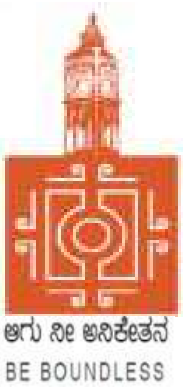


# BENGALURU CITY UNIVERSITY

**CHOICE BASED CREDIT SYSTEM**

**(Semester Scheme with Multiple Entry and Exit Options for Under Graduate Course)**

## Syllabus for B.Sc. Home Science
## (V & VI Semester)

**2023-24 onwards**

**Proceedings of the BOS in Home Science (UG& PG) for Bengaluru City University held on 15th September, 2023**

A meeting of the BOS in Home Science (UG& PG) for Bengaluru City University held on 15th September, 2023 between 10:30 am to 5:30 pm in Smt. V.H.D Central Institute of Home Science, Seshadri Road, Bengaluru – 560 001.

The following members were present in online & offline mode for the meeting:

**Name and Designation**

1. **Dr.Usha Devi. C**
   Chairperson BOS in Home Science (UG, PG & PhD)
   Bengaluru City University (BCU)
   Principal & Director
   Smt. V.H.D Central Institute of Home Science
   Maharani Cluster University
   Seshadri Road, Bengaluru – 560 001.

   Usha 15/9/23

2. **Dr.Vijayalaxmi A.H.M.,**
   Member
   Professor & Joint Director,
   Department of Collegiate Education,
   Regional Joint Director Office,
   Mysuru – 570 001

   ABSENT

3. **Dr.Madhumathy S.,**
   Member
   Professor & HOD,
   Department of Home Science,
   Government College of Home Science,
   Hassan - 573211

   ATTENDED ONLINE

4. **Dr.AshaJyothi U. H.,**
   Member
   Professor & Principal,
   Department of Home Science,
   Government College of Home Science,
   Holenarasipura, Hassan – 573 211

   ATTENDED ONLINE

5. **Dr.Grace Premila Victor.,**
   Member
   Associate professor & HOD,
   Department of Nutrition & Dietetics,
   Bishop Cotton Women's College,
   Field Marshal Kariyappa Road,
   Bengaluru – 560 025

   Grace Premila 15/9/23

6. **Dr.Marie Kavitha Jayakaran.,**
   Member
   Associate professor & HOD,
   Department of Home Science,
   Bishop Cotton Women's College,
   Field Marshal Kariyappa Road,
   Bengaluru – 560 025

MKavitha 15/9/23

7. **Dr.Sangeeta Pandey.,**
   Member
   Professor & HOD,
   Department of Nutrition and Dietetics,
   Mount Carmel College (Autonomous),
   No. 58, Palace Road,
   Bengaluru – 560 052

Pandey 15/9/23

8. **Dr.Komala M**
   Member
   Professor & HOD,
   Department of Human Development,
   University of Mysore,
   Manasa Gangothri, Mysuru – 570 006

ATTENDED ONLINE

The meeting began with Dr Usha Devi C., Chairperson BOS in Home Science, welcoming the members to the meeting and apprising the members of the agenda scheduled for the meeting. She also informed the members that at present two colleges listed below are offering BA/BSc Home Science as one optional and BSc Nutrition and Dietetics courses at UG level and PG in Nutrition and Dietetics in one of the college.

- Bishop Cotton Women's Christian College – BA/BSc Home Science as one optional and Nutrition and Dietetics course; and also PG in Nutrition and Dietetics
- S B A N M College, Yelahanka – BSc Clinical Nutrition & Dietetics

1. The Board reviewed the NEP Home Science UG syllabus of fifth and sixth semester, made the necessary minor changes in the syllabus and approved the same for the academic year 2023-2024 for all the courses
2. The BOS committee also finalised eligibility criteria for M.Sc – Nutrition & Dietetics course offered in Bishop Cotton Women's Christian College under BCU, which is as follows:- students who have studied in B.Sc – Nutrition & Dietetics/ B.Sc Food & Nutrition/ B.Sc – Composite Home Science/ B.Sc – Food Science & Nutrition/ B.Sc – Nutrition & Dietetics as one of the majors (Annexure-I).
3. The Board constitutes the BOE (UG/PG) for approval by the BCU (Annexure-II).

4. The Board included panel of examiners from MCU, School of Home Science, Bishop Cotton Women's Christian College, Mount Carmel College to the Panel of Examiners sent by Bengaluru City University and recommended the same to BCU (Annexure-I) and an additional list of panel from other colleges.

The meeting ended with the Chairperson thanking the members for attending the meeting.

Dr.Grace Premila Victor. 15/9/23

Dr.Marie Kavitha Jayakaran. 15/9/23

Dr.Sangeeta Pandey. 15/9/23

Dr.Usha Devi C
Chairperson

Dr. USHA DEVI. C., MSc., Ph.D., FISCA
Chairperson
BOS in Home Science (UG&PG)
Bangalore City University (BCU)
Central College Campus, Bangalore - 01

# BENGALURU CITY UNIVERSITY

# SYLLABUS

# 5TH AND 6TH SEMESTER

## DEPARTMENT OF HOME SCIENCE

1) **BA/BSC -Home Science**
   **(AS ONE MAJOR)**
2) **BSC -Nutrition & Dietetics**
   **(AS ONE MAJOR)**
3) **BSC -Clinical Nutrition & Dietetics**
   **(Inter-disciplinary)**

**SEPTEMBER 2023**

# THE LIST OF THE MEMBERS OF THE BOARD OF STUDIES

# FACULTY OF HOME SCIENCE

| Sl.No | NAME | DESIGNATION |
|---|---|---|
| 1 | DR. USHA DEVI C | CHAIRPERSON |
| 2 | DR. VIJAYALAXMI A.H.M | MEMBER |
| 3 | DR. MADHUMATHY S | MEMBER |
| 4 | DR. SHANTHA MARIA B. V | MEMBER |
| 5 | DR. GRACE PREMILA VICTOR | MEMBER |
| 6 | DR. ASHAJYOTHI U.H. | MEMBER |
| 7 | DR. SANGEETA PANDEY | MEMBER |
| 8 | DR. KOMALA M | MEMBER |
| 9 | DR. MARIE KAVITHA JAYAKARAN | MEMBER |

# HOME SCIENCE SUBJECT EXPERT COMMITTEE

**Composition of Curriculum – Committee for Home Science**
**(Composite Home Science/ Home Science/ Nutrition & Dietetics/ Clinical Nutrition & Dietetics/ Care and Welfare/ Human Development/ Family Resource Management)**

| S. No. | Name and Organization | Designation |
|---|---|---|
| 1. | Dr. M. Anuradha<br>Principal, Padmashree Institute of Management and Sciences, Bengaluru | Chairperson |
| 2. | Dr. Komala M. (Human Development)<br>Professor, University of Mysore, Mysuru | Member |
| 3. | Dr. Vijayalakshmi A.H.M. (Human Dept./ Care & Welfare), Associate Professor, Maharani Cluster University, Bengaluru | Member |
| 4. | Dr. Shantha Maria (Home Science)<br>Associate Professor, Mount Carmel College, Bengaluru | Member |
| 5. | Dr. Sangeetha Pandey (Nutrition & Dietetics), Associate Professor Mount Carmel College, Bengaluru | Member |
| 6. | Dr. Marie Kavitha (Human Dept.),<br>Bishop Cotton Women's Christian College, Bengaluru | Member |
| 7. | Dr. Gana Shruthy M.K.<br>Special Officer, KSHEC, Bengaluru | Member - Convenor |

# Curriculum

# of

# B.A/ B.Sc Home Science

# as a ONE Major

# ( 5th and 6th Semester)

**KARNATAKA STATE HIGHER EDUCATION COUNCIL**

## Sub-committee members of B. A/ B.Sc. Home Science

| | |
|---|---|
| 1. | Dr. Marie Kavitha Jayakaran - Convenor<br>Bishop Cotton Women's Christian College -Bengaluru |
| 2. | Dr. Vijaya U Patil<br>Government First Grade College -Ankola |
| 3. | Dr. Manjula G. Kadapatti<br>Maharani Cluster University-Bengaluru |
| 4. | Mrs. Veena Tirlapur<br>KLE Society's Art & Commerce College -Gadag |
| 5. | Mrs. Anita Bettaiah<br>Bishop Cotton Women's Christian College -Bengaluru |
| 6. | Mrs. Shobha. S<br>SDM College - Ujire |

## Listing of Courses from I to VI Semesters for the Four-Year Undergraduate Program (FYUGP) in Home Science

| Sem No. | Course Category | Course Code | Course Titles | Credits assigned | Instructional Hours per week | | Duration of Exam(Hrs.) | Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Theory | Practical | | IA | Exam | Total |
| I | DSC | HSCC1-T | Principles of Food and Nutrition | 4 | 4 | | 2.5 | 40 | 60 | 100 |
| | | HSCC2-P | Principles of Food and Nutrition | 2 | - | 4 | 3 | 25 | 25 | 50 |
| | | HSCOE1-T | Food Preservation | 3 | 3 | - | 2.5 | 40 | 60 | 100 |
| II | DSC | HSCC3-T | Fundamentals of Human Development | 4 | 4 | | 2.5 | 40 | 60 | 100 |
| | | HSCC4-P | Fundamentals of Human Development | 2 | | 4 | 3 | 25 | 25 | 50 |
| | | HSCOE2-T | Teaching materials for early childhood education | 3 | 3 | - | 2.5 | 40 | 60 | 100 |
| III | DSC | HSCC5-T | Early childhood care and education | 4 | 4 | | 2.5 | 40 | 60 | 100 |
| | | HSCC6-P | Early childhood care and education | 2 | | 4 | 3 | 25 | 25 | 50 |
| | | HSCC0E3-T | Fundamentals of interior decoration | 3 | 3 | - | 2.5 | 40 | 60 | 100 |
| IV | DSC | HSCC7-T | Introduction to textiles | 4 | 4 | | 2.5 | 40 | 60 | 100 |
| | | HSCC8-P | Introduction to textiles | 2 | | 4 | 3 | 25 | 25 | 50 |
| | | HSCC0E4-T | Fashion designing | 3 | 3 | - | 2.5 | 40 | 60 | 100 |
| V | DSC | HSCC9-T | Human development and family dynamics | 4 | 4 | | 2 | 40 | 60 | 100 |
| | | HSCC10-P | Human development and family dynamics | 2 | | 4 | 3 | 25 | 25 | 50 |
| | | HSCC11-T | Interior decoration | 3 | 3 | | 2.5 | 40 | 60 | 100 |
| | | HSCC12-P | Interior decoration | 2 | | 4 | 3 | 25 | 25 | 50 |
| VI | DSC | HSCC13-T | Traditional textiles and costumes of India | 4 | 4 | | 2-5 | 40 | 60 | 100 |
| | | HSCC14-P | Traditional textiles and costumes of India | 2 | | 4 | 3 | 25 | 25 | 50 |
| | | HSCC15-T | Resource Management | 3 | 3 | | 2.5 | 40 | 60 | 100 |
| | | HSCC16-P | Resource management | 2 | | 4 | 3 | 25 | 25 | 50 |

**Government of Karnataka**

**Model Curriculum**

| | | | | | |
|---|---|---|---|---|---|
| Program Name | **BA/B.Sc. Home Science** | | | Semester | **Fifth Sem** |
| Course Title | **Human development and Family Dynamics (Theory)** | | | | |
| Course No. | **HSCC9-T** | **DSC** | | No. of Credits | **4+2** |
| Contact hours | **60 Hrs** | | | Duration of SEA/Exam | **2 Hours** |
| Formative Assessment Marks | **40** | | | Summative Assessment Marks | **60** |

**Course Pre-requisite(s): Certificate with minimum 45%.**

**Course Outcomes (COs): At the end of the course the student should be able to**

1. Understand the period of Adolescence and its developmental changes.
2. Study the need of counselling for adolescents.
3. Understand the physical, Physiological cognitive and socio-emotional development during adulthood stages.
4. Sensitized about interpersonal relationships, Marriage, functions of marriage, changing trends in marriage and Family and family dynamics.
5. Prepare for outreach activities with varied groups of adults and elderly.

| **Content** | **60 Hrs** |
|---|---|
| **Unit-I. Adolescence** | **15 Hrs** |
| **Chapter No. 1**<br>Definition, characteristics, developmental tasks of Adolescence. | **2 Hrs** |
| **Chapter No. 2**<br>Physical changes, puberty, primary and secondary sexual characteristics among adolescents. | **4 Hrs** |
| **Chapter No. 3**<br>Identity formation, social, emotional, cognitive and moral development. Interests and problems of adolescents | **5 Hrs** |
| **Chapter No. 4**<br>Need for adolescent counselling. Techniques and methods of adolescent counseling. Education and Career guidance | **4 Hrs** |
| **Unit-II. Adulthood- Early Adulthood and Marriage** | **15 Hrs** |
| **Chapter No. 5**<br>Historical perspectives on adulthood, Contemporary changes, increase in life expectancy | **7 Hrs** |

| | |
|---|---|
| and decrease in death rate, classification of Adulthood.<br>Early Adulthood- Characteristics and developmental tasks, physical, social, cognitive, emotional and moral development. Roles, responsibilities and adjustments. | |
| **Chapter No. 6**<br>**Marriage** – definition, functions, areas of marital adjustments, essentials of successful marriage | 3 Hrs |
| **Chapter No. 7**<br>**Changing trends in marriage**: cohabitation, remarriage, LGBT (Lesbian, Gay, Bisexual, and Transgender) marriages | 5 hrs |
| **Unit-III. Family, Family Dynamics and Middle Adulthood** | **15 Hrs** |
| **Chapter No. 8**<br>**Family** – Definition functions and types. Changing trends in family: causes for change, single parent families, separated families, nuclear families cross-generational families, adoptive/foster families, blended families, same-sex parent families | 5 Hrs |
| **Chapter No. 9**<br>**Family Dynamics-** Definition, function and scope. Gender norms and roles in family dynamics | 3 Hrs |
| **Chapter No. 10**<br>**Middle Adulthood** - **C**haracteristics and developmental tasks. Physical, physiological and socio-emotional changes, changes in cognitive abilities, Adjustments and hazards of middle age, preparation for retirement | 7 Hrs |
| **Unit-IV. Family crisis and Late Adulthood** | **15 Hrs** |
| **Chapter No. 11**<br>**Forms of family crisis**: Marriage, divorce/separation, remarriage, financial instability, poor work-family balance, illness, death, childlessness, child abuse/neglect, family violence, peer pressure, addiction, rape, suicide, unemployment, natural disasters, epidemics and wars.<br>**Family cohesion**- the role of effective communication, compassion, perspective-taking, role distribution, positive conflict resolution, and teamwork.<br>**Agencies offering support**: Marriage and family therapists, Family courts, Child guidance clinics, counseling and rehabilitation centers | 10 Hrs |
| **Chapter No. 12**<br>**Late Adulthood -** Characteristics and developmental tasks. Physical, physiological, psychological and social changes. Health care and health problems, Adjustments to retirement. successful ageing | 5 Hrs |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| Course Outcomes (COs) / Program Outcomes (POs) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Understand the period of Adolescence and its developmental changes | | X | | X | X | | | | | | X | |
| Understand the physical, Physiological cognitive and socio-emotional development during adulthood stages | | | | | | | | X | X | | X | |
| Sensitized about interpersonal relationships, Marriage, functions of marriage, changing trends in marriage and Family and family dynamics | | | | | | | | X | | X | | X |
| Prepare for outreach activities with varied groups of adults and elderly | | | X | X | | | | X | | | | |

**Pedagogy - Theory**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Human development and Family Dynamics (Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **HSCC10 P** | Contact Hours: | **52/13Sessions** |
| **Practical Topics - 2 credits** | | | **13 - 15 weeks** |
| **Unit I**<br>• Conduct a study on selection of life partner/ changing trends in marriage//adjustments/ problems in marriage **OR** Plan an interaction with a counselor or therapists working in the area of interpersonal conflicts (in the family family/peer group/parent-child/ Adolescent). | | | **10 Hrs** |
| **Unit II**<br>• Conduct a role play to create awareness among college students on family values / family relationship /stability in marriage. OR Select a form of family crisis or stress. Develop an educational aid to prevent and manage the crisis.<br>• Visit to an Adolescent/ family counselling center and write a report | | | **15 Hrs** |

| | |
|---|---|
| **Unit III**<br>• Organize a workshop for adolescents on -physical changes/health issues/ menstrual hygiene/behaviour during adolescence. OR Conduct a workshop on enhancing family cohesion and conflict resolution | **12 Hrs** |
| **Unit IV**<br>• Plan, prepare and conduct activities to foster cognitive abilities / health/ nutrition/ recreational activities for the aged. **OR** Create posters about ways to improve interpersonal communication skills and patters of relating to enhance resiliency in relationships | **15 Hrs** |

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment / project | 5 + 5 |
| **Total** | **25 marks + 25 marks = 50 marks** |

**References:**


| | |
|---|---|
| 1. | Arnett, J. J., & Jensen, L. A. (2019). *Human Development: A cultural approach (3rded.)*. New York: Pearson. |
| 2. | Berk, L.E. (2005). Child development (5th ed.). New Delhi: Prentice Hall |
| 3. | Baradha.G 'Basics of Human Development' Saradalaya Press, Sri Avinashilingam Education Trust Institutions, Coimbatore 2008. |
| 4. | Cavanaugh, J., & Blanchard-Fields, F. (2011). *Adult development and aging (7thed)*. Stamford, CT: Cengage Learning. |
| 5. | Hurlock.B.Elizabeth 'Developmental Psychology – A Life Span Approach' Tata McGraw Hill Publications, New Delhi Latest Edition. 3. |
| 6. | Kapadia, S. (2011). Psychology and human development in India. Country paper. International Society for the Study of Behavioural Development Bulletin Number 2, Serial No. 60, pp.37-42. |
| 7. | Santrock, J. (2017). A topical approach to life span development (9th ed.). New NY.:Mcgraw-Hill Higher Education. |
| 8. | Singh, A. (2015). Foundations of Human Development: A life span approach. ND: Orient Black Swan |
| 9. | Suriakanthi. A. (2015) 'Child Development' Kavitha Publications, Gandhigram, Tamil Nadu. |
| 10. | Walsh, B.A., Deflorio, L., Burnham, M.M., & Weiser, D.A. (2017). Introduction to Human Development and Family Studies. NY: Routledge |


**Date** **Course Coordinator** **Subject Committee Chairperson**

**Government of Karnataka**

**Model Curriculum**

| | | | | |
|---|---|---|---|---|
| Program Name | **BA/B.Sc. Home Science** | | Semester | **Fifth Sem** |
| Course Title | **Interior Decoration (Theory)** | | | |
| Course No. | **HSCC11-T** | **DSC** | No. of Credits | **4+2** |
| Contact hours | **60 Hrs** | | Duration of SEA/Exam | **2.5 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Pre-requisite(s): Certificate with minimum 45%.**

**Course Outcomes (COs): At the end of the course the student should be able to**

- To Learn about housing and its principles
- To understand about color and its application in interiors
- To apply elements and principles of design in interior decoration
- To know about furniture, window treatment and accessories in interiors

| **Content** | **60 Hrs** |
|---|---|
| **Unit-I. Design Fundamentals** | **15 Hrs** |
| **Chapter No. 1**<br>Types of design- Structural and Decorative, Naturalistic, Stylized, Geometric, Abstract. | **3 Hrs** |
| **Chapter No. 2**<br>Elements of Art- Line, form, color, space, texture, Pattern, light. | **6 Hrs** |
| **Chapter No. 3**<br>Principles of design- Harmony, Proportion, Balance, Rhythm, Emphasis | **6 Hrs** |
| **Unit-II. Dimension of color** | **15 Hrs** |
| **Chapter No. 4**<br>Dimension of color- Hue, Value, Intensity, Advancing and receding colors, cool and warm colors. Characteristics of colors | **7 Hrs** |
| **Chapter No. 5**<br>Prang color system- Primary, secondary, and Tertiary colors, color wheel. Color Harmonies- Related and Non-Related Color Harmonies. | **8 Hrs** |
| **Unit-III Housing** | **15 Hrs** |
| **Chapter No. 4**<br>Principles of Housing , types of Dwelling Units , Kitchen Plans | **7 Hrs** |

| | |
|---|---|
| **Chapter No. 5** Factors to be considered in Selection, Principles of Furniture Arrangement, FurnitureArrangement for different rooms. Styles of Furniture and materials used to make furniture | **8 Hrs** |

| **Unit IV – Window Treatment & Accessories** | **15 hrs** |
|---|---|
| **Chapter No. 8**<br>Windows- Types of windows- casement, bay window, sliding window, awing window, picture window. Window treatment- Modes of Hanging Curtains- Cafe, Tier, Priscilla, CrissCross, Glass, Pleated | 8 Hrs |
| **Chapter No. 9**<br>Accessories – classification and type<br>Flower decoration -styles and shapes | 7 Hrs |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| **Course Outcomes (COs) / Program Outcomes (POs)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To Learn about housing and its principles | | X | | X | X | | | | | | X | |
| To understand about colour and its application in lnteriors | | | | | | | | X | X | | X | |
| To apply elements and principles of design in interior decoration | | | | | | | | X | | X | | X |
| To know about furniture, window treatment and accessories in interiors | | | X | X | | | | X | | | | |

**Pedagogy - Theory**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Interior Decoration (Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **HSCC12 P** | Contact Hours: | **52/13Sessions** |
| **Practical Topics - 2 credits** | | | **13 - 15 weeks** |
| **Unit I**<br>Elements of Arts and Principles of design. | | | **20 Hrs** |
| **Unit II**<br>Color wheel, color harmonies. | | | **7 Hrs** |
| **Unit III**<br>Furniture arrangement and Window treatment | | | **20 Hrs** |
| **Unit IV**<br>Flower arrangement | | | **5 Hrs** |

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 10 |
| Test 2 | 10 |
| Assignment / project | 5 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| **References:** | |
|---|---|
| 1. | Prathap Rao (2003) Interior design Principles - Standard Publishers and Distributors, New Delhi. |
| 2. | Raja Rao and Subramanya (2003) Planning and Designing Residential Buildings - Standard Publishers and Distributors, New Delhi. |
| 3. | Sita Ram Premavathy Pannuparveen (2005) Interior Design and Decoration - CBS Publishers, , New Delhi. |
| 4. | Premlatha Mullick (2015) Textbook Of Home Science - Kalyani Publishers, New Delhi. |

**Date** **Course Coordinator** **Subject Committee Chairperson**

**Government of Karnataka**

**Model Curriculum**

| | | | | |
|---|---|---|---|---|
| Program Name | **BA/B.Sc. Home Science** | | Semester | **Sixth Sem** |
| Course Title | **Traditional Textiles and Costumes of India (Theory)** | | | |
| Course No. | **HSCC13 T** | **DSC** | No. of Credits | **4+2** |
| Contact hours | **60 Hrs** | | Duration of SEA/Exam | **2.5 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Pre-requisite(s): Certificate with minimum 45%.**

**Course Outcomes (COs): At the end of the course the student should be able to**

- Acquaint with Indian Textile and Clothing culture
- Analyse traditional textiles based on the process of making it.
- Understand the physical, geographical, cultural influence on costumes and textiles.
- Differentiates traditional textiles from different parts of the country.
- Appreciates the traditional Textiles and Costumes
- Utilize traditional costume and textiles in contemporary context.
- Understands the techniques of traditional embroidery

| Content | 60 Hrs |
|---|---|
| **Unit-I. Introduction to Traditional Textiles** | **15 Hrs** |
| **Chapter No. 1**<br>Textile Arts of India Weaving and weaving communities, Embroideries, Rugs and carpets, Saris Shawls and wraps. | **3 Hrs** |
| **Chapter No. 2**<br>History of Indian Traditional Textiles Chronological development of spinning, weaving and dyeing various trade routes. | **4 Hrs** |
| **Chapter No. 3**<br>Traditional Costumes- Classification of Traditional Textiles of India Painted and printed, Resist dyed, woven, and embroidered. Traditional Costume and Culture Influence of historical, economic, political and socio-cultural aspects on the evolution of traditional costume | **8 Hrs** |
| **Unit-II. Ornamented and Resist Dyed Textiles** | **15 Hrs** |
| **Chapter No. 4**<br>Pigment painted textiles Patachitra, Pichhavi and Phad Mordant painted textiles | **8 Hrs** |

| | |
|---|---|
| Kalamkari- Masulipatnam and Srikalahasti, Mata-ni- Pachhedi. Printed textiles Hand block printed, Ajrakh, Rogan, Sanganer, Bagh | |
| **Chapter No. 5**<br>Yarn resist Patola, Mashru, Ikat, Bandhana Fabric resist Sungadi, Bhandej, Laheriya | **7 Hrs** |
| **Unit-III. Woven textiles and Embroidery** | **15 Hrs** |
| **Chapter No. 6**<br>Woven textiles of India: Rajasthan – Kota Doria, Gujarat –Sujani, Tangaliya, Pachhedi Madhya Pradesh – Chanderi, Maheshwari, UttarPradesh – Brocades. | **3 Hrs** |
| **Chapter No. 7**<br>West Bengal – Dacca muslin, Balu Chari ,Tangail, Shawls from Kashmir, Assam and Nagaland, Maharashtra Paithani, Himroo , Andhra Pradesh and Telangana – Dharvaram, VenkatGiri, Gadwal and Narayan pet, Karnataka – Ilkal, moorkalmuru ,Tamil Nadu- Kanjeevaram | 4 hrs |
| **Chapter No. 8**<br>Embroideries of India -kutch, ari, chikankari, kasuti, kashida, Chambaroomal | 8 Hrs |
| **Unit –IV Traditional Costumes of India:** | **15 Hrs** |
| **Chapter No. 9**<br>Traditional Costumes of India: Jammu and Kashmir, Punjab, Haryana, Rajasthan, Gujarat, Maharashtra, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Orissa, West-Bengal, Assam, Nagaland, Meghalaya, Manipur, Arunachal, Mizoram, Tripura, India Uttar Pradesh, Madhya Pradesh, and Bihar | 8 Hrs |
| **Chapter No. 10**<br>Traditional costumes of Kerala, Karnataka, Orissa, West-Bengal, Assam, Nagaland, Meghalaya, Manipur, Arunachal, Mizoram, Tripura, India Uttar Pradesh, Madhya Pradesh, and Bihar | 7 Hrs |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| **Course Outcomes (COs) / Program Outcomes (POs)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analyze traditional textiles based on the process of making it. | | X | | X | X | | | | | | X | |
| Differentiates traditional textiles from different parts of the country | | | | | | | | X | X | | X | |
| Understands the techniques of traditional embroidery | | | | | | | | X | | X | | X |
| Utilize traditional costume and textiles in contemporary context. | | | X | X | | | | X | | | | |

**Pedagogy - Theory**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Traditional textiles and costumes of India (Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **HSCC14 P** | Contact Hours: | **52/13Sessions** |
| **Practical Topics - 2 credits** | | | **13 - 15 weeks** |
| **Unit I:** Embroideries of India – 1. Kashida of Kashmir 2. Chamba of Himachal Pradesh 3. Phulkari and Bagh of Punjab 4. Chikankari of Uttar Pradesh 5. Kantha of Bengal | | | **20 Hrs** |
| **Unit II:** Embroideries of India 6. Embroideries of Manipur 7. Embroideries of Gujarat 8. Gold and Silver embroidery 9. Bead work | | | **20 Hrs** |
| **Unit III:** Preparation of portfolio • Pictures of traditional textiles with the descriptive analysis • Pictures of the traditional costumes with constructional details. • Samples of embroidery with its theoretical details | | | **12 Hrs** |

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Record | 10 |
| Test 2 | 10 |
| Assignment / project | 5 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| References: | |
|---|---|
| 1. | Bhatnagar P. (2004), Traditional Indian Costumes and Textiles, Abhishek Publications, New Delhi |
| 2. | Chisti R.K., (2013) Sari tradition and beyond, Roli Publication |
| 3. | Ghurye G. S. (1995), Indian Costume, Popular Prakashan, Bombay |
| 4. | Irwin, J. H. & Hall, M. (1973). Indian Embroideries. Ahmedabad: Historic Textiles of India at Calico Museum of Textiles |
| 5. | Karolia, A. (2019), Traditional India Handcrafted Textiles: Techniques, Processes and Designs Vol.I and II, Niyogi books, Delhi |
| 6. | Pathak A. (2006), Indian Costumes, Roli Books, Mumbai |
| 7. | Saraf, D. N. (1982). Indian Crafts. New Delhi: Vikas Publishing House Limited. |
| 8. | Singh M. (2011) Traditional and Beyond Handcrafted Indian Textile, Roli Books Pvt. Ltd, New Delhi. |
| 9. | Ritu Kumar, (2008). Costumes and Textiles of Royal India, Antique collectors club, India. |
| 10. | John Gillow, Nicholas Barnard, (2008). Indian Textiles, Thames & Hudson, London |
| 11. | Carl Kohler, (2012). A History of Costume, Dover Publications, INC, New York |

**Date** **Course Coordinator** **Subject Committee Chairperson**

**Government of Karnataka**

**Model Curriculum**

| | | | | | |
|---|---|---|---|---|---|
| Program Name | **BA/B.Sc. Home Science** | | | Semester | **Sixth Sem** |
| Course Title | **Resource Management (Theory)** | | | | |
| Course No. | **HSCC15 T** | **DSC** | | No. of Credits | **4+2** |
| Contact hours | **60 Hrs** | | | Duration of SEA/Exam | **2.5 Hours** |
| Formative Assessment Marks | **40** | | | Summative Assessment Marks | **60** |

**Course Pre-requisite(s): Certificate with minimum 45%.**

**Course Outcomes (COs): At the end of the course the student should be able to**

- Understand the available resources and develop the ability to evaluate the managerial efficiency and effectiveness in the family and other organization.
- Acquire an understanding of real-world challenges in HRM and identify measures to ensure a stable work environment efficiently through proper coordination, employee empowerment and training practices
- Critical thinking skills by developing a data-driven approach to improve business productivity and performance.
- Understand International Human Resource Management

| **Content** | **60 Hrs** |
|---|---|
| **Unit-I. Introduction to Resource Management** | **15 Hrs** |
| **Chapter No. 1**<br>Resources: Definition and Classification – Human and Non-Human Resources, Renewable and Non-Renewable resources, Energy conservation and sustainability<br>. | **5 Hrs** |
| **Chapter No. 2** Management: Definition, Motivating factors, Managerial Process, Decision making and Problem Solving<br>. | **5 Hrs** |
| **Chapter No. 3**<br>Money Management<br>Budget plan, Account Keeping, Saving Process and Practice | **5 Hrs** |

| | |
|---|---|
| **Unit-II. Resource management** | **15 Hrs** |
| **Chapter No. 5**<br>Time Management<br>Time plan, Tools, Process and practices | **8 Hrs** |
| **Chapter No. 6** Energy Management ,Fatigue, Work simplification | **7 Hrs** |
| **Unit-III. Ergonomics** | **15 Hrs** |
| **Chapter No. 8** Ergonomics – Concept, Definition, Characteristics of places, things and activities. Human Factors, Principles of Ergonomics, Occupational factors affecting the worker | **7 Hrs** |
| **Chapter No. 9 – Anthropometry** Definition and Applicability of Stature – Eye height, Elbow height, Sitting height,Shoulder and Elbow breadth, Thigh clearance and Popliteal height, Maximum and<br>Minimum Vertical and Horizontal reach | 8 Hrs |
| **Unit-IV. Consumer Education** | **15 Hrs** |
| **Chapter No. 8** Definition of a consumer, Objects and Purpose of Consumer Education, Role of<br>consumers in the economy, Types of consumer problems – products and service related, Causes and solutions | **7 Hrs** |
| **Chapter No. 9**<br>Consumer Protection, Consumer rights and responsibilities, Consumer Protection Act – Salient Features, Limitations and Guidelines for filling consumer compliant | 8 Hrs |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| **Course Outcomes (COs) / Program Outcomes (POs)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Understand the available resources and develop the ability to evaluate the managerial efficiency and effectiveness in the family and other organization | | X | | X | X | | | | | | X | |
| Acquire an understanding of real-world challenges in HRM and identify measures to ensure a stable | | | | | | | | X | X | | X | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| work environment efficiently through proper coordination, employee empowerment and training practices | | | | | | | | | | | | |
| Critical thinking skills by developing a data-driven approach to improve business productivity and performance | | | | | | | | X | | X | | X |
| Understand International Human Resource Management | | | X | X | | | | X | | | | |

**Pedagogy - Theory**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Resource Management (Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **HSCC16 P** | Contact Hours: | **45/13Sessions** |
| **Practical Topics - 2 credits** | | | **13 - 15 weeks** |
| **Unit I:** Preparation of time plans for self | | | **7 Hrs** |
| **Unit II:** Budget and banking procedures | | | **10 Hrs** |
| **Unit III:** Standards of Weights and Measures Act, 1976, ISI, BIS, FPO, AGMARK, ISO, Eco mark,Wool mark, Silk mark, Cotton mark, Handloom mark BEE star labeling, FSSAI, Codex, HACCP, Food laws | | | **20 Hrs** |
| **Unit IV: Anthropometry and work simplification** | | | **15 Hrs** |

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Record | 10 |
| Test 2 | 10 |
| Assignment / project | 5 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| **References:** | |
|---|---|
| 1. | Umesh Prasad, (2011). Essential of Ergonomics. Sonali Publications, New Delhi |
| 2. | Sawhney, H. K. & Mital, M. (2007). Family Finance & Consumer Studies. Elite Publishing House Pvt. Ltd |
| 3. | Engel, J.F. and Black, Well R.D. (1990). Consumer Behaviour, 4th Edition. Holt Sanders International Edition |
| 4. | Seetharaman, P. and Sethi, M. (2001). Consumerism: Strength and Tactics. New Delhi, CBS Publishers |
| 5. | Jan Dul and Bernard Weerdmeester, (2008). Ergonomics for Beginners – A quick reference guide, CRC Press, New York |
| 6. | Gross. I. H.,Crandall,E.W.andKnoll,M.M.(1980).*Management for Modern Families.* New Jersey: Prentice Hall Inc |
| 7. | Bhargava, B. (2005). *Family Resource Management and Interior Decoration*, Jaipur: Apple Printer and V. R. Printers |
| 8. | Varghese, M. A., Ogale. N. and Srinivasan K. (1985). *Home Management*. New Delhi: New Age International (P) Limited, Publishers (ISBN 13: 9780852269046 |

**Date** **Course Coordinator** **Subject Committee Chairperson**

| | |
|---|---|
| 2. | Khan M.I., (2014). Industrial Ergonomics. PHI Learning Private Limited, New Delhi |
| 3. | Umesh Prasad, (2011). Essential of Ergonomics. Sonali Publications, New Delhi |
| 4. | Manjit Kaur Chauhan, (2015). Ergonomics Practical Manual for Beginners. Authors press, New Delhi. |
| 5. | Tayyari. F and Smith J.L, (1997). Occupational Ergonomics – Principles and Applications, Chapman and Hall, Tokyo |
| 6. | Jan Dul and Bernard Weerdmeester, (2008). Ergonomics for Beginners – A quick reference guide, CRC Press, New York. |


**Date** **Course Coordinator** **Subject Committee Chairperson**

# Curriculum

# of

# B.Sc. with

# Nutrition and Dietetics as one Major 5th and 6th Semester

**KARNATAKA STATE HIGHER EDUCATION COUNCIL**

## Sub-committee members of B.Sc. Nutrition and Dietetics

| | |
|---|---|
| 1. | Dr. Sangeeta Pandey -Convenor<br>Mount Carmel College |
| 2. | Dr. Geetha Santhosh<br>Mount Carmel College |
| 3. | Dr. V. Padma<br>Mount Carmel College |
| 4. | Dr Usha Devi C -Principal<br>Maharani Cluster University |
| 5. | Dr Asha G<br>Maharani Cluster University |
| 6. | Dr Vidhya K<br>Maharani Cluster University |

**Content of courses for B.Sc. with Nutrition &Dietetics as Major subject & B.Sc. (Hons) Nutrition &Dietetics II A Model**

| Semester | Course Code. | Category of course | Theory/ Practical | Credits | Paper Titles | Marks | |
|---|---|---|---|---|---|---|---|
| | | | | | | S.A | I.A |
| I | ND T C 1.1 | DSC 1 | Theory | 4 | Fundamentals of nutrition | 60 | 40 |
| | ND P C 1.1 | DSC 1 | Practical | 2 | Fundamentals of nutrition | 25 | 25 |
| | ND OE 1 | OE 1 | Theory | 3 | Fundamentals of food and health / Health lifestyle and nutrition | 60 | 40 |
| | | | | | | | |
| II | ND T C 2.1 | DSC 2 | Theory | 4 | Principles of Food Science and Preservation | 60 | 40 |
| | ND P C 2.1 | DSC 2 | Practical | 2 | Principles of Food Science and Preservation | 25 | 25 |
| | ND OE 2 | OE 2 | Theory | 3 | Food safety and Hygiene/ Food Adulteration | 60 | 30 |
| | **Exit option with certificate (50 credits)** | | | | | | |
| III | ND T C 3.1 | DSC 3 | Theory | 4 | Nutrition through life span | 60 | 40 |
| | ND P C 3.1 | DSC 3 | Practical | 2 | Nutrition through life span | 25 | 25 |
| | ND OE 3 | OE 3 | Theory | 3 | Traditional Foods and Health/ Nutritional Assessment | 60 | 40 |
| | | | | | | | |
| IV | ND T C 4.1 | DSC 4 | Theory | 4 | Human Physiology | 60 | 40 |
| | ND P C 4.1 | DSC 4 | Practical | 2 | Human Physiology | 25 | 25 |
| | ND OE T 4 | OE 4 | Theory | 3 | Nutrition in weight management/ Diet in life style disorder | 60 | 40 |
| | **Exit Option with Diploma (100 credits) or choose any one of the core subjects as major and the other as minor** | | | | | | |
| V | ND T C 5.1 | DSC5 | Theory | 4 | Clinical Nutrition & Dietetics – 1 | 60 | 40 |
| | ND P C 5.1 | DSC5 | Practical | 2 | Clinical Nutrition & Dietetics – 1 | 25 | 25 |
| | ND T C 5.2 | DSC 6 | Theory | 4 | Food Microbiology | 60 | 40 |
| | ND P C 5.2 | DSC 6 | Practical | 2 | Food Microbiology | 25 | 25 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **VI** | ND T C 6.1 | DSC 8 | Theory | 4 | Clinical Nutrition & Dietetics – II | 60 | 40 |
| | ND P C 6.1 | DSC 8 | Practical | 2 | Clinical Nutrition & Dietetics – II | 25 | 25 |
| | ND T C 6.2 | DSC 9 | Theory | 4 | Principles and practices in Public Health Nutrition | 60 | 40 |
| | ND TC P 2 | DSC 10 | Practical | 2 | Principles and practices in Public Health Nutrition | 25 | 25 |
| | **Exit option with Bachelor of Science BSc Degree (142credits) or continue studies with the Major** | | | | | | |

Government of Karnataka

# Model Curriculum

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Nutrition & Dietetics** | | Semester | **Fifth Sem** |
| Course Title | **Clinical Nutrition & Dietetics – I (Theory)** | | | |
| Course No. | **ND T C 5.1** | **DSC 5** | No. of Credits | **4 +2** |
| Contact hours | **60 Hrs** | | Duration of SEA/Exam | **2.5 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Outcomes (COs): At the end of the course the student should be able to**

1. Know the role of dietetics in preventive, promotive and curative health care
2. Understand the clinical condition with relevant data (laboratory, anthropometry, pharmacology)
3. Develop skills to make appropriate dietary modifications in clinical conditions.

| Content | 60 Hrs |
|---|---|
| **Unit – 1** | **15 Hrs** |
| **Chapter No. 1:**<br>Introduction to Diet therapy – Objectives. Nutrition assessment in clinical set up, Nutrition Care Process (ADIME). Role of dietician, responsibilities, code of ethics. | **5 Hrs** |
| **Chapter No. 2:**<br>Therapeutic meal planning - factors to be considered, food groups, exchange list. | **5 Hrs** |
| **Chapter No. 3:**<br>Types of hospital diet; modification of normal diet to therapeutic diet, | **5 Hrs** |
| **Unit – 2:** | **15 Hrs** |
| **Chapter No. 4:**<br>Weight management: Underweight, overweight, etiology, assessment and treatment, dietary guidelines, challenges – eating disorders and fad diets. | **10 Hrs** |
| **Chapter No. 5**:<br>Inborn errors of metabolism – PKU, Galactosemia, GSD, MSUD | **5 Hrs** |

| | |
|---|---|
| **Unit -3:** | **15 Hrs** |
| **Chapter No. 7:**<br>Infections and febrile conditions: host defence mechanism<br>Dietary management in acute and chronic fever – typhoid, malaria, tuberculosis. | **8 Hrs** |
| Food sensitivity: Definition, diagnosis, nutrition management – allergens. | **7 Hrs** |
| **Unit -4** | **15 Hrs** |
| **Chapter No. 8:**<br>Gastrointestinal disorders: Diarrhoea, Constipation, GERD, Peptic ulcers, Irritable Bowel Syndrome, Inflammatory Bowel Disease (Lactose intolerance and gluten intolerance). | **8 Hrs** |
| **Chapter No. 9:**<br>Liver & biliary system: Viral hepatitis, Cirrhosis, cholecystitis, cholelithiasis, acute & chronic pancreatitis | **7 Hrs** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| **Course Outcomes (COs) / Program Outcomes (POs)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Know the role of dietetics in preventive, promotive and curative health care | X | | | | | | X | | | | | |
| Understand the clinical condition with relevant data (laboratory, anthropometry, pharmacology) | | | | | X | | | | | | | |
| Develop skills to make appropriate dietary modifications in clinical Conditions | | X | | | | | | | | | X | |

**Pedagogy**

Lecture, demonstration, hands on learning through projects, presentations, hospital dietary visits, case studies, workshops.

**Assessment**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 10 |
| Test 2 | 10 |
| Presentation / Assignment | 10 |
| Project quiz | 10 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Clinical Nutrition & Dietetics I (Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **ND P C 5.1** | Contact Hours: | **52 Hrs** |
| **Practical Topics - 2 credits** | | **13 - 15 weeks** | |

**Diet planning in**

1. Typhoid
2. Tuberculosis
3. GI condition – peptic ulcer, lactose and gluten intolerance
4. Overweight
5. Underweight
6. Cirrhosis
7. Hepatitis

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Internal Assessment | 25 |
| Summative Assessment (ESE) | 25 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| References: | |
|---|---|
| 1. | Krause MV and Mahan, Food (2008), Nutrition And Diet Therapy, WS Saunders Co.,12th edition |
| 2. | Antia, F.P. (2005): Clinical Nutrition and Dietetics, Oxford University Press, Delhi |
| 3. | Robinson,C.H;Lawler,M.R.Chenoweth,W.L;and Garwick,A.E (1986):Normal and Therapeutic Nutrition,17th Ed., Mac Millan Publishing Co |
| 4. | Shills ME and Shike M (2006), Modern Nutrition in Health and Disease, 10th edition, Lippincott Williams and Wilkins |

**Date** **Course Coordinator** **Subject Committee Chairperson**

Government of Karnataka

# Model Curriculum

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Nutrition & Dietetics** | | Semester | **Fifth Sem** |
| Course Title | **Food Microbiology (Theory)** | | | |
| Course No. | **ND T C 5.2** | **DSC 6** | No. of Credits | **4+2** |
| Contact hours | **60 Hrs** | | Duration of SEA/Exam | **2.5 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Outcomes (COs): At the end of the course the student should be able to**

1. Understand about the origin of microbiology and characteristics of microorganisms.
2. Gain knowledge on factors affecting growth and death of microorganisms
3. Learn about microbial food spoilage and food-borne illnesses
4. Acquire knowledge on the role of food microbiology in biotechnology

| **Content** | **60 Hrs** |
|---|---|
| **Unit – 1 Introduction to Microbiology** | **15 Hrs** |
| **Chapter No. 1:**<br>Scope of Microbiology, Food Microbiology: its origins - historical roots (in brief), Germ theory of Disease. | **5 Hrs** |
| **Chapter No. 2:**<br>Naming, Classification and identification, morphological characteristics of Bacteria, Fungi and viruses. | **5 Hrs** |
| **Chapter No. 3:**<br>Growth and cell division, Bacterial Growth, Culturing bacteria- (Methods of obtaining pure cultures, culture media, maintaining cultures). | **5 Hrs** |
| **Unit – 2: Factors affecting microbial growth and death** | **15 Hrs** |
| **Chapter No. 4:**<br>Factors affecting the growth of micro-organisms- temperature, water activity, pH, oxygen, redox and nutritional factors; interaction of factors and between organisms. | **5 Hrs** |
| **Chapter No. 5**:<br>Death of micro-organisms and microbial populations-<br>a) Heat, preservation of foods (Appertization, Pasteurization). | **10 Hrs** |

| | |
|---|---|
| b) Chemical agents- factors influencing activity of sanitizers, preservatives, Hurdle effect.<br>c) Radiation-preservation,<br>d) High pressure (brief). | |
| **Unit -3: Food Spoilage and Food borne disease** | **15 Hrs** |
| **Chapter No. 7:**<br>Nature, Causes, Contamination, Composition of spoilage, Changes in foods caused by spoilage organisms<br>Spoilage of important food commodities and food products-Meat, Fish, Egg and Milk, Fruits and Vegetables, Cereals.<br>Influence of processing. | **8 Hrs** |
| **Chapter No. 8:**<br>Genetically modified foods<br>Role of Microorganisms in fermented foods- Fermented-baked food preparations, Fermented vegetable foods, soyabean products, dairy products, other meat products, economically important fermentation products (Beer & Wine). | **7 Hrs** |
| **Unit –IV Food Poisoning** | **15 Hrs** |
| Chapter No. 1: Cause of disease, investigations and origins of food poisoning outbreaks, importance of food poisoning to individual and economy, control.<br>Food poisoning bacteria causing:<br>1. Infections- Salmonella, Shigella, E. coli, Vibrio cholerae<br>2. Intoxications- Staphylococcus aureus, Clostridium Botulinum<br>3. Viruses- Hepatitis A<br>. | **10 Hrs** |
| **Chapter No. 2: Chapter No. 6:**<br>Definition of FSSAI, HACCP- A Food Safety Assurance system. | **5 Hrs** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| **Course Outcomes (COs) / Program Outcomes (POs)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Understand about the origin of microbiology and characteristics of microorganisms | | | | | | X | | | | | | |
| Gain knowledge on factors affecting growth and death of microorganisms | | | | | | X | | | | | | |
| Learn about microbial food spoilage and food-borne illnesses | | | | | | X | | | | | | |
| Acquire knowledge on the role of food microbiology in biotechnology | | | | | | X | X | | | | | |

**Pedagogy**

Lecture, demonstration, hands on learning through projects, presentations, case studies, workshops.

**Assessment**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 10 |
| Test 2 | 10 |
| Presentation / Assignment | 10 |
| Project quiz | 10 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Food Microbiology (Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **ND P C 5.2** | Contact Hours: | **52 Hrs** |
| **Practical Topics - 2 credits** | | **13 - 15 weeks** | |

1. Introduction to the microbiology lab
   Safety guidelines, Good microbiological laboratory practice (GMLP), Resources (equipment, apparatus, materials)
2. Microscopy: Using microscope- Compound microscope, Electron microscope.
3. a.-Stained preparations – identification of fungi
   b. Preparing a smear, Simple stain/Differential stain (Gram's staining method)
4. Sterilization, and disinfection- Use of autoclave
5. Spoilage of foods from different food groups – Observation of changes under the microscope, Identification of food spoilage and deterioration under different storage conditions, MPN method (Demonstration)
6. Preparation of fermented products and analyzing microbial load in:
   a. Fermented products- idly/ kimchi/Sauerkraut/fermented rice (pazhaya kanji)

7. Visit to industry to understand – quality operation cycle of commercial kitchen / Milk processing unit / any food industry to understand HACCP
8. Safe food-waste disposal strategies (Case studies)

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Internal Assessment | 25 |
| Summative Assessment (ESE) | 25 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| **References:** | |
|---|---|
| 1. | Norman G. Marriott, (1985) Principles of sanitation, Van Nostrand Reinhold company, Newyork. |
| 2. | Mario Stanga, (2010) Sanitation: Cleaning and Disinfection in the Food Industry, Wiley. |
| 3. | Y. H. Hui, L. Bernard Bruinsma, J. Richard Gorham, Wai-Kit Nip, Phillip S. Tong, Phil Ventresca (2002) Food plant sanitation, CRC Press. |
| 4. | Y. H. Hui, (2014) Plant sanitation for food processing and food service, CRC Press. |
| 5. | Jay, J. M., Loessner, M. J., & Golden, D. A. (2008). Modern food microbiology. Springer Science & Business Media. |
| 6. | Bibek Ray (2014) Fundamental Food Microbiology. CRC press, |

**Date** **Course Coordinator** **Subject Committee Chairpe**

Government of Karnataka

# Model Curriculum

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Nutrition & Dietetics** | | Semester | **Sixth Sem** |
| Course Title | **Clinical Nutrition & Dietetics – II (Theory)** | | | |
| Course No. | **ND T C 6.1** | **DSC 8** | No. of Credits | **4** |
| Contact hours | **60 Hrs** | | Duration of SEA/Exam | **2.5 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Outcomes (COs): At the end of the course the student should be able to**

1. Integrate dietetics and counselling in preventive, promotive and curative health care
2. Understand the clinical condition with relevant data (laboratory, anthropometry, pharmacology)
3. Utilize and demonstrate skills to make appropriate dietary modifications in clinical conditions

| Content | 60 Hrs |
|---|---|
| **Unit – I** | **15 Hrs** |
| **Chapter No. 1:**<br>Nutritional counseling – objectives, importance, process. | **7 Hrs** |
| **Chapter No. 2:**<br>Nutrition support – Enteral and parenteral nutrition overview.<br>Enteral and parenteral nutrition: access routes, formulas, challenges. | **8 Hrs** |
| **Unit – II** | **15 Hrs** |
| **Chapter No. 3:**<br>Diabetes: Classification, Risk factors, Diagnosis, Complications, Dietary management – Type 1 & Type 2. | **7 Hrs** |
| **Chapter No. 4**:<br>Renal: Etiology, Dietary management – Glomerulonephritis, nephrotic syndrome, chronic kidney disease, dialysis, renal calculi. | **8 Hrs** |

| | |
|---|---|
| **Unit -III** | **15 Hrs** |
| **Chapter No. 5:**<br>Starvation, Stress, Trauma.<br>Burns – Assessment, Fluid and electrolyte repletion, nutrition management. | **7 Hrs** |
| **Chapter No. 6**<br><br>Cardiovascular disorder: Atherosclerosis, Dyslipidemia, hypertension – etiology, risk factors, dietary management. | **8 Hrs** |
| **Unit -: IV** | **15 hrs.** |
| **Chapter No. 7:**<br>Nutrient, drug interactions: Effect of drug on food intake; food and nutrient on drugs<br>. | **7Hrs** |
| **Chapter No. 8:**<br>Cancer: Risk factors, prevention, and dietary management | **8 Hrs** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| **Course Outcomes (COs) / Program Outcomes (POs)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Integrate dietetics and counselling in preventive, promotive and curative health care | X | | | | | | X | | | | | |
| Understand the clinical condition with relevant data (laboratory, anthropometry, pharmacology) | | | | | X | | | | | | | |
| Utilise and demonstrate skills to make appropriate dietary modifications in clinical conditions | | X | | | | | | | | | X | |

**Pedagogy**

Lecture, demonstration, hands on learning through projects, experiments, hospital dietary visits, case studies, workshops.

**Assessment**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 10 |
| Test 2 | 10 |

| | |
|---|---|
| Presentation / Assignment | 10 |
| Project quiz | 10 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Clinical Nutrition & Dietetics II (Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **ND P C 6.1** | Contact Hours: | **52 Hrs** |
| **Practical Topics - 2 credits** | | **52 hrs/13 sessions** | |

1. Type 2 Diabetes
2. Type 1 DM (carbohydrate counting)
3. Cancer
4. Chronic kidney disease
5. Renal Calculi
6. Burns
7. Hypertension

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Internal Assessment | 25 |
| Summative Assessment (ESE) | 25 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| **References:** | |
|---|---|
| 1. | Krause MV and Mahan, Food (2008), Nutrition and Diet Therapy, WS Saunders Co.,12th edition |
| 2. | Antia, F.P. (2005): Clinical Nutrition and Dietetics, Oxford University Press, Delhi |
| 3. | Robinson, C.H;Lawler, M.R. Chenoweth, W.L; and Garwick,A.E (1986):Normal and Therapeutic Nutrition,17th Ed., Mac Millan Publishing Co |
| 4. | Shills ME and Shike M, Modern Nutrition in Health and Disease, 10th edition, Lippincott Williams and Wilkins, 2006 |

**Date** **Course Coordinator** **Subject Committee Chairperson**

Government of Karnataka

# Model Curriculum

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Nutrition & Dietetics** | | Semester | **Sixth Sem** |
| Course Title | **Principles and Practices in Public Health Nutrition (Theory)** | | | |
| Course No. | **ND T C 6.3** | **DSC 10** | No. of Credits | **4** |
| Contact hours | **60 Hrs** | | Duration of SEA/Exam | **2.5 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Outcomes (COs): At the end of the course the student should be able to**

1. Understand the definition, utility and applications of epidemiology in nutritional sciences.
2. Understand the multi-faceted nature of problems in public nutrition.
3. Gain understanding about the food and nutrition security in India

| Content | 60 Hrs |
|---|---|
| **Unit – 1 Concept of Public Health and Nutritional Epidemiology** | **15 Hrs** |
| **Chapter No. 1:**<br>Introduction to Nutritional Epidemiology and Public health Nutrition. Scope and principles of public health Nutrition – Definition, aims and objectives. Multidisciplinary nature of public nutrition, Role of public nutritionist. | **6 Hrs** |
| **Chapter No. 2:**<br>National and International agencies in community nutrition- Role of WHO, UNICEF, UNDP, FAO, UNESCO, ILO, WORLD BANK, Red Cross, CARE. | **9 Hrs** |
| **Unit – 2: Nutritional problems and Assessment** | **15 Hrs** |
| **Chapter No. 3:**<br>Etiology, prevalence, clinical features, and preventive strategies of<br>Protein energy malnutrition. Dual Nutrition Burden: i. Under nutrition and Over nutrition<br>Nutritional anemia's, Vitamin A deficiency, Iodine deficiency disorders<br>Obesity, coronary heart disease, Diabetes Mellitus. | **7 Hrs** |
| **Chapter No 4**<br>Assessment of Nutritional Status in community a. Anthropometric Assessment: Measurement of body weight, stature, mid upper arm circumference, standards (NCHS - weight for height, weight for age.<br>Clinical Assessment: clinical signs of nutritional disorders c. Dietary Assessment: Family dietary survey, Assessment of dietary intake of individuals. | **8 Hrs** |

| **Unit -3: Nutrition Security and Education** | **15 Hrs** |
|---|---|
| **Chapter No. 5:**<br>Food and Nutrition Security: Basic concepts & Policies. Overview of the on-going public sector programmes for improving food and nutrition security. Identification and measurement of food insecurity (FIA, ISMAP)Social capital and coping mechanism for food insecurity. | **8 Hrs** |
| **Chapter No. 6:**<br>Objectives, principles and scope of nutrition and health education and promotion<br>Links with health promotion<br>Purpose, advantage and constraints of nutrition education<br>Framework for planning nutrition promotion and education programs for the public<br>Information, education and communication | **7 Hrs** |
| **Unit -IV** | **15 Hrs** |
| **Chapter No. 7:**<br>National Nutrition Policy and Programmes - Integrated Child Development Services (ICDS) Scheme, Midday Meal Programme (MDMP) | **7 Hrs** |
| **Chapter No. 8:**<br><br>National programmes for preventionof Anaemia, Vitamin A deficiency, Iodine Deficiency Disorders National Programme for Prevention and Control of Cancers, Diabetes, Cardiovascular Diseases and | **8 Hrs** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| **Course Outcomes (COs) / Program Outcomes (POs)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Understand the definition, utility and applications of epidemiology in nutritional sciences | X | | | | | X | | | | | | |
| Understand the multi-faceted nature of problems in public nutrition. | | | | | X | | | | | | | |
| Gain understanding about the food and nutrition security in India. | | X | | | | | | X | | | X | |
| Develop and prepare different types of visual aids suitable to community nutrition programmes. | | | | X | | | | | | | | |
| Gain practical experience in imparting the knowledge of nutrition to the community | | | | | | | | | | X | | |

**Pedagogy**

Lecture, demonstration, hands on learning through projects, experiments, field visits, case studies, workshops.

**Assessment**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 10 |
| Test 2 | 10 |
| Presentation / Assignment | 10 |
| Project quiz | 10 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Principles and Practices in Public Health Nutrition** **(Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **ND P C 6.3** | Contact Hours: | **52 Hrs** |
| **Practical Topics - 2 credits** | | **13 weeks** | |

1. Preparation of audio-visual aid for
   a. PEM
   b. Vitamin A deficiency
   c. Anemia
2. Preparation of a low-cost recipes for PEM, Vitamin A deficiency and Anemia
3. Anthropometric and dietary assessment
4. Organize and conduct a nutrition awareness program on Anemia/ Vitamin A

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Internal Assessment | 25 |
| Summative Assessment (ESE) | 25 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| References: | |
|---|---|
| **1.** | Sheila ChanderVir (2011). Public Health Nutrition in developing countries – part I and II, Woodhead Publishing India, Pvt Ltd |
| **2.** | Nutrition in Public Health - A handbook for developing programmes and services.3rd edition, Sari Edelstein, Jones and Bartlett learning, 2011 |
| **3.** | Nutrition Epidemiology- An Introduction |
| **4.** | Wadhava, A. and Sharma, S. (2003). Nutrition in community. New Delhi : Elite publication house pvt. Ltd |
| **5.** | Annual reports – Dept. of agriculture and co-operation –Ministry of agriculture, Govt of India |
| **6.** | Gopaldas, J. and Seshadri, S.(1987). Nutrition monitoring and assessment. New Delhi: Oxford University Press. |
| **7.** | Park, J.E. and Park, K. (1997). Text book of preventive and social medicine (15thed.). Jabalpur: Banarasidas Bhanot. |
| **8.** | Samanta, R. K. (1991). Manual on instructional aids for teachingexcellence. New Delhi: Mittal Publications |
| **9.** | Shukla, P.K. (1982). Nutritional problems of India. New Delhi: PrenticeHall India Pvt. Ltd |
| **10.** | Bamji MS, Krishnaswamy K and Brahmam GNV (Eds) (2016). Textbook of Human Nutrition, 4 thedition. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi, Chapter 34, pg 563 – 575 |

**Date** **Course Coordinator** **Subject Committee Chairperso**

# Curriculum

# of

# B.Sc.

# in

# Clinical Nutrition and Dietetics

# 5th and 6th Semester

**KARNATAKA STATE HIGHER EDUCATION COUNCIL**

## Sub-committee members of B.Sc. Clinical Nutrition and Dietetics

| | |
|---|---|
| 1. | Dr. M. Anuradha Convenor<br>Principal, Padmashri Group of Institutions |
| 2. | Dr. Usha Devi. C -Principal<br>Maharani Cluster University |
| 3. | Dr. Navaneetha.R<br>Maharani Cluster University |
| 4. | Dr. Neetha Pattan<br>Maharani Cluster University |
| 5. | Dr. Bhavana S<br>Padmashri Group of Institutions |
| 6. | Dr. Shilpa P<br>Padmashri Group of Institutions |

# Contents of Courses for B.Sc. Clinical Nutrition and Dietetics as Major Subject
## Model I C

| Semester | Course code. | Course Category | Theory/Practical | Credits | Paper Title | Marks | |
|---|---|---|---|---|---|---|---|
| | | | | | | S. A | I.A |
| 1. | CNDT 1.1 | DSC- 1 | Theory | 3 | Fundamentals of Nutrition | 60 | 40 |
| | CNDP 1.1 | DSC- 2 | Practical | 2 | Fundamentals of Nutrition | 25 | 25 |
| | CNDT 1.2 | DSC- 3 | Theory | 3 | Essentials of Macronutrients | 60 | 40 |
| | CNDP 1.2 | DSC- 4 | Practical | 2 | Essentials of Macronutrients | 25 | 25 |
| | CNDT 1.3 | DSC- 5 | Theory | 3 | Food Sanitation and Hygiene | 60 | 40 |
| | CNDT 1.4 | OE - 1 | Theory | 3 | Fundamentals of Food and Health/Health lifestyle and Nutrition | 60 | 40 |
| 2. | CNDT 2.1 | DSC - 6 | Theory | 3 | Human Physiology | 60 | 40 |
| | CNDP 2.1 | DSC - 7 | Practical | 2 | Human Physiology | 25 | 25 |
| | CNDT 2.2 | DSC- 8 | Theory | 3 | Essentials of Micronutrients | 60 | 40 |
| | CNDP 2.2 | DSC - 9 | Practical | 2 | Essentials of Micronutrients | 25 | 25 |
| | CNDT 2.3 | DSC- 10 | Theory | 3 | Food Safety and Security | 60 | 40 |
| | CNDT 2.4 | OE- 2 | Theory | 3 | Food safety and Hygiene /Food Adulteration | 60 | 40 |
| Exit option with Certificate | | | | | | | |
| 3. | CNDT 3.1 | DSC- 11 | Theory | 3 | Life Cycle Nutrition | 60 | 40 |
| | CNDP 3.1 | DSC - 12 | Practical | 2 | Life Cycle Nutrition | 25 | 25 |
| | CNDT 3.2 | DSC- 13 | Theory | 3 | Dietetics I | 60 | 40 |
| | CNDT 3.2 | DSC - 14 | Practical | 2 | Dietetics I | 25 | 25 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | CNDT 3.3 | DSC- 15 | Theory | 3 | Nutritional Biochemistry | 60 | 40 |
| | CNDT 3.4 | OE- 3 | Theory | 3 | Nutritional Assessment/Traditional Foods in Health | 60 | 40 |
| 4. | CNDT 4.1 | DSC- 16 | Theory | 3 | Dietetics II | 60 | 40 |
| | CNDP 4.1 | DSC- 17 | Practical | 2 | Dietetics II | 25 | 25 |
| | CNDT 4.2 | DSC- 18 | Theory | 3 | Community Nutrition | 60 | 40 |
| | CNDP 4.2 | DSC- 19 | Practical | 2 | Community Nutrition | 25 | 25 |
| | CNDT 4.3 | DSC- 20 | Theory | 3 | Nutrition in Physical Fitness | 60 | 40 |
| | CNDT 4.4 | OE- 4 | Theory | 3 | Nutrition in Weight Management / Diet in Lifestyle Disorders | 60 | 40 |
| | Exit Option with Diploma | | | | | | |
| 5 | CNDT 5.1 | DSC- C21 | Theory | 4 | Dietetics III | 60 | 40 |
| | CNDP 5.1 | DSC- C22 | Practical | 2 | Dietetics III | 25 | 25 |
| | CNDT 5.2 | DSC- C23 | Theory | 4 | Food Science | 60 | 40 |
| | CNDP 5.2 | DSC- C24 | Practical | 2 | Food Science | 25 | 25 |
| | CNDT 5.3 | DSC- C25 | Theory | 4 | Physiologic and metabolic changes in disease | 60 | 40 |
| | CNDT 5.5 | DSE- E1 | Theory | 3 | Nutrigenomics & Nutraceuticals / Geriatric nutrition | 60 | 40 |
| | CNDT 5.4 | VOC - 1 | Theory | 2 | Ayurveda Ahara and Poshan Sahayak / Diet counselling | 60 | |
| | | | Practical | 1 | | | 40 |
| 6. | CNDT 6.1 | DSC- C26 | Theory | 4 | Dietetics IV | 60 | 40 |
| | CNDP 6.1 | DSC- C27 | Practical | 2 | Dietetics IV | 25 | 25 |
| | CNDT 6.2 | DSC- C28 | Theory | 4 | Food Microbiology and functional foods | 60 | 40 |
| | CNDP 6.2 | DSC- C29 | Practical | 2 | Food Microbiology and Functional Foods | 25 | 25 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | CNDT 6.3 | DSC- C30 | Theory | 4 | Food service management | 60 | 40 |
| | CNDT 6.4 | DSE- E2 | Theory | 3 | Information Education Communication (IEC)/ Food entrepreneurship | 60 | 40 |
| | CNDT 6.5 | VOC - 2 | Theory | 2 | Nutrition counseling / Diabetes management | 60 | |
| | | | Practical | 1 | | | 40 |
| Exit Option with Bachelor of Science in Clinical Nutrition and Dietetics | | | | | | | |

**Government of Karnataka**

**Model Curriculum**

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | Semester | **Fifth Sem** |
| Course Title | **Dietetics III (Theory)** | | | |
| Course No. | CNDT 5.1 | **DSC- C21** | No. of Credits | **4+2** |
| Contact hours | **60 Hrs** | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Pre-requisite(s): Certificate with minimum 45%.**

**Course Outcomes (COs): At the end of the course the student should be able to**

1. Gain a solid understanding of the principles of nutrition during diseased condition
2. Knowledge of medical nutrition therapy for various health conditions such as Liver disorders, gastrointestinal disorders, and renal disease, as well as strategies to create tailored meal plans to meet individual health needs.
3. Learn about the dietary management of genetic disorders
4. Seek knowledge on food allergies and their dietary management

| **Content** | **60 Hrs** |
|---|---|
| ***Unit-I*** | 20 hours |
| • Liver disorders<br>- Etiology, types, symptoms, dietary management of Non-alcoholic fatty liver disease, Jaundice, viral hepatitis and cirrhosis<br>• Gall bladder disorders<br>- Etiology, types, symptoms, dietary management of Cholecystitis, Choledocholithiasis, and Cholelithiasis. Biliary dyskinesia, Sclerosing cholangitis<br>• Pancreatic disorders<br>- Etiology, types, symptoms, dietary management of acute and chronic pancreatitis, Cystic fibrosis. | |

| ***Unit- II*** | 15 hours |
|---|---|
| • Renal disorders<br>- Etiology, symptoms, dietary management<br>• Chronic Kidney Disease(CKD)<br>• Glomerulonephritis<br>• Nephrosis | |

| | |
|---|---|
| nic) | |
| ***Unit- III*** | 15hours |
| •Genetic disorders<br><br>Introduction to inborn errors of metabolism, common disorders (phenylketonuria, galactosemia, fructosuria, maple syrup urine disease), Understanding metabolic pathways and their disruption, and Dietary management. Genetic Disorders Affecting Nutrient Digestion and Absorption- Cystic fibrosis and pancreatic insufficiency, Celiac disease and gluten-related disorders, Lactose intolerance and other carbohydrate malabsorption disorders, Dietary modifications and enzyme replacement therapy.<br><br>•Rheumatic Disease-Osteoarthritis, Rheumatoid arthritis, Gout - Etiology, symptoms, dietary management, lifestyle modification | |
| Unit IV | 10 hours |
| • Food Allergy<br>Introduction to Food Allergy and Food Intolerance Immunology and Pathophysiology of Food Allergy, Common Food Allergens Diagnosis of Food Allergies and Intolerances, Management and Treatment of Food Allergies, Food sensitivity: Food sensitivity: Types of reactions, Foods involved in sensitivity, Difference between food allergy and food intolerance, Food Intolerances and Sensitivities. Lactose intolerance, gluten sensitivity, and other common intolerances, Mechanisms and symptoms, Diagnosis and management strategies, Special Considerations and Dietary Planning<br>✓ •Nutrient and Drug interactions: Effect of drug on food intake, digestion, absorption, transportation and excretion | |

**Pedogogy**

| **Formative Assessment** | |
|---|---|
| **Assessment Occasion / type** | **Weightage in Marks** |
| Test 1 | 10 |
| Test 2 | 10 |
| Assignment + Seminar | 5 + 5 |
| Project | 10 |
| **Total** | **40 marks** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)**

| Course Outcomes (COs) / Program Outcomes (POs) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.Gain a solid understanding of the principles of nutrition during diseased condition | ✓ | ✓ | | | | | | | | | ✓ | | | | |
| 2. Knowledge of medical nutrition therapy for various health conditions such as Liver disorders, gastrointestinal disorders, and renal disease, as well as strategies to create tailored meal plans to meet individual health needs. | ✓ | | | | | | | | | | ✓ | | | | |
| 3.Learn about the dietary management of genetic disorders | ✓ | | | | | | | | | | | | | | ✓ |
| 4. Seek knowledge on food allergies and their dietary management | ✓ | | | | | | | | | | | | | | ✓ |

**Pedagogy - Theory**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Dietetics III (Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **CNDP 5.1** | Contact Hours: | **39hrs/ 13Sessions** |
| **Practical Topics - 2 credits** | | | **13 - 15 weeks** |
| Plan, prepare and evaluate:<br>• A day's diet for Cirrhosis (case profile)<br>• A day's diet for Hepatitis (case profile)<br>• Recipes for cholelithiasis<br>• Recipes for acute pancreatitis<br>• A day's diet for Nephrotic syndrome (case profile)<br>• Prepare a list of low, medium and high Potassium foods<br>• Recipes for PKU (adult)<br>• Recipes for **Osteoarthritis / Rheumatoid arthritis** (case profile)<br>• A day's diet for **Gout** and list of low-purine foods (case profile) | | | |

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment / project | 5 + 5 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| **References:** | |
|---|---|
| 1. | Klaus Kraemer and Peter B. Meier. Nutraceuticals in Health and Disease Prevention, CRC Press, 2001 |
| 2. | Jim Kaput and Raymond L. Rodriguez, Nutritional Genomics: Discovering the Path to Personalized Nutrition, Wiley-Interscience, 1st edition, 2006 |
| 3. | Ann L. Yaktine and Robert Pool, Institute of Medicine (IOM). 2007. Nutrigenomics and beyond: Informing the future. Washington, DC: The National Academies Press, 2007 |
| 4. | Debasis Bagchi, Francis Lau, Manashi Bagchi, Genomics, Proteomics and Metabolomics in Nutraceuticals and Functional Foods, Wiley-Blackwell; 1st edition, 2010. |
| 5. | Journal Nutrients 2012, 4, 1898-1944; Molecular Nutrition Research—The Modern Way Of Performing Nutritional Science. |
| 6. | Journal Nutrients 2013, 5, 32-57; Nutrigenetics and Metabolic Disease: Current Status and Implication for Personalized Nutrition |
| 7. | Lynnette R. Ferguson, Nutrigenomics and Nutrigenetics in Functional Foods and Personalized Nutrition, CRC Press, 1st edition, 2013. |
| 8. | Satinder Kaur Brar, Surinder Kaur, Gurpreet Singh Dhillon, Nutraceuticals and Functional Foods: Natural Remedy, Nova Science Publishers, 2014. |
| 9. | Raffaele De Caterina, J. Alfredo Martinez, Martin Kohlmeier, Principles of nutrigenetics and nutrigenomics, Academic Press, 2020. |
| 10. | Debasis Bagchi, Harry G. Preuss, Anand Swaroop, Nutraceuticals and Functional Foods in Human Health and Disease Prevention, CRC Press, 1st edition, 2021. |

**Date** **Course Coordinator** **Subject Committee Chairperson**

**Government of Karnataka**

**Model Curriculum**

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | Semester | **Fifth Sem** |
| Course Title | **Food Science (Theory)** | | | |
| Course No. | CNDT 5.2 | **DSC- C23** | No. of Credits | **4+2** |
| Contact hours | **60 Hrs** | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Pre-requisite(s): Certificate with minimum 45%.**

**Course Outcomes (COs): At the end of the course the student should be able to**

1. Define the fundamental concepts and principles of food science, including the composition of various food components and their roles in food quality and nutrition.
2. Examine the composition and nutritive value of milk and its products, including their properties and changes during cooking
3. Learn various food processing and preservation methods, including their effects on food quality and shelf life.
4. Analyze factors influencing the shelf life of different food products and recommend techniques to prolong product freshness and quality.

| **Content** | **60 Hrs** |
|---|---|
| ***Unit-I*** | 08 hours |
| **Introduction to food science**<br>Food science: Definition, importance and scope of food science.<br>Sensory evaluation- Factors affecting the acceptability of food, Selection of taste panel, Subjective and objective tests<br>Bound and free water, Colloids, Emulsions-Types and factors affecting stability, pH, Osmosis, Freezing point. | |
| ***Unit- II*** | 22 hours |
| Study of cereals and pulses<br>• Structure and composition of cereals, processing of cereals and pulses<br>• Gelatinization of starch and factors affecting<br>• Role of ingredients in baking, dough formation, factors affecting dough formation and gluten formation<br>• Toxic constituents<br>Fruits and vegetables<br>• Classification and composition<br>• Pigments---classification, Changes during cooking and factors affecting it<br>• Enzymatic browning and prevention<br>Fats and oils<br>• Physical and chemical properties<br>• Rancidity | |

| | |
|---|---|
| • Changes during frying<br>• Factors affecting fat absorption<br>Sugar cookery and leavening agents<br>• Stages of sugar cookery<br>• Crystallization and factors affecting it<br>• Non-enzymatic browning | |
| ***Unit- III*** | **15 hours** |
| Milk and milk products: Composition and Nutritive value of milk, properties of milk, Milk cookery, effect of heat on milk, Nutritional importance of milk, milk products -Non fermented and fermented products- Role of milk in cookery.<br><br>Meat, Fish, poultry and Eggs:<br>Meat: Structure, composition and nutritive value, post-mortem changes in meat, tenderization, curing and sessions. Cooking of meat and changes during cooking, Grades of meat<br>Fish and Poultry: composition and nutritive value, Cooking, Fish products.<br>Egg: Structure and composition, Changes during cooking, Storage, effect of heat on proteins, egg products. | |
| ***Unit- IV*** | **15 hours** |
| Sensory evaluation – selection of panel of judges, preparation of samples, types – f tests, judging and results- Objectives methods, subjective methods.<br><br>Food Preservation and Processing: Studying various food processing techniques and preservation methods to enhance food quality and extend shelf life to maintain nutritional content.<br><br>Food Packaging: Food packaging in preserving food quality, preventing spoilage, and maintaining product integrity during storage and transportation.<br>Shelf life studies: factors that affect the shelf life of different food products and techniques to prolong product freshness and quality | |

**Pedogogy**

| **Formative Assessment** | |
|---|---|
| **Assessment Occasion / type** | **Weightage in Marks** |
| Test 1 | 10 |
| Test 2 | 10 |
| Assignment + Seminar | 5 + 5 |
| Project | 10 |
| **Total** | **40 marks** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)**

| Course Outcomes (COs) / Program Outcomes (POs) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Define the fundamental concepts and principles of food science, including the composition of various food components and their roles in food quality and nutrition. | | ✓ | | | | | ✓ | | | | | | | | |
| Examine the composition and nutritive value of milk and its products, including their properties and changes during cooking | | ✓ | | | | | | | | | | | | | |
| Learn various food processing and preservation methods, including their effects on food quality and shelf life. | | ✓ | | | | | | | | | | | | | |
| Analyze factors influencing the shelf life of different food products and recommend techniques to prolong product freshness and quality. | | ✓ | | ✓ | | | | | | | | | | | |

**Pedagogy - Theory**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Dietetics III (Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **CNDP 5.2** | Contact Hours: | **39hrs /13Sessions** |
| **Practical Topics - 2 credits** | | | **13 - 15 weeks** |
| 1. Methods of Cooking- boiling, broiling, frying, Microwave cooking, Poaching<br>2. Starch Cookery- a) Gelatinization of starch, and Dextrinisation of starch, Glutenisation, Effect of kneading<br>3. Pulse cookery<br>a) Whole grams- effect of soaking and germination.<br>b) Dhals-Effect of acid and alkali on cooking time.<br>4. Fats and Oils - Smoking point of different fats and oils.<br>a. Effect of deep frying at smoking point, below smoking point, above smoking point. | | | |

| | |
|---|---|
| b. Shallow frying- vegetable cutlet d) Deep fat frying-papads<br>5. Milk cookery- Coagulation of milk<br>6. Egg Cookery-.<br>a) Assessing of Egg quality<br>b) boiled eggs (soft and hard), effect of beating on egg preparations<br>c) Prevention of ferrous sulphide formation.<br>7. Stages of sugar cookery<br>8. Vegetables and fruits – Enzymatic browning, preparation of jam, jelly and squash. | |

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment / project | 5 + 5 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| **References:** | |
|---|---|
| 1. | Srilakshmi, B. (2003). Food science. New Age International (P) Ltd, New Delhi, 7th edition, Reprint 2022. |
| 2. | Hardy, Ronald W., and Sadasivam J. Kaushik, eds. Fish nutrition. Academic press, 2021. |
| 3. | Bockisch, Michael, ed. Fats and oils handbook (Nahrungsfette und Öle). Elsevier, 2015. |
| 4. | Duckworth, Ronald Barrett. Fruit and vegetables. Elsevier, 2013. |
| 5. | Potter, Norman N., and Joseph H. Hotchkiss. Food science. Springer Science & Business Media, 2012. |
| 6. | Pomeranz, Yeshajahu. Functional properties of food components. Academic Press, 2012. |
| 7. | Coultate, Tom P. Food: the chemistry of its components. Royal Society of Chemistry, 2009. |
| 8. | Feiner, Gerhard. Meat products handbook: Practical science and technology. Elsevier, 2006. |
| 9. | Stone, Herbert, and Joel L. Sidel. "Introduction to sensory evaluation." Sensory Evaluation Practices (Third Edition). Academic Press, San Diego (2004): 1-19. |
| 10. | Aneja, R. P., B. N. Mathur, R. C. Chandan, and A. K. Banerjee. Technology of indian milk products: handbook on process technology modernization for professionals, entrepreneurs and scientists. Dairy India Yearbook, 2002. |
| 11. | Manay, N. Shakuntala O. Food: facts and principles. New Age International, 2001 |

**Date** **Course Coordinator** **Subject Committee Chairperson**

**Government of Karnataka**

**Model Curriculum**

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | Semester | **Fifth Sem** |
| Course Title | **Physiological and metabolic changes in diseases (Theory)** | | | |
| Course No. | CNDT 5.3 | **DSC- C25** | No. of Credits | **4** |
| Contact hours | **60 Hrs** | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Pre-requisite(s): Certificate with minimum 45%.**

**Course Outcomes (COs): At the end of the course the student should be able to**

1. To understand the pathophysiology of various diseases
2. To study the metabolic and physiologic response of the body during disease.
3. Learn to identify the clinical significance and risk factors associated with the disease.

| **Content** | **60 Hrs** |
|---|---|
| ***Unit-I*** | 12 hours |
| Introduction – Objectives and Scope and importance. Pathophysiology<br>• Infection – Fever and metabolic changes.<br>• Common disorders of Digestive tract and associated glands<br>a) Peptic and Duodenal Ulcers<br>b) Diverticulosis, Diarrhoea, Irritable bowel syndrome, Malabsorption<br>c) Hepatitis, Liver Cirrhosis<br>d) Acute and Chronic Pancreatitis | |
| ***Unit- II* Circulatory system** | 12 hours |
| Pathophysiology of Hypertension, Arterio and Atherosclerosis, Variation of HDL & LDL in blood,<br>Angina pectoris and Myocardial Infarction.<br>• Anaemia – Types and Remedial measures. | |
| ***Unit- III* Excretory system** | 12 hours |
| Pathophysiology of Acute and Chronic Nephritis, Nephrosclerosis, Renal calculi, Renal failure, Chronic kidney disease (CKD), 1-5 stages along with dialysis and transplantation | |
| ***Unit- IV*** | 24 hours |
| Part -A<br>Pathophysiology of Diabetes Mellitus – Types, Causes, Symptoms, Remedial measures, Hypo and hyper Vitaminosis, Endocrine Disorders - Thyroid, Adrenal and Growth hormones, Stress – Physiological effects, Neuro-endocrine control of stress<br>Part -B<br>Malnutrition, under and over nutrition | |

| | |
|---|---|
| Obesity – Types, Causes and risks<br>Cancer biology – Types, Properties of cancer cells, Prevention and Regulation.<br>Inborn errors of Metabolism – AKU, PKU, Cystic fibrosis, Galactosemia, Albinism | |

**Pedogogy**

| **Formative Assessment** | |
|---|---|
| **Assessment Occasion / type** | **Weightage in Marks** |
| Test 1 | 10 |
| Test 2 | 10 |
| Assignment + Seminar | 5 + 5 |
| Project | 10 |
| **Total** | **40 marks** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| **Course Outcomes (COs) / Program Outcomes (POs)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To understand the pathophysiology of various disease | ✓ | | | | | | | | | | ✓ | |
| To study the metabolic and physiologic response of the body during disease. | ✓ | | | | | | | | | | ✓ | |
| Learn to identify the clinical significance and risk factors associated with the disease. | ✓ | | | | | | | | ✓ | | | |

**Pedagogy –** Lecture, demonstration, hands on learning through projects, experiments, hospital dietary visits, case studies, workshops.

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| References: | |
|---|---|
| 1. | Bansal, N., Pasricha, C., Kumari, P., Jangra, S., Kuar, R., & Singh, R. (2023). A comprehensive overview of juvenile idiopathic arthritis: From pathophysiology to management. *Autoimmunity Reviews*, 103337. |
| 2. | |
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| 4. | Abbott, M. B., & Vlasses, C. H. (2011). Nelson textbook of pediatrics. *Jama*, *306*(21), 2387-2388. |
| 5. | . |
| 6. | Mann, D. L. (2011). The emerging role of innate immunity in the heart and vascular system: for whom the cell tolls. *Circulation research*, *108*(9), 1133-1145. |
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| 8. | Pallone, T. L., Yagil, Y. O. R. A. M., & Jamison, R. L. (1989). Effect of small-solute gradients on transcapillary fluid movement in renal inner medulla. *American Journal of Physiology-Renal Physiology*, *257*(4), F547-F553. |
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| 10. | Gan, M. J., Albanese-O'Neill, A., & Haller, M. J. (2012). Type 1 diabetes: current concepts in epidemiology, pathophysiology, clinical care, and research. *Current problems in pediatric and adolescent health care*, *42*(10), 269-291. |
| 11. | Del Chierico, F., Rapini, N., Deodati, A., Matteoli, M. C., Cianfarani, S., & Putignani, L. (2022). Pathophysiology of type 1 diabetes and gut microbiota role. *International Journal of Molecular Sciences*, *23*(23), 14650. |
| 12. | Bezabeh, M., Tesfaye, A., Ergicho, B., Erke, M., Mengistu, S., Bedane, A., & Desta, A. (2004). General pathology. |
| 13. | Bezabeh, M., Tesfaye, A., Ergicho, B., Erke, M., Mengistu, S., Bedane, A., & Desta, A. (2008). Genetics: Principles and Analysis. |

**Date** **Course Coordinator** **Subject Committee Chairperson**

**Government of Karnataka**

**Model Curriculum**

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | Semester | **Fifth Sem** |
| Course Title | Nutrigenomics & Nutraceuticals **(Theory)** | | | |
| Course No. | CNDT 5.5 | **DSE – E1A** | No. of Credits | **3** |
| Contact hours | **45 Hrs** | | Duration of SEA/Exam | **2 Hours 30 mins** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Pre-requisite(s): Certificate with minimum 45%.**

**Course Outcomes (COs): At the end of the course the student should be able to**

1. The course provides an in-depth exploration of the field of nutrigenomics and nutraceuticals, focusing on the intersection of nutrition, genetics, and health.
2. Students will gain knowledge and understanding of how individual genetic variations influence nutrient metabolism and response to specific dietary components.
3. This course provides an overview of nutraceuticals, their role in health promotion, and their impact on various aspects of human health.
4. Students will gain knowledge about different types of nutraceuticals, their mechanisms of action, and their potential applications in preventing and managing chronic diseases.

| **Content** | **45Hrs** |
|---|---|
| ***Unit-I*** | 13 hours |
| Introduction to Nutrigenomics: Definition and scope of nutrigenomics, historical background and development of nutrigenomics, key principles, and concepts in nutrigenomics, significance of nutrigenomics in personalized nutrition<br>Genetic Variation and Nutrient Metabolism: basics of genetics and genetic variations, Single nucleotide polymorphisms (SNPs) and their relevance in Nutrigenomics, genes involved in nutrient metabolism and their variants, impact of genetic variations on nutrient requirements and metabolism | |
| ***Unit- II*** | 17 hours |
| Nutrigenomics and Chronic Diseases: Role of genetics and environmental factors in chronic disease development<br>Obesity and Nutrigenomics: Genetic factors contributing to obesity and body weight regulation, Gene-nutrient interactions influencing energy balance and adipose tissue | |

| | |
|---|---|
| metabolism, Nutrigenomic approaches for personalized weight management and obesity prevention<br>Cardiovascular Diseases and Nutrigenomics: Genetic variants associated with cardiovascular diseases, Impact of dietary components on lipid metabolism and cardiovascular health, Nutrigenomic strategies for managing dyslipidemia and reducing cardiovascular risk<br>Diabetes and Nutrigenomics: Genetic predisposition to type 2 diabetes and insulin resistance, Gene-diet interactions influencing glucose metabolism and pancreatic function, Nutrigenomic interventions for diabetes prevention and management<br>Cancer and Nutrigenomics: Genetic factors contributing to cancer development and progression, Nutrigenomic approaches for cancer prevention and adjuvant therapy, Personalized nutrition strategies for reducing cancer risk based on genetic variations<br>Gut Microbiota: Gut microbiota composition and its relationship with chronic diseases, Influence of dietary factors on gut microbiota-host interactions, Nutrigenomic modulation of gut microbiota for improved health outcomes | |
| ***Unit- III*** | 15hours |
| Nutraceuticals and Health Promotion: Definition and classification of nutraceuticals. Dietary supplements: vitamins, minerals, botanicals, and other bioactive compounds, Fortified foods: enriched and fortified products with added nutrients. Introduction to phytochemicals and their role in human health. Exploration of various phytonutrients – curcumin, resveratrol, quercitin, green tea catechins, polyphenols, phytoestrogens, plant pigments, and their potential health benefits. Traditional herbs, spices, and plant-based remedies with nutraceutical properties<br><br>Overview of the nutraceutical market in India, Regulatory framework and challenges in the Indian context, Opportunities and future prospects for nutraceuticals in the Indian healthcare industry | |

**Pedogogy**

| **Formative Assessment** | |
|---|---|
| **Assessment Occasion / type** | **Weightage in Marks** |
| Test 1 | 10 |
| Test 2 | 10 |
| Assignment + Seminar | 5 + 5 |
| Project | 10 |
| **Total** | **40 marks** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)**

| Course Outcomes (COs) / Program Outcomes (POs) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The course provides an in-depth exploration of the field of nutrigenomics and nutraceuticals, focusing on the intersection of nutrition, genetics, and health. | | | | | | | ✓ | | | | | | | | |
| Students will gain knowledge and understanding of how individual genetic variations influence nutrient metabolism and response to specific dietary components. | | | | | | | ✓ | | | | ✓ | | | | |
| This course provides an overview of nutraceuticals, their role in health promotion, and their impact on various aspects of human health. | | ✓ | | | | | | | | | | | | | |
| Students will gain knowledge about different types of nutraceuticals, their mechanisms of action, and their potential applications in preventing and managing chronic diseases. | | ✓ | | | | | | | | | | | | | |

**Pedagogy - Theory**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| References: | |
|---|---|
| 1. | Klaus Kraemer and Peter B. Meier. Nutraceuticals in Health and Disease Prevention, CRC Press, 2001 |
| 2. | Jim Kaput and Raymond L. Rodriguez, Nutritional Genomics: Discovering the Path to Personalized Nutrition, Wiley-Interscience, 1st edition, 2006 |
| 3. | Ann L. Yaktine and Robert Pool, Institute of Medicine (IOM). 2007. Nutrigenomics and beyond: Informing the future. Washington, DC: The National Academies Press, 2007 |
| 4. | Debasis Bagchi, Francis Lau, Manashi Bagchi, Genomics, Proteomics and Metabolomics in Nutraceuticals and Functional Foods, Wiley-Blackwell; 1st edition, 2010. |
| 5. | Journal Nutrients 2012, 4, 1898-1944; Molecular Nutrition Research—The Modern Way Of Performing Nutritional Science. |
| 6. | Journal Nutrients 2013, 5, 32-57; Nutrigenetics and Metabolic Disease: Current Status and Implication for Personalized Nutrition |
| 7. | Lynnette R. Ferguson, Nutrigenomics and Nutrigenetics in Functional Foods and Personalized Nutrition, CRC Press, 1st edition, 2013. |
| 8. | Satinder Kaur Brar, Surinder Kaur, Gurpreet Singh Dhillon, Nutraceuticals and Functional Foods: Natural Remedy, Nova Science Publishers, 2014. |
| 9. | Raffaele De Caterina, J. Alfredo Martinez, Martin Kohlmeier, Principles of nutrigenetics and nutrigenomics, Academic Press, 2020. |
| 10. | Debasis Bagchi, Harry G. Preuss, Anand Swaroop, Nutraceuticals and Functional Foods in Human Health and Disease Prevention, CRC Press, 1st edition, 2021. |

**Date** **Course Coordinator** **Subject Committee Chairperson**

**Government of Karnataka**

**Model Curriculum**

| | | | | | |
|---|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | | Semester | **Fifth Sem** |
| Course Title | Geriatric Nutrition **(Theory)** | | | | |
| Course No. | CNDT 5.5 | **DSE – E1B** | | No. of Credits | **3** |
| Contact hours | **45 Hrs** | | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | | Summative Assessment Marks | **60** |

**Course Pre-requisite(s): Certificate with minimum 45%.**

**Course Outcomes (COs): At the end of the course the student should be able to**

1. Understand the physiology of aging.
2. Learn the nutrition assessment tools and intervention for nutrient deficiencies.
3. Analyze the chronic diseased conditions and dietary needs.
4. Learn dietary modifications and meal planning for adapting diets.

| **Content** | **45Hrs** |
|---|---|
| ***Unit-I*** | 13 hours |
| Physiological Changes in Aging: Age-Related Physiological Changes and Metabolic alterations. Impact of aging on body composition, metabolic rate, and nutrient metabolism, Body composition change, changes in muscle mass, strength, and functional capacity. Effects of increased body fat and visceral fat on health, Hormonal changes and their influence on metabolism. Effects of aging on basal metabolic rate (BMR) and energy expenditure, changes in nutrient absorption and utilization, gastrointestinal changes and their impact on nutrient absorption, age-related alterations in gastric acid secretion, intestinal absorption, and gut microbiota. Consequences of impaired absorption on nutrient status and overall health | |
| ***Unit- II*** | 17 hours |
| Nutritional Assessment of Older Adults: Introduction to screening tools used in geriatric nutrition assessment (e.g., MNA, MUST, SGA), Application of screening tools in identifying malnutrition risk or existing malnutrition<br>Interpretation of screening results and implications for further assessment and intervention. Methods for assessing dietary intake in older adults (e.g., food diaries, 24-hour recalls, FFQs), Analysis and interpretation of dietary intake data, identifying nutrient deficiencies or excesses in older individuals. | |

| | |
|---|---|
| Evaluating dietary intake and nutritional needs, Overview of dietary guidelines and recommendations specific to older adults. Understanding nutrient requirements and recommended intakes for optimal health. Factors influencing individual nutritional needs in elderly population<br>Nutritional Considerations for Age-Related Conditions: Malnutrition and sarcopenia, Causes, consequences, and prevention strategies, Role of nutrition in managing malnutrition and sarcopenia<br>Chronic Diseases and Nutrition: Nutrition implications for cardiovascular disease, diabetes, osteoporosis, and other common conditions<br>Dietary modifications and therapeutic diets for disease management | |
| ***Unit- III*** | 15hours |
| Nutrition Interventions for Healthy Aging: Concept of Hydration and Fluid Balance in the Elderly, Importance of hydration in older adults, Strategies to maintain proper fluid balance<br><br>Meal Planning and Dietary Modifications: Practical considerations for meal planning and preparation, adapting diets for age-related changes, dietary restrictions, and taste preferences<br><br>Using nutritional assessment results to develop personalized nutrition plans. Adapting diets to address nutrient deficiencies, preferences, and dietary restrictions.<br><br>Promoting Optimal Aging through Nutrition: Nutritional strategies for healthy aging and disease prevention. Role of physical activity and overall lifestyle in promoting well-being | |

**Pedogogy**

| **Formative Assessment** | |
|---|---|
| **Assessment Occasion / type** | **Weightage in Marks** |
| Test 1 | 10 |
| Test 2 | 10 |
| Assignment + Seminar | 5 + 5 |
| Project | 10 |
| **Total** | **40 marks** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)**

| Course Outcomes (COs) / Program Outcomes (POs) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Understand the physiology of aging. | | | ✓ | | | | | | | | | | | | |
| Learn the nutrition assessment tools and intervention for nutrient deficiencies. | | | | | | | ✓ | | ✓ | | | | | | |
| Analyze the chronic diseased conditions and dietary needs. | ✓ | | | | | | | ✓ | | | | | | | |
| Learn dietary modifications and meal planning for adapting diets. | | | | | | | ✓ | ✓ | | | | | | | |

**Pedagogy - Theory**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

**References:**


1. Marie Jaffe, Geriatric Nutrition and Diet Therapy, Skidmore-Roth Pub,1995.
2. John E. Morley, David R. Thomas, Geriatric Nutrition, 1st edition, CRC press, 2007
3. Paola S. Timiras, Physiological Basis of Aging and Geriatrics, 4th edition, CRC press, 2007
4. Dr. Sukhpal Kaur Dr. Jugal Kishore Dr. Amarjeet Singh, Comprehensive Textbook of Elderly Care.1st edition, Century publications, 2014
5. Academy of Nutrition and Dietetics, Nutrition Care of the Older Adult A Handbook for Nutrition Throughout the Continuum of Care, American Dietetic Association, 3rd edition, 2016.
6. Jeffrey B. Halter, Joseph G. Ouslander, Stephanie Studenski, Kevin P. High, Sanjay Asthana, Mar Supiano, Christine S. Ritchie, Kenneth Schmader, Hazzard's Geriatric Medicine and Gerontology. 7t McGraw-Hill Education; 2017


**Date** **Course Coordinator** **Subject Committee Chairperson**

**Government of Karnataka**

**Model Curriculum**

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | Semester | **Fifth Sem** |
| Course Title | **Ayurveda Ahara and Poshan Sahayak (Theory)** | | | |
| Course No. | **CNDT 5.6** | **VOC – 1A** | No. of Credits | **2+1** |
| Contact hours | **30 Hrs** | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

| | |
|---|---|
| **Course Pre-requisite(s): Certificate with minimum 45%.** | |
| **Course Outcomes (COs): At the end of the course the student should be able to**<br>1. Understand the basic principles of Ayurveda<br>2. Learn about the principles of ayurvedic diet & nutrition<br>3. Learn about important medicinal plants and their properties used in ayurveda formulations.<br>4. Understand the concept of preventive healthcare in Ayurveda. | |
| **Content** | **30 Hrs** |
| ***Unit-I*** | **13 hrs** |
| Introduction to Basic principles of Ayurveda and their significance: Basic principles of Ayurveda (Vata, Pitta, Kapha). Origin and philosophy of Ayurveda. Five elements in Ayurveda. Role of the Five Elements in the functioning of the body and the environment. Interplay of the elements in maintaining health and causing imbalances. Body constitutions such as Dosha and Dhatus. Characteristics and functions of each Dosha. Influence of Doshas on physical, mental, and emotional well-being. Understanding the concept of Dhatus (seven bodily tissues). Role and functions of each Dhatu in the body. Relationship between Dhatus and Doshas in maintaining health<br>Basic structure and function of human body (Rachana Sharir and Kriya Sharir): Various body parts. Concept of anatomy (Rachana Sharira). Concept of physiology (Kriya Sharira). Concept of six regions (Shadangatwam) of Sharira. Divisions of Sharira. The concept of homeostais (Dhātusāmya) in Ayurveda. Different diseases, disorders and syndromes associated with various body systems.<br>Dietary and medicinal substances and concepts of health and disorders in Ayurveda: Principles of Ayurvedic diet and nutrition. Concept of Sattvic, Rajasic, and Tamasic foods. Dietary guidelines for balancing Doshas and promoting health. | |

| *Unit- II* | |
|---|---|
| Ayurvedic Medicinal Substances: Overview of herbal medicines in Ayurveda, Classification and properties of medicinal herbs and plants, Ayurveda formulations such as churnas, decoctions, and oils and their therapeutic uses. Various treatment modalities used in Ayurveda, including diet and lifestyle modifications, herbal medicines, Panchakarma (detoxification therapies), and rejuvenation therapies.<br>Importance of Ahara in Health and Disorders: The concept of food (Ahara) in health and ailments. Classification of diet/food articles (Aahara Dravya) and their properties. Importance of wholesome food (Hita Avam), and unwholesome food (Ahita Ahara) based on body type and constitution (Doshika Prakriti). Importance of favourable (Pathya) and unfavourable (Apathya) Ahara in the treatment of diseases. Different Dairy products and their uses in health and disease. Macro and micronutrients along with their functions. Use and importance of water in Ahara. Importance of using oils in Ahara as medicinal therapy. Properties and function of taste (Shadrasa) in Ahara.<br>Prevention and Maintenance of Health in Ayurveda: Principles of preventive healthcare in Ayurveda, including Dinacharya (daily routines), Ritucharya (seasonal regimens), and Swasthavritta (health-promoting practices).<br>Roles and responsibilities of Ayurveda Ahara and Poshana Sahayak. Scope of practice of Ayurveda Ahara and Poshana Sahayak. | |

**Pedogogy**

| **Formative Assessment** | |
|---|---|
| **Assessment Occasion / type** | **Weightage in Marks** |
| Test 1 | 10 |
| Test 2 | 10 |
| Assignment + Seminar | 5 + 5 |
| Project | 10 |
| **Total** | **40 marks** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)**

| Course Outcomes (COs) / Program Outcomes (POs) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Understand the basic principles of Ayurveda | | | ✓ | | | | | | ✓ | | | | | | |
| Learn about the principles of ayurvedic diet & nutrition | | | ✓ | | | | | | ✓ | | | | | | |
| Learn about important medicinal plants and their properties used in ayurveda formulations. | | | ✓ | | | | | | ✓ | | | | | | |
| Understand the concept of preventive healthcare in Ayurveda. | | | ✓ | | | | | | ✓ | | | | | | |

**Pedagogy - Theory**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Dietetics III (Practical)** | Practical Credit | **1** |
|---|---|---|---|
| Course No. | **CNDP 5.6** | Contact Hours: | **15hrs** |
| **Practical Topics – 1 credit** | | | **13 - 15 weeks** |
| 1. Apply the knowledge of Ayurveda to identify the Doshas and Dhatus of the body using charts and models.<br>2. Create a diagrammatic representation depicting the characteristic of Vata, Pitta, and Kapha.<br>3. Apply the knowledge of basic human anatomy to identify different parts of the body using charts and models.<br>4. Demonstrate the process of classifying food items based on their nutritional properties such as protein-rich, carbohydrate-rich, etc.<br>5. Demonstrate the process of preparing a diet plan using dairy products as per the health and ailment. | | | |

| | |
|---|---|
| 6. Demonstrate the method of classifying food items in different categories such as Drinkables (Pan), Eatables (Asana), Chewable (Bhakshya), and Lickable (Lehya) etc.<br>7. Demonstrate usage of the appropriate dietetics-related Ayurveda terminology during role play | |

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment / project | 5 + 5 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| **References:** | |
|---|---|
| 1. | CK Gurung - 2011 - elibrary.tucl.edu.np |
| 2. | Ayurveda and Traditional Chinese Medicine; a comparative overview- B Patwardhan, D Warude, P Pushpangadan and Narendra Bhat. |
| 3. | Fundamentals of Pharmacognosy and Phytotherapy- Third edition - Michael Heinrich, Joanne Barnes, Jose em Prieto Garcia, Simon Gibbons, Elizabeth M Williamson, 2018 |
| 4. | Medicinal plants: chemistry and properties, M Daniel – 2006 |
| 5. | Ayurvedic science of Food and Nutrition – S Rastogi, 2014 |
| 6. | Traditional and Ayurvedic foods of Indian origin – P Sarkar, LK Dh, C Dhumal, SS Panigrahi, 2015 |
| 7. | Diet and nutrition concepts in Ayurveda: Gleaming into Opportunities for evidence based applications in healthcare – Devesh rastogi, Shalini Gupta, Ranjan rastogi & Rajeev Rastogi, 2011 |
| 8. | A literature review on fundamental aspect of Sharir Rachana - BR Pathak, S Mulje, S Bhosale – 2023. |
| 9. | From Ancient Medicine to Modern Medicine: Ayurvedic Concepts of Health and Their Role in Inflammation and Cancer- Prachi Garodia, Haruyo Ichikawa, Nikita Malani, Gautam Sethi, Bharat B. Aggarwal, 2007. |

**Date** **Course Coordinator** **Subject Committee Chairperson**

**Government of Karnataka**

**Model Curriculum**

| | | | | | |
|---|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | | Semester | **Fifth Sem** |
| Course Title | **Diet Counselling (Theory)** | | | | |
| Course No. | **CNDT 5.6** | **VOC – 1B** | | No. of Credits | **3** |
| Contact hours | **30 Hrs** | | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | | Summative Assessment Marks | **60** |

| | |
|---|---|
| **Course Pre-requisite(s): Certificate with minimum 45%.** | |
| **Course Outcomes (COs): At the end of the course the student should be able to**<br>1. Understand the basic concepts of counselling.<br>2. Learn and practice the nutrition care plan.<br>3. Demonstrate different assessment before planning a diet.<br>4. Understand the components of counselling process. | |
| **Content** | **45 Hrs** |
| ***Unit-I*** | **15 hrs** |
| **Basic Concepts of Counselling**<br><br>Definition of counseling, Models for behavioral change, trans-theoretical model of behavior change.<br>Motivational interview: Principles, a motivational intervention model<br>Fundamentals of food behavior. Assessment of readiness to change, Client counselor relationship, Therapeutic counselling<br><br>**Communication skills**<br>Objectives, Verbal, non-verbal communication skills.<br>Skills - Listening, response, action process, sharing response, observing, paraphrasing & reflecting<br>Behaviour change: Counseling skills for resistance behaviour<br>Cultural competence in counseling – ABCDE approach | |
| ***Unit- II*** | **15 hrs** |
| Nutrition Care Plan (NCP)<br>Introduction, Goal setting: Basics, Define goals, Design goals, Design plan of action<br>Dietary assessment-Food Intake data collection, Data analysis, Interpretation,<br>Energy determination-Determination of REE, Physical Activity factor (PA), Determination of Total Energy Expenditure (TEE)<br>Physical Assessment; Healthy Weight standards, Weight for height tables, BMI and Waist circumference<br>Documentation – SOAP format | |
| ***Unit- III*** | **15 hrs** |
| Components of counselling process | |

| | |
|---|---|
| Strategies to promote change-Food management tools, Behaviour change strategy, cognitive restructuring, education during counselling<br>Making behaviour change last-social network, stress management, relapse prevention, counselling evaluation<br>Counseling sessions: Not ready to change, unsure about change, Ready to change, skill development for OARS (open end questions, affirmations, reflective listening, summary statements, three Client rights) | |

**Pedogogy**

| **Formative Assessment** | |
|---|---|
| **Assessment Occasion / type** | **Weightage in Marks** |
| Test 1 | 10 |
| Test 2 | 10 |
| Assignment + Seminar | 5 + 5 |
| Project | 10 |
| **Total** | **40 marks** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)**

| **Course Outcomes (COs) / Program Outcomes (POs)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Understand the basic concepts of counselling. | | | | | | | | | ✓ | | | | | ✓ | |
| Learn and practice the nutrition care plan. | | | | | | | | ✓ | | | | | | ✓ | |
| Demonstrate different assessment before planning a diet. | | | | | | | | | | | ✓ | | | ✓ | |
| Understand the components of counselling process. | | | | | | | | | | | | | | ✓ | |

**Pedagogy - Theory**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| References: | |
|---|---|
| 1. | Counseling psychology- CJ Gelso, EN Williams, 2022 |
| 2. | Ethics in psychotherapy and counseling – KS Pope, MJT Vasquez, 2016 |
| 3. | Fundamentals of foods, nutrition and diet therapy- SR Mudambi, 2007<br>Krause's food and the nutrition care process e-book, LK Mahan, JL Raymond, 2016 |
| 4. | An introduction to counselling – J McLeod, 2013 |
| 5. | The therapeutic relationship- P Clarkson, 2003 |
| 6. | Theories of psychotherapy and counseling- RS Sharaf, 2015 |

**Date** **Course Coordinator** **Subject Committee Chairperson**

Government of Karnataka

# Model Curriculum

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | Semester | **Sixth Sem** |
| Course Title | **Dietetics IV (Theory)** | | | |
| Course No. | **DSC- C27** | **DSC** | No. of Credits | **4** |
| Contact hours | **60 Hrs** | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Outcomes (COs): At the end of the course the student should be able to**

1. To understand the critical cases and its stages.
2. To understand diet management during disease condition.
3. To understand the nutrition requirement in different disease conditions.
4. To learn about Medical Nutrition Therapy in different critical cases.

| Content | 60 Hrs |
|---|---|
| **Unit – 1 Nutrition and Cancer** | |
| Definition of cancer and its global health impact, Role of nutrition in cancer development and progression, Link between diet, lifestyle, and cancer risk. Etiology and causes of cancer development. Types of cancer and their risk factors. Role of genetics, environment, and lifestyle in cancer development. Common symptoms experienced by cancer patients.<br>Impact of cancer and treatment on appetite and dietary intake.<br>Strategies to address complaints related to food intake in cancer patients, Dietary management for cancer patients. Importance of a well-balanced diet in supporting treatment and recovery. Strategies to manage nutrition-related side effects of cancer treatment. Addressing malnutrition and weight loss in cancer patients.<br>Immunonutrients and their role in cancer prevention and treatment. Impact of specific nutrients on the immune system and cancer outcomes. Benefits of immunonutrients in reducing treatment-related side effects. Current research and evidence on immunonutrients in cancer care. | **15 Hrs** |
| **Unit – 2: HIV/AIDS: Introduction to HIV/AIDS** | |
| Definition of HIV/AIDS, Modes of transmission and risk factors stages of HIV infection: acute, chronic, and AIDS. Impact of HIV/AIDS on nutritional status and immune function. Specific nutritional requirements for individuals with HIV/AIDS. Effects of HIV on energy expenditure, nutrient absorption, and metabolism. Nutrient deficiencies commonly associated with HIV/AIDS. Importance of adequate macro- and micronutrient intake for immune support. Dietary challenges and strategies for individuals with HIV/AIDS. | **15 Hrs** |

| | |
|---|---|
| Maintaining a balanced diet and managing nutrition-related side effects of antiretroviral therapy (ART). Nutrition's role in managing opportunistic infections and supporting immune function. Dietary considerations for specific symptoms like diarrhoea, oral thrush, and weight loss.<br>**BURNS:** Definition of burns and their health impact. Classification of burns: first-degree, second-degree, third-degree, and fourth-degree. Causes and risk factors for burns. Physiological response to burns and its impact on nutrition. Dietary needs and challenges during the acute or flow phase of burn injury. Meeting increased energy and protein requirements for wound healing and recovery. Role of hydration and electrolyte balance in burn management. Strategies for oral, enteral, and parenteral nutrition support as needed. Dietary requirements during the anabolic or recovery phase of burn injury. Promoting wound healing, tissue regeneration, and muscle recovery. Importance of adequate protein, carbohydrates, fats, vitamins, and minerals in the healing process.<br>Review of current research and advancements in nutrition and burn management | |
| **Unit -3: General nutrition care in Stress, Infection and Surgery:** | |
| Types of diet orders/prescription-Adequate general (regular) diet; Modified diet<br>Stress-Metabolic changes associated with stress, causative agents of stress, result of acute or prolonged stress, diet changes.<br>Infection- nutritional needs and dietary requirements<br>Surgery and nutritional status:<br>Pre-operative nutrition -objectives and dietary management<br>Post-operative nutrition – points to be considered to promote food intake (spacing meals, creating a pleasant environment, conditions favouring a patient to eat and favouring digestion, promoting adequate fluid intake. Role of Progressive diet); Common complaints of patients associated with food intake and management. | **15 Hrs** |
| **Unit - 4: Nutrition support in critically ill** | |
| Definition of critical illness and its impact on nutritional status**,** Understanding the importance of nutrition support in critically ill patients. Overview of the goals and benefits of providing adequate nutrition during critical illness. Introduction to the different methods of nutrition support. Malnutrition in critically ill patients, assessing nutritional status in critically ill patients. Understanding the impact of critical illness on body composition and metabolic changes. Assessing energy requirements and determining the appropriate route of feeding. Exploring the role of laboratory values in assessing nutritional needs and monitoring nutritional interventions. Enteral nutrition - Definition, patient screening, Indications, and Tube feeding: Nasogastric, Nasoduodenal, Nasojejunal, Types of enteral feeds: natural liquid foods, blenderised diets and elemental diets.<br>Parenteral Nutrition: Definition, composition, Indications, Parenteral routes for nutrition and drug administration, Total Parenteral Nutrition (TPN).<br>Refeeding syndrome- Definition, causes, symptoms.<br>Home care for critically ill and requiring long-term nutrition support, palliative care, rehabilitation diets (stages). | **15 Hrs** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)**

| Course Outcomes (COs) / Program Outcomes (POs) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To understand the critical cases and its stages. | | | | | | | | | | | | | | | ✓ |
| To understand diet management during disease condition. | ✓ | | | | | | | | | | | | | ✓ | ✓ |
| To understand the nutrition requirement in different disease conditions. | | | | | | | | | | | | | | ✓ | ✓ |
| To learn about Medical Nutrition Therapy in different critical cases. | | | | | | | | | | | | | | | ✓ |

**Pedagogy**

Lecture, demonstration, hands on learning through projects, experiments, hospital dietary visits, case studies, workshops.

**Assessment**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Dietetics IV (Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **DSC – C27** | Contact Hours: | **60 Hrs** |
| **Practical Topics - 2 credits** | | **13 - 15 weeks** | |
| Plan, prepare, and evaluate;<br>• A day's diet for Cancer<br>• A day's diet for HIV/AIDS<br>• A day's diet for different stages of burns<br>• Recipes for elderly hospitalized patients (soft diet post-surgery)<br>• Recipes for hospitalized sick children (soft diet post-surgery)<br>• Market survey and listing of commercially available enteral and parenteral formulas | | | |

**Assessment**

| Formative +Summative Assessment = 25+25=50 marks | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Internal Assessment | 25 |
| Summative Assessment (ESE) | 25 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| **References:** | |
|---|---|
| 1 | Nutrition and HIV infection- A Mangili, DH Murman, AM Zampini, 2006 |
| 2 | The ASPEN nutrition support core curriculum, 2007 |
| 3 | Clinical nutrition in practice- N Katsilambros, C Dimosthenopoulos, MD Kontogianni, 2011 |
| 4 | Nutritional therapy in major burns- AF Rousseau, MR Losser, C Ichai, MM Berger - Clinical nutrition, 2013 |
| 5 | Nutrition, metabolism and integrative approaches in cancer survivors- V Sierpina, L Levine, J Mckee, C Campbell, 2015 |
| 6 | The essential burn unit handbook- JJ Roth, W Hughes, 2015 |
| 7 | Krause's food and the nutrition care process – LK Mahan, JL Raymond, 2016 |

**Date** **Course Coordinator** **Subject Committee Chairperson**

Government of Karnataka

# Model Curriculum

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | Semester | **Sixth Sem** |
| Course Title | **Food Microbiology and Functional Foods (Theory)** | | | |
| Course No. | **DSC- C28** | **DSC** | No. of Credits | **4** |
| Contact hours | **60 Hrs** | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Outcomes (COs): At the end of the course the student should be able to**

- To understand the microorganisms in foods and its relation to health.
- To study about contaminated food and infectious diseases.
- To understand the sanitary practices required to prevent food borne diseases.
- To learn about functional foods and their health benefits

| Content | 60 Hrs |
|---|---|
| **Unit – 1 Introduction to Food Microbiology** | |
| Introduction to Food Microbiology, Definition and scope of food microbiology. Microorganisms in the food environment: bacteria, viruses, fungi, and parasites. Factors influencing microbial growth in food. Foodborne illnesses and their impact on public health. Microbial Spoilage of Food: Microbial spoilage: causes, signs, and symptoms. Common spoilage microorganisms in different food groups (e.g., dairy, meat, fruits, vegetables). Factors affecting microbial spoilage and shelf life of food. Preventive measures and control strategies for reducing microbial spoilage. Major foodborne pathogens and their characteristics (e.g., Salmonella, E. coli, Listeria, Campylobacter), Routes of contamination and transmission of foodborne pathogens, Symptoms and health risks associated with foodborne infections, Food safety regulations and preventive measures for controlling foodborne pathogens. | **15 Hrs** |
| **Unit – 2: Food Hygiene and Sanitation Practices** | |
| Importance of food hygiene and sanitation in preventing foodborne illnesses**.** Good Manufacturing Practices (GMP) and Hazard Analysis and Critical Control Points (HACCP) principles**.** Cleaning and sanitizing procedures for food preparation areas and equipment**.** Personal hygiene and employee practices in the food industry**.** Food Safety Management Systems: Introduction to food safety management systems (e.g., ISO 22000, FSSC 22000), | **15 Hrs** |

| | |
|---|---|
| Implementation and maintenance of food safety programs**.** Auditing, monitoring, and verification of food safety practices**.** Role of regulatory agencies in ensuring food safety and compliance. Food regulations and standards related to microbiological criteria. International organizations and agencies involved in food safety regulation. Case studies and real-world examples of foodborne outbreak investigations. | |
| **Unit -3: Functional foods** | |
| Introduction: Definitions: functional food, nutraceutical and food supplements. Significance of functional foods and nutraceuticals in the food and pharma industry.<br>FOSHU (Foods for specified health use) categories of functional ingredients. Food labels and regulations of nutraceuticals and functional foods.<br>Benefits and Active principles of common herbs/ plants (containing beneficial ingredients) used in the field of nutraceuticals – Ginseng, Rosemary, Thyme, Oregano, Sage, Basil, wheat grass, turmeric. | **15 Hrs** |
| **Unit - 4: Prebiotics** | |
| Prebiotics: Definition, sources, Non-digestible/slow digestible carbohydrates: Dietary fibre, Oligosaccharides, sugar alcohols used in food products, resistant starch, Gums.<br>Role of fibre in the diet: Diabetes and Obesity, Constipation and Diverticular disease, Colon cancer, breast cancer.<br>Health benefits of Oligosaccharides: Anti-constipation, Non-carcinogenic, Reduction of serum cholesterol, improved intestinal flora.<br>Probiotics: Definition, sources, Health benefits of Lactic acid bacteria, Bifidobacterium, Saccharomyces Boulardii, Streptococcus thermophiles.<br>Health benefits - natural pigments (chlorophyll, chlorophyllin, carotenoids, anthocyanins), Polyunsaturated fatty acids (Omega 3 and Omega 6), peptides and proteins (Glutamine, L-Arginine), Glycosides, Isoprenoides, Alcohols and Phenols, Lecithin and Choline, Isoflavonoids, phytoestrogens, antioxidants, phytosterols.<br>Vitamins and mineral supplements in health. | **15 Hrs** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)**

| Course Outcomes (COs) / Program Outcomes (POs) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To understand the microorganisms in foods and its relation to health. | | | | ✓ | | | | | | | | | | | |
| To study about contaminated food and infectious diseases. | | | | ✓ | | | | | | | | | | | |
| To understand the sanitary practices required to prevent food borne diseases. | | | | ✓ | | | | | | | | | | | |
| To learn about functional foods and their health benefits. | | ✓ | | | | | | | | | | | | | |

**Pedagogy**

Lecture, demonstration, hands on learning through projects, experiments, hospital dietary visits, case studies, workshops.

**Assessment**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Food Microbiology and Functional Foods (Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **DSC – C29** | Contact Hours: | **60 Hrs** |
| **Practical Topics - 2 credits** | | **13 - 15 weeks** | |
| 1. Quality testing for milk – MBRT, Alcohol, Formalin and Starch test of milk samples and their standard plate count.<br>2. Alkaline phosphatase test to check the efficiency of pasteurization of milk.<br>3. Production, antimicrobial effect and nutritional value of probiotics- yoghurt, kefir and acidophilus milk. | | | |

4. Isolation of any pathogenic bacteria (Staphylococcus or Salmonella) from food products.
5. Isolation of spoilage microorganisms from spoiled vegetables/fruits.
6. Quality testing for milk and milk products.
7. Microbial enumeration of street foods and restaurant foods.
8. Direct count of microbes present in milk by haemocytometer.
9. Physical, chemical and microbial assessment of water and potability test for water.
10. Preparation of a resource file on functional foods
11. Market survey on dietary supplements, probiotics and prebiotics available in the market
12. Planning and preparation of probiotic product.
13. Planning and preparation of nutraceutical product.

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Internal Assessment | 25 |
| Summative Assessment (ESE) | 25 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| References: | |
|---|---|
| 1 | Adams.M.R and Moss.M.O (2000) Food Microbiology, New Age International Ltd. New Delhi. |
| 2 | Benson Harold, J (1990) Microbiological applications, Wn C Brown Publishers, USA. |
| 3 | Bibek Ray (2001).Fundamentals of Food Microbiology.Bibek Ray. 2nd Edition. CRCPress |
| 4 | Bibek Ray and Arun Bhunia (2013).Fundamentals of Food Microbiology. 5thEdition. CRCPress |
| 5 | Collins, C H and Lyne, PM (1976): Microbiological Methods, Butters worth, London |
| 6 | Frazier, WC and Westholf, DC (1988): Fourth Edition, Food Microbiology, McGraw Hill Inc |
| 7 | James M. and Jay J.M (1991) Food Borne Pathogen An illustrated text, Wolfepublications Ltd, England, Jay James, M (1986) : Third Edition, Modern Food Microbiology, Van No strand Reinhold company Inc |
| 8 | Sullia, S.B and Shantharam, S (2017). General Microbiology, 2nd Edition, Oxford and IBH Publishers |
| 9 | Thomas, J Montville and Karl, R Mathews. Food Microbiology- An Introduction, 2nd Edition, ASM PublisherColour in food improving quality – D MacDougall, 2002 |
| 10 | Nutraceuticals- B Lockwood, L Rapport, 2007 |
| 11 | Prescription for Nutritional Healing: A Practical A-to-Z Reference to Drug-Free Remedies Using Vitamins, Minerals, Herbs & Food Supplements" by Phyllis A. Balch and James F. Balch (2010) |
| 12 | Functional foods and Nutraceuticals, modern approach to food science- World Applied Sciences Journal, 2012 |
| 13 | Dietary fiber: sources, properties and relation to health - D Betancur-Ancona, L Chel-Guerrero eBooks, 2013 |
| 14 | Handbook of nutraceuticals and functional foods- REC Wildman, TC Wallace, 2016 |
| 15 | Prebiotics and probiotics - K Venema, AP do Carmo – Wageningen, 2015 |
| 16 | Probiotic dairy products – AY Tamime, LV Thomas, 2018 |
| 17 | Polyunsaturated fatty acids and their health benefits – F Shahidi, P Ambigaipalan, 2018 |
| 18 | The Vitamin Book: The Complete Guide to Vitamins, Minerals, and the Most Effective Herbal Remedies and Dietary Supplements" by Harold M. Silverman (2018) |

**Date** **Course Coordinator** **Subject Committee Chairperson**

Government of Karnataka

# Model Curriculum

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | Semester | **Sixth Sem** |
| Course Title | **Food Service Management (Theory)** | | | |
| Course No. | **DSC- C30** | **DSC** | No. of Credits | **4** |
| Contact hours | **60 Hrs** | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Outcomes (COs): At the end of the course the student should be able to**

- To learn about various institutional food service systems.
- To understand the process of food service systems.
- To learn about costing in food service industry.
- To learn about quality management in food service industry.

| Content | 60 Hrs |
|---|---|
| **Unit – 1** | |
| Evolution of the Food Service Industry: Historical overview of the food service industry. Factors influencing the growth and development of the industry. Evolution of food service establishments and concepts. Types of Food Service: Commercial food service establishments: restaurants, cafes, fast food chains, etc. Non-commercial food service establishments: schools, hospitals, prisons, etc.<br>Characteristics and unique considerations for each type of food service, Similarities and differences in operations, management, and customer expectations. Styles of Food Service: Formal food service: fine dining, upscale establishments. Semi-formal food service: casual dining, family-style restaurants. Informal food service: fast casual, quick-service restaurants. Differentiating factors, ambiance, and customer experiences in each style.<br>Management- Definition, principles, functions.<br>Menu planning and design: considerations, strategies, and techniques, Equipment and technology: selection, maintenance, and utilization, Inventory management: procurement, storage, and stock control. Facility layout and design: optimizing space utilization and workflow Tangible and Intangible tools. | **15 Hrs** |
| **Unit – 2** | |
| Layout of kitchen space-Layout plan, hotel kitchen, college hostel, food service area of a canteen. Facility layout and design: optimizing space utilization and workflow.<br>Equipment and technology: selection, maintenance, and utilization, Catering equipment-classification based on mode of operation. Selection, purchase and storage of food. | **15 Hrs** |

| | |
|---|---|
| Methods of purchasing- open market buying, formal buying, wholesale buying, contract purchase, auction buying.<br>Menu planning-Types of menus, factors affecting menu planning. Hygiene and sanitation: Environmental hygiene and sanitation, hygiene in food handling, personal hygiene, accidents and safety procedures, waste disposal | |
| **Unit -3** | |
| Costing in the Food Service Industry: Introduction to cost concepts and principles, Components of cost: material cost, employee cost, overhead cost. Understanding cost behaviour: fixed, semi-fixed, and variable, concept of break- even and cost benefit ratio; cost control-Food, labour, overhead and hidden cost; Pricing of dishes: Factors influencing menu pricing decisions, Cost-based pricing vs. value-based pricing, Menu engineering and pricing strategies for maximizing profitability, Pricing considerations for different food service segments, Food laws and regulations: Overview of food laws and regulations in the food service industry. Understanding regulatory agencies and their roles (local, national, international). Food safety standards and requirements for food establishments. Compliance with labelling, packaging, and allergen regulations.<br>Compulsory Indian food standards. | **15 Hrs** |
| **Unit - 4** | |
| Concept of Total Quality Management in the food service industry. Definition and principles of Total Quality Management, Understanding the importance of TQM in the food service industry, Key concepts of customer focus, continuous improvement, and employee involvement, Benefits of implementing TQM in food service operations. Quality assurance principles and practices. Overview of quality assurance in the food service industry. Establishing quality standards and specifications for food and service. Implementing quality control measures to ensure adherence to standards.<br>Monitoring and evaluating quality through inspections and audits. Quality Control Measures- Developing standard operating procedures (SOPs) for key processes. Implementing quality control checks at each stage of food production and service. Corrective and preventive actions for non-conformities and deviations. Overview of quality certifications and accreditations in the food service industry (e.g., ISO 9001, HACCP).Understanding the requirements and benefits of certification. Implementing certification processes and documentation. Maintaining compliance and continuous improvement in relation to certifications. | **15 Hrs** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)**

| Course Outcomes (COs) / Program Outcomes (POs) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To learn about various institutional food service systems. | | | | | | | | | | | ✓ | | | | |
| To understand the process of food service systems. | | | | | | | | | | | ✓ | | | | |
| To learn about costing in food service industry. | | | | | | | | | | | ✓ | | | | |
| To learn about quality management in food service industry | | | | | | | | | | | ✓ | | | | |

**Pedagogy**

Lecture, demonstration, hands on learning through projects, experiments, hospital dietary visits, case studies, workshops.

**Assessment**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| **References:** | |
|---|---|
| 1 | Service management and marketing – C Gronroos, 2007 |
| 2 | Foodservice Manual for Health Care Institutions" by Ruby Parker Puckett (2012) |
| 3 | Foodservice Organizations: A Managerial and Systems Approach" by Mary B. Gregoire (2014) |
| 4 | Managing Quality Service In Hospitality: How Organizations Achieve Excellence In The Guest Experience" by Robert C. Ford and Michael C. Sturman (2014) |
| 5 | Introduction to Foodservice" by June Payne-Palacio and Monica Theis (2015) |
| 6 | Foodservice Management: Principles and Practices" by June Payne-Palacio and Monica Theis (2018) |
| 7 | Pricing and revenue optimization- RL Philips, 2021 |

**Date** **Course Coordinator** **Subject Committee Chairperson**

Government of Karnataka

# Model Curriculum

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | Semester | **Sixth Sem** |
| Course Title | **Information and Communication Technology (Theory)** | | | |
| Course No. | **DSE- 2A** | **DSE** | No. of Credits | **3** |
| Contact hours | **45 Hrs** | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Outcomes (COs): At the end of the course the student should be able to**

- To learn importance of ICT in nutrition.
- To learn utilization of social media platform for nutrition communication.
- To learn the importance of AI in nutrition.
- To understand utilization of ICT in diet assessment.

| **Content** | **45 Hrs** |
|---|---|
| **Unit – 1** | |
| ICT- Meaning, Components of ICT, Applications of ICT. Introduction to Information Communication Technology (ICT) in Nutrition. Overview of ICT and its role in the field of nutrition. Benefits and applications of ICT in nutrition research, education, and practice. Data Collection and Analysis Tools Introduction to data collection tools used in nutrition research and practice (e.g., online surveys, mobile data collection).Using software and tools for data entry, cleaning, and analysis. Data visualization techniques for presenting nutrition-related information. Applying statistical software for data analysis and interpretation. Nutrition Education and Counselling Technologies: Using technology for nutrition education and behaviour change interventions. Digital tools for interactive and engaging nutrition education materials. Telehealth and virtual platforms for remote nutrition counselling. Considerations for effective implementation of technology in nutrition education and counselling. | **15 Hrs** |
| **Unit – 2** | |
| Introduction to MS Word, Excel, and PowerPoint. Data Communication: Meaning, Types and Components. Concept of computer networking: Types, Benefits, Teleconferencing, Videoconferencing, and Computer conferencing. Social Media and Online Communication: Utilizing social media platforms for nutrition communication and advocacy. Ethical considerations and guidelines for professional use of social media. Creating and managing online nutrition communities and support groups. Engaging with the public through social networking sites, blogs, podcasts, and other online platforms. | **15 Hrs** |

| | |
|---|---|
| Electronic Health Records and Nutrition Documentation: Introduction to electronic health records (EHR) and nutrition documentation system. Utilizing EHR for nutrition assessment, intervention, and monitoring. Privacy and security considerations in EHR and nutrition documentation. Integrating nutrition data with electronic medical records for comprehensive patient care. | |
| **Unit -3** | |
| ICT in Health sector<br>E health: Meaning, Benefits of e health, ICT applications in Public health Care in India: E health projects: Birth and death registration, online maternal death review monitoring system, National Identification Number (NIN), Self-monitoring healthcare devices.<br>Mobile Health: meaning, Difference between e health and m health, health apps, Healthy you card, 1 mg, mswasthya-CDAC, CycleTel, mDiabetes, Evoz, MAMA, My Fitness Pal, Zoojoo.be. Adverse health consequences of using mobile phones.<br>Overview of Artificial Intelligence (AI) and its applications in the field of nutrition. AI-powered tools and methods for dietary assessment and analysis. Automated food recognition and portion estimation using image recognition and machine learning algorithms. AI-based tools and platforms for delivering nutrition education and information.<br>ICT in Food and Nutrition:<br><br>ICT and food security. Use of ICT for dietary assessment: 24-hour recall, use of a personal digital assistant, digital photography, smart cards. ICT in counselling.. | **15 Hrs** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| **Course Outcomes (COs) / Program Outcomes (POs)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To learn importance of ICT in nutrition | | | | | | | | | ✓ | | | | ✓ | | |
| To learn utilization of social media platform for nutrition communication | | | | | | | | | ✓ | | | | ✓ | | |
| To learn the importance of AI in nutrition | | | | | | | | | ✓ | | | | ✓ | | |
| To understand utilization of ICT in diet assessment | | | | | | | | | ✓ | | ✓ | | ✓ | | |

**Pedagogy**

Lecture, demonstration, hands on learning through projects, experiments, hospital dietary visits, case studies, workshops.

**Assessment**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| **References:** | |
|---|---|
| 1 | Artificial Intelligence: A Modern Approach - Stuart Russell and Peter Norvig (2016) |
| 2 | Digital Communications: Fundamentals and Applications- Bernard Sklar (2016) |
| 3 | Data Communications and Networking - Behrouz A. Forouzan (2017) |
| 4 | Computer Organization and Design: The Hardware/Software Interface - David A. Patterson and John L. Hennessy (2017) |
| 5 | Computer Security: Principles and Practice - William Stallings and Lawrie Brown (2017) |
| 6 | Enterprise Systems for Management -Luvai F. Motiwalla and Jeffrey Thompson (2018) |
| 7 | Information Systems: A Manager's Guide to Harnessing Technology - John Gallaugher (2018) |
| 8 | Information Technology for Management: Digital Strategies for Insight, Action, and Sustainable Performance- Efraim Turban, Linda Volonino, Gregory R. Wood (2020) |
| 9 | Database System Concepts - Abraham Silberschatz, Henry F. Korth, and S. Sudarshan (2020) |
| 10 | Computer Networking: A Top-Down Approach - James F. Kurose and Keith W. Ross (2020) |
| 11 | Information Technology Project Management - Kathy Schwalbe (2021) |

**Date** **Course Coordinator** **Subject Committee Chairperson**

Government of Karnataka

# Model Curriculum

| | | | | |
|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | Semester | **Sixth Sem** |
| Course Title | **Food Entrepreneurship (Theory)** | | | |
| Course No. | **DSE- 2B** | **DSE** | No. of Credits | **3** |
| Contact hours | **45 Hrs** | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | Summative Assessment Marks | **60** |

**Course Outcomes (COs): At the end of the course the student should be able to**

- To enable students to acquire necessary knowledge to become self-employed.
- To understand various dimensions of entrepreneurship.
- To learn about food product development.
- To understand financial management in entrepreneurship.

| **Content** | **45 Hrs** |
|---|---|
| **Unit – 1 Introduction to Food Entrepreneurship** | |
| Understanding Food Entrepreneurship: Definition and scope of food entrepreneurship, Importance of food entrepreneurship in the food industry, Characteristics and skills required to become a successful food entrepreneur.<br>Identifying Food Business Opportunities: Market research and analysis for food business opportunities, Identifying target markets and customer segments, Assessing competition and trends in the food industries, Concept Development, and Business Planning<br>Generating innovative food product ideas: Concept development and refinement, Business planning process for food entrepreneurship.<br>Legal and Regulatory Considerations: Understanding legal requirements and regulations for food businesses, Licensing, permits, and certifications needed for food entrepreneurship, Food safety and quality standards compliance. | **15 Hrs** |
| **Unit – 2 Launching and Managing a Food Business** | |
| Developing a Business Model: Defining the business model for a food venture, Value proposition and competitive advantage, Revenue streams, cost structure, and pricing strategies.<br>Product Development and Production: Product design and development considerations, Sourcing ingredients and raw materials, Food production processes, quality control, and packaging.<br>Marketing and Branding: Creating a unique brand identity for a food business, Marketing strategies and tactics for food entrepreneurship, Building customer relationships and implementing effective marketing campaigns. | **15 Hrs** |

| | |
|---|---|
| Sales and Distribution: Developing sales channels and distribution networks, Sales techniques and strategies for food products, Managing distribution logistics and supply chain for food businesses. | |
| **Unit -3** | |
| Sustainable sourcing and ethical considerations, Waste reduction and environmentally friendly practices, Social responsibility in the food industry, Growth and Scaling Strategies, Scaling up a food business, Franchising and licensing opportunities, Managing growth challenges, and expanding into new markets.<br>Financial management for growth and expansion, Securing investment and financing for food ventures, Exit strategies, and succession planning, Developing entrepreneurial skills, such as creativity, problem-solving, and resilience, Overcoming challenges and managing risk in the food industry, Networking, and building industry connections. | **15 Hrs** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| **Course Outcomes (COs) / Program Outcomes (POs)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To enable students to acquire necessary knowledge to become self-employed | | | | | | | | | | | | | | ✓ | ✓ |
| To understand various dimensions of entrepreneurship | | | | | | | | | | | | | | ✓ | ✓ |
| To learn about food product development | | | | | | | | | | | | | | ✓ | ✓ |
| To understand financial management in entrepreneurship | | | | | | | | | | | | | | | ✓ |

**Pedagogy**

Lecture, demonstration, hands on learning through projects, experiments, hospital dietary visits, case studies, workshops.

**Assessment**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| **References:** | |
|---|---|
| 1 | Entrepreneurship: Theory, process and practices- DF Kuratko, 2016 |
| 2 | Researching entrepreneurship – P Davidsson, 2004 |
| 3 | Innovation and entrepreneurship – P Drucker, 2014 |
| 4 | Concepts in strategic management and business policy – TL Wheelen, 2011 |
| 5 | Quality and safety standards in the food industry, developments and challenges- J Trienekens, P Zuurbier- International Journal of Production Economics, 2008 |
| 6 | Exploring consumer attitude and behavior towards green practices in the lodging industry in India- K Manaktola, V Jauhari, 2007 |

**Date** **Course Coordinator** **Subject Committee Chairperson**

Government of Karnataka

# Model Curriculum

| | | | | | |
|---|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | | Semester | **Sixth Sem** |
| Course Title | **Nutrition Counselling (Theory)** | | | | |
| Course No. | **CNDT 6.5 – VOC2A** | **VOC** | | No. of Credits | **2+1** |
| Contact hours | **30 Hrs** | | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | | Summative Assessment Marks | **60** |

**Course Outcomes (COs): At the end of the course the student should be able to**

- To learn the skills of diet counselling.
- To understand various levels of counselling techniques.
- To learn designing counselling plans.
- To understand nutritional counselling for different conditions.

| Content | 30 Hrs |
|---|---|
| **Unit – 1 Components of nutrition counselling** | |
| Assessment component: Methods of review (verbal and non-verbal techniques).Dietary Data Analysis: Usage of standard cups and measurement, 24 hour dietary recall method, 3 days dietary recall method, Food Frequency Questionnaire (FFQ), Food log.<br>Counselling process: Techniques for obtaining relevant information – General profile, medical history, clinical information, lifestyles, physical activity, stress, nutritional status.<br>Planning component: Designing of counselling plans- goals and objectives, client care plan and designing evaluation instruments.<br>Implementation component: counselling the patient.<br>Evaluation component: Measuring the success of performance of client and evaluating the counselling process, counselling strategies for behaviour modification, the OARS technique. | **15 Hrs** |
| **Unit – 2** | |
| Counselling spectrum: Individual and group counselling.<br>Nutrition counselling for adolescent eating disorder- Anorexia nervosa, Bulimia nervosa, Binge eating disorder. Nutrition counselling for weight management during adulthood- Lifestyle modification strategies. Nutrition Counselling for pregnant women with respect to pre pregnancy, prenatal and ante natal care. Nutrition counselling for mothers on weaning. Nutrition counselling for geriatrics- Definition of ageism, geriatrics. | **15 Hrs** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| Course Outcomes (COs) / Program Outcomes (POs) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To learn the skills of diet counselling | | | | | | | | | | ✓ | | | | ✓ | |
| To understand various levels of counselling techniques | | | | | | | | | | ✓ | | | | ✓ | |
| To learn designing counselling plans | | | | | | | | | | | | | | ✓ | |
| To understand nutritional counselling for different conditions | | | | | | | | | | | | ✓ | | ✓ | |

**Pedagogy**

Lecture, demonstration, hands on learning through projects, experiments, hospital dietary visits, case studies, workshops.

**Assessment**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Nutrition Counseling (Practical)** | Practical Credits | **1** |
|---|---|---|---|
| Course No. | **CNDP 6.5 -1** | Contact Hours: | **60 Hrs** |
| **Practical Topics - 2 credits** | | **13 - 15 weeks** | |

- Preparation of counseling aids for all stages of life (Vulnerable group)
  Complementary feeding
  Child nutrition during preschool and school years.
- Preparation of counseling aids for a given condition
  Adolescence-Importance of breakfast, Importance of five food group
  Pregnanacy
  Lactation

Geriatrics

- Preparation of data sheet, questionnaire, client care plan
- Setting up counseling centre and conducting counseling sessions for obesity, diabetes mellitus, hypertension, CVD and cancer
- Evaluation and report writing.

**Assessment**

| **Formative +Summative Assessment = 25+25=50 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Internal Assessment | 25 |
| Summative Assessment (ESE) | 25 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| **References:** | |
|---|---|
| 1 | Nutrition Counseling and Communication Skills: 1,000 Strategies for Success- Kathleen D. Bauer and Carol Sokolik (2009) |
| 2 | Motivational Interviewing in Nutrition and Fitness - Dawn Clifford and Laura Curtis (2015) |
| 3 | "Nutrition Counseling and Education Skills for Dietetics Professionals" by Betsy Holli, Judith Beto, and Sara Long (2011) |
| 4 | Medical Nutrition Therapy: A Case Study Approach" by Marcia Nahikian Nelms, Sara Long Roth, and Karen Lacey (2012) |
| 5 | Counseling and Therapy Skills - David G. Martin (2014) |
| 6 | Clinical Nutrition Counseling Skills- Susan B. Roberts (2017) |
| 7 | Counseling in Communication Disorders: A Wellness Perspective" by Audrey L. Holland and Ryan L. Nelson (2017) |
| 8 | Nutrition Counseling Skills for the Nutrition Care Process" by Linda Snetselaar and Mark L. Hackett (2018) |
| 9 | "Nutrition Counseling and Education Skill Development" by Kathleen Bauer, Doreen Liou, and Carol Sokolik (2018) |
| 10 | “Motivational Interviewing in Nutrition and Dietetics" by Dawn Clifford and Laura Curtism (2020) |

**Date** **Course Coordinator** **Subject Committee Chairperson**

Government of Karnataka

# Model Curriculum

| | | | | | |
|---|---|---|---|---|---|
| Program Name | **B.Sc. Clinical Nutrition and Dietetics** | | | Semester | **Sixth Sem** |
| Course Title | **Diabetes Management (Theory)** | | | | |
| Course No. | **CNDT 6.5 - VOC2B** | **VOC** | | No. of Credits | **2+1** |
| Contact hours | **45 Hrs** | | | Duration of SEA/Exam | **2.30 Hours** |
| Formative Assessment Marks | **40** | | | Summative Assessment Marks | **60** |

**Course Outcomes (COs): At the end of the course the student should be able to**

- To learn about diabetes and its types.
- To understand management of diabetes.
- To learn dietary management for diabetes conditions.
- To understand complications of diabetes.

| **Content** | **45 Hrs** |
|---|---|
| **Unit – 1** | |
| Understanding Diabetes Mellitus (DM), glucose utilization in the body, Physiology of glucose absorption, insulin and pancreas, blood glucose homeostasis, glucose metabolism. Types of DM -Type I, Type II, Gestational DM. Modifiable and non- modifiable risk factors of Type II DM. Other types of DM. Impaired Glucose tolerance. Etiology of DM, Indian diabetes risk score, Symptoms of DM. Understanding diagnostic tests for DM : urine glucose testing, Commercially available HbA1c meter, urine ketone testing, blood ketone monitoring, Diabetes monitoring: self-monitoring of blood glucose using glucometer, continuous glucose monitoring system. | **15 Hrs** |
| **Unit – 2 Management of DM** | |
| Pharmacological-oral glucose lowering drugs, other agents, Insulin therapy-Types<br>Non pharmacological (lifestyle management)- MNT, Physical activity, weight management<br>MNT -Objectives, principles, assessment prior to MNT.<br>Food and blood sugars-Macro and micronutrients, functional foods in DM.<br>Menu planning, dietary exchanges, healthy eating plate carbohydrate counting, Glycaemic index, Glycaemic load, portion control.<br>Role of Exercise in DM-importance of exercise, types of exercise (Aerobic, resistance, flexibility), blood sugars and exercise.<br>Complications of Diabetes: Acute -hypoglycaemia, diabetic ketoacidosis, hyperglycaemic syndrome. Chronic-Microvascular (Neuropathy, Nephropathy, Retinopathy) and Macro vascular (Cardiovascular, cerebrovascular, peripheral vascular disease). Diabetic Neuropathy and foot care guide for diabetics. | **15 Hrs** |

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)**

| Course Outcomes (COs) / Program Outcomes (POs) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To learn about diabetes and its types | | | | | | | ✓ | ✓ | | | | | | | |
| To understand management of diabetes | | | | | | | | ✓ | | | | | | | |
| To learn dietary management for diabetes conditions | | | | | | | | | | | | | | | ✓ |
| To understand complications of diabetes | ✓ | | | | | | | | | | | | | | |

**Pedagogy**

Lecture, demonstration, hands on learning through projects, experiments, hospital dietary visits, case studies, workshops.

**Assessment**

| **Formative Assessment + Summative assessment = 40+60=100 marks** | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Test 1 | 15 |
| Test 2 | 15 |
| Assignment + Project | 5 + 5 |
| **Summative Assessment** | 60 |
| **Total** | **40 marks + 60 marks = 100 marks** |

| Course Title: | **Diabetes Management (Practical)** | Practical Credits | **2** |
|---|---|---|---|
| Course No. | **CNDP 6.5 -2** | Contact Hours: | **60 Hrs** |
| **Practical Topics - 2 credits** | | **13 - 15 weeks** | |

**Diet in Diabetes management**

- Demonstrate weights and measures of food ingredients of different food groups (raw ingredients and cooked food weight) and learn concept of portion size.
- Use of Food exchange list and carbohydrate count
- Prepare a list Low , Medium and High GI foods from different food groups
- Planning low GI recipes and calculation of glycemic load
- Planning and preparation of day's diet for IDDM (individual case profile)
- Planning and preparation of day's diet for NIDDM (individual case profile)

**Assessment**

| Formative +Summative Assessment = 25+25=50 marks | |
|---|---|
| **Formative Assessment** | **Weightage in Marks** |
| Internal Assessment | 25 |
| Summative Assessment (ESE) | 25 |
| **Total** | **25 marks + 25 marks = 50 marks** |

| **References:** | |
|---|---|
| 1 | Srilakshmi, B. (2014) Dietetics,4th and 7th edition, New Age International Publications, New Delhi |
| 2 | Clinical Dietetics Manual, January 2018 by Indian Dietetic Association (Author) |
| 3 | Diet Metrics: Hand Book of Food Exchanges by Meenakshi Bajaj |
| 4 | Dietary Guidelines For Indians a manual colour full,2nd edition by Dr Laxmaiah |
| 5 | Nutrient Requirements for Indians Recommended Dietary Allowances Estimated Average Requirements - A Report of the Expert Group, 2020 ICMR, NIN , Ministry of Health and Family Welfare |
| 6 | Shubhangini A Joshi (2011) Nutrition and Dietetics, with Indian Case Studies, 3rdedn Tata McGraw Hill Publication, New Delhi |
| 7 | Mahan, L.K. &Ecott-Stump, S. (2000): Krause's Food, Nutrition and Diet Therapy, 12th Edition, W.B. Saunders Ltd |
| 8 | Modern Nutrition in Health and Disease 10th edition by Maurice E. Shils |
| 9 | Alfred H.Katz, Prevention and health, the Haworth, Press, New York 1999 |
| 10 | Textbook of Nutrition and Dietetics by Ranjana Mahna & Seema Puri Kumud Khanna, Sharda Gupta, Santosh Jain Passi, Rama Seth, Elite publishing house, India |
| 11 | International Life Sciences Institute Present Knowledge in Nutrition – latest edition. |
| 12 | Clinical and therapeutic nutrition-IGNOU school of continuing education |
| 13 | Normal and Therapeutic Nutrition September 1990 by Corinne Hogden Robinson , Marilyn Lawler , Macmillan USA |

**Date** **Course Coordinator** **Subject Committee Chairperson**