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 2024 - 2025)

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)
(2024-2025 onwards)

UG PROGRAMMES

Name of the Course	Course Code	Semester	Department
Introduction to Tourism	24UHIN11	I	History (E.M)
Indian Constitution	24UHIN21	II	
சுற்றுலா ஓர் அறிமுகம்	24UHIN11	I	History (T.M)
இந்திய அரசியலமைப்பு	24UHIN21	II	
Popular Literature and Culture	24UENN11	I	English
Philosophy for Literature	24UENN21	II	
அடிப்படைத் தமிழ் இலக்கணம் – I எழுத்தறிதல்/ பேச்சுக்கலைத்திறன்	24UBTN11/ 24UTAN11	I	Tamil

அடிப்படைத்தமிழ் – மொழித் திறனறிதல் / பயன்முறைத் தமிழ்	24UBTN21/ 24UTAN21	II	
Basic Hindi - I	24UBHN11	I	Hindi
Basic Hindi - II	24UBHN21	II	
Practical Banking/ Financial Literacy-I	24UCON11/ 24UCON12	I	Commerce
Basic Accounting Principles/ Financial Literacy-II	24UCON21/ 24UCON22	II	
Practical Banking / Self-Employment and Startup Business	24UCON11/ 24UCCN11	I	Commerce C.A.
Basic Accounting Principles / Fundamentals of Marketing	24UCON21/ 24UCCN21	II	
Women Protection Laws	24UCPN11	I	Commerce Professional Accounting
Basic Labour Laws	24UCPN21	II	
Basics of Event Management	24UBAN11	I	Business Administration
Managerial Skill Development	24UBAN21	II	
Quantitative Aptitude -I	24UMTN11	I	Mathematics
Quantitative Aptitude - II	24UMTN21	II	
Physics for EveryDay Life	24UPHN11	I	Physics
Astrophysics	24UPHN21	II	
Food Chemistry	24UCHN11	I	Chemistry
Dairy Chemistry	24UCHN21	II	
Ornamental fish farming and Management	24UZYN11	I	Zoology
Biocomposting for Entrepreneurship	24UZYN21	II	
Foundations of Baking and Confectionery	24UHSN11	I	Home Science – Nutrition and Dietetics
Women's Health and Wellness	24UHSN21	II	
Nutrition and Health	24UBCN11	I	Biochemistry
Life Style Diseases	24UBCN21	II	
Social and Preventive Medicine	24UMBN11	I	Microbiology
Nutrition & Health Hygiene	24UMBN21	II	
Herbal Medicine	24UBON11	I	Biotechnology
Organic Farming and Health Management	24UBON21	II	
Basics of Fashion	24UCFN11	I	Costume Design And Fashion
Interior Designing	24UCFN21	II	
Office Automation	24UCSN11	I	Computer Science

Introduction to HTML	24UCSN21	II	
Office Automation	24UITN11	I	Information Technology
Basics of Internet	24UITN21	II	
Fundamentals of Information Technology	24UDSN11	I	Data Science
Computer Fundamentals	24UDSN21	II	
Office Automation	24UCAN11	I	B.C.A.
Web Designing	24UCAN21	II	
OrganicFarming	24UBYN11	I	Botany
Nursery and Landscaping	24UBYN12	I	
Mushroom Cultivation	24UBYN21	II	Botany
MedicinalBotany	24UBYN22	II	
Library and Information Science - I	24ULSN11	I	Library Science
Library and Information Science - II	24ULSN21	II	
Cadet Corps for Career Development I	24UNCN11	I	National Cadet Corps
Cadet Corps for Career Development II	24UNCN21	II	

B. OUTCOME BASED EDUCATION (OBE) FRAMEWORK

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

Vision of the Institution

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

Mission of the Institution

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

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

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

Vision of the Department of Home Science

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

Mission of the Department of Home Science

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

B.1.1 Programme Educational Objectives (PEOs)

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

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

The students will be able to

- become professionally competent nutritionist, dieticians, 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.

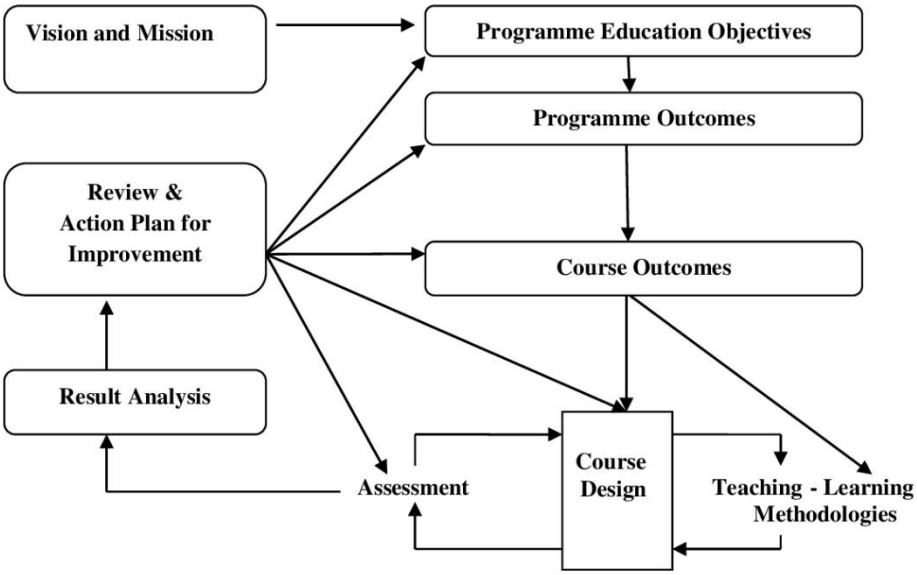
PO-PEO Mapping Matrix

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	-	-	✓

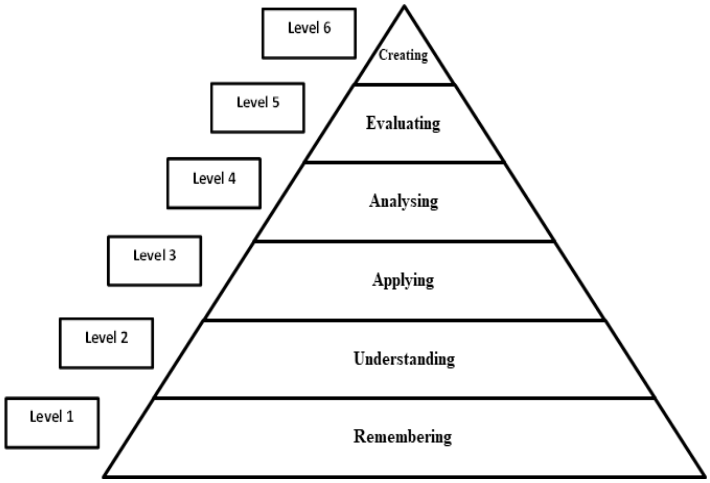
B.1.4 Course Outcomes (COs)

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
Model Test	:	30
Record & Performance	:	10
Total	**:**	**40**

Two Model Tests - Average of the two 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

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: 2½ Hours**

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

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

B.2.5 PART IV- Internship/ 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
Total	**:**	**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.

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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 intheAcademicYear2024-2025

Components	Semester						Total Number of Hours (Credits)
	I	II	III	IV	V	VI	
Part I : Tamil /Hindi	6 (3)	6 (3)	6 (3)	6 (3)	-	-	24 (12)
Part II : English	6 (3)	6(3)	6 (3)	6 (3)	-	-	24 (12)
Part III : Core Courses, Elective Courses &Self Study Course							
Core Course	5 (5)	4 (4)	5 (5)	4 (3)	6 (5)	6 (5)	30 (27)
Core Course	-	4(3)	-	3(3)	5 (4)	5 (4)	17 (14)
Core Course	-	-	-	-	5 (4)	5(4)	10(8)
Core Course						4(4)	4(4)
Core Course Practical	3(2)	-	3 (2)	-	3 (2)	-	9(6)
Core Course Project	-	-	-	-	1 (3)	-	1 (3)
Elective Course (DSEC)	-	-	-	-	5(4)	5 (5)	10 (9)
Elective Course (DSEC Practical)	-	-	-	-	3(2)	3(2)	6(4)
Elective Course I (Allied)	4 (3)	4 (3)	-	-	-	-	8(6)
Elective Course I Practical I(Allied)	2(1)	2(1)	-	-	-	-	4 (2)
Elective Course II(Allied)	-	-	6 (4)	6(4)	-	-	12(8)
Elective Course II Practical II(Allied)	-	-	-	-	-	-	-
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 2024- 2025)

S. No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.	**Part I**		Tamil/Hindi	24UTAG11/ 24UHDG11	6	3	3	25	75	100
2.	**Part II**		English	24UENG11	6	3	3	25	75	100
3.	**Part III**	Core Course -1	Food Science	24UHSC11	5	5	3	25	75	100
4.		Core Course -2 Practical - I	Basic Cookery Practical	24UHSC11P	3	2	3	40	60	100
5.		Elective Course -I	Chemistry for Biological Sciences - I	24UCHA11	4	3	3	25	75	100
6.		Elective Course I Practical I	Chemistry Practical for Biological Sciences - I	24UCHA11P	2	1	3	40	60	100
7	**Part IV**	NME-1	Foundations of Baking and Confectionery	24UHSN11	2	2	2	25	75	100
8		SEC- 1 Foundation Course	Introduction to Home Science	24UHSF11	2	2	2	25	75	100
				Total	**30**	**21**				**800**

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

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

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

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

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	24UTAG41/ 24UHDG41	6	3	3	25	75	100
2	**Part II**		English	24UENG41	6	3	3	25	75	100
3.	**Part III**	Core Course -7	Human Development	24UHSC41	4	3	3	25	75	100
4.		Core Course -8	Nutrition Through Life Cycle	24UHSC42	3	3	3	25	75	100
5.		Elective Course -3	Nutritional Biochemistry	24UHSA41	6	4	3	25	75	100
6.	**Part IV**	SEC- 5	Computer Applications in Home Science	24UHSS41	2	2	2	25	75	100
7.		SEC- 6	Fundamentals of Art and Design	24UHSS42	2	2	2	25	75	100
8.			Environmental Studies	24UGES41	1	2	2	100	-	100
Total					**30**	**22**				**800**

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

S.No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.	Part III	Core Course -9	Dietetics	24UHSC51	6	5	3	25	75	100
2.		Core Course -10	Nutrition Education and Communication	24UHSC52	5	4	3	25	75	100
3.		Core Course -11	Fibre to Fabric	24UHSC53	5	4	3	25	75	100
4.		Core Course -12 Practical-II	Dietetics Practical	24UHSC51P	3	2	3	40	60	100
5.		Core Course	Project	24UHSC54PR	1	3	-	100	-	100
6.		Elective Course DSEC-1	Quantity Food Production and Service	24UHSE51	5	4	3	25	75	100
7.		Elective Course DSEC Practical -1	Quantity Food Production and Service Practical	24UHSE51P	3	2	3	40	60	100
8.	**Part IV**		Value Education	24UGVE51	2	2	2	100	-	100
9.		Self Study Course	Practice for Competitive Examinations - Online	24UGCE51	-	1	-	100	-	100
10.			Internship / Field Project	24UHSI51G	-	1	-	100	-	100
Total					**30**	**28**				**1000**

	Extra Credit Course - Self-Study Course)	Community Nutrition	24UHSO51	-	**2**	**3**	-	-	**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	24UHSC61	6	5	3	25	75	100
		Core Course -13	Food Safety and Quality Control	24UHSC62	5	4	3	25	75	100
		Core Course -14	Functional Foods for Chronic Diseases	24UHSC63	5	4	3	25	75	100
4.		Core Course -15	Foundations of Entrepreneurship	24UHSC64	4	4	3	25	75	100
5.		Elective Course DSEC-2	Food Preservation	24UHSE61	5	5	3	25	75	100
6.		Elective Course DSEC-2 Practical	Food Preservation Practical	24UHSE61P	3	2	3	40	60	100
7.		Self Study Course	Core Course Quiz - Online	24UHSQ61	-	1	-	100	-	100
8.	**Part IV**	SEC-7	Aptitude and Reasoning Skills for Competitive Examinations	24UHSS61	2	2	2	25	75	100
9.	**Part V**		Extension Activities		-	1	-	100	-	100
Total					**30**	**28**				**900**

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

Course Outcomes

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

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

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

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

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

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

UNIT I

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

Cereals

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

UNIT II

Pulses, Legumes, Nuts, Fats and Oils

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

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

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

Fats and Oils

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

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

(15 hours)

UNIT III
Vegetables and Fruits

Vegetables

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

Fruits

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

(15 hours)

UNIT IV
Flesh foods, Eggs, and Milk

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

Poultry-types, nutritive value, selection and cooking

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

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

Milk and milk products - Nutritive value, kinds of milk, pasteurization, and homogenization, coagulation of milk, fermentation of milk; milk products - whole and skimmed milk, milk powders and yogurt, ghee, butter, cheese. Storage and preservation. (15 hours)

UNIT V
Sugars, Food Adjuncts and Beverages

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

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

Food adulteration - Definition, common adulterants in food

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

PRACTICAL

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

Preparation of one dish each applying the different cooking methods

Self-study

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

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

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

`

Dr.D.Vijayarani
Head of the Department

Dr.D.Vijayarani
Course Designer

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

Course Outcomes

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

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

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

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

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

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

UNIT I
Introduction to Basic Cooking Skills

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

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

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

UNIT II
Cereals, Millets and pulses

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

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

dextrinization

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

Wheat and Millet preparations - Kesari, Phulka, poori, paratha, naan, ragiadai, samaicurdrice, thinaiuppuma, -a few

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

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

UNIT III
Vegetables and Fruits

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

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

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

(9 Hours)

UNIT IV
Eggs, milk and milk products, meat and fish:

Egg Cookery:

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

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

Milk and milk products

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

Milk preparations

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

Meat and Fish

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

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

(9 Hours)

UNIT V

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

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

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

Smoking point of oil - bread cube test.

Emulsions- definition, Preparation of mayonnaise

Food additives and Raising agents

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

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

TEXT BOOK

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

REFERENCE BOOKS

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

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

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

Dr.D.Vijayarani

Head of the Department

Dr.D.Vijayarani
Dr.S.Mathangi

Course Designers

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
(for those who join in 2024- 2025)

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

Course Outcomes

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

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

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

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

CO4: understand the nuclear 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 Kb of organic acids and bases, electromeric, mesomeric, hyper conjugation and steric-examples and explanation.

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

UNIT IV

Drugs and Speciality Chemicals

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

Artificial Sweeteners viz., saccharin, Aspartame and cyclamate;

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

UNIT V

Analytical Chemistry

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

TEXT BOOKS

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

REFERENCE BOOKS

1. P.L.Soni, Mohan Katyal, *Text book of Inorganic chemistry*; Sultan Chand and Company, New Delhi, twentieth edition, 2007.

2. B.K,Sharma, *Industrial Chemistry*; GOEL publishing house,Meerut, sixteenth edition, 2014.
3. Jayashree gosh, *Fundamental Concepts of Applied Chemistry*; Sultan & Chand, 1st Edition 2006.

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

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

Dr.M.Dhanalakshmi
Head of the Department

Dr.M.Amutha
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
(for those who join in 2024- 2025)

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

Course Outcomes

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

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

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

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

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

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

VOLUMETRIC ANALYSIS

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

REFERENCE BOOK

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

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

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

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Dr.J.Kavitha
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B.Sc. Home Science- Nutrition and Dietetics
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Semester I	**FOUNDATIONS OF BAKING AND CONFECTIONERY**	Hours/Week: 2	
Elective Course NME -1		Credits: 2	
Course Code **24UHSN11**		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 andcondiments, 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. YogambalAshokkumar, (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*,3rdEdition,USA: Pearson Education Ltd.

e-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 24UHSN11	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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Head of the Department

Mrs.S.Balasaraswathi
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B.Sc. Home Science – Nutrition and Dietetics
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Semester I	**INTRODUCTION TO HOME SCIENCE**	Hours/Week: 2	
Skill Enhancement Course –1 Foundation Course		Credits: 2	
Course Code **24UHSF11**		Internal 25	External 75

Course Outcomes

On completion of the course, students will be able to

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

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

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

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

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

UNIT I

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

UNIT II

Food Science and Nutrition - Definition – Food, Food Science, Nutrition, Nutrients, Balanced diet and RDA. Functions of food, functions of nutrients. Nutritional status. Food in relation to health.

Human Development – Meaning, stages of life span - characteristics, importance of harmonious relationship in the family.

Role and career opportunities. (6 Hours)

UNIT III

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

Dietetics – Meaning and role of dietitian.

Role and career opportunities. (6 Hours)

UNIT IV

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

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

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

Role and career opportunities. (6 Hours)

UNIT V

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

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

REFERENCES

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

Course Code 24UHSF11	**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)

Mrs.S.Balasaraswathi
Dr.D.Vijayarani Dr.S.Mathangi
Head of the Department **Course Designers**

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

Course Outcomes

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

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

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

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

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

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

UNITI

Cell, Tissues and Blood

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

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

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)

UNITIII

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)

UNITIV

Digestive system and Excretory system

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

UNIT V

Endocrine system and Reproductive system

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

PRACTICAL:

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

TEXT BOOKS

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

REFERENCE BOOKS

1. Gillian Pocock, Christopher D. Richards, David A. Richards · (2018). *Human Physiology*, Oxford University Press.

2. Saladin,K.S.(1998).*AnatomyPhysiology*, New York: MC Grow-hill.

3. Sarada Subramanyam, Madhavan Kutty,K. and Singh,H.D.(1996).*Text Book of Human Physiology*, New Delhi: S.Chand Company.

4. Silverthorn, Dee Unglaub. (2015) *Human physiology*. Jones & Bartlett Publishers.

5. Vidhya,R.(1993).*Hand Book of Physiology*, New Delhi: Medical Publishers (P) Ltd.

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

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

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B.Sc. Home Science – Nutrition and Dietetics
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Semester II	**BASICS OF FOOD MICROBIOLOGY**	Hours/Week: 4	
Core Course -4		Credits: 3	
Course Code **24UHSC22**		Internal 25	External 75

Course Outcomes

On completion of the course, students will be able to

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

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

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

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

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

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. (12 hours)

UNIT II

Microbial spoilage and contamination of common food

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

UNIT III

Beneficial uses of microorganisms in food and health

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

UNIT IV

Food poisoning and Food borne disease

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

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

UNIT V

Microorganisms found in water, soil, air and sewage

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

Control of Microorganisms in food

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

PRACTICAL

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

REFERENCES

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

e-learning resources

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

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

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

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

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

Mrs.A.Jeevarathinam — **Course Designer**

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VIRUDHUNAGAR
Quality Education with Wisdom and Values

B.Sc. Home Science – Nutrition and Dietetics

(for those who join in 2024- 2025)

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

Course Outcomes

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

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

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

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

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

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

UNIT I

Co-ordination Chemistry and Water Technology

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

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

Unit II

Carbohydrates

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

UNIT III

Amino Acids and Essential elements of biosystem

Classification - preparation and properties of alanine, preparation of dipeptides using Bergmann method - Proteins- classification – structure - Colour reactions – Biological functions – nucleosides -nucleotides

– RNA and DNA – structure. Essentials of trace metals in biological system-Na, Cu, K, Zn, Fe, Mg. (12 Hours)

UNIT IV

Electrochemistry

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

UNIT V

Photochemistry

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

TEXT BOOKS

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

REFERENCE BOOKS

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

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

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

Dr.M.Dhanalakshmi
Head of the Department

Mrs.R.Nagasathya
Course Designer

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Semester II	**CHEMISTRY PRACTICAL FOR BIOLOGICAL SCIENCES - II**	Hours/Week: 2	
Elective Course I Practical II		Credit: 1	
Course Code **24UCHA21P**		Internal 40	External 60

Course Outcomes

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

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

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

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

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

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

SYSTEMATIC ANALYSIS OF ORGANIC COMPOUNDS

The analysis must be carried out as follows:

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

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

(c) To distinguish between aliphatic and aromatic compounds.

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

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

Dr.M.Dhanalakshmi
Head of the Department

Dr.J.Kavitha
Course Designer

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Semester II	**WOMEN'S HEALTH AND WELLNESS**	Hours/Week: 2	
Elective Course NME-2		Credits: 2	
Course Code **24UHSN21**		Internal 25	External 75

Course Outcomes

On completion of the course, students will be able to

CO1: describe the concept and importance of nutrition, physical, reproductive, mental and social health. [K1]

CO2: state the consequences of eating disorders in young women, common mental health problems and describe the sexually transmitted diseases. [K1]

CO3: indicate the nutrient requirements for young and older women, physical, reproductive, mental and social health. [K2]

CO4:discuss the dietary guidelines for a healthy lifestyle, strategies to improve mental health in a holistic manner, trends and issues relating to women. [K2]

CO5: Identify the factors affecting nutrient intake, risks associated with NCD's, strategies to improve mental health, preventive measures for both pre- and post-menopausal concerns, technological advancements and its impact in social health.[K3]

UNIT I

Nutrition for Women - Dietary Guidelines for a healthy lifestyle, Current concepts pertaining to Balanced Diets, Nutrient requirements for young and older women with special focus on Protein, Iron, Vitamin D and Calcium, Factors affecting nutrient intake in women- Socioeconomic, Environmental conditions, Health conditions, Consequences of Eating disorders in young women.

(6 Hours)

UNIT II

Physical Health - Significance of Body weight and Body composition parameters, Benefits ofAerobic, Flexibility and Strength training exercises- on General health, Bone health, and risks associated with NCD's – diabetes mellitus, coronary heart diseases and cancer.

(6 Hours)

UNIT III

Reproductive Health - Menstrual Health, Pregnancy and Lactation, Pre- and Post-Menopausalconcerns- preventive measures, sexually transmitted diseases- an overview.

(6 Hours)

UNIT IV

Mental Health - Common mental health problems - Trends and issues relating to women, Depression, Anxiety and coping with Stress, Strategies to improve mental health- learning new skills and hobbies, relaxation techniques such as yoga and meditation. (6 Hours)

UNIT V

Social Health - Balancing home and career, strengthening relationships, enhancingcommunication skills and Personality Development, technological advancements and its impact, Dealing with domestic violence, and harassment issues. (6 Hours)

REFERENCES:

1. Srilakshmi B. (2024) *Dietetics*, 9th edition, New age Publishing Press, New Delhi.
2. Lanza di Scalea, T., Matthews, K.A., Avis, N.E., et al. (2012). *Role stress, role reward, and mental health in a multiethnic sample of midlife women: results from the Study of Women's Health Across the Nation* (SWAN). J Women's Health, 21(5), 481-489.
3. Mahan, K., & Sylvia, E. Stump. (2000). *Krause's Food Nutrition and Diet Therapy*. Saunders, USA.
4. Minkin, M.J., & Wright, C.V. (2003). *The Yale Guide to Women's Reproductive Health from Menarche to Menopause*. Yale University Press, London.
5. Sizer, F.S., & Whitney, E. (2014). *Nutrition: Concepts & Controversies*. 13th Ed., Wadsworth, Cengage Learning, USA.
6. Sperry, L. (2016). *Mental Health and Mental Disorders*. ABC-Clio, California.
7. Williams, M.H., Anderson, D.E., & Rawson, E.S. (2013). *Nutrition for Health, Fitness and Sport. McGraw Hill*, New York.

8. Wrzus, C., Hänel, M., Wagner, J., &Neyer, F.J. (2013). *Social network changes and life events across the life span: a meta-analysis*. Psychol Bull, 139(1), 53-80.

e-Learning Resources:

- https://www.nhp.gov.in/social-health_pg
- https://ncert.nic.in/textbook/pdf/jehp112.pdf
- https://ncert.nic.in/textbook/pdf/iehp113.pdf
- https://ncert.nic.in/textbook/pdf/lebo104.pdf
- https://www.nih.gov/health-information/social-wellness-toolkit
- https://www.cdc.gov/reproductivehealth/womensrh/index.htm
- https://www.nimh.nih.gov/health/topics/caring-for-your-mental-health
- https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response
- https://www.cdc.gov/mentalhealth/learn/index.htm

CourseCode 24UHSN21	PO1		PO2		PO3	PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	1	1	1	3	-	-	-	1	-	-
CO2	2	2	2	3	-	-	-	2	-	1
CO3	2	2	2	3	-	-	1	2	-	2
CO4	3	3	3	3	3	-	1	3	-	2
CO5	3	3	3	3	3	-	3	3	-	2

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

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

Mrs.B.AmeenaBeebi — **Course Designer**

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

Course Outcomes

On completion of the course, students will be able to

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

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

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

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

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

UNIT I

Family

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

UNIT II

Contemporary Alternative Family Patterns and Relationships

Familylifecycle–stagesandsub-stages

Singlehood: Reasons.

Cohabitation: Types.

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

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

UNIT III

Marriage

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

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

(6 Hours)

UNIT IV

Parent's Nurturance of Children over the Life Course - Paren t-Child Relationships in Diverse Contexts–Planned parenthood and duties, styles of parenting, child rearing techniques, small family norms. (6 Hours)

UNIT V

Family Crisis and Counselling

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

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

Practicals

- Analysisofvarioustypesoffamily
- Analysisof familylifecycle
- AnalysisofvariouscontemporaryFamilyPatterns
- Asurveyonpreferencesof adolescentsin choosingalifepartner.
- Preparecasestudiesonparent–childrelationshipsinconcernwithparentingstyle

REFERENCES

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

e- Learning Resources

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

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

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

Dr.D.Vijayarani
Head of the Department

Dr.D.Vijayarani
Course Designer