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 2023 - 2024)

V.V.Vanniaperumal College for Women, Virudhunagar, established in 1962, offers 13 UG Programmes (Aided), 15 UG Programmes (SF), 15 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 (TANSCHE) 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, Zoology, Biochemistry, Home Science - Nutrition and Dietetics, Biotechnology, Computer Science, Computer Science (Data 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)
(2023-2024 onwards)

UG PROGRAMMES

Name of the Course	Course Code	Semester	Department
Introduction to Tourism	23UHIN11	I	History(EM)
Indian Constitution	23UHIN21	II	History(EM)
சுற்றுலா ஓர் அறிமுகம்	23UHIN11	I	History (TM)
இந்திய அரசியலமைப்பு	23UHIN21	II	History(TM)
Popular Literature and Culture	23UENN11	I	English
English for Professions	23UENN21	II	
பேச்சுக்கலைத்திறன்	23UTAN11	I	Tamil
பயன்முறைத் தமிழ்	23UTAN21	II	
Practical Banking Basic Accounting Principles	23UCON11 23UCON22	I II	Commerce (Aided)
Financial Literacy-I Financial Literacy -II	23UCON12 23UCON21	I II	Commerce (SF)
Self-Employment and Startup Business	23UCCN11	I	Commerce CA (SF)

Fundamentals of Marketing	23UCCN21	II	
Women Protection Laws	23UCPN11	I	Commerce (Professional Accounting)
Basic Labour Laws	23UCPN21	II	
Basics of Event Management	23UBAN11	I	Business Administration
Business Management	23UBAN21	II	
Quantitative Aptitude I	23UMTN11	I	Mathematics
Quantitative Aptitude II	23UMTN21	II	
Physics for Everyday life -I	23UPHN11	I	Physics
Physics for Everyday life -II	23UPHN21	II	
Food Chemistry	23UCHN11	I	Chemistry
Drugs and Natural Products	23UCHN21	II	
Ornamental fish farming and Management	23UZYN11	I	Zoology
Biocomposting for Entrepreneurship	23UZYN21	II	
Foundations of Baking and Confectionery	23UHSN11	I	Home Science – Nutrition and Dietetics
Basic Nutrition and Dietetics	23UHSN21	II	
Nutrition and Health	23UBCN11	I	Biochemistry
Life Style Diseases	23UBCN21	II	
Social and Preventive Medicine	23UMBN11	I	Microbiology
Nutrition & Health Hygiene	23UMBN21	II	
Herbal Medicine	23UBON11	I	Biotechnology
Organic farming and Health Management	23UBON21	II	
Basics of Fashion	23UCFN11	I	Costume Design And Fashion
Interior Designing	23UCFN21	II	
Office Automation	23UCSN11	I	Computer Science
Introduction to Internet and HTML 5	23UCSN21	II	
Office Automation	23UITN11	I	Information Technology
Introduction to HTML	23UITN21	II	
Introduction to HTML	23UCAN11	I	Computer Applications
Fundamentals of Computers	23UCAN21	II	
Introduction to HTML	23UGDN11	I	Computer Applications - Graphic Design
Fundamentals of Computers	23UGDN21	II	
Organic Farming	23UBYN11	I	Botany
Nursery and Landscaping	23UBYN12		
Mushroom Cultivation	23UBYN21	II	
Medicinal Botany	23UBYN22		
Cadet Corps for Career Development I	23UNCN11	I	National Cadet Corps
Cadet Corps for Career Development II	23UNCN21	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, heath 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 fullfillment 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 thateach 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.

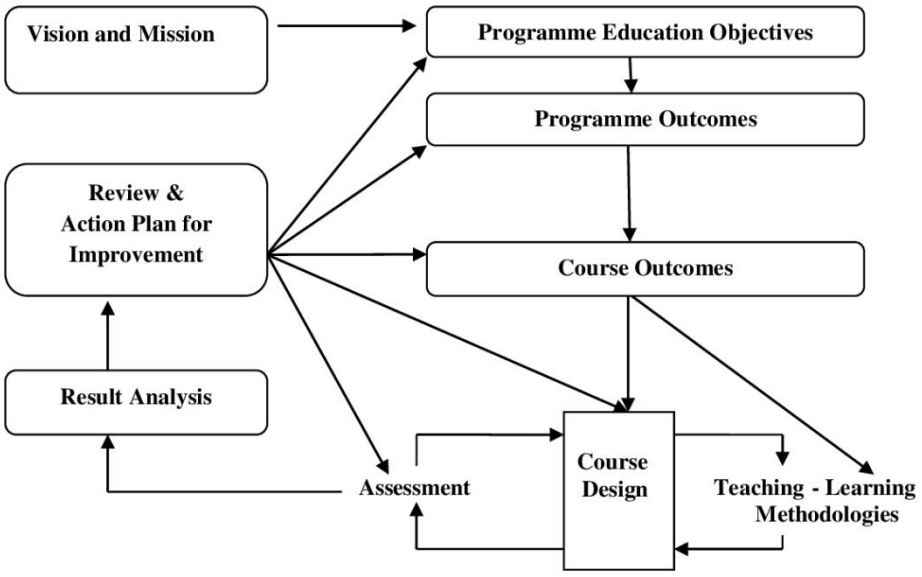
PO-PEO Mapping Matrix

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	-	-	✓

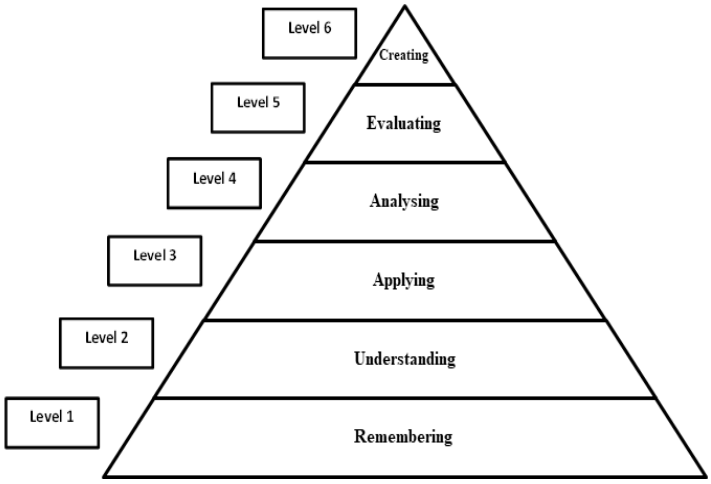
B.1.4 Course Outcomes (COs)

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 toany 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, 2and 1 respectively.

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

PO/PSOs / 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 Boardof 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
		Field Project/Internship
		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 FOUNDATATION 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	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

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 (Based on the listed activities) - K3 Level	:	10
Online Quiz (Multiple Choice Questions - K2 Level)	:	25
Poster Presentation - K3 Level		10
Report on student's Awareness creation on Environmental Protection /Ethical Values - 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: 2 ½ 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/ Field Project

Internship / Field Project is compulsory for II year UG Science Students

- **Internship:** A designated activity that carries one credit involving not less than 15 days of working in an organization under the guidance of an identified mentor
- **Field Project:** Students comprising of maximum 5 members in a team need to undertake project that involve conducting surveys inside/outside the college premises and collection of data from designated communities or natural places.
- Assessment by Internal Examiner only

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

B.2.6 SELF STUDY COURSE

B.2.6 .1 PART III - Core & Elective Courses 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
	:	**100**

Two Periodic Tests - Better of the two will be considered

B.2.6 .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.2.7. 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.2.8 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.
  Attendance, progress and conduct certification from the Head of the Institution will be required for the students to write the examination.
  - 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
  - Pass minimum for External Practical Examination is 21 marks out of 60 marks.
  - Pass minimum for Ability Enhancement Compulsory Course and Generic Elective Course is 40 marks.
  - Pass minimum for Self Study Courses is 40.

ATTENDANCE

- For UG, PG Programmes,

(a) The students who have attended the classes for 76 days (85%) and above are permitted to appear for the Summative Examinations without any condition.

(b) 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.

(c) The students who have attended the classes for 59 days and less - upto 45 days (50%- 65%) can appear for the Summative Examinations only after getting special permission from the Principal.

(d) 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.

- These rules are applicable to UG, PG and M.Phil. Programmes and come into effect from 2020-2021 onwards.
- For Certificate, Diploma, Advanced Diploma and Post Graduate Diploma Programmes, the students require 75% of attendance to appear for the Theory/Practical Examinations. These rules come into effect from 2023-2024 onwards.

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 fixedas 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 ≥70%	Excellent
60% ≤ Attainment Value < 70%	Very Good
50% ≤ Attainment Value < 60%	Good
40% ≤ 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**

$$\text{Percentage of PEO Attainment from Employment} = \frac{\text{Number of Students who have got Employment}}{\text{Target}} \times 100$$

$$\text{Percentage of PEO Attainment from Higher Education} = \frac{\text{Number of Students who pursue Higher Education}}{\text{Target}} \times 100$$

$$\text{Percentage of PEO Attainment from Entrepreneurship} = \frac{\text{Number of Students who have become Entrepreneurs}}{\text{Target}} \times 100$$

Expected Level of Attainment for each of the Programme Educational Objectives

POs	Level of Attainment
Attainment Value ≥70%	Excellent
60% ≤ Attainment Value < 70%	Very Good
50% ≤ Attainment Value < 60%	Good
40% ≤ 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 PROGRMME 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.

V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

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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 AcademicYear2023-2024

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)	5(5)	5 (5)	4(4)	6 (5)	6 (5)	31 (29)
Core Course	-	-	-	-	5 (4)	6 (5)	11(9)
Core Course	-	-	-	-	5 (4)	5 (5)	10 (9)
Core Course Practical	3(2)	3(2)	3(2)	3(2)	3 (2)	3 (2)	18 (12)
Core Course Project	-	-	-	-	1(3)	-	1(3)
Elective Course (DSEC)	-	-	-	-	5 (4)	5 (5)	10 (9)
Elective Course Practical (DSEC)					3(2)	3(2)	6(4)
Elective Course I	4 (3)	4(3)	-	-	-	-	8(6)
Elective Course Practical I(Allied)	2(1)	2(1)	-	-	-	-	4(2)
Allied Course II	-	-	4 (3)	4(3)	-	-	8 (6)
Allied Course Practical II(Allied)	-	-	2 (1)	2 (1)	-	-	4(2)
Self Study Course	-	-	-	-	-	0 (1)	0 (1)
Part IV : Skill Enhancement Courses, Elective Courses, Environmental Studies, Value Education, Self Study Course &Internship/ Field Project							
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)
Value Education	-	-	-	-	2 (2)	-	2 (2)
Environmental Studies	-	-	1(0)	1(2)	-	-	2 (2)
Self Study Course	-	-	-	-	0(1)	-	0 (1)
Internship/Field Project	-	-	-	-	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)

DSEC: Discipline Specific Elective Course SEC: Skill Enhancement Course

NMEC: Non Major Elective Course

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B.Sc. Home Science – Nutrition and Dietetics - 2028
PROGRAMME CONTENT
SEMESTER I
(for those who join in 2023- 2024)

S.No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.	**Part I**		Tamil/Hindi	23UTAG11/ 23UHDG11	6	3	3	25	75	100
2.	**Part II**		English	23UENG11	6	3	3	25	75	100
3.	**Part III**	Core Course -1	Food Science	23UHSC11	5	5	3	25	75	100
4.		Core Course -2 Practical-I	Basic Cookery Practical	23UHSC11P	3	3	3	40	60	100
5.		Elective Course -1	Organic, Inorganic and Physical Chemistry – I	23UCHA11	4	3	3	25	75	100
6.		Elective Course 1 Practical-I	Volumetric Analysis Practical	23UCHA11P	2	2	3	40	60	100
7	**Part IV**	Elective Course NME-1	Foundations of Baking and Confectionery	23UHSN11	2	2	2	25	75	100
8		SEC- 1 Foundation Course	Introduction to Home Science	23UHSF11	2	2	2	25	75	100
Total					**30**	**23**				**800**

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	23UTAG21/ 23UHDG21	6	3	3	25	75	100
2.	**Part II**		English	23UENG21	6	3	3	25	75	100
3.	**Part III**	Core Course -3	Nutrition Science	23UHSC21	5	5	3	25	75	100
4.		Core Course -4 Practical-II	Nutrition Science Practical	23UHSC21P	3	3	3	40	60	100
5.		Elective Course -I	Organic, Inorganic and Physical Chemistry-II	23UCHA21	4	3	3	25	75	100
6.		Elective Course -I Practical-II	Organic Analysis Practical	23UCHA21P	2	2	3	40	60	100
7.	**Part IV**	Elective Course NME - 2	Basic Nutrition and Dietetics	23UHSN21	2	2	2	25	75	100
8.		SEC- 2	MS-Office Practical	23UHSS21P	2	2	2	40	60	100
				Total	**30**	**23**				**800**

B.Sc. Home Science – Nutrition and Dietetics - 2028
SEMESTER III
(for those who join in 2023- 2024)

S.No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext	Total
1.	**Part I**		Tamil/ Hindi	23UTAG31/ 23UHDG31	6	3	3	25	75	100
2.	**Part II**		English	23UENG31	6	3	3	25	75	100
3.	**Part III**	Core Course -5	Basics of Food Microbiology	23UHSC31	5	5	3	25	75	100
4.		Core Course -6 Practical-III	Food Microbiology Practical	23UHSC31P	3	2	3	40	60	100
5.		Elective Course -II	Human Physiology	23UBHA31	4	3	3	25	75	100
6.		Elective Course – II Practical-I	Human Physiology Practical	23UBHA31P	2	1	3	40	60	100
7.	**Part IV**	Skill Enhancement Course -3	Food Product Development Practical	23UHSS31P	1	1	2	100	-	100
8.		Skill Enhancement Course -4	Changing Trends in Extension Education	23UHSS32	2	2	2	25	75	100
9.			Environmental Studies	23UGES41	1	-	-	-	-	-
Total					**30**	**20**				**800**

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

S.No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext	Total
1.	**Part I**		Tamil/ Hindi	23UTAG41/ 23UHDG41	6	3	3	25	75	100
2.	**Part II**		English	23UENG41	6	3	3	25	75	100
3.	**Part III**	Core Course -7	Nutrition Through Life Cycle	23UHSC41	4	4	3	25	75	100
4.		Core Course -8 Practical-IV	Nutrition Through Life Cycle Practical	23UHSC41P	3	2	3	40	60	100
5.		Elective Course -2	Nutritional Biochemistry	23UBHA41	4	3	3	25	75	100
6.		Elective Course – 2 Practical-II	Nutritional Biochemistry Practical	23UBHA41P	2	1	3	40	60	100
7.	**Part IV**	SEC- 5	Computer Applications in Home Science	23UHSS41	2	2	2	25	75	100
8.		SEC- 6	Fundamentals of Art and Design	23UHSS42	2	2	2	25	75	100
9.			Environmental Studies	23UGES41	1	2	2	100	-	100
Total					**30**	**22**				**900**

B.Sc. Home Science – Nutrition and Dietetics

SEMESTER V

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	23UHSC51	6	5	3	25	75	100
2.		Core Course -10	Human Development	23UHSC52	5	4	3	25	75	100
3.		Core Course -11	Nutrition Education and Communication	23UHSC53	5	4	3	25	75	100
4.		Core Course -12 Practical-II	Dietetics Practical	23UHSC51P	3	2	3	40	60	100
5.		Core Course Project	Project	23UHSC54PR	1	3	-	100	-	100
6.		DSEC-1	Fibre to Fabric	23UHSE51	5	4	3	25	75	100
7.		DSEC Practical	Fibre to Fabric Practical	23UHSE51P	3	2	3	40	60	100
8.	Part IV		Value Education	23UGVE51	2	2	2	100	-	100
9.		Self Study Course	Practice for Competitive Examination - Online	23UGCE51	-	1	-	100	-	100
10.			Internship / Field Project	23UHSI51G	-	1	-	100	-	100
Total					**30**	**28**				**1000**

11.	Extra Credit Course - Self-Study Course)	Community Nutrition	23UHSO51	**-**	**2**	**3**	**100**	**-**	**100**

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

S.No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
3.	**Part III**	Core Course -12	Clinical Nutrition	23UHSC61	6	5	3	25	75	100
		Core Course -13	Food Service Management	23UHSC62	6	5	3	25	75	100
		Core Course -14	Functional Foods for Chronic Diseases	23UHSC63	5	5	3	25	75	100
4.		Core Course Practical -15	Clinical Nutrition Practical	23UHSC61P	3	2	3	40	60	100
5.		DSEC-2	Principles of Resource Management	23UHSE61	5	5	3	25	75	100
6.		DSEC-2 Practical	Home Management Practical	23UHSE61P	3	2	3	40	60	100
7.		Self Study Course	Core Course Quiz - online	23UHSQ61	-	1	-	100	-	100
8.	**Part IV**	SEC -7	Aptitude and Reasoning Skills for Competitive Examinations	23UHSS61	2	2	2	25	75	100
9.	**Part V**		Extension Activities		-	1	-	100	-	100
Total					**30**	**28**				**900**

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B.Sc. Home Science – Nutrition and Dietetics
(2023-2024 onwards)

Semester I	**FOOD SCIENCE**	Hours/Week: 5	
Core Course – 1		Credits: 5	
Course Code **23UHSC11**		Internal 25	External 75

Course Outcomes
On completion of the course, 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. (10 Hours)

UNIT II

Cereals, **Millets**, **Pulses, Legumes and Nuts** - 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.

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 (10 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.

(10 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
Fats and oils, sugars, food adjuncts and beverages 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.

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 (15 Hours)

Self-study

Sensory Evaluation - sensory characteristics of foods, types of test - difference tests, rating test, sensitivity tests and descriptive tests.

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 23UHSC11	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

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B.Sc. Home Science – Nutrition and Dietetics
(2023-2024 onwards)

Semester I	**BASIC COOKERY PRACTICAL**	Hours/Week: 3	
Core Course – 2 Practical I		Credits: 2	
Course Code **23UHSC11P**		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. (8 Hours)

UNIT II
Cereals, Millets and pulses

Cereals and Millets: Methods of combining fine and course cereal with Liquid (eg.Ragi porridge,rava upma)

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, samai curdrice, thinai uppuma, -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 softwater, pressure cooking, boiling and straining.

Pulse preparations- Sundal, sambhar, sprouted green gram patchadi, Vadai, pongal, ompodi, green gram payasam, masala vadai ,medhu vadai-a few (8 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 methodsof cooking, cooking medium and addition of acid/alkali.

Vegetable preparations – Poriyal, Aloo methi curry, vegetable cutlet thoran, vegetable kurma, avial, keerai maseal, 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.

(13 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, thayir vadai, morkulumbu, basundhi, lassi, spiced buttermilk and baked macaroni and cheese.

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. (8 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. (8 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 23UHSC11P	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)

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Head of the Department

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Dr.S.Mathangi
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VIRUDHUNAGAR - 626 001

B.Sc. Home Science – Nutrition and Dietetics
(2023 -2024 onwards)

Semester I	**ORGANIC, INORGANIC AND PHYSICAL CHEMISTRY – I**	Hours/Week: 4	
Elective Course - I		Credits: 3	
CourseCode **23UCHA11**		Internal 25	External 75

COURSE OUTCOME

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 fiction 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 Ka 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 ofvolumetric analysis. Separation and purification techniques: extraction, distillation and crystallization. Chromatography: principle and application of column, paper and thin layer chromatography. **(12 Hours)**

Recommended Text

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.Chandand 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, Edition 2006.

Course Code 23UCHA11	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

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Dr.M.Amutha — **Course Designer**

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B.Sc. Home Science – Nutrition and Dietetics
(2023 -2024 onwards)

Semester I	**VOLUMETRIC ANALYSIS PRACTICAL**	Hours/Week: 2	
Elective Course I Practical I		Credits: 1	
CourseCode **23UCHA11P**		Internal 40	External 60

COURSE OUTCOME

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

CO1 **:** understand the use of Standard flash, pipette and burette [K2]

CO2 **:** carry out the reactions and find out the values in titrations. [K2]

CO3 **:** find the results of Volumetric titrations. [K3]

CO4 **:** apply their skill in the analysis of hardness using EDTA [K3]

CO5 **:** identify the Chemical constituents in allied chemical products. [K3]

VOLUMETRIC ANALYSIS

1. Estimation of sodium hydroxide using standard sodiumcarbonate.
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 standardsodium hydroxide.
6. Estimation of magnesium using EDTA. (Demonstration only)

Reference Books

V.Venkateswaran, R.Veerasamy, A.R.Kulandaivelu, Basic PrinciplesofPractical Chemistry; Sultan Chand & sons, Second edition,

Course Code 23UCHA11P	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

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B.Sc. Home Science- Nutrition and Dietetics
(2023-2024 onwards)

Semester I	**FOUNDATIONS OF BAKING AND CONFECTIONERY**	Hours/Week: 2	
NME -1		Credits: 2	
Course Code **23UHSN11**		Internal 25	External 75

Course Outcomes:

On completion of the course, students will be able to

CO1: state the concept, principles and importance of bakery, confectionery and marketing and describe the types of bakery equipment, bakery and confectionery products. [K1]

CO2: Identify the various ingredients used in bakery and confectionery products and state its composition. [K1]

CO3: discuss the current status and growth of bakery and confectionery industries in India and the role and functions of ingredients used in baking and confectionary. [K2]

CO4: explain the processing methods of bakery and confectionery items. [K2]

CO5: identify the hygienic practices, packaging materials and marketing of bakery and confectionery items and find the faults and remedial measures occur during the preparation of it. [K3]

UNIT I

An Overview of Bakery Industry

Baking – principles, process.

Equipment and tools used in baking and confectionery. Bakery sanitation and personnel hygiene.

(6 Hours)

UNIT II

Ingredients in Bakery and Confectionery

Ingredients - Flour, Sugar, Shortenings, Egg, Leavening agents-yeast, baking soda, baking powder, chocolates, cocoa powder. Other ingredients- salt, milk and milk derivatives, malt products, dough improver, oxidizing agents, flavours and colors, nuts, spices and condiments, preserved and candied fruit peels. (6 Hours)

UNIT III

Breads and Cakes

Bread - ingredients, types of breads, faults and its prevention

Cakes – ingredients, types of cakes, **c**ake judging, faults and remedies.

techniques of cake decoration – icing and types

Related experience

Preparation of pizza base.

Preparation of cake (6 Hours)

UNIT IV

Pastries, Cookies and Biscuits

Pastries- types of pastries- puff pastry, short crust, phyllo pastry, flaky pastry, choux pastry

Cookies & biscuits – ingredients, types and processing.

Related experience

Preparation of sweet and salt biscuits

Preparation of pastries- puff pastry (6 Hours)

UNIT V

Confectionery and Marketing of Baked Products Chocolates- production, types, chocolate decorations **S**ugar based confectionery – fudge, fondant, sugar candies.

Marketing and sales promotion- costing, packaging and labeling of baking and confectionery products.

Related experience

Preparation of plain chocolate (6 Hours)

REFERENCES

1. John Kingslee, (2006). *A Professional Text book to Bakery and Confectionary*, New Delhi: New Age International Pvt Limited Publisher.
2. Uttam, K. Singh, (2011). *Theory of Bakery and Confectionary- An Operational Approach*, New Delhi: Kanishka Publishers and Distributors.
3. Yogambal Ashokkumar, (2012). *Theory of Bakery and Confectionary*, New Delhi: PHI publication.
4. Nicolello, I. and Foote, R. (2000). *Complete Confectionary Techniques*. London: Hodder and Solution.
5. Emil Braun, (2000). *Bakers hand Book on practical Baking*,, New Delhi: U.S. Wheat Associates.
6. Dubey, S.C. (2002). *Basic Baking*, 4th Edition, New Delhi: Society of Indian Bakers.

7. Sarah, R. Lebensky, Pricilla, et al., (2004). *Textbook of Baking and Pastry Fundamentals*,3rd Edition,USA: Pearson Education Ltd.

LEARNING RESOURCES

1. https://www.lifestyleasia.com/ind/food-drink/dining/bookmark-the-best-baking-youtube- channels-to-bake-like-a-pro/
2. www.bakels.in
3. https://www.youtube.com/watch?v=dfvkplBBO2g

Course Code 23UHSN11	PO1	PO2	PO 3	PO4	PO 5	PO 6	PO 7
CO1	3	3	1	3	1	1	-
CO2	3	3	1	3	2	3	1
CO3	3	3	3	3	3	2	3
CO4	3	3	3	3	3	2	3
CO5	3	3	3	3	3	3	3

Strong 3 Medium 2 Low 1

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Dr.D.Vijayarani Ms.W.Jayanthi Selva Sundari
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B.Sc. Home Science – Nutrition and Dietetics
(2023-2024 onwards)

Semester I	**INTRODUCTION TO HOME SCIENCE**	Hours/Week: 2	
SEC –1 Foundation Course		Credits: 2	
Course Code **23UHSF11**		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*, 3 rd ed, New Age International Publishers, New Delhi.

9. Srilakshmi B, *Dietetics* (2019),8th edition, New Age International Publishing Ltd, NewDelhi.
10. Pushpa Chakravorty (2007), *Home Management*, New Delhi:Pointer Publishers.
11. Sumathi, G.J. (2002) *Elements of Fashion and Apparel Design*. New Age International Publishers, New Delhi.
12. Reddy, A. (1999): *Extension Education*, Sree Lakshmi Press, Bapatla.

Course Code 23UHSF11	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	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

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B.Sc. Home Science- Nutrition and Dietetics
(2023-2024 onwards)

Semester II	**NUTRITION SCIENCE**	Hours/Week: 5	
Core Course-3		Credits: 5	
Course Code **23UHSC21**		Internal 25	External 75

COURSE OUTCOMES

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

CO1: state the concept of health, nutrition, nutritional status, the food sources and deficiency diseases of all nutrients. [K1]

CO2: discuss the dimensions of health, energy value of food, BMR, quality of protein and classification of macro and micro nutrients. [K2]

CO3: explain the functions, digestion and absorption of macro and micro nutrients. [K2]

CO4: identify the factors affecting BMR, absorption of various nutrients and write the recommended Dietary Allowances for different stages of life. [K3]

CO5:find out the causes and consequences of nutrient deficiency diseases. [K3]

UNIT I

Introduction to Nutrition

Nutrition, health and nutrients – definition

Nutritional status-optimum/ideal nutrition - malnutrition - under and over nutrition, signs of good and poor nutrition.

Energy - unit of energy, definition, RDA, determination of energy value of food and Total Energy Requirements. Basal Metabolic Rate – factors influencing BMR. (15 Hours)

UNIT II

Carbohydrates

Carbohydrates – nutritional classification, sources, functions, digestion and absorption.

Dietary Fibre - role of dietary fibre in human nutrition and Recommended Dietary Allowances. (15 Hours)

UNIT III

Protein

Protein - nutritional classification of protein, sources, functions, digestion and absorption, measurement of protein quality, deficiency diseases and Recommended Dietary Allowances. (15 Hours)

UNIT IV

Lipids

Lipids - nutritional classification, sources, digestion, absorption and functions of lipids on human health.

Fatty acids – types, sources, functions, deficiency diseases, RDA and functions of essential fatty acids. (15 Hours)

UNIT V

Vitamins and Minerals

Vitamins- Classification, unit of measurements, sources, functions , deficiency diseases and RDA. Fat soluble vitamins -Vitamin A, D, E and K Water soluble vitamins - Vitamin B Complex and C Minerals-Functions, sources, storage in body, RDA and deficiency of macro (Ca,P, Mg)and micro (Fe,I,Fl,cu,zn) minerals. (15 Hours)

TEXTBOOK

Srilakshmi, B. (2022). *Nutrition Science*, 7th Edition, New Delhi: New Age International Ltd.

REFERENCE BOOKS

1. Robinson, H. C. (1978). *Fundamentals of Normal Nutrition*, 3rd Edition. Collier Macmillan International Edition. Macmillan.
2. Williams and Rodewell, S. (1985). *Nutition and Diet Therapy*, 5th Edition, St. Louis: Times Mirror/Mosby College Publications.
3. Swaminathan, M. (2018). *Essentials of Food and Nutrition*, Vol I & II. Bangalore: The Bangalore printing and Publishing Co Ltd.
4. Kravse, M.V. and Mohan, (1984). *Food, Nutrition and Diet Therapy*, Philadelphia:W.B. Saunders.

Course Code 23UHSC21	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	2	2	2	3	1	1	1	3	-	-
CO2	3	2	2	3	1	1	1	3	-	-
CO3	3	2	2	3	1	2	2	3	-	-
CO4	3	2	2	3	3	3	3	3	-	-
CO5	3	2	2	3	3	3	3	3	-	-

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

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Semester II	**NUTRITION SCIENCE PRACTICAL**	Hours/Week:3	
Core Course-4 Practical II		Credits: 2	
Course Code **23UHSC21P**		Internal 40	External 60

COURSE OUTCOMES

On completion of the course, students will be able to

CO 1: describe the various equipment used in food analysis laboratory. [K2]

CO 2: discuss the procedure, aim, principle of the food analysis methods. [K2]

CO 3: determine the quality of food by using various food analytical techniques. [K3]

CO 4: identify the amount of nutrients present in the food sample and record it. [K3]

CO5: find the reagents, reactions and techniques involved in analyzing the food samples. [K3]

PRACTICALS

1. Personal protection and conduct in food analysis Laboratory.
2. Identification of equipment used in food analysis lab.
3. Determination of moisture content in food samples.
4. Qualitative analysis of carbohydrates – glucose, fructose, maltose, lactose and sucrose.
5. Qualitative analysis of protein
6. Estimation of reducing sugar by Benedict's method.
7. Estimation of protein by Lowry's method.
8. Estimation of ascorbic acid by titration method.
9. Determination of ash content in food samples.
10. Estimation of phosphorus by ANSA method.
11. Estimation of iron by Wong's method.
12. Visit to food processing industries.

Course Code 23UHSC21P	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	3	1	3	3	2	2	2	-	1
CO2	3	3	1	3	3	3	3	3	-	2
CO3	3	3	1	3	3	3	3	3	-	2
CO4	3	3	1	3	3	3	3	3	-	3
CO5	3	3	1	3	3	3	3	3	-	3

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B.Sc. Home Science- Nutrition and Dietetics
(2023 -2024 onwards)

Semester II	**ORGANIC, INORGANIC AND PHYSICAL CHEMISTRY – II**	Hours/Week: 4	
Elective Course -I		Credits: 3	
CourseCode **23UCHA21**		Internal 25	External 75

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

CO1 : know about the basic concepts in organic, inorganic and physical chemistry [K1]

CO2 : . understand the chemical constituent in oils, fats, soaps, detergents, biomolecules, colloids and pollutants [K2]

CO3 : identify the methods of preparation for organic and inorganic compounds, sources, effects and control measures of pollutions, methods for removal of salt from water [K2]

CO4 : comprehend the classification of biomolecules, colloids, catalyst, pollutions, application of adsorption and biomolecule [K3]

CO5 : analyze the oils, fats and biomolecules functions, sources of pollutions, characteristics of catalysts and the effects with control measures for various pollution [K3]

UNIT I

1. Oils and Fats – Definition – Properties - Distinction between them -Hydrogenation, Hydrogenolysis, Rancidification and Drying of oils – Preparation of Vanaspathi- Analysis of oils and Fats – Saponification and iodine number.

2. Soaps and Detergents

Soap – Definition – Different types – Manufacture of soap – Kettle process - Detergent – Definition – Synthetic detergents – examples – Distinction between soaps and detergents.

(12Hours)

UNIT II

1. Carbohydrates – classification – Differences between glucose and fructose – Inter conversion of glucose and fructose – Haworth structure of glucose and fructose- Differences between starch and cellulose – Derivatives of cellulose and their uses.
2. Amino acids – classification – preparation of α-amino acids– properties – Zwitterion – isoelectric point .
3. Proteins – classification – Biological function – colour reaction of proteins.
4. Nucleic acids – RNA and DNA – Biological functions (Elementary idea only).

(12Hours)

UNIT III

1. Colloids – Definition and classification.
2. Sols – Different types – examples –Dialysis – electro osmosis – electrophoresis – stability of colloids- Gold number.
3. Emulsion – Types of emulsion – Emulsifier – Examples – Cleansing action of soap.
4. Gels – Types of gels – examples – Properties – Hydration – Swelling – syneresis – Thixotropy.
5. Applications of colloids. **(**12Hours)

UNIT IV

1. Adsorption – Characteristics – Types of adsorption and comparison – Factors influencing adsorption – Langmuir and Freundlich adsorption isotherm (No derivation) – Applications of adsorption.
2. Catalysts – Characteristics- Different types with examples – Catalytic poisoning – promoters with examples. (12 Hours)

UNIT V

1. Air pollution – Definition – sources of air pollution –classification and effects of air pollutants – Ozone layer- formation and depletion – Green house effect – Acid rain – Preventive measures of air pollution.
2. Water pollution –types and sources of water pollution –classification and effects of water pollutants-control of water pollution-Desalination of sea water by electrodialysis and reverse osmosis.
3. Radioactive pollution – sources – nuclear waste disposal – Effects of radiations.

(12 Hours

TEXT BOOKS

1. Soni P.L.,(2008).*Text book of Organic Chemistry*, Latest Edition.Sultan Chand & Sons.
2. Soni P.L.,(2008).*Text book of Inorganic Chemistry*, Latest Edition. Sultan Chand & Sons.
3. 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 23UCHA21	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

Dr.M.Dhanalakshmi
Head of the Department

Mrs.R.Nagasathya
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V.V.VANNIAPERUMAL COLLEGE FOR WOMEN
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Re-accredited with 'A' Grade (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

B.Sc. Home Science- Nutrition and Dietetics
(2023 -2024 onwards)

Semester II	**ORGANIC ANALYSIS PRACTICAL**	Hours/Week: 2	
Elective Course I Practical-II		Credits: 1	
CourseCode **23UCHA21P**		Internal 40	External 60

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

CO1 **:** remember the functioned 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 the aliphatic and aromatic compunds.[K3]

CO4 **:** apply the skill in the analysis of functional group of Organic compunds. [K3]

CO5 **:** identify the chemical constituents of Organic compunds. [K3]

SYSTEMATIC ANALYSIS OF ORGANIC COMPOUNDS

The analysis must be carried out as follows:

(a) Functional group tests [phenol, acids (mono & di) aromatic primary amine, amides (mono & di), ester, aldehydeand glucose].

(b) Detection of elements (N, S, Halogens).

(c) To distinguish between aliphatic and aromaticcompounds.

(d) To distinguish – Saturated and unsaturated compounds. **(30 Hours)**

Reference Book

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

Course Code 23UCHA21P	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

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Head of the Department

Dr.J.Kavitha
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B.Sc. Home Science- Nutrition and Dietetics
(2023-2024 onwards)

Semester II	**BASIC NUTRITION AND DIETETICS**	Hours/Week: 2	
NME - 2		Credits: 2	
Course Code **23UHSN21**		Internal 25	External 75

COURSE OUTCOMES

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

CO1: define the concept of food, nutrients, balanced diet, meal planning and sources of nutrients. [K1]

CO2: state the functions of nutrients, principles of meal planning and foods to be included and excluded for normal and special conditions [K1]

CO3: classify macro and micro nutrients and deficiency diseases.[K2]

CO4: explain the role of nutrients and dietary modifications for the various persons.[K2]

CO5: plan the menu based on RDA for various age group and the factors influencing meal planning. [K3]

UNIT I

Carbohydrates, Protein, Fats - meaning, classification, functions and food sources, Protein Energy Malnutrition (Marasmus, Kwashiorkor) - causes, symptoms and treatment. Fibre - definition and role of dietary fiber in human health. (6 Hours)

UNIT II

Vitamins – definition, classifications, functions, food sources and deficiency diseases of the following Vitamins.

Water soluble Vitamins – Thiamine, Riboflavin, Niacin, Folic acid and Vitamin C.

Fat soluble Vitamins – A, D, E and K (6 Hours)

UNITIII

Minerals – definition, classifications, functions, food sources and deficiency diseases of the following minerals- calcium, phosphorous, iron, iodine, zinc, copper and magnesium. 6 Hours)

UNITIV

Balanced diet **–** definition, meal planning – definition, principles, factors influencing meal planning and its modification to suit different income levels, age and physiological states.Recommended Dietary Allowances (2020) for different age groups of both sex.

(6 Hours)

UNIT V

Diet for vulnerable groups **-** diet for pregnant woman, lactating woman and for elderly. Special diet – slimming.

Diet for diseased conditions - fever, diarrhea, obesity, hypertension, cancer and diabetes.

(6 Hours)

TEXT BOOKS

1. Srilakshmi.B, (2023). *Dietetics*, 9th Edition, New Delhi: New Age International (P) Ltd. Publishers.
2. Gajalakshmi.R, (2015). *Nutrition Science*, New Delhi:CBS Publishers and Distributors Pvt.Ltd.

REFERENCE BOOKS

1. Khanna, K. (1997). *Nutrition and Dietetics*, New Delhi: Phoenix Publishing House Pvt Ltd.
2. Srilakshmi, B. (2022).*Nutrition Science*, 7th Edition, New Delhi: New Age International (P) Ltd. Publishers.
3. Swaminathan, M. (2018). *Food and Nutrition* - volume 1, Bangalore: Bangalore Printing and Publishers Co Ltd.

Course Code 23UHSN21	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO 1	2	-	1	1	3	-	-
CO 2	2	2	2	2	3	-	1
CO 3	2	2	1	1	3	-	-
CO 4	3	2	3	3	3	-	-
CO 5	3	2	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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VIRUDHUNAGAR - 626 001

B.Sc. Home Science – Nutrition and Dietetics
(2023-2024 onwards)

Semester II	**MS - OFFICE PRACTICAL**	Hours/Week: 2 (1T+1P**)**	
SEC - 2		Credits: 2	
Course Code **23UHSS21P**		Internal 40	External 60

COURSE OUTCOMES

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

CO1: write the commands for windows and Microsoft Office. [K2]

CO2: make use of the technical skills to create the documents in MS Office. [K2]

CO3: execute the prepared documents in MS Word, MS Excel, MS Power point and MS Access. [K3]

CO4: prepare the record with formatted outputs. [K3]

CO5: find the formatting options and short cut keys used in MS Office. [K3]

UNIT I

Introduction to windows - windows - Graphic User Interface (GUI) - multitasking - format of a Window - icons - selecting, moving, sizing windows - menus - Help menu. (6 Hours)

UNIT II

MS-WORD - opening word – Toolbar highlights – changing fonts - settings – documents patterns - Book marks - Auto text – AutoCorrect - Auto save- other major commends. (6 Hours)

Exercises

- Design a bio data using formatting options.
- Draft a report for an industrial visit.
- Prepare the steps to be followed for a recipe.
- Implement the mail merge option.
- Hotel menu card using clipart and word art.

UNIT III

MS-EXCEL - Excel windows - Data in work sheet – Types. Formula - types, entering and editing formula. Functions - Cell referencing - Manipulating worksheet - Formatting cells – MS Excel charts – types and components. (6 Hours)

Exercises

- Prepare table for nutrient content of given foods.
- Create a chart for the BMI of the students.
- Perform calculations using formula.

UNIT IV

MS-Power Point – component of a power point window – creates a presentation using Auto Content Wizard and based on Blank presentation, types of auto layouts – power point views – enhancing the presentation – working with charts and tables – importing and exporting charts.

Exercises

- Create PPT slides for Food processing techniques.
- Create a slide show for new product development advertisement. (6 Hours)

UNIT V

MS-Access – Database - parts of access window – creating a new database – creating a database through table wizard – creating a new table – saving the database – relationships – creating table through design view – query forms – reports.

Exercises

- Create a database containing details in your class.
- Create a form using design view.
- Create a query using design view. (6 Hours)

REFERENCES BOOKS

1. Revathi,M.(2008). *Hand book on MS Office*, 1st Edition. V.V.V. College,Virudhunagar.
2. NellaiKannan, C. (2012).*MS-Office*, Tirunelveli, Tamilnadu: Nels Publications.
3. Nagpal,D.P.(2001). *Computer Course*, New Delhi: Wheelers Publishing.

Course Code 23UHSS21P	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	2	1	2	2	3	-	-
CO2	3	3	1	2	3	3	3	3	-	-
CO3	3	3	2	2	3	3	3	3	-	-
CO4	3	3	2	3	1	3	3	3	2	-
CO5	3	3	2	3	1	3	3	3	-	2

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

Mrs.A.Jeevarathinam
Dr.D.Vijayarani ` Mrs.T.Devi
Head of the Department **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 2023- 2024)

Semester III	**BASICS OF FOOD MICROBIOLOGY**	Hours/Week: 5	
Core Course - 5		Credits: 5	
Course Code **23UHSC31**		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 ,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]

UNITI

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. (15 hours)

UNITII

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. (15 hours)

UNITIII

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. (15 hours)

UNITIV

Food poisoningand Food bornedisease

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

Measures to prevent food poisoning and food borne infection. (15 hours)

UNITV

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) (15 hours)

REFERENCES

1. McDonell, Gerald. (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. Frazier, W.C., &Westhoff, D.C. (2013). *Food Microbiology*. 5th Edition. New Delhi: McGraw Hill.
7. Sathyanarayana, U. (2013). *Biotechnology*. Kolkata: Books and Allied Pvt Ltd.
8. Parija, S.C. (2012). *Textbook of Microbiology and Immunology*. 2nd edition. Elsevier India.
9. Sharma, Dushyant Kumar. (2013). *Microbiology*. New Delhi: Narosa Publishing House.
10. Jay, J.M., Loessner, M.J., & Golden, D.A. (2005). *Modern Food Microbiology*. 7th edition. New Delhi: CBS Publishers and Distributors.
11. Ramesh, V. (2007). *Food Microbiology*. Chennai: MJP Publishers.
12. Ananthanarayanan, R., & Panicker, C.K. (2009). *Textbook of Microbiology*. Hyderabad: Universities Press (India) Pvt Ltd.
13. Garbutt, J. (1997). *Essentials of Food Microbiology*. 2nd edition. New York: Arnold Publication.
14. 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

CourseCode 23UHSC31	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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B.Sc. Home Science – Nutrition and Dietetics
(for those who join in 2023- 2024)

Semester III	**FOOD MICROBIOLOGY PRACTICAL**	Hours/Week: 3	
Core Course -6 Practical -III		Credits: 2	
Course Code **23UHSC31P**		Internal 40	External 60

Course Outcomes

On completion of the course, students will be able to

CO 1: indicate the various equipment used in food analysis laboratory [K2].

CO 2: write the aim, principle and procedure of the food analysis methods [K2].

CO 3: prepare media and slides to know the microbial load present in the food sample [K3].

CO 4: determine the quality of food by using various food analytical techniques and record it [K3].

CO 5: find the reagents,techniques and reactions used in food analysis [K3].

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. Preparation of broth, deep, slant and plates.
10. Preparation of streak, spread plate and pour plate.
11. Visit (atleast one) to food processing units or any other organization dealing with advanced methods in food microbiology.

REFERENCES

1. Rajan,S. and Selvichristy,R. (2011). *Experimental Procedures in Life Sciences*, Chennai: Anjanaa Book House
2. Ray, B. (2001). *Fundamental Food Microbiology*, 2nd Ed, Boca raton F : CRC press.
3. Arora,B. and Arora, D.R. (2007*). Practical Microbiology*, New Delhi: CBS Publishers.
4. Gunasekaran, P. (2005). *Laboratory Manual in Microbiology*, New Delhi: New Age International (P) Limited Publishers.
5. Kalaiselvan,P.T.(2006). *Microbiology and Biotechnology* - a Laboratory manual, Tamilnadu: MJP Publishers.

CourseCode 23UHSC31P	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO	PSO 4.a	PSO 4.b	PSO	PSO	PSO
CO1	2	3	2	3	3	2	2	2	-	1
CO2	3	3	2	3	3	3	3	3	-	2
CO3	3	3	2	3	3	3	3	3	-	2
CO4	3	3	2	3	3	3	3	3	-	3
CO5	3	3	2	3	3	3	3	3	-	3

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

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B.Sc. Home Science -Nutrition and Dietetics
(for those who join in 2023- 2024)

Semester III	**HUMAN PHYSIOLOGY**	Hours/Week:4	
Elective Course -II		Credits:3	
Course Code **23UBHA31**		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 itsfunctions.Erythropoiesis, Blood clotting, Blood groups andhistocompatibility. Immune system-Antigen, Antibody, Cellular and Humoral Immunity (in brief). (12 Hours)

UNITII

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)

Text Book

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

References

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, MadhavanKutty, K.andSingh, 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*, NewDelhi: Medical Publishers (p) Ltd.

Course Code 23UBHA31	**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.B.Karunai Selvi
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Dr.R.Sreebha
Course Designer

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HOME SCIENCE - NUTRITION AND DIETETICS
(for those who join in 2023- 2024)

Semester III	**HUMAN PHYSIOLOGY PRACTICAL**	Hours/Week:2	
Elective Course –II Practical -I		Credit:1	
Course Code **23UBHA31P**		Internal 40	External 60

Course Outcomes

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

CO1: describe the basic concepts learnt in various tissues in human body. [K2]

CO2: illustrate the structure and the functions of human organs.[K2]

CO3: identify the microscopic study of tissues of the pituitary, thyroid, ovary and testis. [K3]

CO4: discover the blood smear, blood count and blood grouping. [K3]

CO5: find out the importance and role of human organs. [K3]

EXPERIMENTS

1. Microscopic study of epithelial tissue and muscular tissues
2. Blood Experiments- Blood Smear, Blood Count and Blood Grouping - ABO Blood grouping,
3. Bleeding time and Clotting time.
4. Spotters - Structure and functions of organs - Brain, Eye, Ear, Heart, Lung, Liver, Pancreas, Stomach.
5. Study of the structure of the male and female reproductive organs
6. Recording of Blood Pressure
7. Microscopic study of tissues of the Pituitary, Thyroid, Ovary and Testis

References:

1. Beck, W.S. (1971) *Human Design*. Harcourt Brace Jovanovich Inc., New York.
2. Best, C. H. and Taylor, N. B. (1980) *Living Body*. 4th ed. BIP, Bombay.

3. Creager, J. G. (1992) *Human Anatomy and Physiology*. 2nd ed. WMC Brown Publishers, England.
4. Ghai, C. L. (2022). *A textbook of practical physiology*. JP Medical Ltd.
5. Guyton, A.C. (1979) *Physiology of the Human Body*. 5th ed. Saunders College of Publishing, Longman Ltd., Madras.
6. Tortora G. J.Anagnostakos N.P. (1984) *Principles of Anatomy and Physiology*, 4th edition, Harper and Row Publishers, New York.

Course Code 23UBHA31P	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.B.KarunaiSelvi
Head of the Department

Dr.R.Sreebha
Course Designer

V.V.VANNIAPERUMAL COLLEGE FOR WOMEN
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Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics
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Semester III	**FOOD PRODUCT DEVELOPMENT PRACTICAL**	Hours/Week: 1
Skill Enhancement Course Practical– III		Credit: 1
Course Code **23UHSS31P**		Internal 100

Course Outcomes

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

CO1:describe 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:determine 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

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

Course Code 23UHSS31P	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
Dr.S.Mathangi

Dr.D.Vijayarani

Head of the Department

Course Designers

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B.Sc. Home Science – Nutrition and Dietetics
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Semester III	**CHANGING TRENDS IN EXTENSION EDUCATION**	Hours/Week: 2	
Skill Enhancement Course - 4		Credits: 2	
Course Code **23UHSS32**		Internal 25	External 75

Course Outcomes

On completion of the course, students will be able to

CO1: state the definition, scope, objectives need of extension education and volunteerism and concept of Extension, diffusion and adoption of innovations, communication, extension teaching methods, extension teaching aids and Current approaches in extension education.[K1]

CO2: identify the types of education, innovation decision, communication and communication skills, teaching methods, audio visual aids and rural development problems [K1]

CO3: discuss the principles and philosophy of extension education and explain the adoption Process , elements of diffusion, role of communication, extension methods, audio visual aids, GO's and NGO's. [K2]

CO4: explain the Emergence of Home Science Extension Education in India, techniques of teaching methods, advantage and limitation of various methods of teaching aids and activities of ATIC, Kissan Call Centers, NAIP. [K2]

CO5: Write the Extension Education as a profession, consequence on innovations, barriers in communication, selection of audio visual aids, suitable extension methods and discuss the audio visual aids to overcome the community problems.[K3]

UNITI

Home Science Extension Education

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

UNITII

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)

UNITIII

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

Various 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 to Central/State Social Welfare Board and CAPART Employments Generation Programmes – NREGP, Women Development Programmes – ICDS, Self Help Groups, MSY, RMK. (6 hours)

PRACTICALS

- Exercises on presentation skills, listening skills, writing skills, exercises on distortion of communication message.
- DesigningandPreparationoflow-costcharts,posters,flashcards,pamphlet,leaflet etc
- 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.

References

1. Albrecsht, 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,* JyotiPrakashan, 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

Course Code 23UHSS32	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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Mrs.S.Balasaraswathi — **Course Designer**

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Semester IV	**NUTRITION THROUGH LIFECYCLE**	Hours/Week: 4	
Core Course -7		Credits: 4	
Course Code **23UHSC41**		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 person and astronaut.[K2]

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

CO5: plan the menu suitable for various stages of lifespan, sports person 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. (12 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. (12 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.

(12 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. (12 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. (12 hours)

References

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, Elseivier 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/healthlyliving/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

CourseCode 23UHSC41	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)

Dr.D.Vijayarani
Head of the Department

Dr.S.Mathangi
Course Designer

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Semester IV	**NUTRITION THROUGH LIFECYCLE PRACTICAL**	Hours/Week: 3	
Core Course -8 Practical - IV		Credits: 2	
Course Code **23UHSC41P**		Internal 40	External 60

Course Outcomes

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

CO1: describe the nutrition, principles of diet and RDA recommended by ICMR. [K2]

CO2: explain the foods to be included and excluded for normal persons.. [K2]

CO3: plan the suitable diet for normal persons and prepare the planned menu for them. [K3]

CO4: make use of ICMR recommended RDA value and compute the nutritional value for the planned menu of the normal persons and prepare the record. [K3]

CO5: identify the recommended nutritive values and obtained nutritive values and comment its results. [K3]

PRACTICALS:

1. Preparation of Complementary feed.
2. Planning and preparation of diets for different activitylevelsand incomegroup.
   a. Pre-schoolchild
   b. Schoolgoingchildren
   c. Adolescents
   d. Adult
   e. Expectantmother
   f. Nursingmother
   g. Oldage
3. Planning and preparation of diets (low and medium cost) for deficiency diseases-
   a. PEM
   b. Vitamin A deficiency
   c. Nutritionalanemia

4. Packed lunch for school children
5. Healthy snacks

References:

- https://sol.du.ac.in/mod/book/view.php?id=1422&chapterid=1288

Course Code 23UHSC41P	**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)

Dr.D.Vijayarani — **Head of the Department**

Dr.S.Mathangi — **Course Designer**

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Semester IV	**NUTRITIONAL BIOCHEMISTRY**	Hours/Week: 4	
Elective Course 4		Credits:3	
Course Code **23UBHA41**		Internal 25	External 75

Course Outcomes:

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

CO1:state the role of enzymes and co enzymes in biological oxidation [K1].

CO2:explain metabolism and regulation of Carbohydrate, lipids and proteins [K2]

CO3:discuss the integration of carbohydrate, lipid and protein metabolism [K2]

CO4:identify the significance of recent biochemical concepts namely xenobiotics, recombinant DNA technology and Nutrigenomics [K3].

CO5:organize the structure and functions of nucleic acids [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. (12 hours)

UNIT II

Metabolism of Carbohydrates

Classification, Glycolysis, The Citric Acid Cycle Glycogenesis, Glycogenolysis, Gluconeogenesis, The Hexose Monophosphate, Shunt and bioenergetics. (12 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. (12 hours)

UNIT IV

Metabolism of Lipids

Classification of fatty acid, Biosynthesis of fatty acids, beta oxidation of saturated fatty acids, ketone bodies. Essential fatty acids – types and functions.Lipo proteins – classification and function.Biosynthesis of cholesterol. (12 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. (12 hours)

Text 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. Malik, D., Narayanasamy, N., Pratyusha, V. A., Thakur, J., &Sinha, N. (2022). *Textbook of Nutritional Biochemistry*.Springer Nature Singapore.
5. Patricia Trueman. (2019). *Nutritional Biochemistry,* MJP Publishers, India.

References

1. Lieberman, M., & Ricer, R. E. (2009). *Lippincott's Illustrated Q&A Review of Biochemistry*. Lippincott Williams & Wilkins.
2. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2000): 25th Ed. *Harpers Biochemistry*.Macmillan worth publishers.
3. Nelson, D. L., Lehninger, A. L., & Cox, M. M. (2017). *Lehninger Principles of Biochemistry*. Macmillan.
4. Shanmugham Ambika (1985) *Fundamentals of bio-chemistry to medical students*. NVA Bharat Printers, and traders 56, Peters Road, Madras-86

Course Code 23UBHA41	**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	2	3	3	3	-	-
CO2	3	3	3	3	2	3	3	3	-	-
CO3	3	3	3	3	3	3	3	3	-	-
CO4	3	3	3	3	3	3	3	3	-	-
CO5	3	3	3	3	3	3	3	3	-	-

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

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Semester IV	**NUTRITIONAL BIOCHEMISTRY PRACTICAL**	Hours/Week: 2	
Elective Course -2 Practical -II		Credit: 1	
Course Code **23UBHA41P**		Internal 40	External 60

Course Outcomes:

CO1:explain the principles behind each test and the specific reactions that occur.[K2].

CO2:estimate the quantitative determination of minerals.[(K2]

CO3:identify the principles behind blood glucose estimation methods, such as colorimetric assays.[K3]

CO4:determinethe principles behind nitrogen estimation methods, such as kjeldahl, Dumas, and micro-kjeldahl methods.[K3]

CO5:develop a fat extraction from food samples using the soxhlet method.[K3]

Practical

- Assessment of Nutritional Status
  -Body Composition parameters
  -Circumference measurements
  -Clinical signs
  -Dietary assessment
- Estimation of acid value in oil/fat
- Preparation of ash solution
- Estimation of calcium in food
- Determination of Iodine value
- Estimation of haemoglobin in blood
- Estimation of glucose in blood (colorimetric estimation and use of glucometer)
- Determination of plasma cholesterol, Triglycerides, HDL and LDL cholesterol (with the use of the semiauto analyser)

- Estimation of calorific value of food using the Bomb Calorimeter -Demonstration
- Estimation of protein content in food by the kjeldahl method-Demonstration
- Determination of fat content in food using Soxhlet method -Demonstration
- Visit to a food and Clinical analytical lab

References

1. Harisha, S. (2005*). An Introduction to Practical Biotechnology*. Firewall Media.
2. Koch, F. C. (1953*). Practical Methods in Biochemistry*. Practical methods in biochemistry., 6th Ed.
3. Rajendiran, S., &Dhiman, P. (2019). *Biochemistry Practical Manual-E-Book.* Elsevier Health
4. Sciences.
5. Tiwari, A., 2015. *Practical Biochemistry: A Student Companion*. LAP Lambert Academic Publishing.

Course Code 23UBHA41P	**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	2	3	3	3	-	-
CO2	3	3	3	3	2	3	3	3	-	-
CO3	3	3	3	3	3	3	3	3	-	-
CO4	3	3	3	3	3	3	3	3	-	-
CO5	3	3	3	3	3	3	3	3	-	-

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

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Semester IV	**COMPUTER APPLICATIONS IN HOME SCIENCE**	Hours/Week: 2	
Skill Enhancement Course - 5		Credits: 2	
Course Code **23UHSS41**		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. (6hours)

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-Sqaure, T –test, ANOVA and Correlation Co-efficient.Export and saving results in Word document.Creating Tables. (6 hours)

References:

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*.

e-Learning Resources:

➢ 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

Course Code 23UHSS41	**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)

Mrs.A.Jeevaratinam
Dr.D.Vijayarani Mrs.R.Subha

Head of the Department **Course Designers**

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

B.Sc. Home Science – Nutrition and Dietetics
(for those who join in 2023- 2024)

Semester IV	**FUNDAMENTALS OF ART AND DESIGN**	Hours/Week: 2	
Skill Enhancement Course -6		Credits: 2	
Course Code **23UHSS42**		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 colorsMonochromatic, 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.

References:

1. Andal. 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 EveryDay 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=oJE8VvucFMOl8wfe0ZnICw#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

Course Code 23UHSS42	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
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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**