company.

e-Learning Resources

- <http://ecoursesonline.iasri.res.in/course/view.php?id=243>
- https://onlinecourses.swayam2.ac.in/cec19_mg32/preview

Mapping with Programme Outcomes

Course Code 24UHSS32	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	2	2	2	2	2	3	-	3
CO2	3	3	2	2	3	3	2	3	-	3
CO3	3	3	3	3	3	3	2	3	-	3
CO4	3	3	2	1	3	3	2	3	-	3
CO5	3	3	2	1	3	3	2	3	-	3

Strong (3) Medium (2) Low (1)

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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics

(2024 - 2025 onwards)

Semester IV	HUMAN DEVELOPMENT	Hours/Week: 4	
Core Course - 7		Credits: 3	
Course Code 24UHSC41		Internal 25	External 75

COURSE OUTCOMES

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

CO1: state the concept of growth and development, methods of child study, play, discipline, children with special needs, characteristics and developmental tasks at various stages of life span. [K1]

CO2: explain the areas of growth and development of various stages of life span and the needs and identification of children with special needs. [K2]

CO3: write the principles of growth and development and find the changes that occur and care to be taken in various stages of lifespan and also classify the methods of child study, play, disciplinary techniques and children with special needs. [K2]

CO4: find the causes and prevention of problems in various stages of lifespan and children with special needs. [K3]

CO5: identify the best method of rearing and bringing up an individual at various stages of lifespan and rehabilitation of Juvenile Delinquency and exception children to achieve positive human relationship. [K3]

UNIT I

Growth and development

Meaning - growth and development, principles of governing growth and development. Methods of study of human development.

Infancy – Characteristics and developmental task, physical, social and emotional development, cognitive and language development and care during infancy (12 hours)

UNIT II

Childhood

Characteristics and developmental task, physical, social and emotional development, cognitive and language development and care during early childhood, and late childhood. Behavioral problems.

Children's play – meaning, types, importance stages. Parental disciplinary techniques – merits and demerits

(12 hours)

UNIT III

Adolescence

Adolescence – Characteristics and developmental task, physical and psychological changes, emotional, moral and social development, Problems of adolescence.

Delinquency – causes, prevention, and rehabilitation.

Educational and vocational guidance, role of family and schools and colleges in guiding adolescence

(12 hours)

UNIT IV

Adulthood and Old Age

Adulthood - Characteristics and developmental tasks, all aspects of development and vocational adjustments.

Old age - Characteristics of old age, physical changes, psychological changes and care. (12 hours)

UNIT V

Exceptional Children

Introduction to Children with Special Needs, causes, identification, care and Educational Rehabilitation

Gifted children, orthopedically challenged, Mentally retarded, Hearing impaired

Visually handicapped and Learning disability

(12 hours)

Practicals

1. Preparation of case study - observing various development- physical, motor, cognitive, creative, social, emotional, and intellectual of a particular child.
2. Analysis of various play techniques.
3. Survey on problems of old age.
4. Visit to an institution for exceptional children.

REFERENCE BOOKS

1. Hurlock E.B., (2017). Child Development, New York: McGraw Hill Book company.
2. Hurlock, E.B., (2017): Developmental Psychology - A Life Span Approach, 5th (Ed.) New York: McGraw Hill Book Co.
3. Nanda V.K., (1998): Principles of Child Development, New Delhi: Anmol Publications Pvt. Ltd.
4. Rajammal P. Devadas and Jaya N. Muthu (2002). A Textbook of Child Development, New Delhi: Macmillan Publishers.
5. Singh, A. (2015). Foundations of Human Development: A Life Span Approach. New Delhi: Orient Black Swan.
6. Swaminathan, M (1998). The First Five Years: A Critical Perspective on Early Childhood Care and Education in India. New Delhi: Sage Publications.
7. Suriakanthi, A., (2009). Child Development - An Introduction. Tamilnadu: Kavitha publications.

e- Learning Resources

- http://www.wbnsou.ac.in/online_services/SLM/BED/SEM-01_A1.pdf
- <https://ncert.nic.in/textbook/pdf/kepy104.pdf>
- <https://egyankosh.ac.in/bitstream/123456789/17134/1/Unit-3.pdf>
- https://www.cukashmir.ac.in/departmentsdocs_16/Growth%20&%20Development%20-%20Dr.%20Ismail%20Thamarasseri.pdf

Mapping with Programme Outcomes

Course Code 24UHSC41	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	2	3	1	1	2	3	-	1
CO2	3	3	2	3	1	2	3	3	-	1
CO3	3	3	2	3	2	2	3	3	-	1
CO4	3	3	2	3	3	3	3	3	-	-
CO5	3	3	2	3	3	3	3	3	-	1

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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics

(2024 - 2025 onwards)

Semester IV	NUTRITION THROUGH THE LIFECYCLE -THEORY AND PRACTICAL	Hours/Week: 3	
Core Course -8		Credits: 3	
Course Code 24UHSC42		Internal 25	External 75

COURSE OUTCOMES

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

CO1: describe the concept, importance and principles of meal planning, food pyramid, nutritional status of men and women, space foods and sports nutrition. [K1]

CO2: explain the factors influencing the meal planning, RDA, nutritional requirements, changes that occur during the various stages of life span and classify space food and energy systems in the human body.[K2]

CO3: discuss the symptoms, preventive measures and treatment for various nutritional problems and illustrate the steps involved in planning a diet and also dietary guidelines to be followed for various stages of lifespan, sports persons and astronauts.[K2]

CO4: identify the nutrition related problems and deficiency disorders at every stages of lifecycle, sports persons and astronauts.[K3]

CO5: plan the menu suitable for various stages of lifespan, sports persons and astronauts which help them to get job opportunity in dietary department of hospitals, fitness centers and diet counselling centers. [K3]

UNIT I

Introduction to meal planning - Balanced diet, food groups, Food Guide Pyramid (ICMR), Food plate, RDA, factors affecting RDA. Principles of meal planning – steps involved in planning a diet. Nutrition for Adult - nutritional requirements, planning balanced diets for adult men and women, promoting healthy lifestyle through holistic approach. (9 hours)

UNIT II

Nutrition during pregnancy- Physiological demands of pregnancy, nutritional needs, effect of nutrition on pregnancy outcome, optimal weight gain, nutrition related problems in pregnancy, complications of pregnancy.

Nutrition during lactation- Physiology of lactation, nutritional requirements, concerns of breast-feeding mother. (9 hours)

UNIT III

Nutrition during infancy- Growth and development, growth standards, food and nutritional requirements, breast feeding, artificial feeding, low birth weight babies, complementary feeds.

Nutrition for preschool children- Growth and development, food and nutritional requirements, eating habits and food behaviors, nutrition related problems- PEM, VAD and their dietary interventions. (9 hours)

UNIT IV

Nutrition for school children- Growth pattern, nutritional requirement, importance of healthy snacks, factors affecting eating habits, school lunch.

Nutrition during adolescence- Growth and development, nutritional requirements, food habits, nutritional problems – obesity, underweight, anaemia and eating disorders. (9 hours)

UNIT V

Nutrition for old age- Physiological changes in elderly, food and nutritional requirements, nutritional and health concerns in old age, healthy lifestyle.

Sports and Space Nutrition

Sports - nutritional requirement, pre event meals, food requirement, RDA, weight and body composition of athletes and dietary guidelines.

Space nutrition – classification, preparation and recent trends in space foods. (9 hours)

REFERENCE BOOKS

1. Srilakshmi B. (2024) *Dietetics*, 9th Edition, New age Publishing Press, New Delhi.
2. Suganthi.V, Anitha.V.,(2017).*Manual on Diet Therapy*, New age International (P),Publishers, New Delhi.
3. Gopalan,C., Ramanathan, P.V. Balasubramanian, S.C. (2001) Nutritive value of Indian foods, NIN, Hyderabad.

4. Longvah T, Ananthan R, Bhaskar K, Venkaiah K. (2017) *Indian Food Composition Tables*, National Institute of Nutrition.
5. Abraham S, (2016) *Nutrition through Lifecycle*. 1st Edition, New age international publishers, New Delhi.
6. Stacy N, (2005) *William's Basic Nutrition and Diet Therapy*. 12th Edition, Elsevier publications, United Kingdom.
7. Whitney, EN and Rolfes SR, (2002). *Understanding Nutrition*. 9th Edition West/Wordsworth, London.
8. Groff JL, Gropper SS, (2000). *Advanced Nutrition and Human Metabolism*. 3rd Edition, West /Wadsworth, United Kingdom.
9. Cataldo, DeBruyne and Whitney, (1999). *Nutrition and Diet therapy– Principles and Practice*. 5th Edition, West/ Wadsworth, London.

e-Learning Resources

- <http://vikaspedia.in/health/nutrition/dietary-guidelines-1/dietary-guideline-1>
- <https://www.nhp.gov.in/healthyliving/healthy-diet>
- <https://motherchildnutrition.org/india/complementary-feeding-guidelines.html>
- <http://vikaspedia.in/health/nutrition/dietary-guidelines-1/diet-for-children-and-adolescents>
- <https://motherchildnutrition.org/india/complementary-feeding-guidelines.html>
- <https://sol.du.ac.in/mod/book/view.php?id=1422&chapterid=1288>

Mapping with Programme Outcomes

Course Code 24UHSC42	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	2	3	-	-	-	3	-	-
CO2	3	3	2	3	-	-	-	3	-	-
CO3	3	3	3	3	-	-	-	3	-	-
CO4	3	3	3	3	3	3	3	3	-	1
CO5	3	3	3	3	3	3	3	3	-	2

Strong (3) Medium (2) Low (1)

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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics

(2024- 2025 onwards)

Semester IV	NUTRITIONAL BIOCHEMISTRY- THEORY AND PRACTICAL	Hours/Week: 6	
Elective Course-3		Credits:4	
Course Code 24UHSA41		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: discuss the basic concept of biomolecules, enzymes and free radicals present in the human body. [K1]

CO 2: classify the enzymes, free radicals and other biomolecules. [K2]

CO3: explain the biological importance of free radicals, enzymes and biomolecules in human body. [K2]

CO4: identify the various biochemical mechanisms, metabolic pathway and factors affecting enzyme activity in human body.[K3]

CO5: find the role and regulations of biomolecules in human body and the recombinant DNA technology. [K3]

UNIT I

Biological oxidation and Enzymes

Biological oxidation, Electron transport chain and Oxidative Phosphorylation. Enzymes – Definition, Types, Mechanism of action, Factors affecting enzyme activity, Coenzyme, Role of b vitamin as coenzyme.

Free radicals – Definition, Formation in biological systems. Antioxidants – definition, Role of antioxidants in prevention of degenerative disorders (18 hours)

UNIT II

Metabolism of Carbohydrates

Classification, Glycolysis, The Citric Acid Cycle Glycogenesis, Glycogenolysis, Gluconeogenesis, The Hexose Monophosphate Shunt and bioenergetics. (18 hours)

UNIT III

Metabolism of Protein

Classification of amino acids, Oxidative Deamination, decarboxylation, transamination and transmethylation of amino acids, urea cycle, biosynthesis of non-essential amino acids, catabolism of essential amino acids. Protein biosynthesis. (18 hours)

UNIT IV

Metabolism of Lipids

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

(18 hours)

UNIT V

Intermediary Metabolism, Nucleic acid & Recent concepts

Overview of intermediary metabolism of carbohydrates, protein and lipid. Hormonal regulation of carbohydrate protein and fat metabolism Structural components and functions of nucleic acid, Structure of DNA, RNA types and functions. Recombinant DNA technology, Metabolism of Xenobiotics, Nutrigenomics (18 hours)

Practicals

1. Qualitative tests for sugars-glucose, fructose, lactose, maltose and glucose.
2. Quantitative estimation of reducing sugar.
3. Qualitative tests for proteins
4. Demonstration Experiments.
5. Estimation of total nitrogen in foods (Micro or Macrokjeldahl methods)
6. Determination of Iodine value
7. Determination of fat content in food using Soxhlet method.

REFERENCE BOOKS

1. Albanese, A. (Ed.). (2012). Newer methods of nutritional biochemistry V3: With applications and interpretations. Elsevier.
2. Bettelheim, F. A., Brown, W. H., Campbell, M. K., & Farrell, S. O. (2009). General, Organic & Biochemistry. Brooks/Cole Cengage Learning.
3. Champe, P. C., Harvey, R. A., & Ferrier, D. R. (2005). Biochemistry. Lippincott Williams & Wilkins, 6th Edition, Wolters Kluwer, London.
4. Harvey, R. and Ferrier, D., (2014). Lippincott's Illustrated Reviews: Biochemistry, 6th edition, Lippincott Williams and Wilkins, Philadelphia.

5. Lehninger, A.L. (1993) Biochemistry. 3rd ed. CBS Publishers, New Delhi.
6. Lieberman, M., & Ricer, R. E. (2009). Lippincott's Illustrated Q&A Review of Biochemistry. Lippincott Williams & Wilkins.
7. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2000): 25th Ed. Harpers Biochemistry. Macmillan worth publishers.
8. Shanmugham Ambika (1985) Fundamentals of bio-chemistry to medical students. NVA Bharat Printers, and traders 56, Peters Road, Madras-86.

e- Learning Resources

- <https://www.udemy.com/share/1027yA/>
- <https://www.classcentral.com/course/swayam-biochemistry-5229>
- <https://www.classcentral.com/course/edx-biochemistry-biomolecules-methods- and-mechanisms-12585>
- <https://www.classcentral.com/course/swayam-experimental-biochemistry-12909>
- <https://youtu.be/y6YGZfcAegw>

Mapping with Programme Outcomes

Course Code 24UHSA41	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1.a	1.b	2.a	2.b	3	4.a	4.b	5	6	7
CO1	3	1	-	1	1	2	2	1	-	1
CO2	3	1	-	1	3	3	2	2	-	2
CO3	3	1	-	1	3	3	2	2	-	2
CO4	3	1	-	1	3	3	3	3	-	3
CO5	3	1	-	1	3	3	3	3	-	3

Strong (3) Medium(2) Low(1)

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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics (for those who join in 2024- 2025)

Semester IV	COMPUTER APPLICATIONS IN HOME SCIENCE	Hours/Week: 2	
Skill Enhancement Course - 5		Credits: 2	
Course Code 24UHSS41		Internal 25	External 75

COURSE OUTCOMES

- CO1:** describe the concept and features of MS Office package, Auto CAD, SPSS and Software package used in nutrition education [K1].
- CO2:** state the need and applications of MS Office package, Auto CAD and Softwares in various disciplines of Home Science [K1].
- CO3:** discuss the types and advantages of various software packages in the field of nutrition [K2].
- CO4:** explain the procedure to create, design, maintain and analyze the nutritional data using various computer applications [K2].
- CO5:** find the appropriate software to develop and interpret the research data in the field of Home Science [K3].

UNIT I

General commands - Creating and opening a file, Steps in creating a folder and saving a file in the destined folder. MS Office Package - Software in MS Office package, creating a document using MS Word, preparing slide presentation using MS Power Point. Making Graphs and Charts using MS office. (6 hours)

UNIT II

Computer Application in Space planning - AutoCAD in Interior Design - Need, Purpose and merits. Application – Preparing Plan, Elevation and section drawings for interiors and exteriors. Need for rendered views in design. Creating 3D models and 3D views using Google Sketchup. Advantages of software in design field. (6 hours)

UNIT III

Computer Application in Nutrition - Software package in nutrition education and diet counselling - Patient's health record, Nutritive value of food items, Nutritional analysis, Meal planning and recipes, Types of nutrition Softwares – Nutrium, Nutrition maker, Nutritionist pro, Nutritics, Core plus.

Benefits of Nutrition Software's to Nutritionists and Clients. (6 hours)

UNIT IV

Computer Application in Textiles - AutoCAD in Textile Designing – Definition, Concept, Application of CAD – Sketching, pattern making, grading patterns, Making markers, Apparel production. Types of Textile CAD software – Woven Textiles, Knitted Fabrics, Printed fabrics, Sketch Pad system, Texture mapping, Embroidery system, Apparel industry and computer. Advantages of Textile CAD. (6 hours)

UNIT V

Computer Application in Research - Data collection – creating online form using Google forms, Data entry in MS Excel and data analysis using SPSS – Frequency analysis, Cross Tabulation, Chi-Square, T –test, ANOVA and Correlation Co-efficient. Export and saving results in Word document. Creating Tables. (6 hours)

REFERENCES BOOKS

1. *AutoCAD 2018 for Novices* (Learn By Doing), CAD Soft Technologies.
2. Patience Chitura., (2020) *CAD Practical Skills in Textile Technology and Design (TTD)*.
3. *Microsoft Office 365 for Beginners 2022: [8 in 1] The Most Updated All-in-One Guide from Beginner to Advanced | Including Excel, Word, PowerPoint, OneNote, OneDrive, Outlook, Teams and Access*, James Holler.
4. Jesus Salcedo and Wiley Publishers., (2017) *SPSS Statistics for Data Analysis and Visualization*.
5. NellaiKannan, C .(2012).MS-Office, Thirunelveli: Nels Publications.

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- <https://www.tutorialspoint.com/word/index.htm>
- <https://www.vmaker.com/tutorial-video-hub/microsoft-tutorial-videos/microsoft-office-tutorial/>
- <https://www.thesourcecad.com/autocad-tutorials/>
- <https://nutrium.com/blog/why-should-you-choose-a-nutrition-software-over-an-excel-word/>
- <https://sol.du.ac.in/mod/book/view.php?id=1422&chapterid=1288>

Mapping with Programme Outcomes

Course Code 24UHSS41	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	2	2	2	1	1	1	-	1
CO2	3	3	2	3	2	2	1	2	1	1
CO3	2	3	2	2	1	1	2	2	-	-
CO4	3	3	3	3	3	3	3	3	1	1
CO5	3	3	3	3	3	3	3	3	1	1

Strong (3) Medium (2) Low (1)

Dr.D.Vijayarani
Head of the Department

Mrs.A.Jeevaratinam
Mrs.R.Subha
Course Designers



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics (for those who join in 2024- 2025)

Semester IV	FUNDAMENTALS OF ART AND DESIGN	Hours/Week: 2	
Skill Enhancement Course -6		Credits: 2	
Course Code 24UHSS42		Internal 25	External 75

COURSE OUTCOMES

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

- CO1:** state the concept of design, colour, housing, elements and principles of design in interior decoration. [K1]
- CO2:** describe the characteristics of design and elements, ways of creating designs, qualities of colour and functions of house. [K1]
- CO3:** classify the various types of design and colour. [K2]
- CO4:** explain the elements and principles of design in housing and everyday life. [K2]
- CO5:** apply the application of design, art principles, art elements, colours and housing principles in creating aesthetic interiors. [K3]

UNIT I

Introduction to art and design - Importance of design, Application of good taste and Role of good designer. Types of design- Structural and Decorative design. Classification of Decorative Design - Naturalistic, Stylized, Abstract and Geometrical Design. (6 hours)

Practical: Sketching different types of designs.

UNIT II

Elements of design - Line and its types – horizontal, vertical, diagonal, curved, zigzag; Shape; Form – 2D&3D, Size, Texture-tactile and visual; light, pattern, Space- positive & negative and Colour-warm and cool. Application of elements to form design. (6 hours)

Practical: Creating Optical illusion in Interiors.

UNIT III

Principles of Design – Harmony – harmony of line, shape, size, texture and ideas.

Balance – symmetrical, asymmetrical and radial.

Proportion – proportional relationships, Greek oblong and Scale.

Emphasis – emphasis through grouping of objects, use of contrast color, decoration, plain background space, unusual lines, shapes, and sizes.

Rhythm – achieving rhythm through repetition of shapes, progression of size, continuous line movement, radiation, and gradation (6 hours)

Practical: Application of Art Principles in arranging areas in interiors.

UNIT IV

Colour - Definition, Qualities of colour, Hue, Value, Intensity. Tints and Shades. The colour wheel/systems - Prang colour system, Physicist's Theory, Psychologist's Theory, Harmonies of related colors Monochromatic, Analogous and Accented Neutral; Harmonies of contrasting colours – Direct, double, split and triad. (6 hours)

Practical: Painting different rooms with various colour harmonies.

UNIT V

Housing - Selection of site and functions of house. Basic principles of planning a life space - Orientation, Grouping, Roominess, Lighting, Circulation, Storage Facilities and Privacy. Creating a life space Factors in planning different rooms – Living Room, Bedroom, Dressing Room, Dining, Kitchen, Study Room, Store room, Bathroom, Utility space, Staircase and Verandah. (6 hours)

Practical: Planning layout for different areas in interiors.

REFERENCE BOOKS

1. Andar, A and Parimalam, P, (2008), "*A Text Book of Interior Decoration*", Satish Serial Publishing House.
2. Chaudhari, S.N. (2006), "*Interior Design*", Aavishkar Publishers, Jaipur.
3. Goldstein, (1976), "*Art in Every Day Life*", Oxford and IBH Publishing House.
4. Kasu, A.A. 2005, "*Interior Design*", Ashish Book centre Delhi.

5. P.C. Varghese (2013), “*Building Construction*”, PHI Learning Private Limited.
6. Premavathy Seetharaman and ParveenPannu, (2009), “*Interior Design and Decoration*”, CBS Publishers and Distributors Pvt Ltd. New Delhi.

e-Learning Resources

- https://www.google.co.in/?gfe_rd=cr&ei=oJE8VvucFM0l8wfe0ZnICw#tbm=vid&q=principles+of+design+in+interior+design
- <http://www.docstoc.com/docs/108663367/The-Munsell-and-Prang-Color-Systems>
- <https://www.decorilla.com/online-decorating/transitional-interior-design/>
- <https://www.apartmenttherapy.com/modern-vs-contemporary-vs-minimalistdesign-261783>
- <https://sol.du.ac.in/mod/book/view.php?id=1422&chapterid=1288>

Mapping with Programme Outcomes

Course Code 24UHSS42	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	2	3	1	1	1	3	1	1
CO2	3	2	2	3	1	1	1	3	1	1
CO3	3	3	2	3	-	-	-	3	1	-
CO4	3	3	2	3	3	3	3	3	1	1
CO5	3	3	2	3	3	3	3	3	1	2

Strong (3) Medium (2) Low (1)

Dr.D.Vijayarani

Head of the Department

Mrs.R.Subha

Course Designer



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics (2024 - 2025 onwards)

Semester V	DIETETICS	Hours/Week:5	
Core Course - 9		Credits:5	
Course Code 24UHSC51		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: state the concept of diet therapy, dietitian, antioxidant, artificial sweeteners and various diseases and disorders. [K1]

CO2: explain the purpose, importance and types of diet, diet therapy, dietitian, antioxidant, artificial sweeteners and indicate the determination, diagnostic techniques and causes of various diseases and disorders. [K2]

CO3: discuss the mode of special feeding, the role of dietitian, antioxidant and artificial sweeteners, and also indicate the clinical manifestations and consequences of various diseases and disorders. [K2]

CO4: identify the suitable menu for various diseases and disorders based on the principles, nutritional requirements and dietary considerations. [K3]

CO5: plan the suitable feeding techniques and diet for various diseases and disorders. [K3]

UNIT I

Concept of diet therapy and role of dietitian

Principles of therapeutic diets, modification of normal diet, classification of therapeutic diets.

Different feeding techniques -enteral and parenteral feeding. – Indications, contraindications and complications,

Dietitian- Definition, role and code of ethics, classification of dieticians in nutritional care (15 Hours)

UNIT II

Diseases of Gastrointestinal tract

Etiology, symptoms, dietary management of: Diarrhoea, dysentery, and constipation

Peptic ulcer, irritable bowel syndrome & inflammatory bowel disease (ulcerative colitis), Crohn's disease and celiac disease (15 Hours)

UNIT III

Diseases of liver, gall bladder & febrile conditions

Etiology, symptoms, dietary management of:

Disease of liver & Gall bladder- Hepatitis, cirrhosis, gall stones Febrile conditions - Acute & Chronic fevers (Typhoid, influenza, malaria, tuberculosis, COVID) (15 Hours)

UNIT IV

Metabolic disorders

Etiology, symptoms, and dietary management of: Obesity and PCOS

Diabetes mellitus- types, symptoms and metabolic changes, treatment with diet and insulin, GI, GL, carbohydrate counting, artificial sweeteners and complications

Cardiovascular diseases – hypertension, atherosclerosis. (15 Hours)

UNIT V

Diseases of excretory system and cancer

Etiology, symptoms, dietary management of: Glomerular nephritis Nephrotic syndrome, urinary calculi, renal failure. Cancer – Risk factors, modification of diet in cancer, nutritional problems of cancer therapy

Role of antioxidants in prevention of degenerative diseases. (15 Hours)

SELFSTUDY/EXPERIENTIALLEARNING

Conduct a group discussion to understand various diseases and presentation of case-studies.

Planning of various low-cost recipes using locally available ingredients for dietetics practical

Conducting a nutrition exhibition to display sample menus for various diseased conditions for different sections of society.

Suggested Activity

Internship in dietary unit of a hospital

REFERENCE BOOKS

1. Antia F.P.(2002), Clinical Dietetics and Nutrition, 4th edition, Oxford University Press, Chennai.
2. Guthrie H.A, Picciano M.F (1995) Human Nutrition, Mosby, St. Louis Missouri.
3. Joshi.S.A.(2005), Nutrition and Dietetics, Tata McGraw-Hill Publishing Company Limited, New Delhi
4. Passmore R. and Davidson S.(1986) Human nutrition and Dietetics. Limington publishers
5. Sharma.A.(2017), Principles of Therapeutic Nutrition and Dietetics, CBS Publishers & Distributors Pvt Ltd, New Delhi.
6. Srilakshmi B, Dietetics (2019), 8th edition, New Age International Publishing Ltd, New Delhi
7. Williams S.R.(2000) Basic Nutrition and Diet Therapy, Mosby publication.

e-Learning Resources

- https://www.cdss.ca.gov/agedblinddisabled/res/VPTC2/9%20Food%20Nutrition%20and%20Preparation/Types_of_Therapeutic_Diets.pdf
- <http://www.differencebetween.net/science/health/difference-between-enteral-and-parenteral-nutrition/>
- https://www.medicinenet.com/difference_between_diarrhea_and_dysentery/article.html
- <https://my.clevelandclinic.org/health/diseases/15587-inflammatory-bowel-disease-overview>

Mapping with Programme Outcomes

Course Code 24UHSC51	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1.a	1.b	2.a	2.b	3	4.a	4.b	5	6	7
CO1	3	2	2	3	2	1	2	3	-	-
CO2	3	2	2	3	2	2	2	3	-	-
CO3	3	3	2	3	3	2	3	3	-	-
CO4	3	2	2	3	3	3	3	3	-	1
CO5	3	2	2	3	3	3	3	3	-	1

Strong(3) Medium(2) Low(1)

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Mrs.S.Balasaraswathi
Mrs. Ameena Beebi
Course Designers



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science - Nutrition and Dietetics

(2024 - 2025 onwards)

Semester-V	NUTRITION EDUCATION AND COMMUNICATION	Hours/Week:5	
Core Course - 10		Credits: 5	
Course Code		Internal	External
24UHSC52		25	75

COURSE OUTCOMES

On completion of the course, students will be able to

- CO1:** state the concept of nutrition education, public nutrition, nutritional problems, nutritional status, nutritional assessment, nutritional policies and programmes, community and communication system[K1]
- CO2:** discuss the objectives and scope of nutrition education, nutritional assessment, communication, nutritional policies and programmes. [K2]
- CO3:** explain the types of deficiency diseases, nutritional assessment, nutritional policies and programmes, community and communication system and also write the principles of nutrition education.[K2]
- CO4:** identify the clinical features of various deficiency diseases, communication system, rural and urban community and also importance of nutrition education, nutritional status, communication, nutritional policies and programmes [K3]
- CO5:** write the role and factors influencing nutrition education, nutritional assessment, nutritional policies and programmes and communication to overcome the nutrition related problems [K3]

UNIT I

Nutrition Education - Importance of Nutrition education, objectives, principles and scope of nutrition and health education and promotion.

Concept and Scope of Public Nutrition Definition, concept, scope and multidisciplinary nature of public nutrition. Principles of nutrition education. (15 hours)

Practical

Calculating nutritive value of school children

UNIT II

Nutritional problems affecting the community - Etiology, prevalence, clinical features and preventive strategies for malnutrition related problem and Nutrient deficiency control programmes - Protein energy malnutrition, Obesity, Nutritional anemia, Vitamin A deficiency, Iodine deficiency disorders, Fluorosis.

Practical

Visit to an ongoing nutrition and health promotion program Visit to community health centres.

(15 hours)

UNIT III

Assessment of Nutritional Status - Objectives and importance, Methods of assessment: Direct (Clinical signs, nutritional anthropometry, biochemical tests, biophysical tests); Indirect (Diet surveys, vital statistics) and Indirect assessment methods of nutritional status. Nutritional Anthropometry. Classified list of signs used in Nutritional Assessment.

(15 hours)

Practicals

Assessment of nutritional status:

- Anthropometry: Weight and height measurements
- Plotting and interpretation of growth charts for children below 5 years
- Identification of clinical signs of common nutritional disorders
- Dietary assessment: FFQ and 24 hours recall

UNIT IV

Nutrition Policy and Programs - National nutritional policy; Integrated child development scheme (ICDS), Midday Meal Program, National programs for the prevention of anemia, Vitamin A deficiency, Iodine deficiency disorders. Implementation of Nutrition Education Program.

National organizations and agencies - FSSAI, ICMR, CFTRI, NSI,

FNB, NIN. International organizations and agencies - FAO, WHO, UNICEF. (15 hours)

Practical

Planning of low-cost nutritious recipes for infants, pre-schoolers, pregnant/lactating mothers for nutrition education.

UNIT V

Community - Characteristics of rural and urban community, types of community, community nutrition, community health, Factors affecting community health.

Introduction to Communication - Concept, Elements of Communication, Models of Communication. Expanding scope of Nutrition Practice.

Communication Systems - Nature, characteristics, and types - Formal and Informal communication, Verbal and Non-verbal Communication, Approaches of Communication - One way-two way, Upward-downward, Horizontal - vertical and Interpersonal Communication - Concept, types and functions of interpersonal communication, Barriers of Communication. (15 hours)

Practical

Preparing Project report in community nutrition Preparing/ creating a new fortified food menu

REFERENCE BOOKS

1. Jelliffe DB, Jelliffe ERP, Zervas A and Neumann CG (1989). Community nutritional assessment with special reference to less technically developed countries. Oxford University Press. Oxford.
2. Park K (2011). Park's Textbook of Preventive and Social Medicine, 21st Edition. M/s Banarasidas Bhanot Publishers, Jabalpur, India.
3. Suryatapa Das (2016). Textbook of Community Nutrition. Academic Publishers, Kolkata.
4. Wadhwa A and Sharma S (2003). Nutrition in the Community - A textbook. Elite Publishing House Pvt. Ltd. New Delhi.
5. WHO (2006). Child Growth Standards: Methods and development: height-for-age, weight-for-age, weight-for-length, weight-for-height, and body mass index-for-age

e-Learning Resources

- <https://books.google.co.in/books?id=o5CxDAQAQBAJ&printsec=frontcover#v=onepage&q&f=false>
- <https://nces.ed.gov/pubs/96852.pdf>
- <http://www.fao.org/docrep/017/i3235e/i3235e.pdf>
- <http://www.fns.usda.gov/sites/default/files/NutritionEdRTC.pdf>
- http://frac.org/wp-content/uploads/2010/10/providing_nutrition_education_afterschool.pdf

Mapping with Programme Outcomes

Course Code 24UHSC52	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	3	3	3	2	3	3	2	2
CO2	3	3	3	3	3	2	3	3	2	2
CO3	3	3	3	3	3	2	3	3	2	2
CO4	3	3	3	3	3	2	3	3	2	2
CO5	3	3	3	3	3	2	3	3	2	2
Strong(3)			Medium(2)			Low(1)				

Dr.D.Vijayarani

Head of the Department

Mrs. S.Balasaraswathi

Mrs.Ameena Beebi

Course Designers



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science - Nutrition and Dietetics

(2024 - 2025 onwards)

Semester V	FIBRE TO FABRIC	Hours/Week:5	
Core Course -11		Credits: 4	
Course Code 24UHSC53		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: describe the concept and importance of textile fibres, yarn, weaving, knitting, non-woven fabric, dyeing, printing and finishes. [K1]

CO2: classify the types of textile fibre, yarn, weaving, knitting, non-woven fabric, dyeing, printing, finishes and colour fastness testing methods.[K2]

CO3: write the processing of textile fibres, yarn, weaving, knitting, non-woven fabric, dyeing, printing and finishes [K2]

CO4: identify the properties of textile fibres and yarn, qualities of fabric, factors to be considered in selection of fabric for weaving, dyeing and printing [K3]

CO5: find the uses and effect of yarn making, weaving, knitting, non-woven, dyeing, printing and finishes on fabric and select the suitable dyeing, printing and finishes for different fabrics.[K3]

UNIT I

Introduction to Textile- Introduction, Terms and definition related to textiles, importance of textiles. Fibre – meaning, classification, general properties - primary and secondary properties and identification of textile fibres.

Textile fibres

- Classification of fibres– natural and man-made fibres. Manufacturing processes/Cultivation,
- properties and uses of Cotton, Silk, Wool, Polyester, Rayon and Nylon. (15 hours)

UNIT II

Yarns

- a) Definition of yarn
- b) Spinning process- Conventional yarn spinning- Cotton system and Unconventional yarn spinning.
- c) Types of yarn- spun yarns, filament yarns, sewing threads, simple and complex yarns.
- d) Properties of yarn- Yarn twist, Yarn count/number (definition, unit of yarn count),
Texturization – types. (15 hours)

UNIT III

Woven Fabric Construction

- a) Weaving- Warp and weft yarns, grain line, selvedge and Fabric count.
- b) Parts of a simple loom and basic weaving operations.

Types of weaves- Basic weaves (Plain weave, variations in plain weave, Twill weave, variations in Twill weave, Satin weave and Sateen weave) Decorative weaves (Dobby weave, Jacquard weave, Leno weave, Surface figure weave, Pile, Double weave) (15 hours)

UNIT IV

Other fabric construction

- a) Knitted fabric- warp and weft knitting
- b) Non-Woven fabric- method of manufacture – web formation- parallel laid, cross laid, random laid, high velocity sprayed. Types- bonded fabrics, felts and care of non-woven. Other fabric construction process- Braided fabric, Net, Laces, Film fabric, tufted fabric. Factors influencing the choice of clothes – different age groups, sex, income, family size, occupation, customs and tradition, climate, fashion, occasion and suitability. (15 hours)

UNIT V

Finishing- definition, need, types- Basic finishes - boiling, bleaching, desizing, weighing, degumming, mercerizing, texturising and calendaring. Special finishes- shrinkage control, water repellency, wrinkle resistance, permanent press, water proof and water resistant – moth proof, mildew proof and chemical finishes - acid and alkali finishes. Evaluation of finishes.

Dyeing and Printing - classification of dyes and their suitability to different fibres and methods of dyeing. Printing – hand printing- stencil, block, tie and dye and batik. Machine Printing – process and types - roller, screen and stencil. (15 hours)

Practical

Identification of fibres.

Identification of yarns

Identification of weaves –Collection of samples for basic weaves.

Field visits to various textiles units

REFERENCE BOOKS

1. Corbman,B.P (1975) Textiles fiber to fabric. Mc.Grawhill,New York.
2. KleinW.DA Practical Guide to Ring Spinning Textile Institute, Manchester
3. MarjoryL.J (1977) Introductory Textile Sciences Holt Reinhart and Winston, NewYork
4. Sara.K.J,Langford.A (2002)Textiles.9thed Prentice Hall, London
5. Rastogi,D.,&Chopra,S.(2017).TextileScience.India:OrientBlackswanPrivateLimited.
6. Robert,R.&Mather,R.H.(2015).TheChemistryofTextileFibers.Cambridge:RSCPublishers.
7. Sekhri,S.(2011)Textbook of Fabric Science: Fundamentals to Finishing. India: PHI Learning Pvt. Ltd.
8. Smith,J.L.(2015).Textile Processing: Printing Dyeing Finishing. Chandigarh: Abhishek Publication.

e-learning Resources

- <http://fibersource.com/f-tutor/rayon.htm>
- <http://www.fibersource.com/f-tutor/nylon.htm>
- <http://www.ehow.com/facts5016460parts-loom.html>
- <http://www.fabrics-manufacturers.com/>
- <http://www.fabrics-manufacturers.com/>

Mapping with Programme Outcomes

Course Code 24UHSC53	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	2	3	2	2	2	2	-	3	2
CO2	3	2	3	2	2	3	2	-	3	1
CO3	3	2	3	3	3	3	3	-	2	3
CO4	2	2	2	2	2	3	3	-	2	1
CO5	3	3	3	3	3	3	3	1	2	1

Strong 3 Medium 2 Low 1

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Course Designers



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science - Nutrition and Dietetics (2024 - 2025 onwards)

Semester V	DIETETICS PRACTICAL	Hours/Week:3	
Core Course-12		Credits:2	
Practical-III			
Course Code 24UHSC51P		Internal 40	External 60

COURSE OUTCOMES

On completion of the course, students will be able to

- CO1:** trace the diet principles, RDA requirements, foods to be included and excluded for various diseases and disorders. [K2]
- CO2:** select and plan the suitable diet for various diseases and disorders. [K2]
- CO3:** prepare the planned menu for various diseases and disorders. [K3]
- CO4:** write the recommended RDA value, compute the nutritional value for the planned menu of the normal and diseased persons and also prepare the record. [K3]
- CO5:** make use of the recommended nutritive values and obtained nutritive values to write the inference. [K3]

Practicals

1. Planning, Calculation of nutrient content, Preparation and Service of diets for: Tube feeds for special conditions Fevers – Typhoid and Tuberculosis
2. Planning, Calculation of nutrient content, Preparation and Service of diets for: Diarrhoea Peptic Ulcer and constipation
3. Planning, Calculation of nutrient content, Preparation and Service of diets for: Viral hepatitis Cirrhosis of liver
4. Planning, Calculation of nutrient content, Preparation and Service of diets for: Obesity
5. Diabetes Mellitus Atherosclerosis
6. Planning, Calculation of nutrient content, Preparation and Service of diets for:
7. Hypertension and Chronic kidney disease

SELF STUDY/EXPERIENTIAL LEARNING

1. Initiate a diet counseling center in the institution for students, teaching, and non-teaching faculty.
2. Conduct exhibitions to display diets for various disease conditions.
3. Prepare pamphlet indicating foods to be included / avoided/ restricted in different disease conditions.
4. Commemorate days such as World Diabetes Day, World Heart Day and organize Seminars and awareness programs.

REFERENCE BOOKS

1. Antia, F.B. (2010), Clinical Nutrition and Dietetics, Oxford University Press, London.
2. IDA. (2018), Clinical Dietetic Manual, 2nd edition, Elite Publishing House, New Delhi
3. Sri Lakshmi. B., (2019) Dietetics, 8th Ed, New Age International Pub. Co, Chennai.
4. Vimala V. (2010). Advances in Diet Therapy, 1st Ed., National Institute of Nutrition–Hyderabad.
5. Williams S.R., (2000) Basic Nutrition and Diet Therapy, Most by publication.
6. Sharma. A. (2017), Principles of Therapeutic Nutrition and Dietetics, CBS Publishers & Distributors Pvt Ltd, New Delhi.
7. Bajaj. M. (2019) Diet Metrics: Handbook of Food Exchanges, Norton Press, Chennai.

e- Learning Resources

- https://www.cdss.ca.gov/agedblinddisabled/res/VPTC2/9%20Food%20Nutrition%20and%20Preparation/Types_of_Therapeutic_Diets.pdf
- <http://www.differencebetween.net/science/health/difference-between-enteral-and-parenteral-nutrition/>
- https://www.medicinenet.com/difference_between_diarrhea_and_dysentery/article.html
- <https://my.clevelandclinic.org/health/diseases/15587-inflammatory-bowel-disease-overview>

Course Code	PO1		PO2		PO3	PO4		PO5	PO6	PO7
24UHSC51P	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	2	3	2	2	2	2	-	3	2
CO2	3	2	3	2	2	3	2	-	3	1
CO3	3	2	3	3	3	3	3	-	2	3
CO4	2	2	2	2	2	3	3	-	2	1
CO5	3	3	3	3	3	3	3	1	2	1

Strong 3 Medium 2 Low 1

Dr.D.Vijayarani

Head of the Department

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VIRUDHUNAGAR

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B.Sc. Home Science – Nutrition and Dietetics (2024 - 2025 onwards)

Semester V	PROJECT	Hours/Week: -1	
Core Course - 13		Credits:1	
Course Code 24UHSC54PR		Internal 100	External -

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: trace the existing problems of the community. [K2]

CO2: plan the research design for the study and carry out it. [K3]

CO3: make use of the collected data to prepare the research report. [K3]

CO4: find the results and infer it. [K3]

CO5: conclude the research findings which in turn helpful for human upliftment. [K4]

Candidate is expected to select a project in the field of Home Science and related fields. The report on the completed project work shall be submitted to the department in the month of November during V semester. Two typed copies (one for candidates and one for Department) of the project report will be submitted to the COE through the Head of the department. Evaluation will be done internally. Minimum pages for project report should be 20 pages. Projects can be done individually or in a group of two students.

Project work and Report - 60 marks

Presentation and Viva-voce - 40 marks

Mapping with Programme Outcomes

Course Code 24UHC54PR	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	3	3	3	3	3	2	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	3

Strong(3) Medium(2) Low(1)

Dr.D.Vijayarani
Head of the Department

Dr.D.Vijayarani
Course Designer



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science - Nutrition and Dietetics

(2024 - 2025 onwards)

Semester V	QUANTITY FOOD PRODUCTION AND SERVICE- THEORY AND PRACTICAL	Hours/Week:5	
DSEC-1		Credits:4	
Course Code		Internal	External
24UHSE51		25	75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: describe the history and concept of food service establishments and entrepreneurship in catering [K1]

CO2: explain the different types of food service establishment, food production, menu, styles of service and entrepreneur in food service establishments. [K2]

CO3: discuss the system management for food production and procedure for quantity food production, table laying and start-up process [K2]

CO4: identify the functions of food service systems and menu planning and significance of production forecasting, food service personnel and entrepreneurship in foodservice establishments. [K3]

CO5: write the skills required for quantity food production and food service personnel and find the factors affecting menu planning, challenges and problems faced by women entrepreneurs.[K3]

UNIT I

Food Service Industry

History of development of food service institution in India. Classification of food service establishments – Commercial -Transport catering, Hotels, Restaurants, Outdoor catering and Non-commercial / Welfare - Hospital, Institutional -School / College, Orphanage / Old age homes, prisons, Industrial catering.

Food Service systems - conventional, ready-prepared, commissary, assembly-serve. (15 hours)

UNIT II

Quantity food production

Production forecasting, planning, production scheduling;

Standardization of recipes definition, need, uses, methods of enlargement of recipes. Portion control, effective use of left-overs. (15 hours)

UNIT III

Menu Planning

Menu – origin, definition and functions of menu, importance of planning menus, factors affecting menu planning, French classical menu. Types of menu - A la carte, Table d' hote, Du jour, static, cyclic, single use, construction and writing menu, menu display.

Basic terminologies in food service relating to stocks, soups, sauces, salads and beverages - alcoholic and non-alcoholic. (15 hours)

UNIT IV

Food and Beverage Service

Table Setting - Mise-en-scene, Mise-en-place, Basic rules for laying a table, Cover – definition, A la Carte cover and Table d' hote cover.

Food service personnel: basic technical skills, inter-personal skills, attributes of food and beverage personnel. Duties of a waiter- before guests arrive, when guests arrive, during the meal and after guests leave, rules for waiting at table.

Styles of Service - Table Service - Waiter – Silver / English, Family, American, French, Russian, Gueridon; Bar Counter, Assisted- Carvery, Buffet, Self-service-Cafeteria - Counter, Free-flow, Echelon, Supermarket, Single-point Service- Takeaway, Drive-thru, Fast food; Vending; Kiosks; Food court , In-situ Service- Tray, Trolley, Home delivery, Lounge, Room, Drive-in. (15 hours)

UNIT V

Entrepreneurship in catering

Entrepreneurship–concept and significance

Entrepreneur-definition, characteristics and classification.

Food start up, Start -up process, steps, opportunities and challenges, problems faced by women entrepreneurs. (15 hours)

Practicals

1. Plan menu for different types of food service institutions- commercial and non- commercial food service institution
2. Preparation of menus for different types of events.
3. Preparation and standardisation of dishes of different cuisines (one portion).
4. Quantity production and service of meals - stepping up of recipe to 50 portions.
5. Table Setting – Cover- A la carte and Table d' hote covers.
6. Napkin folding.
7. Visit to food service units – commercial and non- commercial.

8. Organise food sales.
9. Internship in food service establishment for a month.

REFERENCE BOOKS

1. Sethi, Mohini, Malhan, Surjeet.(2015).Catering Management–An Integrated Approach,3rd ed, New Age International Publishers,New Delhi.
2. JunePayne Palacio, Monica Theis, Introduction to Foodservice(2009),11th illustrated, Published by Pearson/Prentice Hall.
3. Dhawan andVijay. (2001).Foodand Beverage Service, Frank Boss and Co, NewDelhi.
4. Suganthi, Vand Premakumari,C.(2017).Food Service Management, Dipti Press(OPC)Pvt.Ltd, Chennai.
5. Andrews and Sudhir. (2000). Introduction to Hospitality Industry, Tata-Mc GrawHill Pub.Co.,New Delhi.
6. FoskettDavid.(2011).The Theory of Hospitality and Catering, Hodder Education, London.
7. Gupta,CB and Srinivasan, NP.(2002) Entrepreneurial Development, Sultan Chand& Sons,NewDelhi.
8. Jagmohan.N.(2013).Food and Beverage Service Operation, S. Chand & Co.Ltd.,New Delhi.

e- Learning Resources

- <https://www.scribd.com/document/119449120/History-of-Food-Service-Industry>
- <https://sirvo.com/>
- <https://www.yaaka.cc/unit/types-of-catering-establishment/>
- <https://www.scribd.com/doc/24003230/Unit-1-Food-and-Beverage-Service-Management>
- <https://www.universalclass.com/.../types-of-service-and-table-settings-in-waiter>

Course Code 24UHSE51	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	3	3	-	-	-	3	-	-
CO2	3	3	3	3	-	-	2	2	-	3
CO3	2	2	1	1	-	-	2	2	-	1
CO4	1	1	1	1	1	2	2	1	-	1
CO5	1	1	1	1	1	1	1	1	-	1

Strong(3) Medium(2) Low(1)

Dr.D.Vijayarani

Head of the Department

Mrs.T.Devi

Ms.R.Subha

Course Designers



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science - Nutrition and Dietetics

(2024 - 2025 onwards)

Semester V	HOUSE KEEPING	Hours/Week:5	
DSEC- 1		Credits:4	
Course Code 24UHSE52		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: discuss the concept of guest room and housekeeping department [K1]

CO2: describe the types of guest room and housekeeping department [K2]

CO3: explain the importance, functions and organisational structure of housekeeping department.[K2]

CO4: identify the various duties and responsibilities, linen management and laundry operation of house keeping department.[K3]

CO5: find the appropriate layout of the housekeeping department, cleaning agents, equipment, safety and security procedure, pest and pest control measures.[K3]

UNIT I

Housekeeping Department - Importance of housekeeping, Duties and Responsibilities of Housekeeping Department. Organizational Structure, types of lodging establishments. Job Description and Job Specification of staff in the department. Layout of the department, Personal Attributes. Qualities of the Housekeeping staff - skills of a good Housekeeper.

Activity: Prepare working schedule for a hotel 10 suites.

(15 hours)

UNIT II

Housekeeping co-ordination and Procedures

Briefing, Debriefing, Gate pass, Inter departmental Co-ordination with more emphasis on Front office and the Maintenance department. Indenting from stores- Inventory of Housekeeping Items, Housekeeping control desk, Importance, Role, Co-ordination, check list, key control, Handling Lost and Found, Forms, Formats and registers used in the Control Desk, Paging systems and methods, Handling of Guest queries, problem, request. General operations of control desk, Role of control desk during Emergency.

Activity: Maintaining various house keeping records and documents. (15 hours)

UNIT III

Hotel Guest room - Importance of the Guestroom to a Guest, Types of guest rooms, Guest Supplies/Amenities in a guest room, Bed making procedures and types.

Different types and importance of keys – section key, master key, floor key and grand master key. Key of executive offices and public areas and computerized key.

Pest control and eradication – with special reference to rats, cockroaches, furniture beetle, clothes moth, etc.

Dealing with emergency like fire, death, theft, accidents, safety security control.

Activity: Prepare layout diagram containing furniture and decorative items arrangement in front office, restaurants and guestrooms. (15 hours)

UNIT IV

Linen/ Uniform / Sewing Room

Its importance in hotels, selection and buying of linen, inspecting, Storage Facilities, receiving used linen.

Linen stock for any establishment, Layout, Types of Linen, sizes and Linen exchange procedure, and conditions, Linen Inventory system.

Uniform designing: Importance, selection, characteristics, and types.

Activity: Practice of Ironing, storing, cleaning and discarding of linen. (15 hours)

UNIT V

Housekeeping Inventories

Introduction, Cleaning equipment – Selection of equipment.

Manual Equipment - brooms and brushes, protective equipment, cloths used in cleaning and box sweeper.

Mechanical equipment - electric equipment, vacuum cleaner, floor scrubbing and polishing machine, floor shampooing machine, containers trolley, chambermaid's trolley, etc.

Cleaning Agents – Water, Detergents, Abrasives, Reagents, Organic Solvents, Disinfectants and Bleaches, Glass Cleaners, Laundry Aids, Toilet Cleaners, Polishes, Floor sealers and Carpet Cleaners, characteristics of a good cleaning agent. Selection, Storage and Issuing of Cleaning Agents.

Activity: Demonstrate Cleaning and polishing of various surfaces, hard flooring, semi-hard floorings, and wooden flooring. (15 hours)

REFERENCE BOOKS

1. Aleta Nitschke (2008) “Managing Housekeeping Operations” Educational Inst Of The AmerHotel; Revised Edition, Isbn-13 : 978-0866123365
2. G. Raghubalan (2015) “Hotel Housekeeping: Operations and Management” 3e Oxford University Press India, Isbn-13 978-0199451746
3. Jatashankar Tewari (2016), “Hotel Front Office 2E: Operations and Management” Oxford University Press; Third Edition

4. Nishant Pal (2022) “Accommodation Operations: Introduction to Housekeeping and Hotel Guest Room, Guest Services, Housekeeping Control Desk, Linen Room” Kindle Edition.
5. Reeta Pal and Nishant Pal (2022), Housekeeping - Housekeeping Procedures, Hotel Guest Room, Housekeeping Manpower Planning, Cleaning Science and Managing Quality Service, Kindle Edition.

e-Learning Resources:

- <https://www.ihmnotes.in/assets/Docs/Books/9780199451746.pdf>
- <https://www.slideshare.net/SatyajitRoy21/personal-attributes-of-housekeeping-staff-62900148>
- <https://www.slideshare.net/96vidya/duties-and-responsibilities-of-an-executivehousekeeper>
- <https://www.ihmnotes.in/assets/Docs/Sem-3&4/Accommodation/Ch-1,%20Linen%20Room.pdf>
- <http://kubersshah.blogspot.com/2017/04/uniform-room.html>

Mapping with Programme Outcome

Course Code 24UHSE52	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	2	1	2	-	-	-	2	-	2
CO2	3	2	1	2	-	1	1	2	-	-
CO3	3	1	2	2	1	1	1	2	-	-
CO4	3	1	2	2	3	1	3	2	-	2
CO5	3	2	2	2	3	2	3	2	-	1

Strong(3) Medium(2) Low(1)

Dr.D.Vijayarani

Head of the Department

Mrs.T.Devi

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Course Designers



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science - Nutrition and Dietetics

(2024 - 2025 onwards)

Semester V	LANDSCAPE DESIGN AND ORNAMENTAL GARDENING	Hours/Week: 4	
Discipline specific elective course -2		Credits: 3	
Course Code 24UHSE53		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: recall the concept and importance of landscape design, ornamental garden, and garden styles, indoor and outdoor plans [K1].

CO2: explain the types of landscape garden, ornamental garden, special garden and plants and also the principles of design in landscaping [K2].

CO3: indicate the requirements for landscaping, gardening and planting [K2].

CO4: identify the properties of soil, components of garden, factors influencing the growth of garden [K3].

CO5: write the plan for landscape designing, ornamental gardening, special gardening, indoor and outdoor plants [K3].

UNIT I

Landscape Design -Definition, Importance and Principles of Design in Landscaping. Requirements in Landscape Area- Site & Location, Site Evaluation, Soil Properties, Water Systems, Climatic Conditions and Lighting. Public and Private Garden. Importance of Kitchen Garden.

(12 hours)

UNIT II

Ornamental Garden - Definition, Components of Garden- Arboretum. Shrubbery, Fernery, Arches and Pergolas, Edges and Hedges. Integral Elements of Garden- Climbers and Creepers, Cacti & Succulents, Herbs, Annuals & Perennials, Flower Borders & Beds. Supplementary Elements of Garden- Ground Covers, Carpet Beds, Bamboo Grooves, Topiary and Garden Adornments.

(12 hours)

UNIT III

Styles and Types of Landscape Garden - Garden Styles: Formal, Informal and Freestyle, Wild Gardening, Types of Gardens: Persian, Mughal, Japanese, English, Italian, Buddha and Spanish garden.

(12 hours)

UNIT IV

Special Types of Gardens - Vertical Garden, Roof Garden, BogGarden, Sunken Garden, Rock Garden, Clock Garden, Bonsai Gardens, Temple Garden & Sacred Groves.

(12 hours)

UNIT V

Indoor-Outdoor Plants - Kinds and Classification, Factors Influencing Growth of Plants.

Planning and Execution of Landscape Design Based on the Styles and Kinds of Plants.

(12 hours)

EXPERIENTIAL LEARNING

Preparation of home garden designs. Identifying and Selection of ornamental plants. Practices in preparing any one style of garden design. Visit to parks and botanical gardens.

REFERENCE BOOKS

1. A K Tiwari (2012) Fundamentals of Ornamentals Horticulture and Landscape Gardening, NIPA publisher
2. Alka singh (2015) A colour handbook: Landscape gardening, NIPA publisher
3. Desh raj (2017) Floriculture at a glance, Kalyani publishers
4. G. S. Randhawa, A.N. Mukhopadyay, A. Mukhopadhyay (1998) Floriculture in India, Jaideep publishers Delhi.
5. Harikrishnan Paliwal (2013) Ornamental Gardening- A user's Companion, Jain Publishing Company, New Delhi
6. M Kannan , P Ranchana , S Vinodh (2016) Ornamental Gardening and Landscaping, New India publishing agency

e-Learning Resources

- http://www.megagriculture.gov.in/PUBLIC/floriculture_objectives.aspx
- <http://ncert.nic.in/vocational/pdf/kegr101.pdf>
- http://agritech.tnau.ac.in/horticulture/horti_Landscaping_freshflower.html
- <https://www.basicsofgardening.com/types-of-garden>
- <https://www.designcad.com.au/wp/Docs/Landscape%20Design%20and%20CA D.pdf>

Mapping with Programme Outcomes

Course Code 24UHSE53	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	2	3	2	2	2	2	-	3	2
CO2	3	2	3	2	2	3	2	-	3	1
CO3	3	2	3	3	3	3	3	-	2	3
CO4	2	2	2	2	2	3	3	-	2	1
CO5	3	3	3	3	3	3	3	1	2	1

Strong 3 Medium 2 Low 1

Dr.D.Vijayarani

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Mrs.S.Balasaraswathi

Dr.R.Sreebha

Course Designers



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics (2024- 2025 onwards)

Semester V	FUNDAMENTALS OF RESEARCH IN NUTRITIONAL SCIENCES	Hours/Week: 4	
DSEC-2		Credits: 3	
Course Code 24UHSE54		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: describe the concept of research, research design, sampling, data collection, coding, data analysis and report writing [K1].

CO2: explain the types of research design, sampling techniques, data, data collection, data presentation, statistical analysis and bibliographic styles to pursue research [K2].

CO4: discuss the significance, advantages, disadvantages and challenges of the research process to overcome scientific research problems [K2].

CO3: find the data collection tools, statistical tools, sources of data, data manipulation and interpretation of data for the research in nutrition [K3].

CO5: identify the procedure for identifying research problem, construction of research design, sampling, data processing and report writing [K3].

UNIT I

Introduction to research

Research- Meaning, objectives, significance.

Research problem- Definition and selection of research problem. Research design –Types of research design

Method of sampling - probability and non-probability sampling – Merits and Demerits

Determining sample size (12 hours)

UNIT II

Data Collection - Primary and secondary data, selection of appropriate method for data collection.

Tools used for data collection- Questionnaire and Interview schedule (12 hours)

UNIT III

Coding and tabulation of data

Data entry and computation, Tabulation of data – parts of the table

Presentation of data- use of bar graph and pie chart (12 hours)

UNIT IV

Basic statistical tools for analysis and interpretation Measures of central tendency – Mean, Median, Mode. Variations-the range and standard deviation (12 hours)

UNIT V

Correlation –Karl Pearson’s coefficient of correlation Test of significance- Student’s t test

Report writing - Steps in report writing, Layout of a report. Bibliography-citing references-any one style. (12 hours)

EXPERIENTIAL LEARNING

Carry out a small survey, code and tabulate data and present data using tables and graphs. Interpret data using simple statistical tools and present report following rules for report writing.

REFERENCE BOOKS

1. G. Vijayalakshmi, C. Sivapragasam. (2019). Research Methods Tips and Techniques. New Delhi: MJP Publisher.
2. Kothari ,G.R.(2019). Research Methodology Methods and Techniques, New Delhi: Wiley Eastern Limited.
3. Peer Mohamed and Shazuli Ibrahim.(2015). Research Methodology.Madurai :Pass publications.
4. Gupta, S.P. (2019) Statistical methods. 46th ed. Sultan Chand and Co, New Delhi.
5. Kerlinger F. N. and Lee, H.B. (2000) Foundations of Behavioura Research 4th Ed. Harcourt College Publishers.
6. Kothari, C.R. (2019). Research methodology methods and techniques, New Age International publishers, New Delhi.
7. Kumar, R. (2005) Research Methodology: A Step-by-Step Guide for Beginners. Sage Publications, New Delhi.
8. Gupta, S.P. (2021). Statistical Methods, New Delhi: Sultan Chand and Sons.

9. Gurumani,N. (2021). An Introduction to Biostatistics, Chennai: MJP Publishers.
10. Pillai, R.S.N. and Bagavathi (2016).Statistics Theory and Practice.8 th edition, New Delhi: Chand and Company Ltd.
11. Goode, WJ and Hatt, PK (1981) Methods in Social Research, McGrawHill International Editions, Sociology Series.

e-Learning Resources

- <http://www.socialresearchmethods.net/tutorial/mugo/tutorial.htm>
- https://ebooks.lpude.in/library_and_info_sciences/MLIS/year_1/DLIS401_METHO DO LOGY_OF_RESEARCH_AND_STATISTICAL_TECHNIQUES.pdf
- <https://mfs.mkcl.org/images/ebook/Fundamental%20of%20Research%20Methodology %20and%20Statistics%20by%20Yogesh%20Kumar%20Singh.pdf>

Mapping with Programme Outcomes

Course Code 24UHSE54	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	2	3	2	2	2	2	-	3	2
CO2	3	2	3	2	2	3	2	-	3	1
CO3	3	2	3	3	3	3	3	-	2	3
CO4	2	2	2	2	2	3	3	-	2	1
CO5	3	3	3	3	3	3	3	1	2	1

Strong 3 Medium 2 Low 1

Dr.D.Vijayarani
Head of the Department

Dr.R.Sreebha
Mrs.A.Jeevarathinam
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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science - Nutrition and Dietetics

(2024 - 2025 onwards)

Semester V	INTERNSHIP	Hours/Week:-	
Internship/ Industrial Training		Credits: 1	
Course Code – 24UHSI51		Internal 100	External -

COURSE OUTCOMES

On completion of the Internship/ Industrial Training, students will be able to

- CO1:** discuss the procedure followed in the dietary department of the hospital, nutritional assessment techniques and clinical manifestations of the patients. [K2]
- CO2:** plan and prepare the routine hospital and special feeding diet for the diseased persons based on the diet principles and RDA recommended by ICMR. [K3]
- CO3:** make use of ICMR recommended RDA value and compute the nutritional value for the planned menu of the diseased persons. [K3]
- CO4:** identify the nutritive values for the planned menu and infer the result and prepare the record.[K3]
- CO5:** examine the suitable therapeutic diet for the patients to improve the health status. [K4]

Guidelines/ Regulations

- ❖ Each student must go for Internship training in a reputed Hospital (Dietary Department) / Industry / Company / Organization/ Educational Institution.
- ❖ Students should produce the completion certificate after the completion of Internship period.
- ❖ A report of 10-15 pages must be submitted by each student after the completion of the Internship period.
- ❖ Internal Viva-voce examination will be conducted.
- ❖ Students with diverse disabilities must complete a 10 day internship programme at their preferred places.

Course Code 24UHSI51	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	2	2	3	-
CO2	3	2	2	2	2	3	-
CO3	3	2	-	-	-	3	-
CO4	3	3	2	2	-	2	3
CO5	3	2	3	3	2	-	-

❖ **Strong (3)****Medium (2)****Low (1)**

Dr.D.Vijayarani
Head of the Department

Dr.D.Vijayarani
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B.Sc. Home Science - Nutrition and Dietetics

(2024 - 2025 onwards)

Semester	COMMUNITY NUTRITION	Hours/Week:
Extra Credit Course		Credits: 2
Course Code 24UHSO51		Internal 100

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: state the concept of community nutrition, malnutrition, healthcare, nutrition monitoring, nutrition

education, food and nutrition security.

CO2: identify the causative factors and consequences of the nutrition and health problems in the community.

CO3: describe the methods to assess the nutritional status and intervention programmes to combat nutritional problems of the community.

CO4: illustrate the frame work for health care system, food security, nutrition security, nutrition surveillance system and nutrition education.

CO5: analyse the role of food security, nutritional assessment, nutrition education and public nutritionists

in prevention of nutritional problems.

UNIT I

Community nutrition - definition, factors influencing community nutrition and health.

Health Care - concept, levels and primary health care.

Health care delivery system – definition, meaning, principles. Health system in India - central, state, district, block and village levels.

Role of public nutritionists in health care delivery

UNIT II

Malnutrition - meaning, definition, types, risk, aetiology, prevalence of malnutrition, poverty -malnutrition interaction, consequences, impact of malnutrition on national development, indicators of malnutrition and prevention of malnutrition.

UNIT III

Food Security - definition, meaning, dimensions, determinants of food security, framework for assessment of food security, food security system in India.

Nutrition security - definition, meaning, inputs, factors underlying the current status of food and nutrition security - Global perspective and Indian perspective, principles of ensuring food and nutrition security.

UNIT IV

Nutrition monitoring and surveillance - objectives, components, nutrition monitoring and surveillance system in India.

Nutritional assessment methods – objectives, types - anthropometric measurement, clinical method, biochemical analysis and diet survey.

UNIT V

Nutrition education – definition, importance, components, steps and methods – individual, group and mass.

REFERENCE BOOKS

1. Boyle, M.A. (2016). Community nutrition in action: An entrepreneurial approach, 7th edition, USA: Brooks cole publishers.
2. Das, S. (2020). Text book of community nutrition, Kolkata: Academic publishers.
3. Edelstein, S, (2010). Nutrition in public health: A handbook for developing programmes and services, 3rd edition, USA: Jones and bartlett publishers.
4. Park, A. (2015). Textbook of preventive and social medicine, 23rd edition, India: Bhanot publishers.
5. Srilakshmi, B. (2016). Human nutrition, Delhi: New age international pvt ltd.



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B.Sc. Home Science - Nutrition and Dietetics

(2024 - 2025 onwards)

Semester VI	CLINICAL NUTRITION- THEORY AND PRACTICAL	Hours/Week:5	
Core Course-14		Credits:4	
Course Code 24UHSC61		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: state the definition and concept of various diseases and disorders. [K1]

CO2: explain the various types of diseases and disorders. [K2]

CO3: describe the causes and consequences of various diseased conditions. [K2]

CO4: identify the clinical manifestations of various diseased conditions and biochemical role of nutrients in metabolism. [K3]

CO5: find the nutritional implications and recent advances in various diseased conditions. [K3]

UNIT I

Biochemical changes due to disorders of metabolism

Metabolic and Nutritional implications in Diabetes mellitus, Inborn errors of metabolism –

Gout, phenylketonuria, Galactosemia, Lactose intolerance, Ageing – physiological changes with ageing. Cellular adaptations to stress

(15 hours)

UNIT II

Cardiovascular Disorders

Metabolic and Nutritional implications of Myocardial infarction, atherosclerosis hyperlipidaemia, hypertension, metabolic syndrome, Role of lipids in cardiovascular disease and Recent advances.

(15 hours)

UNIT III

Digestive System, Liver and Pancreatic Disorders

Metabolic and Nutritional implications of Diarrhoea, constipation. Gastritis, ulcers, colitis, malabsorption syndrome, celiac disease, Inflammatory bowel disease, Irritable bowel syndrome, Diet and gut microflora. Recent advances.

Metabolic and nutritional implications of Hepatitis. Cirrhosis of liver, Hepatic coma, Pancreatitis, Cholecystitis and Cholelithiasis. Recent advances (15 hours)

UNIT IV

Renal Disorders

Metabolic and nutritional implications of Nephritis, Nephrotic syndrome, Renal Transplant, Nephrolithiasis and Dialysis. Role of kidney in Water and Electrolyte Balance and Imbalance.(15 hours)

UNIT V

Carcinogenesis

Carcinogens in Food, Types of cancer, Causes, pathogenesis, cancer cachexia, Effect of cancer on metabolism and nutritional status, Recent developments in nutrition and cancer. (15 hours)

Practical

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

REFERENCE BOOKS

1. Schlenker, E., & Gilbert, J. A., (2018), Williams' Essentials of Nutrition and Diet Therapy-E-Book. Elsevier Health Sciences.
2. Wardlaw, GM., (2004), Contemporary Nutrition, 2nd edition, Mosby Publishing.
3. Rolfes, S. R., Pinna, K., & Whitney, E. (2020), Understanding normal and clinical nutrition, Cengage learning.
4. Carol Byrd – Bredbenner, (2013), Wardlaw's perspectives in Nutrition, 9th edition McGraw – Hill International Edition.

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

e- Learning References

- <https://www.nutrition.gov/>
- <https://nutrition.org/>
- [Nutrition Resources for Online Learning \(healthyeating.org\)](https://www.healthyeating.org/)

Mapping with Programme Outcomes

Course Code 24UHSC61	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	1	-	1	1	2	2	1	-	1
CO2	3	1	-	1	3	3	2	2	-	2
CO3	3	1	-	1	3	3	2	2	-	2
CO4	3	1	-	1	3	3	3	3	-	3
CO5	3	1	-	1	3	3	3	3	-	3

Strong(3) Medium(2) Low(1)

Dr.D.Vijayarani

Head of the Department

Mrs.T.Devi
Ms.S.Vaishnavi
Course Designers



V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science - Nutrition and Dietetics

(2024 - 2025 onwards)

Semester VI	FOOD SAFETY AND QUALITY CONTROL	Hours/Week:5	
Core Course-15		Credits:4	
Course Code 24UHSC62		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: describe the concept of food safety, quality control, food laws and food regulations in food industries [K1].

CO2: discuss the types of food quality systems, adulteration, contaminants, SOPs, safety systems, laws and regulations to enhance food safety [K2].

CO3: explain the importance of food safety regulations, quality assurance, certifications, licensing, SOP, quality policy, food hygiene and sanitation in food sectors [K2].

CO4: find the role of food safety, quality management, standards, regulatory system and SOP check list in maintaining the quality of food production [K3].

CO5: identify the applications of HACCP, food adulteration trends, factors contributing food borne hazards, procedures to determine food related risks and control it in an industry to ensure food safety [K3].

UNIT I

Food safety - Introduction to concepts of food quality, food safety, food quality assurance. General food laws and food safety regulations. History of Food regulations. Importance of Food safety and quality control concepts applied in the food processing industry.

Evaluation of Food safety – Applications of HACCP in the food industry. (15 marks)

UNIT II

Quality assurance - Importance and functions of quality control. Theoretical and practical considerations, description of different systems: GAP, GMP, TQM, ISO. **Indian food standards** - Voluntary and Obligatory standards (PFA, FPO, MMPO, AGMARK etc) Codex Alimentarius.

(15 hours)

UNIT III

Food sanitation and safety - Factors contributing to physical, chemical and biological contamination in food chain, prevention and control of food borne hazards. Personal hygiene of food handlers, cleaning compounds, sanitation methods, waste disposal strategy (solid and liquid waste) and pest control

Food adulteration - Food adulteration, Common adulterants, Simple tests for detection of adulteration and toxic constituents. Functional role and safety issues - Recent trends and challenges in food adulteration. (15 hours)

UNIT IV

Food safety regulation in India - An overview of Food Regulation in India, Food Laws and Regulations; Structure, organization and duties of regulatory system- Duties and responsibilities of food business operator, Registration and Licensing process and requirements, Labeling of Food Products, Traceability, Import and Export of Foods, Liability for Defective Products, Food safety management systems and certifications. (15 hours)

UNIT V

Standard operating procedure and checklist - Preparing scope, quality policy and quality objectives of food processing company, Defining Standard operating procedure. SOP for purchasing raw materials, receiving raw materials, storage, cleaning, holding, cooling, freezing, thawing, reheating, personal hygiene, facility and equipments.

Preparation of HACCP based SOP checklist - personal hygiene, food preparation, hot holding, cold holding, refrigerator, freezer and milk cooler, food storage and dry storage, cleaning and sanitizing, utensils and equipments, large equipments, garbage storage and disposal and pest control. (15 hours)

Activity

Assignment on the preparation of food safety related risk analysis in food processing industry.

Training on the preparation of Standard Operating

Procedure (SOP) and manual for GMP

Prepare a HACCP Plan for a food processing industry.

Practical analysis of the detection of adulteration in different types of foods.

Preparing work instructions for the staff in charge of sanitation and the cleaning staff in food industry/food outlets.

Prepare Audit Checklist for various food industries.

REFERENCE BOOKS

1. AOAC International. (2005) Official methods of analysis of AOAC International. 17thEd., current through 1st revision. Gaithersburg, MD, USA, Association of Analytical Communities.
2. Bhatia,R. and Ichhpujan,R.L (2004), Quality assurance in Microbiology, CBS Publishers and Distributors, New Delhi. 2004.
3. Bryan, F.L. (2007) Hazard Analysis Critical Control Point Evaluations A Guide toIdentifying Hazards and Assessing Risks Associated with Food Preparation and Storage. World Health Organization, Geneva.
4. Early, R. (2006) Guide to Quality Management Systems for the Food Industry, Blackie,Academic and professional, London.
5. FAO (2006) Manuals of Food Quality Control. 2-Additives ContaminantsTechniques,Rome.
6. Food and Agricultural Organization (1980): Manuals of Food Quality Control. 2Additives Contaminants Techniques, Rome
7. Food safety and standards act 2006, Rules 2011, Regulations 2011, 10th Edition,ILBCOIndia, Indian Law Book Company, 2013.

e- Learning Resources

- <http://www.fssai.gov.in/>
- <http://www.medindia.net>
- <http://www.foodsafety.unl.edu/>

Course Code 24UHSC62	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	2	3	2	2	3	3	2	2	3
CO2	3	2	3	2	2	3	3	2	2	3
CO3	3	2	3	3	2	3	3	2	2	3
CO4	3	2	3	2	2	3	3	2	2	3
CO5	3	3	3	3	2	3	3	2	2	3

Strong(3) Medium(2) Low(1)

Dr.D.Vijayarani

Mrs.A.Jeevarathinam

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Head of the Department

Course Designers



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science - Nutrition and Dietetics

(2024 - 2025 onwards)

Semester VI	FUNCTIONAL FOODS FOR CHRONIC DISEASES	Hours/Week: 5	
Core Course -16		Credits: 4	
Course Code 24UHSC63		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: state the concept of antioxidants, functional foods, various diseases and disorders [K1]

CO2: trace the history, sources and components of various functional foods used to treat the various diseases and disorders [K2]

CO3: discuss the types of functional foods in the prevention and management of various diseases and disorders. [K2]

CO4: identify the role and properties of functional foods in the prevention and management of various diseases and disorders. [K3]

CO5: find the effect of functional foods in the prevention of various diseases and disorders.[K3]

UNIT I

Introduction

Functional foods - Definition, History, types and classification of functional foods, Relation of functional foods (FF) to chronic diseases.

Food sources

Functional foods in different foods: cereal products (oats, wheat bran, rice bran, etc.), fruits and vegetables, milk and milk products, legumes, nuts, oil seeds and sea foods, herbs, spices and medicinal plants. Coffee, tea and other beverages as functional foods/drinks and their protective effects. (15 hours)

UNIT II

Antioxidants

Concept of free radicals and antioxidants, antioxidant role as functional foods. Antioxidant and chronic diseases.

Properties and functions of various functional food ingredients

Protein, complex carbohydrates (dietary fiber) as functional food ingredients; probiotic, prebiotics, symbiotic foods, and their functional role. Sources and role of isoprenoids, isoflavones, flavonoids, carotenoids, tocotrienols, chlorophyll, polyunsaturated fatty acids, lecithin, choline, terpenoids, Glucosamine, lycopene, proanthocyanins. (15 hours)

UNIT III

Functional foods and cardiovascular diseases (CVD) Epidemiology of cardiovascular diseases, Biomarkers of different cardiovascular diseases, effect of functional foods on biomarkers of CVD, Effect of functional foods like green tea, grapes, oats, soybean, sunflower seeds or pumpkin seeds on CVD (15 hours)

UNIT IV

Functional foods and cancer

Functional Food Components in Cancer Disease, Effect of functional foods like cruciferous vegetables, green tea, garlic, walnuts, berries on cancer.

Functional foods and renal diseases

Epidemiology of kidney disease, functional foods for kidney diseases, Effect of functional foods like garlic, buckwheat on kidney. (15 hours)

UNIT V

Functional foods and obesity

Functional foods and obesity, biomarkers of obesity, bioactive compounds in functional foods to manage healthy weight. Effect of functional foods like dietary fibres, psyllium husk, apple on obesity.

Functional foods and diabetes

Epidemiology of Diabetes, Functional Foods for Type 2 diabetes, effect of functional foods like turmeric, garlic, green tea, dietary fibre on diabetes. (15 hours)

Activity

- Prepare a list of functional foods and its benefits.

- Make a Power point presentation of Biomarkers for obesity, CVD, cancer, diabetes, kidney failure.
- Group discussion on Bioactive compounds and its functions that are beneficial for chronic diseases.

REFERENCE BOOKS

1. Cho S. S. and Dreher, M.L. (2001): Handbook Dietary Fibre, Marcel Dekker Inc., New York.
2. Gibson, G.R. and C.M. Williams (2000), “Functional Foods: Concept to Product”. Woodhead.
3. Giuseppe Mazza (1998), “Functional Foods: Biochemical and Processing Aspects”, Volume 1; CRC Press
4. Goldberg, I. Ed (1994): Functional Foods: Designer Foods, Pharma Foods, Nutraceuticals, Chapman & Hall, New York.
5. Ikan, Raphael (2005), “Natural Products: A Laboratory Guide”, 2nd Edition, Academic Press / Elsevier.
6. Webb, P P (2006), “Dietary Supplements and Functional Foods”. Blackwell.
7. Wildman, Robert E.C (2006), “Handbook of Nutraceuticals and Functional Foods”. CRC.

e- Learning Resources

- <https://youtu.be/uFf0zxQ3rBU>
- <http://epgp.inflibnet.ac.in/Home/Download>

Mapping with Programme Specific Outcomes

Course Code 24UHSC63	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	1	1	1	2	1	3	1	3
CO2	3	3	1	1	3	3	2	3	1	3
CO3	3	3	2	2	3	3	2	3	2	3
CO4	3	3	1	1	3	3	2	3	1	3
CO5	3	3	1	1	3	3	2	3	1	3

Strong(3) Medium(2) Low(1)

Dr.D.Vijayarani

Head of the Department

Mrs.B.Ameena Beebi

Mrs.R.Subha

Course Designers



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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics (2024- 2025 onwards)

Semester VI	FOUNDATIONS OF ENTREPRENEURSHIP	Hours/Week: 4	
Core Course -17		Credits: 4	
Course Code 24UHSC64		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

- CO1:** state the concept of entrepreneur, entrepreneurship, rural entrepreneurship, enterprise, women entrepreneur and government development schemes and institutions providing financial assistance [K1]
- CO2:** discuss the objectives, importance and need of entrepreneurs, entrepreneurship, rural entrepreneurship government development schemes and institutions providing financial assistance. [K2]
- CO3:** classify the types of entrepreneur, government development schemes and institutions providing financial assistance and growth of entrepreneurship, women entrepreneurship also indicate the characteristics of entrepreneurs [K2]
- CO4:** identify the phases of entrepreneurship development, problems of entrepreneurs, women entrepreneurs, factors influencing entrepreneurship and beneficiaries of government development schemes and institutions providing financial assistance. [K3]
- CO5:** find the role of entrepreneur, entrepreneurship, women entrepreneur and government development schemes and institutions providing financial assistance [K3]

UNIT I

Entrepreneurship - Introduction, Concept of Entrepreneur, Entrepreneurship and Enterprise, Definition of Entrepreneurship, Objectives of Entrepreneurship Development, Phases of Entrepreneurship Development, Role of Entrepreneurship, Characteristics of Entrepreneurship, Traits of Entrepreneurship .Factors influencing Entrepreneurship

Activity: Understanding the application process of financial services in Government sectors/MSME.

(12 hours)

UNIT II

Entrepreneur - Meaning, Functions of Entrepreneur, types of entrepreneurs, stages of entrepreneurial process, role of entrepreneur in economic development.

Activity: Categorize the stages of entrepreneurial process. (12 hours)

UNIT III

Women entrepreneurship - Concept, functions, growth, problems, functions, development. Rural entrepreneurship – meaning – need – problems – how to develop rural entrepreneurs – Role of NGOs and SHGs in rural entrepreneurship.

Activity: List out the self-help group activities. (12 hours)

UNIT IV

Government Development Schemes - Prime Minister Employment Generation Programme (PMEGP), stand up India, Pradhan Mantri Mudra Yojana (PMMY), Prime Minister Rural Development Fellows Scheme, Entrepreneurship and Skill Development Programmes (ESDP) and State Development Schemes.

Activity: Preparing/Submission of Project Proposal for Start Up/Business models (12 hours)

UNIT V

Institutions providing financial assistance - Loan schemes offered by SIDBI, SIDC's, SIIC's, NSIC and NABARD- Difficulties in procuring Institutional finance Agencies for Urban and Rural Development – Government, District Rural Developmental Agencies (DRDA).

Activity: Visit to SSI Units. Availing Seed fund from SIDBI/ Angel Investors. (12 hours)

REFERENCE BOOKS

1. Dr. Jayashree Suresh (2012) Entrepreneurial Development, Margham Publications
2. Dutta and Sundaram, Indian Economy, S Chand Publications, New Delhi, 2013.
3. Rakesh Saxena (2020) Government Schemes, missions, campaigns and programmes in India, Prabhat Prakashan.
4. S S Khanka (2011) Entrepreneurial development, S Chand, and company
5. S.K. Singh, Rural Development Policies and Programmes, Northern bookcentre New Delhi, 2002.
6. Sreedhar and Rajasekhar (2014) Rural Development in India Strategies and process, Concept Publishing Company.

e-Learning Resources

- <http://www.simplynotes.in/e-notes/mbabba/entrepreneurship-development/>
- https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_Entrepreneurial_Development_NOTES.pdf

- <https://www.yourarticlelibrary.com/women/women-entrepreneurship/women-entrepreneurship/99813>
- https://ccsuniversity.ac.in/bridge-library/pdf/DHA-MHA-403_Unit3.pdf
- <https://www.creditmantri.com/article-top-10-government-schemes-to-support-startups-promote-the-spirit-of-entrepreneurship/>

Course Code 24UHSC64	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	3	3	-	-	-	-	-	-
CO2	3	3	3	3	-	-	-	-	-	3
CO3	3	3	3	3	-	-	-	-	2	3
CO4	3	3	3	3	-	3	3	2	2	3
CO5	3	3	3	3	-	3	3	2	3	3

Strong(3) Medium(2) Low(1)

Dr.D.Vijayarani

Head of the Department

Dr.D.Vijayarani

Mrs.B.Ameena Beebi

Course Designers



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VIRUDHUNAGAR
Quality Education with Wisdom and Values

B.Sc. Home Science - Nutrition and Dietetics

(2024 - 2025 onwards)

Semester VI	FOOD PRESERVATION –THEORY AND PRACTICAL	Hours/Week:5	
DSEC-3		Credits:5	
Course Code 24UHSE61		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: describe the concept of food preservation, food spoilage, food packaging and food additives. [K1]

CO2: explain the causes of food spoilage, need and principles of food preservation techniques [K2]

CO3: explain the different types of preservation method, food spoilage, food packaging and food additives [K2]

CO4: identify the various microorganism involved in food spoilage and write the processing steps involved in preserving food by using drying, sugar, salt, low and high temperature. [K3]

CO5: find out the role of microbes in food spoilage and the effect of preservation methods on the quality of food [K3]

UNIT I

Food Spoilage - Definition, causes, microorganisms involved in spoilage of bread, fruits and vegetables, meat, fish, egg, milk, juices and pickles.

Food preservation - Definition, principles and importance, classification– bactericidal and bacteriostatic methods. (15 hours)

UNIT II

Processing by high temperature

Processing and preservation by high temperature: blanching, pasteurization, sterilization and UHT processing, canning, extraction cooking, dielectric heating, Dehydration. (15 hours)

UNIT III

Processing by low temperature

Processing and preservation by low temperature – refrigeration, freezing, dehydro-freezing.
(15 hours)

UNIT IV

Preservation by drying

Processing and preservation by drying, concentration and evaporation: various methods sun – drying, tray or tunnel drying, spray drying, drum drying freeze drying, fluidized bed drying, advantages and disadvantages.
(15 hours)

UNIT V

Preservation by non - thermal treatments and food packaging Processing and preservation by non – thermal methods: salt, sugar, chemicals, smoking. Irradiation

Food additives: Definition, types and functions, permissible limits and safety aspects.

Food packaging- its types and uses

Practical - Preparation of jams, jellies and squashes using seasonal fruits and vegetables. Preparation of pickles using fruits and vegetables.

Preparation of sauce and ketchup.
(15 hours)

REFERENCE BOOKS

1. Arthey, D and Ashurst, P.R (1996), Fruit processing, Blackie academic and professional. London.
2. Fellows, P.J (2016): Food Processing Technology: Principles and Practice, second edition, CRC Wood head publishing Ltd, Cambridge.
3. Gould. G.W (1995), New methods of food preservation. Blackie academic and professional. London.
4. Rahman M S (2020) Handbook of Food Preservation CRC Press, USA
5. Srilakshmi B (2017) Food Science, New Age International Publications, New Delhi.
6. Suganthi.V and Subaratinam.R (2021) Textbook on Food preservation, Dipti Press(OPC) Pvt. Ltd, Chennai.

e- learning resources

- <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/food-spoilage>.
- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=111436>
- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=111435>
- <http://www.homepreservingbible.com/2247-an-introduction-to-the-drying-food-preservation-method/>

Mapping with Programme Outcomes

Course Code 24UHSE61	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	1	1	1	2	1	3	1	3
CO2	3	3	1	1	3	3	2	3	1	3
CO3	3	3	2	2	3	3	2	3	2	3
CO4	3	3	1	1	3	3	2	3	1	3
CO5	3	3	1	1	3	3	2	3	1	3

Strong(3)**Medium(2)****Low(1)**

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VIRUDHUNAGAR

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B.Sc. Home Science – Nutrition and Dietetics (2024 - 2025 onwards)

Semester VI	FRONT OFFICE MANAGEMENT	Hours/Week:5	
DSEC-3		Credits:5	
Course Code 24UHSE62		Internal 25	External 75

COURSE OUTCOMES

After successful completion of the course the student will be able to:

CO1: state the concept of hotel, hotel organization, front office and account keeping[K1]

CO2: classify hotels, rooms based on star category, ownership, location, registration, tariff and accounting. [K2]

CO3: describe the organization chart of a front office department and job description of various front office staff. [K2]

CO4: find the features of hotels, process of registration, guest handling and accounting .[K3]

CO5: Identify the duties and responsibilities of front office staff in ensuring customer comfort [K3]

UNIT I

Classification of hotels

Classification of hotels based on star category, size, ownership and other categories.

Types of rooms (15 hours)

UNIT II

Hotel organization and functions

Organization pattern in a large, medium and small sized hotel. Functions of receptionist, job description of front office manager, assistant front office manager, assistant manager, reservation manager, lobby manager, front office assistants, night manager, night clerk, bell captain and bellboy. (15 hours)

UNIT III

Tariff, basis of charging, tariff fixation, room tariff card- group rate, volume rate, executive business service rates, tour group wholesale rate, discounted rate, crib rate, extra bed rate, family rate, crew rate corporate rate and student faculty programme (15 hours)

UNIT IV

Front office and guest handling

Stages of guest contact with the hotel-the guest arrival, preparing, and receiving, registration procedure- systems of registration, rooming of guest, group arrival, VVIP guest arrival and greeting. Activities of front desk during stay- mail and message handling, safe deposit boxes. (15 hours)

UNIT V

Guest accounting

Basics of keeping accounts, guest ledger, city ledger- accounting entries, front office cashiering, guest accounting process, night auditing- night audit duties, night audit process, night audit report and departure procedure (15 hours)

REFERENCE BOOKS

1. Ahmed Ismail (2004). Front office operations and management, Delmar Publications
2. Andrews.S (1982) , Hotel Front office training manual , Tata mc Graw Hill publishing company Ltd, New Delhi
3. Chon K and Raymond. T S (2001) . Welcome to hospitality- An introduction- II nd Edition, Delamar publication
4. Raghubalan G, Raghubalan .S(2001). Hotel housekeeping operations and management, Oxford University Press

e- learning resources

- <http://paramjamwal.blogspot.in/2013/11/duties-and-responsibilities-of.html>
- <http://www.hotelhousekeeping.org/Hotel-Housekeeping-Duties.html>
- <http://hotel-industry.learnhub.com/lesson/7885-importance-of-housekeeping>

Mapping with Programme Outcomes

Course Code 24UHSE62	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	2	2	3	2	1	2	3	-	-
CO2	3	2	2	3	2	2	2	3	-	-
CO3	3	3	2	3	3	2	3	3	-	-
CO4	3	2	2	3	3	3	3	3	-	1
CO5	3	2	2	3	3	3	3	3	-	1

Strong(3) Medium(2) Low(1)

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Course Designers



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B.Sc. Home Science – Nutrition and Dietetics (2024- 2025 onwards)

Semester VI	CONCEPTS IN APPAREL DESIGNING	Hours/Week: 4	
DSEC 4		Credits: 3	
Course Code - 24UHSE63		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: state the concept of sewing tools, fabric and garment components such as stitches, seams, seam finishes, fullness, plackets, fasteners, sleeves, sleeve and bodice combined, collars, pockets and facings. [K1]

CO2: classify the types of basic clothing construction techniques to make an attire. [K2]

CO3: explain the functions of basic construction techniques. [K2]

CO4: apply the principles and techniques involved in garment construction in an attractive way. [K3]

CO5: write the factors to be considered while making the basics of clothing construction and develop the skills needed to construct the trendy garments. [K3]

UNIT I

Introduction and basic hand stitches

- Parts, functions, attachments and use and care of a Sewing machine. Minor troubles and solutions encountered while sewing.
- Tools used for clothing construction– cutting tools, measuring tools, marking tools, general tools, pressing tools.
- Basic hand stitches- temporary and permanent stitches.
- Hems – types, different stitches used.

Practical

1.Preparation of samples for Basic hand stitches.

2.Preparation of samples for Hems

(12 hours)

UNIT II

Basic construction techniques- seams and fullness

- a) Seams and seam finishes – types, working of seams and seam finishes.
- b) Fullness- definition, types- darts, tucks, pleats, flares and godets, gathers and shirrs, frills or ruffles, flounces

Practical

- 1.Preparation of samples for seam -Plain, Top Stitched, Flat fell, Piped seam.
- 2.Preparation of samples for seam finishes - Overcast, Hem, Edge stitched, Bound.
- 3. Preparation of samples for fullness - Darts, Tucks -pin, cross, group tucking with scalloped effect, Pleats (any 3)-knife, box, kick, gathering by machine, elastic. Ruffles- single, double. (12 hours)

UNIT III

Basic construction techniques- Plackets and Fasteners

- a) Plackets – definition, characteristics of a good placket, types – inconspicuous placket and conspicuous plackets. Method of constructing the same.
- b) Fasteners – conspicuous (Button and button-holes, button loops, button with holes, shank buttons, eyelets and cords). Inconspicuous (press buttons, hooks and eyes, zips).

Practical

- Preparation of samples for Plackets and Fasteners-continuous, bound, faced and zipper plackets, Tailored Placket, button and buttonhole, press button, hook and eye.
- (12 hours)

UNIT IV

Basic construction techniques-sleeves and neckline

- a) Sleeves – definition, types, set-in-sleeves – plain sleeve, puff sleeve, bishop sleeve, bell, circular, cap sleeve and magyar sleeve.
- b) Sleeve and bodice combined – raglan, kimono and dolman.
- c) Modified armhole – squared armhole.
- d) Collars – definitions, types of collars- peter pan, scalloped, puritan, sailor, square, rippled, full shirt collar, open collar, chinese, turtleneck, shawl collar
- e) Yokes – types, simple yoke, yoke with fullness within the yoke, yoke supporting/ releasing fullness

Practical

- 1.Preparation of samples for Sleeves- plain sleeve, puff sleeve and Raglan or cap sleeve.
- 2.Preparation of samples with Yoke –simple yoke and yoke supporting fullness.
- 3.Preparation of samples for Collar - peter pan collar and shirt collar (12 hours)

UNIT V

Basic construction techniques-Pockets, Facing and Binding

a) Pockets – definition, types of pockets – patch pocket, bound pocket, pocket in a seam, front hip pocket.

b) Facings – bias facing, shaped facing and decorative facing and

Binding – single bias binding, double bias binding.

Practical

- 1.Preparation of samples for Pocket- Patch pocket
- 2.Preparation of samples for Facing and Binding-bias facing, shaped facing, binding (12 hours)

REFERENCE BOOKS

1. Dorothy Wood (2007). The Practical Encyclopedia of Sewing. Anness Publishing Ltd.
2. Claire B. Shaeffer (2011). Couture Sewing Techniques. Taunton Press Inc., USA.
3. J. Matthews (2018). Pattern Design: Fundamentals — Construction and Pattern Making for Fashion Design. Fairbanks Publishing, USA.
4. Adele Margolis (2019). The Dressmaking Book: A Simplified Guide for Beginners. Echo Point Books & Media, USA.

e-learning Resources

- <http://www.sewingsupport.com/seam-finishes.html>
- <http://vintagesewing.info/1930s/33-pt/pt-02.html>
- <http://www.stitchplaystudio.com/AnnouncementRetrieve.aspx?ID=521146>
- <http://aces.nmsu.edu/pubs/c/C-233.html>

Mapping with Programme Outcomes

Course Code 24UHSE63	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	1	1	1	2	1	3	1	3
CO2	3	3	1	1	3	3	2	3	1	3
CO3	3	3	2	2	3	3	2	3	2	3
CO4	3	3	1	1	3	3	2	3	1	3
CO5	3	3	1	1	3	3	2	3	1	3

Strong(3)**Medium(2)****Low(1)**

Dr.D.Vijayarani
Head of the Department

Dr.S.Mathangi
 Mrs.B.Ameena Beebi
Course Designers



V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics (2024- 2025 onwards)

Semester VI	LIFE SKILL STRATEGIES AND TECHNIQUES	Hours/Week: 4	
DSEC 4		Credits: 3	
Course Code - 24UHSE64		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: state the concept of various life skills needed to maintain a healthy personal and professional approach to life[K1]

CO2: classify the different types of skills for a healthy lifestyle.[K2]

CO3: explain the various life skills techniques involved for a holistic life.[K2]

CO4: identify the factors to be considered to promote the life skills. [K3]

CO5: choose the life skill strategies for the holistic development of an individual. .[K3]

UNIT I

Communication Skills

Developing Listening, Speaking and Reading Skills, An introduction to Scientific Writing, Letter Writing, Usage of Non-verbal Communication. Writing for Grants- a brief Proposal, Statement of Purpose (SoP).

Effective use of social media in communicating messages. (12 hours)

UNIT II

Professional Skills

Resume Writing. Interview Skills. Group Discussions, Presentation Skills. Work-Life Balance- Strategies to achieve them, Time Management. (12 hours)

UNIT III

Leadership/ Management Skills

Leadership skills, Managerial skills, Team building, Entrepreneurial skills, Ethics and Integrity.

(12 hours)

UNIT IV

Basic Lifestyle-related Skills

Healthy eating using simple cooking practices, Home makeover skills, Basics in Gardening, Stress Management- Yoga and Fitness practices- benefits for a Holistic Life, An introduction to Martial Arts as a protective strategy.

(12 hours)

UNIT V

Human Value Skills

Strategies and techniques to promote Non-Violence, Service to the community, developing skills pertaining to administering First Aid.

(12 hours)

Practical

1. Workshops on Leadership/ Writing Skills, Yoga and Martial Arts.
2. Developing Listening and Speaking Skills.
3. Practical Demonstration on healthy recipes.
4. A practical exposure to administering First Aid.

REFERENCE BOOKS

1. Ashokan, M. S. (2015). Karmayogi: A biography of E. Sreedharan. Penguin,UK.
2. Hanson C.W. (2021). Resume Writing 2021: The ultimate guide to writing a resume that lands you the job. Independently Published, Kindle.
3. Jane E., Burt S., and Nudelman G. (2018). Professional Communication: Deliver effective written, spoken and visual messages. 4th ed. Juta and Company Pvt. Ltd., Cape Town, South Africa.
4. Kelly T., and Kelly D. (2014). Creative Confidence: Unleashing the Creative Potential Within Us All. William Collins
5. Kumar S., and Lata P. (2015). Communication Skills. 2nd ed. Oxford University Press, India.

6. Kurien V., and Salve G. (2012). I Too Had a Dream. Roli Books Private Limited
7. O'Toole J. (2019) The Enlightened Capitalists: Cautionary Tales of BusinessPioneers Who Tried to Do Well by Doing Good. Harpercollins.
8. Sullivan D. R. E. (2022). Effective Leadership Skills for Teachers of YoungChildren. 3rd ed. Redleaf Press.

e-Learning Resources

1. Fries, K. (2019). 8 Essential Qualities That Define Great Leadership. Forbes. Retrieved 2019- 02-15
from <https://www.forbes.com/sites/kimberlyfries/2018/02/08/8-essential-qualities-that-define-great-leadership/#452ecc963b63>
2. How to Build Your Creative Confidence, Ted Talk by David Kelly
- https://www.ted.com/talks/david_kelley_how_to_build_your_creative_confidence
3. India's Hidden Hot Beds of Invention Ted Talk by Anil Gupta
- https://www.ted.com/talks/anil_gupta_india_s_hidden_hotbeds_of_invention
- 4 Knowledge @ Wharton Interviews Former Indian President APJ Abdul Kalam - .
"A Leader Should Know How to Manage Failure"
<https://www.youtube.com/watch?v=laGZaS4sdeU>
- 5 Martin, R. (2007). How Successful Leaders Think. Harvard Business Review, 85(6):60.

Mapping with Programme Outcomes

Course Code 24UHSE64	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	3	3	1	1	1	2	1	3	1	3
CO2	3	3	1	1	3	3	2	3	1	3
CO3	3	3	2	2	3	3	2	3	2	3
CO4	3	3	1	1	3	3	2	3	1	3
CO5	3	3	1	1	3	3	2	3	1	3

Strong(3) Medium(2) Low(1)

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VIRUDHUNAGAR

Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics (2024- 2025 onwards)

Semester VI	APTITUDE AND REASONING SKILLS FOR COMPETITIVE EXAMINATIONS	Hours/Week:2	
SEC -7		Credits:2	
Course Code 24UHSS61		Internal 25	External 75

COURSE OUTCOMES

On completion of this course, the students will be able to

CO1: state the formulas to perform various mathematical operations [K1].

CO2: describe the types of number systems, data representation, logical reasoning, analogies, family trees, and rules for reasoning problems [K1].

CO3: illustrate the steps to solve problems in numbers, arithmetic, finance, graphs, language-based reasoning and critical analysis [K2].

CO4: discuss the methods to compute roots, averages, data trends, logical thinking, decision-making, action-based reasoning and time and motion problems [K2].

CO5: determine the solution for percentage, probability, set-based representation, non-verbal reasoning, and interpretation-based reasoning [K3].

UNIT I

Quantitative Ability (Basic Mathematics)

Number Systems, LCM and HCF, Simplification, Square Roots and CubeRoots, Average, Problems on Ages, Percentages, Problems on Numbers (6 hours)

UNIT II

Quantitative Ability (Advanced Mathematics)

Probability, Profit and Loss, Simple and Compound Interest, Time, Speed and Distance, Time & Work, Ratio and Proportion. (6 hours)

UNIT III**Data Interpretation**

Tables, Column Graphs, Bar Graphs, Line Charts, Pie Chart, VennDiagrams (6 hours)

UNIT IV**Verbal and Non-Verbal reasoning**

Analogy, Blood Relation, Directional Sense, Number and Letter Series, Coding – Decoding,

Calendars, Clocks, Venn Diagrams, Mathematical Operations, logical sequence of work,

Mirror-image, Water-image, Completion of incomplete pattern, Grouping of identical figures (6 hours)

Logical Reasoning

Statement – Argument, Statement Assumptions, Statement – Course of action, Statement and Conclusions, Cause and Effect reasoning, Deriving conclusion from passages, Theme detection.

(6 hours)

REFERENCE BOOKS

1. Aggarwal, R. S. (2000). *A Modern Approach to Verbal & Non Verbal Reasoning*. S.Chand.
2. Sijwali, B. S and Indu Sijwali (2014). *Analytical and Logical reasoning*, Arihant Publications.
3. Guha A, (2020) *Quantitative Aptitude by Competitive Examinations*, 7 th Edition, Mcgraw Hill Education Publication.
4. Rajgotra, A. & Pradhan P (2020). *Wileys Exam Xpert A simpler Approach to Logical Reasoning*, Willey Publications

e – Learning Resources

- <https://prepinsta.com/>
- <https://www.indiabix.com/>
- <https://www.javatpoint.com>

Course Code 24UHSS61	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1a	PSO 1b	PSO 2a	PSO 2b	PSO 3	PSO 4a	PSO 4b	PSO 5	PSO 6	PSO 7
CO1	2	3	3	3	3	2	3	2	3	3
CO2	2	3	3	3	3	2	3	2	3	3
CO3	2	3	3	3	3	2	3	2	3	3
CO4	2	3	3	3	3	2	3	2	3	3
CO5	2	3	3	3	3	2	3	2	3	3

Strong 3 Medium 2 Low 1

Dr.D.Vijayarani

Head of the Department

Mrs.A.Jeevarathinam

Ms.S.Vaishnavi

Course Designers