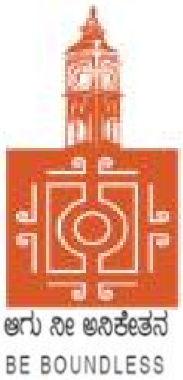

BENGALURU CITY UNIVERSITY

CHOICE BASED CREDIT SYSTEM

(Semester Scheme with Multiple Entry and Exit Options for Under Graduate Course- as per NEP 2020)

Syllabus for Home Science
(III & IV Semester)

2022-23 onwards

Proceedings of the BOS in Home Science (UG& PG) for Bengaluru City University held on 16th September, 2022

A meeting of the BOS in Home Science (UG& PG) for Bengaluru City University held on 16th September, 2022 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 for the meeting:

Name and Designation

1. **Dr Usha Devi. C**
   Chairperson BOS in Home Science (UG, PG & PhD)
   Bengaluru City University (BCU)
   HOD, Dept. of Food and Nutrition & Research Centre,
   Smt. V.H.D Central Institute of Home Science,
   Seshadri Road, Bengaluru – 560 001.

2. **Dr. Vijayalaxmi A.H.M.,**
   Member
   Principal & Associate Professor,
   Department of Human Development and Research Centre,
   Smt. V.H.D Central Institute of Home Science,
   Seshadri Road, Bengaluru – 560 001

3. **Dr. Madhumathy S.,**
   Member
   Associate Professor & HOD,
   Department of Early Childhood Care and Administration,
   Smt. V.H.D Central Institute of Home Science,
   Seshadri Road, Bengaluru – 560 001

4. **Dr. Asha Jyothi U. H.,**
   Member
   Associate Professor & HOD,
   Department of Resource Management,
   Smt. V.H.D Central Institute of Home Science,
   Seshadri Road, Bengaluru – 560 001

5. **Dr. Grace Premela Victor.,**
   Member
   Associate Professor & HOD,
   Bishop Cotton Women's Christian College,
   Field Marshal Kariyappa Road,
   Bengaluru – 560 025

Name and Designation

6. **Dr. Marie Kavitha Jayakaran.,**
   Member
   Associate Professor,
   Bishop Cotton Women's Christian College,
   Field Marshal Kariyappa Road,
   Bengaluru – 560 025

7. **Dr. Shanta Maria B. V.,**
   Member
   Associate Professor,
   Home Science,
   Mount Carmel College (Autonomous),
   No. 58, Palace Road,
   Bengaluru – 560 052

8. **Dr. Sangeeta Pandey.,**
   Member
   Associate Professor & HOD,
   Food and Nutrition,
   Mount Carmel College (Autonomous),
   No. 58, Palace Road,
   Bengaluru – 560 052

9. **Dr. Komala M**
   Member
   Professor,
   Department of Human Development,
   University of Mysore,
   ManasaGangothri, Mysuru – 570 006

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 ND 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 ND course; and PG in Nutrition and Dietetics
- S B A N M College, Yelahanka - BSc CND

1. The Board reviewed the NEP Home Science UG syllabus of third and fourth semester, made the necessary minor changes in the syllabus and approved the same for the academic year 2022-2023 for all the courses

2. The board also reviewed M.Sc., Nutrition and Dietetics syllabus and made the necessary changes in the matrix and the blown up syllabus of III and IV semester and approved the same for academic year 2022-2023
3. The Board also 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. Vijayalaxmi A.H.M.	**Dr. Madhumathy S.**	**Dr. Asha Jyothi U. H.**
Dr. Grace Premela Victor.	**Dr. Mary Kavitha Jayakiran.**	**Dr. Shanta Maria B. V.**
Dr. Sangeta Pandey.	Prof. Komala M.	

Dr. Usha Devi C,
Chairperson

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

THE LIST OF THE MEMBERS OF THE BOARD OF STUDIES – FACULTY OF HOMESCIENCE

DR. USHA DEVI. C

DR.VIJAYLAXMI A.H.M

DR. MADHUMATHY. S

DR. SHANTHA MARIA B.V

DR.GRACE PRAMILA VICTOR

DR.ASHA JYOTHI U.H

DR.SANGEETHA PANDEY

DR. KOMALA . M

DR. MARIE KAVITHA JAYAKARAN

Contents

CURRICULAM

OF

BA/BSc HOMESCIENCE

3rd and 4th semester

MODEL

BENGALURU CITY UNIVERSITY

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

1	Dr. Marie Kavitha
2	Dr. Vijaya U Patil
3	Dr. Manjula G. Kadapatti
4	Mrs. Veena Tirlapur
5	Mrs. Anita Bettaiah
6	Mrs. Shobha .S

Government of Karnataka

Curriculum

Program Name	**B.A/B.Sc. Honours**	Total Credits for the Program	**265 Credits**
Discipline Core	**Home Science**	Starting year of implementation	**2021-22**

Program Outcomes: At the end of the program the student should be able to:

(Refer to literature on outcome-based education (OBE) for details on Program Outcomes)

PO1. Deliver quality tertiary education through learning whiledoing.

PO2. Reflect universal and domain-specific values in Home Science.

PO3. Involve, communicate, and engage keystakeholders.

PO4. Preach and practice change as acontinuum.

PO5. Develop the ability to address the complexities and interface among of self, societal and national priorities.

PO6. Generate multi-skilled leaders with a holistic perspective that cuts across disciplines.

PO7. Instill both generic and subject-specific skills to succeed in the employmentmarket.

PO8. Foster a genre of responsible students with a passion for lifelong learning andentrepreneurship.

PO9. Develop sensitivity, resourcefulness, and competence to render service to families, communities, and the nation atlarge.

PO10. Promote research, innovation, and design (product) development favouring all the disciplines in Home Science.

PO11. Enhance digital literacy and apply them to engage in real time problem solving and ideation related to all fields of Home Science.

PO12. Appreciate and benefit from the symbiotic relationship among the five core disciplines of Home Science – Resource Management, Food Science and Nutrition,

PO13.Textiles and Clothing, Human Development and Family Studies and Extension and Communication

Assessment:

Weightage for assessments (in percentage)

Type of Course	Formative Assessment / IA	Summative Assessment
Theory	**40**	**60**
Practical	**25**	**25**
Projects	-	-
Experiential Learning (Internships etc.)	-	-

Contents of Courses for BA/B.Sc. Home Science as Major Subject

Model II A

Semester	Course Name	Course Category	Theory / Practical	Credits	Paper Title	Marks	
						S. A	I.A
3.	HSCT3.1	DSC- A3	Theory	4	Early Childhood Care and Education	60	40
	HSCP3.1		Practical	2	Early Childhood Care and Education	25	25
	HSCT3.2	OE-3	Theory	3	Fundamentals of Interior Decoration	60	40
4.	HSCT4.1	DSC- A4	Theory	4	Introduction to Textiles	60	40
	HSCP4.1		Practical	2	Introduction to Textiles	25	25
	HSCT4.2	OE-4	Theory	3	FashionDesigning	60	40
Exit Option with Diploma in Home Science (100 Credits)							

Note: In Semester 3 open elective has been changed from Income Generating skills to Fundamentals of Interior Decoration

Government of Karnataka

Curriculum

Program Name	**BA/BSc Home Science**		Semester	**Third Sem**
Course Title	**Early Childhood Care and Education (Theory)**			
Course No.	**HSCT3.1**	**DSC A-3**	No. of Credits	**4+2**
Contact hours	**52Hrs**		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. Explain the importance of early childhood years and significance of intervention programs for early childhooddevelopment.
2. Describe the historical developments – global and Indian including the current programs and policies in ECCE
3. Identify various indigenous (Indian) models of Early Childhood Education and apply it to understand the current early childhood research, theoretical trends, andissues.
4. Analyze curriculum models and pedagogical approaches in early childhoodeducation.
5. Create developmentally appropriate programs for youngchildren.

Content	**52Hrs**
Unit–I Early Childhood Care and Education	**13 Hrs**
Chapter 1 Meaning, Importance and Need for ECCE, Objectives of ECCE.	2 Hrs
Chapter 2- Types of ECCE Programs – Day care, Montessori, Kindergarten, Balwadi, Anganwadi. Mobile Crèche and Play Group	4 Hrs
Chapter 3- Historical overview of Early Childhood Care and Education – Contributions of Western and Indian Educators- Gandhiji, Jijubai Modak, Montessori, Frobel, and John Dewey	5 Hrs
Chapter 4- Policies and Contributions of Agencies to ECCE in India	2 Hrs
Unit -II - Organizational Setup and Material Management	**13 Hrs**
Chapter5: Organizational Setup and Material Management–Place/Building/Space–indoor and outdoor, amenities and facilities for indoor and outdoor, garden, playground ,storage	5 Hrs

Chapter 6: Equipment and Materials required for Play and Learning – Selection and Care of equipment; Equipment needed for Urban and Rural preschools.	4 Hrs
Chapter 7: Curriculum models and Programme Planning – Meaning of curriculum, curriculum models, Programme planning – Principles, Types and Factors influencing Programme planning, Programme evaluation	4 Hrs
Unit -III	**13 Hrs**
Chapter8: ActivitiesforYoungchildreninECCE–Age/Developmentallyappropriateactivities, Art and creative activities, Music and Rhythmic Activities, Mathematic, Language and Communication activities; Nature and ScienceActivities.	5 Hrs
Chapter 9: 3 Rs – Reading readiness, writing readiness and readiness for arithmetic; Literature for Children; Indoor and outdoor Play activities – Role of teacher in planning and implementing the activities.	4 Hrs
Chapter 10: Parent Education and Involvement – Needs and Importance, Methods, Planning, Implementing and Evaluation of parent education program.	4 Hrs
Unit -IV	**13 Hrs**
Chapter 11: Personnel Management – Personnel required in ECCE centre – Selection and recruitment, qualities, roles, duties and responsibilities; Supervision and monitoring, Evaluation of personnel – Cooperation and Coordination of personnel	8Hrs
Chapter 12: Documentation and Financial Management – Importance and Principles of Record keeping, Types of records; Financial allocations and budgetary considerations, budget making and Resource generation avenues	5 Hrs

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

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1 Explain the importance of early childhood years and significance of intervention programs for earlychildhooddevelopment.		X		X	X						X	
2. Describe the historical developments –global and Indian including the current programs and policies in ECCE								X	X		X	
4. Analyze curriculum models and pedagogical approaches in early childhoodeducation.			X	X				X				
5 Create developmentally appropriate programs for young children.			X	X					X			

Pedagogy-Theory

Formative Assessment :40 MARKS	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment / Project	5+5
Total	THEORY 60 MARKS + 40 Marks =100

Course Title	**Early Childhood Care and Education (Practical)**	Practical Credits	**2**
Course No.	**HSCP3.1**	Contact Hours	**52/13 sessions**
List of Experiments to be conducted			
Unit-I: Visit to Nursery School, Day Care/ Crèches, Anganwadi/ Balwadi – Observe the early childhood education programme and write a report			**4 Hrs**
Unit-II: Plan and prepare teaching aids for physical development, storytelling, creative activities, nature, and science activities			**15 Hrs**
Unit-III: a) Develop low cost and indigenous play materials for cognitivedevelopment b) Prepare a Scrap Book/picture book/ resource book fortoddlers			**6 Hrs**

Unit-IV: a) Plan any one theme based and one non-theme-based programs used in the ECE. b) Design a parent handbook/ brochure to provide information about an early childhood education centre or any topic related to early childhood education.	**5 Hrs**

Pedagogy-Practical:

Formative Assessment :25 MARKS	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment / Project	5+5
Total	Exam 25 Marks + IA 25 Marks =50

	References	
	1	Agarwal, J. C. (2007). Early childhood care and education: principles and practices. New Delhi:Shipra
	2	Agarwal,S.P.andUsmani,M.(2000).Children'seducationinIndia:fromVedictimestotwentyfirst centuryNew Delhi:Shipra.
	3	OECD. (2004). Curricula and pedagogies in early childhood education and care. Retrieved from http://www.oecd.org/education/school/31672150.pd
	4	Burtonwood, N. (2002). Anthropology, Sociology and the Preparation of Teachers for a culturallyPlural Society. Pedagogy, Culture and Society. 10(3), 367-387.
	5	Clarke, P. (2001). Teaching &learning: the culture of pedagogy. New York: Sage
	6	Kress, J.S., Norris, J. A., Schoenholz, D. A., Elias, M.J., and Seigle, P. (Nov., 2004). Bringing TogetherEducationalStandardsandSocialandEmotionalLearning:MakingtheCaseforEducators. American Journal of Education, 111 (1), pp66-89
	7	Moyles, J. & Hargreaves, L. (1998). The primary curriculum. Learning from international perspectives. London: Routledge
8	National association for the education of young children, July 1998. Learning to read and Write: developmentally appropriate practices for young children. 53 (4), 30-46.	
9.	NCERT (2007). Handbook of arts in education	
10.	Neuman, S., Dwyer, J. &Koh, S. (2007). Child/Home Enguage and literacy observation. Baltimore:Brookes Publishing House.	

Date Signature of Committee Chairperson

Government of Karnataka

Curriculum

Program Name	**BSc Home Science**		Semester	**Third Sem**
Course Title	**Fundamentals of Interior Decoration (Theory)**			
Course No.	**HSCT3.2**	**OE-3**	No. of Credits	**3**
Contact hours	**45 Hrs**		Duration of SEA/Exam	**2Hours**
Formative Assessment Marks	**40**		Summative Assessment Marks	**60**

Course Pre-requisite(s): Standard 12 and its equivalence with minimum 35%	
Course Outcomes (COs): At the end of the course the student should be able to: 1. Appreciate growth and development of interior design and decoration inIndia 2. Enabling students distinguish between Interior decoration and Interiordesign 3. Analyze place of elements and principles in interiordesigning 4. Use of Accessories ininteriors	
Content	**45 Hrs**
Unit–I Interior Design vs. Interior Decoration	
1.1 Interior Design and Interior Decoration: concept and basicdifferences 1.2 Aims of Interior Design: Beauty, Expressiveness andFunctionalism 1.3 Interior decoration in India:History	5 Hrs
Unit -II - Fundamentals in Designing	
21 Design: Definition and classification, Structural and Decorative design – importance and requirements of good structural design. Classification of decorative design- naturalistic, conventional, geometric, andabstract. 22 Elements of Art- Line- meaning and definition, types; Shape and form; Texture – meaning and classification- tactile and visual textures; Light-types	15 Hrs
2.3 Colour –The Prang Colour System, Dimensions of Colour, Colour schemes (related, contrasting), consideration for the choice of colour in different rooms.	15 Hrs

2.4Principlesofdesign-Balance:meaninganddefinition,classification-Rhythm:meaningand definition, types - Emphasis– meaning and definition, types, and methods of achieving - Proportion: meaning and definition, - Harmony: meaning and definition, methods ofachieving.	
Unit -III Accessories in Interiors	
3.1 Accessories: Definition and importance Classification – functional, decorative andboth 3.2 Selection and placement ofaccessories 3.3 Types ofaccessories	10 Hrs

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

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Know the elements of Art			X		X							
Understand the use of Light in interiors.				X	X							
Acquire skills to formulate colour schemes in interiors.							X	X				
Explore the principles of design							X		X			
Skills in arranging and placement of accessories.					X		X					

Pedagogy

Formative Assessment :40 MARKS	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment / Project	5+5
Total	60 Marks + 40 Marks =100

References	
1	Gandotra, V., Shukul, M., and Jaiswal, N .(2010-11). Introduction to Interior Design & Decoration. New Delhi: Dominant Publishers and Distributors. (ISBN No.81-7888-295-7)
2	Goldstein., and Goldstein, V. (1967).Art in Everyday Life. New Delhi: Oxford and IBH PublishingCo.
3	Kasu, A.A (2005).Interior Design. Delhi: Ashish Book Centre
4	Mullick P,(2016) Text book of Home Science
5	Seetharaman, P., and Pannu, P.(2010). Interior Design and Decoration.NewDelhi : CBS Publishers& Distributors Pvt. Ltd(ISBN No. 81-239-1192-0).
6	Bhatt,P. (2011). Foundation of Art and Design. Mumbai: The Lakhani Book Depot.
7	Gandotra, V. ,Shukul, M., and Jaiswal, N .(201011). Introduction to Interior Design & Decoration

Date: Subject Committee Chairperson

Government of Karnataka

Curriculum

Program Name	**BSc Home Science**		Semester	**Fourth Sem**
Course Title	**Introduction to Textiles (Theory)**			
Course No.	**HSCT4.1**	**DSC A4**	No. of Credits	**4+2**
Contact hours	**52 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 structure and production techniques of various natural and manmade fibers and their physicalproperties. 2. Understand the various conventional and non-conventional techniques of yarnspinning. 3. Demonstrate an understanding of various types of fabric formingmethods. 4. Gain understanding of quality parameters for fiber, yarn andfabrics. 5. To introduce the basic scientific concepts related to processing and production oftextiles.	
Content	**52Hrs**
Unit–I Textile, Yarn and Fabric Construction	**16 Hrs**
Chapter 1 Meaning, Importance and Scope of Textiles, Classification of Natural and Manmade fiber.	2 Hrs
Chapter 2-Properties of Cotton, Silk, Wool, Nylon, Polyester, Classification of Yarns, Yarn Twists and Counts. Manufacturing process of cotton ,silk and nylon.	8 Hrs
Chapter 3- Parts of a Basic Loom – Shuttle, Heddle, Reed, Warp beam & Cloth Beam Basic; Weaving operation – Shedding, Picking, Beating, taking in and Letting off	2 Hrs
Chapter4-BasicWeaves–PlainWeave,BasketWeave,Rib,Twill,Satin,Fancyweaves–Leno, Pile andJacquard.	4 Hrs
Unit -II – Finishing	**12 Hrs**
Chapter 5: Objectives, Classification Finishes - Aesthetic Finishes (Singeing, Bleaching, Mercerization, Tentering, Shrinking, Weighting, Calendaring, Sizing, Embossing and Napping).	7 Hrs

Chapter 6: Finishes for enhancing special character-Functional Finishes (Fireproof, Waterproof, proof, and Mildew proof	5 Hrs
Unit -III Care of Clothing	**6 Hrs**
Chapter 7: Laundering of Cotton, Silk and Wool and Storage	4 Hrs
Chapter 8: Dry Cleaning – Meaning, Methods and Advantages & Disadvantages.	2 Hrs
Unit -IV Processing of Fabric	**18 Hrs**
(a) DYEING **Chapter 9:** Introduction, Principles of dyeing, Methods of dyeing (fiber, yarn, fabric and garment)	5 Hrs
Chapter 10: Synthetic Dyes: (Direct, Azoic, Basic, Vat, Solubilized vat dyes, Sulphur, Acid, Mordant, Reactive and Disperse)	5 Hrs
Chapter 11: Natural Dyes: (Classification, their application and ecological concern)	4 Hrs
(b) PRINTING **Chapter 12:** Introduction to printing and Various methods of Printing-block, roller and screen.	4 Hrs

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

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Understand the structure and production techniques of various natural and manmade fibers and their physical properties.			X	X			X					
Understand the various conventional and non-conventional techniques of yarnspinning.				X				X				
Demonstrate an understanding of various types of fabric forming methods.	X			X				X				
Gain understanding of quality parameters for fiber, yarn, and fabrics.			X	X			X					
To introduce the basic scientific concepts related to processing and production of textiles.			X				X	X				

Pedagogy-Theory

Formative Assessment :40 MARKS	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment / Project	5+5
Total	THEORY 60 MARKS + 40 Marks =100

Course Title	**Introduction to textiles (Practical)**		Practical Credits	**2**
Course No.	**HSCP4.1**	Contact hours	**52 hrs / 13 Sessions**	

List of Experiments to be conducted

1. Fiber IdentificationTest-

A) Visualtest.

B) Solubilitytest.

C) Burning testand

D) Microscopictest

(Cotton, Silk, Wool, Rayon, Polyester & Nylon fibers)

2. Yarn Identification- Single, Ply, Cord, elastic, Monofilament, Multifilament and SpunYarn

3. Identification of fiber, yarn, weave, print &dyeing-samples

4. Weaving- Making samples of thefollowing:

A) Plain- BasketRibbed.

B) Twill

C) Sateen Warp and WeftFace

5. Dyeing & Printing –Block/stencil/tie &dye/batik

6. Visit to spinning/weaving/dyeing/printingunit

Pedagogy-Practical:

Formative Assessment: 25 MARKS	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	10
Test 2	10
Assignment / Project	5/5
Total	Exam 25 Marks + IA 25 Marks =50

References	
1	Hollen and Saddler J (1995): Textiles latest Ed., Mac Millan and Co., New York.
2	Mullick P.,(2012), "Text Book of Home Science "Kalyani Publishers. New Delhi.
3	Potter and Cob man "Fiber to Fabric".
4	Dorothy Burhan "A Textile Terminology"
5	Hert K.P." Textiles fibers and their use", IBH Publishing co.
6	Durga.Deulkar "Household Textiles and Laundry" Bangaram L Sons Delhi.
7	Corbman. B. P (2001): Textile Fiber to Fabric, McGraw Hill, New York
8	Peter. R. Lord, (2003). Handbook of Yarn Production, Wood head Publishing Ltd, England.
9	Kothari, V. K, (2010). Progress in Textile Science, Vol I, II and III, IAFL Publications, New Delhi.
10	Seema Sekhri, (2011). Textbook of Fabric Science, Fundamentals to finishing, PHI Learning Private limited, New Delhi.

Date: Subject Committee Chairperson

Government of Karnataka

Curriculum

Program Name	**BSc Home Science**		Semester	**Fourth Sem**
Course Title	**FASHION DESIGNING (Theory)**			
Course No.	**HSCT4.2**	**OE-4**	No. of Credits	**3**
Contact hours	**45 Hrs**		Duration of SEA/Exam	**2 Hours**
Formative Assessment Marks	**40**		Summative Assessment Marks	**60**

Course Pre-requisite(s): Standard 12 and its equivalence with minimum 35%	
Course Outcomes (COs): At the end of the course the student should be able to: 1. To obtain basic knowledge on Fashion and Fashionterminology 2. To acquire conceptual knowledge of elements and principles ofdesign. 3. To enable students to gain knowledge of design, textile design andfashion. 4. To understand the fashion design concept andprocess. 5. To obtain knowledge on fashiondesigners	
Content	**45 Hrs**
Unit–I- Introduction to Fashion	
1.1 Fashion – Definition, Classification,terminologies, 1.2 Fashion cycle, Factor influencing the fashiontrends, 1.3 Fashion psychology andforecasting	5 Hrs
Unit -II- Elements and Principles of Design	
2.1 Introduction to textile, Textileterminology 2.2 Textile fibres and their classification, physical and chemical properties offibres. 2.3 Elements of Design and colour– Definition, Types, Elements, Principles and its application in dressdesign. 2.4 Selection of suitable clothing and design, factors affecting selection of clothing,Clothing of different agegroups.	25 Hrs

Unit -III- Fashion Design	
3.1 Fashion illustration: - Definition, terminology, importance and theories, tools for fashion drawing, sketching principles, Basic human proportion of male andfemale. 3.2 Illustration for apparels using the themes- Casual, formal, ethnic, office wear, winter, summer, andspring 3.3 Fashion Designer – meaning, classification, Designers of National repute	15 Hrs

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

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Know the Fashion terminology			X		X							
Understand the fashion cycle and factors influencing the fashion trends.				X	X							
Acquire skills in recognizing different fibres.							X	X				
Explore the principles and elements of Art and Design							X		X			
Skills in illustrating apparel using themes.					X		X					

Pedagogy

Formative Assessment : 40 MARKS	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment / Project	5+5
Total	60 Marks + 40 Marks =100

References	
1	Derrick, L. (2018) Fashion Sketchbook: Fashion Sketchbook with figure templates (Fashion Croquis), Create Space Independent Publishing Platform
2	Elaine, S. (2013) The Dynamics of Fashion. 4th Ed. New York: Bloomsbury publication.
3	Patrick, J. I. (2003) Introduction to Fashion Design, London: B.T. Batsford

References	
4	Sharon L. T. and Glazer, S.S. (2017), Illustrating Fashion, 4th Ed. New York: Fairchild Books. The Snap Fashion Sketch Book, Prentice Hall, NewJersey.
5	Stipelman, S. (2017) Illustrating Fashion, 4th Ed. New York: Fairchild Books.
6	Booth,J.E.(1996).PrinciplesofTextileTesting.NewDelhi:CBSPublishers&DistributorsPvt.Ltd.
7	Corbman, P.B. (1983). Textiles: Fibre to Fabric. McGraw-Hill Publishers.
8	Tyagi, A. (2016). Handbook of Fashion and Textile Design.New Delhi: Sonali publication
9	Wynne. A.,(1997).Textiles, The Motivate Series Mcmillain Education Ltd. ,London.

DATE **SIGNATUTRE OF COMMITTEE CHAIRPERSON**

CURRICULAM

OF

BSc -NUTRITION AND DIETETICS

3RD AND 4TH SEMESTER

BENGALURU CITY UNIVERSITY

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

1	Dr. Sangeeta Pandey
2	Dr. Geetha Santhosh
3	Dr. V. Padma
4	Dr Usha Devi C
5	Dr Asha G
6	Mrs Vidhya K

Government of Karnataka

Curriculum

Program Name	**B.Sc. Honours**	Total Credits for the Program	**226 Credits**
Discipline Core	**Nutrition and Dietetics**	Starting year of implementation	**2021-22**

Program Outcomes: At the end of the program the student should be able to:

PO1. Disciplinary Knowledge: Understand the role and importance of food and nutrition for the welfare of the community and acquire the skills in planning diet, health anddiseases

PO2. Communication Skills: Learn and apply evidence-based guidelines in the field of dietetics, nutrition counselling, nutrition research laboratory, community

PO3. Critical thinking: Understand the structure and functions of the different organs systems in relation to nutrition

PO4. Interpersonal and Problem Solving: Design solutions and novel food products to meet the specified nutrient needs with appropriate consideration for the public health and safety.

PO5. Critical thinking, Communication and problem solving: Comprehend, communicate effectively, plan, design and implement programs in the field of nutrition and dietetics

PO6. Decision making, Analytical and Research skills: Understand and demonstrate the knowledge of food science, food science and quality control in societal and environmental contexts

PO7. Moral and ethical awareness/reasoning and Research skills: Apply ethical principles and commit to professionalethicsandresponsibilitiesinthefieldofnutrition,sports,foodindustryandhealthcare sectors.

PO8. Interpersonal and Business skills: Understand the applications of nutraceuticals and functional foods in the product development from conceptualization to evaluation of the quality of the food product

PO9. Analytical and Research skills: Comprehend the knowledge and role of food additives in food industry in relation to its analytical techniques

PO10. Critical thinking, Analysis and Research skills: Understand and apply the concept of nutrients and nutritional science in the evaluation of health and disease

PO11. Goal Setting and Problem-solving skills: Enable students to pursue higher education and research

Assessment:

Weightage for assessments (in percentage)

Type of Course	Formative Assessment / IA	Summative Assessment
Theory	**40**	**60**
Practical	**25**	**25**
Projects	**30**	**70**
Experiential Learning (Internships etc.)	**30**	**70**

Contents of Courses for B.Sc. Degree/ Honours in Nutrition and Dietetics

Model II A

Semester	Course Name	Course Category	Theory / Practical	Credits	Paper Title	Marks	
						S. A	I.A
III	NDT3.1	DSC- 3	Theory	4	Nutrition through life span	60	40
	NDP3.1		Practical	2	Nutrition through life span	25	25
	NDT3.2	OE-3	Theory	3	Nutritional Assessment/ Traditional Foods and Health	60	40
IV	NDT4.1	DSC- 4	Theory	4	Human Physiology	60	40
	NDP4.1		Practical	2	Human Physiology	25	25
	NDT4.2	OE-4	Theory	3	Nutrition in weight management/ Diet in lifestyle disorder	60	40
Exit Option with Diploma in Nutrition and Dietetics (100 Credits)							

Note: The Discipline core paper of 4th semester has been changed to Human Physiology

Government of Karnataka

Curriculum

Program Name	**BSc Nutrition and Dietetics**		Semester	**Third Sem**
Course Title	**Nutrition through life span (Theory)**			
Course No.	**NDT3.1**	**DSC 3**	No. of Credits	**4+2**
Contact hours	**56 Hrs**		Duration of SEA/Exam	**2 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. Gains knowledge and learn to apply the latest in research-based nutrient needs of different lifestages.
2. Relate nutrient needs to developmental stages and plan diets which will adequately meet nutritional requirements.
3. Relate the role of changing metabolism, risk of chronic diseases and impact of functional foods in effectively planning diets foradults.
4. Gains competence on meeting nutrition needs and establishing dietary patterns to promote optimum health and reducing the impact of chronicdiseases.

Content	**56 Hrs**
Unit–I Nutrition during Pregnancy and Lactation	
Pregnancy: Physiological stages of pregnancy b) Effect of Nutritional status on Pregnancy outcome c) Nutritional Requirements d) Guide for eating during pregnancy)Complications of pregnancy and their dietary Implications. **Lactation**: Physiology b) Nutritional Requirements, breast feeding an infant	14 Hrs

utrition during Infancy and Toddlers

a) PhysiologicalDevelopment b) NutritionalRequirements c) Milk for Infants-Composition of human and cow's milk,formulas d) Complimentary foods-weaning pattern, composition, general principles in feeding infants, special feedingproblems **HighRiskInfant**:Assessmentofnutritionalstatus,Nutritionriskfactors,Nutrientneedsofhigh- risk infants, Feeding the high-risk infant. Growth and developmental outcome Nutritional requirements of Toddlers (1-3years)	14 Hrs
Unit -III Nutrition in Childhood and Adolescence	
Nutrition In Childhood Pre-School and School going:a) Growth and Development, b) Nutritional Requirement's, c) Factors influencing food intake, d) NutritionalConcerns. **Adolescence**: a) Growth and Development-Physiologic changes, b) Nutritional Requirements, c) Situations with special needs.	14 Hrs
Unit -IV Nutrition for the Adults and the Elderly	
Nutrition in adults: a) nutrient needs modifications for different activity levels and different income groups. **Nutrient requirements during old Age**: a) Process of Aging, b) Nutrient Requirements, Nutrition Related problems of old Age, Nutrition and Bone health in brief, c) Degenerative diseases, d) Drug-Food and nutrient Reaction.	14 Hrs

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

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
Gainsknowledgeandlearntoapplythelatestinresearch-based nutrient needs of different lifestages.		X										
Relate nutrient needs to developmental stages and plan diets which will adequately meet nutritional requirements.	X											
Relate the role of changing metabolism, risk of chronic diseases and impact of functional foods in effectively planning diets for adults				X								
Gains competence on meeting nutrition needs and establishing dietary patterns to promote optimum health and reducing the impact of chronic diseases.					X					X		

Pedagogy- Lecture, Group discussion, Demonstrations, Hands on training skills

Formative Assessment:	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	10
Test 2	10
Assignment / Project	5+5
Project	10
Total	40 Marks

Course Title	**Nutrition through life span (Practical)**	Practical Credits	**2**
Course No.	**NDP3.1**	Contact hours	**4 Hrs/Week**

List of Experiments to be conducted

1. Planning a day's diet for Pregnant Woman Sedentary, moderate and heavyworker
2. Preparing Complimentary Feeds for Infants-weaning foods (6, 8 month)
   OR
   Preparing Complimentary Feeds for Infants-weaning foods (10, 12 month).
3. Planning and preparation of a day's diet for a pre school going child with special emphasis on Packed Lunches (4-6 yrs)
4. Planning and preparation of a day's diet for a school going child with special emphasis on Packed Lunches (7-9yrs.).
5. Planning and preparation of a day's diet for an adolescent girl (13-15yrs and 16-17yrs).
   OR
   Planning and preparation of a day's diet for an adolescent boy (13-15yrs and 16-17yrs)
6. Planning and preparation of a day's diet for an adult man (sedentary/moderate/ heavyworker)
7. Planning and preparation of a day's diet for an adult woman (sedentary/moderate/ heavyworker)
8. Planning and preparing recipes for a senior citizen:Breakfast/Lunch.
   OR
   Planning and preparing recipes for a senior citizen:Snacks/Dinner

Pedagogy- Lecture, Group discussion, Demonstrations

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	05
Test 2	05
Practical record	10
Participation & Involvement	05
Total	25 Marks

References	
1	Antia, F.P. (2005): Clinical Nutrition and Dietetics, Oxford University Press, Delhi
2	Gordon M Ward law (1999) Perspectives in Nutrition 4th ed.WCB/Mcgraw Hill. International edition.
3	Mahan,L.K.,Arlin,M.T.(2000):Krause'sFood,NutritionandDiettherapy,11th edition, W.B.Saunders Company,London.
4	Passmore, R and Davidson S (1986) Human Nutrition and Dietetics.Living stone Publishers.
5	Robinson,C.H;Lawler,M.R.Chenoweth,W.L;and Garwick,A.E(1986):Normal and Therapeutic Nutrition,17th Ed., Mac Millan PublishingCo
6	Shil's M E, Alfon J A, Shike M (1994) Modern Nutrition In health and Diseases 8th ed.
7	Shubhangini A Joshi (2002): Nutrition and Dietetics2nd edition, Tata Mc Graw-Hill Publishing Company Limited, New Delhi.
8	Srilakshmi,B.(2005):Dietetics,5th edition, New Age International(P) Limited Publishers, New Delhi
9	Vincent Hegarty© (1988, Decissions in Nutrition.Times Mirror/Mosby College Publishing, St.Louis.
10	Williams's (1989): Nutrition and diet Therapy.6th edition. Times Mirror/Mosby College Publishing, St.Louis.
11	Mary Kay Mitchell (2015) Nutrition Across the Life span. Scientific International Pvt ltd,New Delhi

Date: Subject Committee Chairperson

Government of Karnataka

Curriculum

Program Name	**BSc Nutrition and Dietetics**		Semester	**Third Sem**
Course Title	**Traditional Foods & Health (OPEN ELECTIVE) – (Theory)**			
Course No.	**NDT3.2**	**OE 3**	No. of Credits	**3**
Contact hours	**45 Hrs**		Duration of SEA/Exam	**2 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. Developing a sound knowledge on diversities of foods in India with focus on traditionalfoods.
2. Develop an understanding of historical and traditional perspective of foods and foodhabits

Content	**45 Hrs**
Unit–I Introduction to Traditional foods	
Definition of Traditional foods, food as religious and cultural symbols; importance of food in understanding human culture - variability, diversity. Indian traditional foods and cuisine: History and evolution Specialty ingredients in regional cuisines – herbs, extract, spices, masala powders and cooking oils of different regions Geographical Indication (GI) tag for traditional foods Health Aspects of Traditional Foods: Comparisonoftraditionalfoodswithtypicalfastfoods/junkfoods–cost,foodsafety,nutritional facts and benefits; traditional foods used for specific ailments /illnesses, emotionalbenefits.	15 Hrs
Unit -II - Traditional Food Patterns	
Typical breakfast, meal and snack foods of different regions of India. Regional foods that have gone Pan Indian / Global. Popular regional foods; Traditional fermented foods, pickles and preserves, beverages, snacks, desserts and sweets, street foods. Regional cuisines of India- Traditional foods of south Indian, north Indian, west Indian, and east Indian cuisine. Traditional processing methods: sun drying, osmotic drying, brining, pickling, and smoking Adding yoghurt, browning of onions, preparation of curry base, cooking spice paste, natural colorings, dry roasting, spices in oil, ground spices, tempering	15 Hrs

Unit -III Commercial production of Traditional foods	
Processing and manufacture of traditional foods- paneer, butter and ghee manufacture Commercialproductionoftraditionalbreads,snacks,ready-to-eatfoodsandinstantmixes,frozen foods Commercial production and packaging of traditional beverages such as tender coconut water, neera, lassi, buttermilk, dahi. Commercialproductionofintermediatefoods–gingerandgarlicpastes,tamarindpastes,masalas (spice mixes), idli and dosabatters.	15 Hrs

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

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
Developing a sound knowledge on diversities of foods in India with focus on traditional foods	X											
Develop an understanding of historical and traditional perspective of foods and food habits	X											

Pedagogy- Lecture, Group discussion, Demonstrations

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

References	
1	Sen, Colleen Taylor Food Culture in India Greenwood Press, 2005.
2	Davidar, Ruth N. Indian Food Science: A Health and Nutrition Guide to Traditional Recipes: East West Books, 2001
3	WyaneGisslen. Professional Cooking. John Wiley& Sons, New Jersey. 2015. 8th edn
4	Jagmohan Negi. Fundamentals of Culinary Art. S. Chand and Company Pvt. Ltd., New Delhi. 2013.3

5	JagmohanNegi.FoodPresentationTechniques(GarnishingandDecoration).S.ChandandCompany Pvt. Ltd., New Delhi. 2013.4.
6	Eva Medved. Food Preparation and Theory. Prentice-Hall Inc., Englewood Cliffd, New Jersey.1986.
7	Al-Khusaibi, M., Al-Habsi, N., & Rahman, M. S. (Eds.). (2019). Traditional Foods: History, Preparation, Processing and Safety. Springer Nature.
8	Kristbergsson, K., & Oliveira, J. (2016). Traditional Foods: General and Consumer Aspects (Integrating Food Science and Engineering Knowledge Into the Food Chain, 10)(2016 ed.).
9	Galanakis, C. M. (Ed.). (2019). Innovations in traditional foods. Woodhead Publishing.

Date Signature of Chairperson

Government of Karnataka

Curriculum

Program Name	**BSc Nutrition and Dietetics**		Semester	**Fourth Sem**
Course Title	**Human Physiology (Theory)**			
Course No.	**NDT4.1**	**DSC 4**	No. of Credits	**4+2**
Contact hours	**56 Hrs**		Duration of SEA/Exam	**2 Hours**
Formative Assessment Marks	**40**		Summative Assessment Marks	**60**

Objectives

1. To understand the structure and functions of different organsystems
2. To learn about fundamental concepts in pathogenesis of diseases – inflammation
3. To learn measurement and estimation methods for various physiologicalcomponents
4. To build a strong foundation of human physiology which is critical in understanding of nutritional science

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

CO1: Gain knowledge about the cellular components, the role of blood and its components

CO2: Learn about the functions and components of the lymphatic and immune system

CO3: Gather in-depth the physiology of the cardiovascular, nervous, musculoskeletal, respiratory, digestive, reproductive, and endocrine systems

CO4: Understand the concepts involved in pathogenesis of diseases – inflammation

Content	**56 Hrs**
Unit–I Blood, Lymphatic, and Immune System	
Cell structure and function, cell membrane composition, fluid mosaic model, membrane proteins. Blood: Components of blood, functions of plasma proteins, erythropoiesis, coagulation cascade Lymphatic system and spleen Immune system: Innate, acquired, cell mediated and humoral immunity. Role of T and B cells, leukocytes, granulocytes, monocytes, macrophage. Inflammation, pro- and anti-inflammatory cytokines.	12 Hrs

Unit -II - Cardiovascular and Respiratory System	
Heart – cardiac muscle, cardiac cycle, heart rate and regulation, blood pressure-regulation and physiological variations. Respiratory system – Organs and functions, internal and external respiration, regulation, principles of gas exchange. Transport of oxygen and carbon Dioxide. Role of Hb as a buffer system. Cardio-respiratory response to exercise and effects of training.	15 Hrs
Unit -III Gastrointestinal and Renal System	
Digestive system – Organs, structure, layers of GIT, enteric nervous system, role of hormones in gut motility, mechanical and chemical digestion, secretory and absorptive function. Liver – structure, functions, gall bladder. Pancreas – structure, exocrine functions. Renal system – Structure and functions. Regulation of GFR, renal blood flow. Urine formation and regulation, water, electrolyte, and acid base balance	14 Hrs
Unit -IV Musculoskeletal, Nervous, Endocrine and Reproductive System	
Musculoskeletal system – Structure and function of bone, cartilage, and connective tissue; Types of muscles-structure and function. Exercise physiology. Nervous system – Review of structure and function of neuron, conduction of nerve impulse, synapse, organization of CNS. Structure and function of brain and Spinal cord, CSF. Hypothalamus –appetite and sleep regulation. Endocrine system – Functions and regulation of hormone of pituitary, thyroid, adrenal, parathyroid, pancreas (endocrine). Disorders of endocrine glands. Roleofadiposetissueasanendocrineorgan.Reproductivesystem:Maleandfemalereproductive systems – functions. Menstrual cycle	15 Hrs

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

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)										
	1	2	3	4	5	6	7	8	9	10	11
Gain knowledge about the cellular components and role of blood and its components			X								
Learn about the functions and components of the lymphatic an			X								
Gather in depth the physiology of the cardiovascular, nervous, musculoskeletal, respiratory, digestive, reproductive, and endocrine systems			X								
Understand the concepts involved in pathogenesis of diseases – inflammation			X								

Pedagogy-

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

Course Title	**Human Physiology (Practical)**	Practical Credits	**2**
Course No.	**NDP4.1**	Contact hours	**4 Hrs/Week**

List of Experiments to be conducted

1. Microscopic examination of Basic tissues.
2. Estimation ofhaemoglobin -Sahli's Method
3. Interpretation of RBCindices -blood group, RBC count demo
4. Measurement of blood pressure and heartrate and pulse at rest and after exercise.
5. Measurement of respiratory function – spirometer, oxygen saturation (pulseoximeter)
6. Measurement of muscle strength using hand grip dynamometer
7. Body composition measurement for muscle mass (using BIA) and fat mass (using BIA and skinfold callipers)

Pedagogy- Lecture, Group discussion, Presentation and Assignments

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	05
Test 2	05
Practical record	10
Participation & Involvement	05
Total	25 Marks

References	
1	Hall, J. E., Guyton, A. C. (2010). Guyton and Hall Textbook of Medical Physiology E-Book. United Kingdom: Elsevier Health Sciences.
2	Waugh,A.,Grant,A.,Grant,A.W.,Chambers,G.(2006).RossandWilsonAnatomyandPhysiology in Health and Illness. United Kingdom: ChurchillLivingstone.
3	McArdle, W. D., Katch, F. I., Katch, V. L. (2010). Exercise Physiology: Nutrition, Energy, and Human Performance. United Kingdom: Lippincott Williams & Wilkins.
4	Ganong, W. F. (2005). Review of Medical Physiology. United Kingdom: McGraw-Hill Education.
5	Tortora,G.J.,Derrickson,B.(2017).Tortora'sPrinciplesofAnatomyandPhysiology.UnitedStates: Wiley.

Date: Subject Committee Chairperson

Government of Karnataka

Curriculum

Program Name	**BSc Nutrition and Dietetics**		Semester	**Fourth Sem**
Course Title	**Nutrition in weight management– (Theory)**			**(OPEN ELECTIVE)**
Course No.	**NDT4.2**	**OE 4**	No. of Credits	**3**
Contact hours	**45 Hrs**		Duration of SEA/Exam	**2 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. Gain knowledge about issues regarding body weight and their implication onhealth.
2. Familiarize with popular fad diets and related health concerns.
3. Understand the macronutrient and micronutrient guidelines for weightmanagement.
4. Comprehend the dietary requirements to support exercise for weightmanagement.

Content	**45 Hrs**
Unit–I Understanding Body Weight	
Body weight components – water, fat, muscle, bone mass Assessment - ideal body weight, BMI, classification of BMI for Asians, waist circumference, hip circumference Undernutrition – definition, causes, consequences Overnutrition – obesity, causes, consequences	12 Hrs
Unit -II - Macronutrients, Micronutrients and Functional Foods for Weight Management	
Fad diets – concept, overview of the popular diets, impact on health Macronutrients – role and recommendations for weight management: Carbohydrates – simple and complex, sources Dietary fibre – soluble and insoluble, sources Protein – protein quality – high biological value Fats – SFA, MUFA, PUFA, sources Common nutrient deficiencies – calcium, iron, it D, folic acid, B12 Sources and role of antioxidants in weight management Functional foods – probiotics, prebiotics for gut health and weight issues	18 Hrs

Unit -III Diet and Physical Activity for Weight Management	
Aerobic and resistance exercise Recommendations for physical activity/exercise Exercises for fat loss and muscle gain Role of diet in physical activity and weight management Health benefits of exercise	15 Hrs

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

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
Gain knowledge about issues regarding body weight and their implication on health.	X											
Familiarize with popular fad diets and related health concerns.	X	X										
Understand the macronutrient and micronutrient guidelines for weightmanagement.	X	X										
Comprehend the dietary requirements to support exercise for weight management.	X	X										

Pedagogy- Lecture, Group discussion, Demonstrations

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

References	
1	Nix S (2009) William's Basic Nutrition & Diet Therapy, 13th edition, Missouri: Mosby
2	AgarwalAandUdipiSA(2014)TextbookofHumanNutrition.NewDelhi:JaypeeBrothersMedical Publishers.
3	B. Srilakshmi, V. Suganthi, C Kalaivani Ashok. (2016). Exercise Physiology, Fitness and Sports Nutrition. New Delhi: New Age International Publishers.

Date: Subject Committee Chairperson

Curriculum of

B.Sc

in

Clinical Nutrition and Dietetics

3rd and 4th Semester

(Model I C)

BENGALURU CITY UNIVERSIY

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

1	Dr. M. Anuradha
2	Dr. Usha Devi. C
3	Dr Navaneetha.R
4	Dr Neetha Pattan
5	Dr Bhavana S
6	Dr. Shilpa P

Government of Karnataka

Curriculum

Program Name	**B.Sc. Honours**	Total Credits for the Program	**224 Credits**
Discipline Core	**Clinical Nutrition and Dietetics**	Starting year of implementation	**2021-22**

Program Outcomes: At the end of the program the student should be able to:

PO1. Understand the basic concepts of food science and nutrition and role of food and nutrients in growth, development, disease prevention and management.

PO2. Explain functions of macro and micronutrients, deficiencies, disorders and identify foods rich in specific nutrients.

PO3. Understand the complex processes of human physiology, metabolism, and human biochemistry with reference to energy and nutrition requirements.

PO4. Competent to implement food safety regulations and create awareness about sanitation, safety, hygiene for individuals, families, and communities.

PO5. Understand food and nutrition security and create awareness to public and communities.

PO6. Evaluate and assess the nutrient requirements of infants, children, and adults.

PO7. Critically analyse nutritional status of different age groups, and design diet plan as per the nutritional requirements.

PO8. Understand the importance of nutrition in lifestyle disorders and derive plan accordingly.

PO9. Apply technical skills, knowledge of nutrition, and decision-making skills, assessing capabilities in evaluating the nutritional status of individuals and communities and their response to nutrition intervention.

PO10. Provide nutrition awareness and counselling to individuals, groups, and communities.

PO11. Competence in the skills of Nutritional assessment, Diet planning and Food service management in health-care systems, communities, and institutions

PO12. Shall be able to understand the principles of fitness and nutrition, during various stages of lifecycle suchaschildhood,adolescenceandoldageandassessandevaluatetheirdietaryandexercisehabits.

PO13. Data collection and interpretation in nutrition surveys and critical analysis to resolve complex societal problems

PO14. Maintain ethical, legal, and professional practice standards during nutritional counselling or consultancy and to take leadership roles in fields of health, food research laboratories, dietetics, special nutritional needs, and nutritional counselling.

PO15.Practiceandimplementstateofartnutritioncareorconsultancyinhealthfoodindustry,criticalcare nutrition segments, clinical setups, nutraceutical industry, sports and fitness centers, therapeutic nutrition product manufacturing set ups, geriatric care units, meal/food distribution centers, women andchilddevelopmentorganizations,Foodauditingsetups,FoodtestinglabsandFoodcorporations.

Assessment:

Weightage for assessments (in percentage)

Type of Course	Formative Assessment / IA	Summative Assessment
Theory	**40**	**60**
Practical	**25**	**25**
Projects	**40**	**60**
Experiential Learning (Internships etc.)	**40**	**60**

Contents of Courses for B.Sc. Clinical Nutrition and Dietetics as Major Subject

Model I C

Semester	Course Name	Course Category	Theory / Practical	Credits	Paper Title	Marks	
						S. A	I.A
III	CNDT 3.1	DSC- 7	Theory	3	Life Cycle Nutrition	60	40
	CNDP 3.1		Practical	2	Life Cycle Nutrition	25	25
	CNDT 3.2	DSC- 8	Theory	3	Dietetics I	60	40
	CNDP 3.2		Practical	2	Dietetics I	25	25
	CNDT 3.3	DSC- 9	Theory	3	Nutritional Biochemistry	60	40
	CNDT 3.4	OE-3	Theory	3	Traditional Foods and Health	60	40
IV	CNDT 4.1	DSC- 10	Theory	3	Dietetics II	60	40
	CNDP 4.1		Practical	2	Dietetics II	25	25
	CNDT 4.2	DSC- 11	Theory	3	Community Nutrition	60	40
	CNDP 4.2		Practical	2	Community Nutrition	25	25
	CNDT 4.3	DSC- 12	Theory	3	Nutrition in Physical Fitness	60	40
	CNDT 4.4	OE-4	Theory	3	Nutrition in Weight Management	60	40
Exit Option with Diploma in Clinical Nutrition and Dietetics (100 Credits)							

Government of Karnataka

Curriculum

Program Name	**BSc Clinical Nutrition and Dietetics**		Semester	**Third Sem**
Course Title	**Life Span Nutrition (Theory)**			
Course No.	**CNDT3.1**	**DSC 7**	No. of Credits	**3+2**
Contact hours	**45 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. To understand the nutrition requirements of different agegroups
2. To understand the guidelines of dietrequirements
3. To determine nutrient requirements/needs of individuals at different stages oflife
4. To discuss the major nutrition related concerns at each stage oflife

Content	**45 Hrs**
Unit–I Nutrition in pregnancy and lactation	
Pregnancy: Physiologic changes during pregnancy, nutritional requirements and dietary guidelines, gestational weight gain, dietary problems, complications during pregnancy, adolescent pregnancy, pre - conceptional nutrition. Lactation: Physiology of lactation, composition of breast milk, importance of breast feeding, advantages and disadvantages of breast feeding, factors affecting breast feeding, lactogogues, nutritional requirement and dietary guidelines,	15 Hrs
Unit -II - Nutrition- pediatrics	
Infancy: Nutritional requirements and dietary guidelines, Growth and development, Types of feeding – breast feeding, formula feeding, complementary feeding, failure to thrive in infants. Pre-school and school age: Nutritional requirements and dietary guidelines, Importance of breakfast and packed lunch, factors influencing food intake, nutritional problems.	15 Hrs
Unit -III Nutrition in adolescents, adult, and geriatrics	
Adolescents: Physiological changes during puberty, nutritional requirements, and dietary guidelines, eating disorders,	15 Hrs

Adults: Nutritional requirements and dietary guidelines, importance of weight management. Geriatrics:Physiologicalchangesduringoldage,Nutritionalrequirementsanddietaryguidelines, nutritional problems	

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

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
To understand the nutrition requirements of different age groups			✓				✓								
To understand the guidelines of diet requirements							✓					✓			
To determine nutrient requirements/needs of individuals at different stages oflife							✓				✓				
To discuss the major nutrition related concerns at each stage of life		✓			✓				✓						

Pedagogy- Lecture, Group discussion, Demonstrations, Hands on training skills

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

Course Title	**Life Span Nutrition (Practical)**	Practical Credits	**2**
Course No.	**CNDP3.1**		
Plan, prepare and evaluate			
1. A day's diet for pregnantwomen. 2. A day's diet for lactatingwomen. 3. Complimentary foods suitable forinfants. 4. Packed lunch for schoolchildren. 5. Nutrient dense recipes foradolescents.			
6. A day's diet for adultman 7. A day's diet for adultwoman 8. Suitable recipes forgeriatrics. 9. Nutrient rich breakfastrecipes 10. Healthysnacks			

Pedagogy- Lecture, Group discussion, Demonstrations

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	05
Test 2	05
Participation & Involvement	10
Records	05
Total	Exam 25 Marks + 25 Marks = 50 Marks

References	
1	Chadha R and Mathur P, Nutrition: A life cycle Approach. Orient Blackswan New Delhi, 2015.
2	SethVandSinghKN,DietPlanningthroughlifecycle:Part1NormalNutrition.APracticalManual, Elite Publishing House Pvt.Ltd. New Delhi,2006.
3	SrilakshmiB(2014) Dietetics, 4th and 7th edition, New Age International Publications, New Delhi.
4	Shubhangini A Joshi (2011) Nutrition and Dietetics, with Indian case Studies, 3rd edition, Tata McGraw Hill Publication, New Delhi
5	Mahan,L.K&Ecott-Stump,S(2000):Krause'sFood,NutritionandDietTherapy,12thEdition,W.B SaundersLtd
6	Bamji, M.S, Reddy, V. (1998), Text Book of Human Nutrition, Oxford & IBH Publishing Co, New Delhi.
7	Gibney M.J, Elia M Ljingquist. O (2005), Clinical Nutrition, Backwell Science Publishing Co.

References	
8	Robinson C.H and Winely E.S, (1984). Basic Nutrition and Diet Therapy, Macmillian Pub. Co. New York.
9	Swaminathan, M. (2002) Food and Nutrition, Volume I, The Bangalore Printing and Publishing Company Ltd.
10	Guthrie, H.A &Picciano, M.F (1995), Morby Publishing Co, New York.
11	Srilakshmi, B. (2005). Dietetics, New Age International Publishers, New Delhi

Date: Subject Committee Chairperson

Government of Karnataka

Curriculum

Program Name	**BSc Clinical Nutrition and Dietetics**		Semester	**Third Sem**
Course Title	**DIETETICS I (Theory)**			
Course No.	**CNDT3.2**	**DSC 8**	No. of Credits	**3+2**
Contact hours	**45 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 concept of nutrient modifications in therapeuticdiets.
2. Understand the principles of diet and nutrition in infections andfever
3. Learn dietary requirements in therapeuticconditions
4. Understand the concept and importance of Weightmanagement

Content	**45 Hrs**
Unit–I Introduction to Dietetics	
The dietician: responsibilities, code of ethics, Definition and Objectives of diet therapy, medical nutrition therapy. Factors to be considered in planning therapeutic diets. Routine hospital diets – NPO, Liquid Diets- Clear Liquid Diet, Full Liquid Diet, Soft diet Special feeding methods (Enteral and Parenteral)	10 Hrs
Unit -II - Nutrition in Febrile Conditions	
Causes and nutritional management in; a) Infection- Host defence mechanisms, causes, types, Metabolic changes during infection, nutritionalmanagement b) Fever - types of fevers [long term (typhoid, TB, malaria) and short term (covid, dengue, chikungunya), metabolic changes duringfevers.	15 Hrs

Unit -III Nutrition for Weight Management	
Body weight components, Assessment: BMI, WHR, Energy imbalance: underweight, overweight, obesity	20 Hrs
Obesity - classification, theories, etiology, risk factors, nutritional management and dietary modifications, Role of hormones in control of appetite and weight management–action of leptin, ghrelin, insulin, estrogen, neural and hormonal count, other types of peptide hormones. Underweight- classification, etiology, risk factors, nutritional management and dietary modifications,	

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

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Understand the concept of nutrient modifications in therapeutic diets.			✓				✓								
Understand the principles of diet and nutrition in infections and fever	✓						✓								
Learn dietary requirements in therapeutic conditions							✓				✓				
Understand the concept and importance of Weight management								✓				✓			

Pedagogy- Lecture, Group discussion, Demonstrations, Hands on training skills

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

Course Title	**DIETETICS –I (Practical)**	Practical Credits	**2**
Course No.	**CNDP3.2**		
Plan, prepare and evaluate			
1. Routine hospital diets a. Clear fluid, b. Full fluid, c. Soft diet, d. Bland diet e. Blenderiseddiet			
2. A day's diet fortyphoid 3. A day's diet forTuberculosis 4. High calorie and high protein recipes for febrileconditions 5. Therapeutic recipes (micronutrient rich) forinfections 6. A day's low-calorie diet for obeseperson. 7. A day's high calorie diet for underweightperson.			

Pedagogy- Lecture, Group discussion, Demonstrations Hands on training skills

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	05
Test 2	05
Participation & Involvement	10
Records	05
Total	25 Marks + 25 Marks = 50 Marks

References	
1	Modern Nutrition in Health and Disease 10th edition by Maurice E. Shils
2	Alfred H.Katz, Prevention and health, the Haworth, Press, New York 1999.
3	Nutritional biochemistry of vitamins. David a bendor.
4	Achayya, K.T.:(1998) A Historical Dictionary of Indian Foods, Oxford Publishing Co.
5	Mahindru, S.N. (2002). Food Additives Characteristics, Detection andEstimation,Tata McGraw-Hill Publishing Co. Ltd. NewDelhi.
6	Research Methodology By C.R Kothari
7	International Life Sciences Institute Present Knowledge in Nutrition – latest edition.
8	Krause's food and nutrition care process,14th edition
9	Mahan,LK&Escott-Stump,(2000),Krause's food nutrition and diet therapy,12th edition
10	Sareen S,(2005)Advanced nutrition in human metabolism,4thedition,USA,IAPEN, BAPEN website
11	Williams, S.R. (1993): Nutrition and Diet Therapy, 7th Edition, Times Mirror/Mosby College Publishing.
12	Davis, J. and Sherer, K. (1994): Applied Nutrition and Diet Therapy for Nurses, 2nd Edition, W.B. Saunders Co.

Government of Karnataka

Curriculum

Program Name	**BSc Clinical Nutrition and Dietetics**		Semester	**Third Sem**
Course Title	**Nutritional Biochemistry (Theory)**			
Course No.	**CNDT3.3**	**DSC 9**	No. of Credits	**3**
Contact hours	**45 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 basics of Biomolecules – Macronutrients and micronutrients
2. Role of biomolecules as nutrients and their requirement for physiologicalfunctions
3. Learn the biochemical mechanisms of nutrition andmetabolism.
4. Understand the mechanism and carbohydrate metabolism and inter relationship betweenmetabolic pathways

Content	**45 Hrs**
Unit–I Macronutrients	
Carbohydrates: Classification, Caloric value, Recommended daily allowances, Dietary sources, Functions, Digestion, absorption and storage, metabolism of carbohydrates, Malnutrition: Deficiencies and Overconsumption Protein: Classification, Caloric value, Recommended daily allowances, Dietary sources, Functions, Digestion, absorption and storage, metabolism of carbohydrates, Malnutrition: Deficiencies and Overconsumption Fat: Classification, Caloric value, Recommended daily allowances, Dietary sources. Functions, Digestion,absorptionandstorage,metabolism,Malnutrition:DeficienciesandOverconsumption	15 Hrs
Unit -II - Fat soluble vitamins and Water-soluble vitamins	

Classification, Recommended daily allowances, Dietary sources, Functions, Absorption, synthesis, metabolism storage & excretion, Deficiencies, Hypervitaminosis Water and electrolytes: Daily requirements, regulation of water metabolism, distribution ofbody water, Maintenance of fluid & electrolyte balance, Over hydration, dehydration and water intoxication, Electrolyteimbalances.	15 Hrs
Macro and micro minerals:Classification, Recommended daily allowances, Dietary sources ,Functions , Absorption, synthesis, metabolism storage & excretion , Deficiencies , Over consumption and toxicity	
Unit -III Carbohydrates Metabolism	
Introduction to metabolism, Metabolism of glucose (glycolysis), fructose and galactose; Metabolism of pyruvate and lactate; Metabolism of acetyl CoA (TCA cycle); energetic of glucose metabolism, Synthesis of ribose (HMP Shunt); Synthesis of glucose from noncarbohydrates (gluconeogenesis); Metabolism of Glycogen- Glycogenesis and Glycogenolysis,	15 Hrs

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

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Understand the basics of Biomolecules – Macronutrients andmicronutrients		✓													
Role of biomolecules as nutrients and their requirement for physiological functions		✓	✓												
Learn the biochemical mechanisms of nutrition and metabolism.			✓												
Understand the mechanism and carbohydrate metabolism and inter relationship between metabolic pathways			✓												

Pedagogy- Lecture, Group discussion, Demonstrations, Hands on training skills

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

References	
1	Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2000): 25th Ed. Harpers Biochemistry. Macmillan Worth Publishers.
2	Nelson, D.L. and Cox, M.M. (2000): 3rd Ed. Lehninger's Principles of Biochemistry, Macmillan Worth Publishers.
3	Devlin, T.M. (1997): 4th Ed. Text book of Biochemistry with Clinical Correlations, Wiley LissInc
4	Stryer, L. (1998): 4th Ed. Biochemistry, WH Freeman and Co.
5	Conn,E.E.,Stumpf,P.K.,Bruening,G.andDoi,R.H.(2001):5thEd.OutlinesofBiochemistry,John Wiley andSons.
6	Voet, D. Voet, J.G. and Pratt, C.W. (1999). Fundamentals of Biochemistry.
7	Tietz, N.W. (1976) Fundamentals of Clinical Chemistry. WB Saunders Co.
8	King, E.J. and Wootton, I.D.P. (1956). 3rd ed. Micro-Analysis in Medical Biochemistry. J and A Churchill Ltd.
9	Plummer, D.T. (1987). 3rd ed. An Introduction to Practical Biochemistry. McGraw-Hill Book Co.

Date: Subject Committee Chairperson

Government of Karnataka

Curriculum

Program Name	**BSc Clinical Nutrition and Dietetics**		Semester	**Third Sem**
Course Title	**Traditional Foods and Health (Theory)**			
Course No.	**CNDT3.4**	**OE -3**	No. of Credits	**3**
Contact hours	**45 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 basics of Biomolecules – Macronutrients and micronutrients
2. Role of biomolecules as nutrients and their requirement for physiologicalfunctions
3. Learn the biochemical mechanisms of nutrition andmetabolism.
4. Understand the mechanism and carbohydrate metabolism and inter relationship betweenmetabolic pathways

Content	**45 Hrs**
Unit–I Introduction to Traditional foods	
Definition of Traditional foods, food as religious and cultural symbols; importance of food in understanding human culture - variability, diversity. Indian traditional foods and cuisine: History and evolution Specialty ingredients in regional cuisines – herbs, extract, spices, masala powders and cooking oils of different regions Geographical Indication (GI) tag for traditional foods **Health Aspects of Traditional Foods**: Comparison of traditional foods with typical fast foods / junk foods – cost, food safety, nutritional facts, and benefits; traditional foods used for specific ailments /illnesses, emotional benefits.	15 Hrs
Unit -II - Traditional Food Patterns	
Typical breakfast, meal, and snack foods of different regions of India. Regional foods that have gone Pan Indian / Global. Popular regional foods; Traditional fermented foods, pickles and preserves, beverages, snacks, desserts and sweets, street foods.	15 Hrs

Regional cuisines of India- Traditional foods of south Indian, north Indian, west Indian and east Indian cuisine.	
Unit -III Commercial production of Traditional foods	
Processing and manufacture of traditional foods- paneer, butter and ghee manufacture. Commercial production and packaging of traditional beverages such as tender coconut water, neera, lassi, buttermilk, dahi. Commercialproductionofintermediatefoods–gingerandgarlicpastes,tamarindpastes,masalas (spice mixes), idli and dosabatters.	15 Hrs

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

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Understand the basics of Biomolecules – Macronutrients andmicronutrients		✓													
Role of biomolecules as nutrients and their requirement for physiological functions		✓	✓												
Learn the biochemical mechanisms of nutrition and metabolism.			✓												
Understand the mechanism and carbohydrate metabolism and inter relationship between metabolic pathways			✓												

Pedagogy- Lecture, Group discussion, Demonstrations, Hands on training skills

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

References	
1	Sen, Colleen Taylor Food Culture in India Greenwood Press, 2005.
2	Davidar, Ruth N. Indian Food Science: A Health and Nutrition Guide to Traditional Recipes: East West Books, 2001
3	WyaneGisslen. Professional Cooking. John Wiley& Sons, New Jersey. 2015. 8th edn
4	Jagmohan Negi. Fundamentals of Culinary Art. S. Chand and Company Pvt. Ltd., New Delhi. 2013. 3.
5	JagmohanNegi.FoodPresentationTechniques(GarnishingandDecoration).S.ChandandCompany Pvt. Ltd., New Delhi. 2013.4.
6	Eva Medved. Food Preparation and Theory. Prentice-Hall Inc., Englewood Cliffd, New Jersey. 1986.
7	Al-Khusaibi, M., Al-Habsi, N., & Rahman, M. S. (Eds.). (2019). Traditional Foods: History, Preparation, Processing and Safety. Springer Nature.
8	Kristbergsson, K., & Oliveira, J. (2016). Traditional Foods: General and Consumer Aspects (Integrating Food Science and Engineering Knowledge Into the Food Chain, 10)(2016 ed.).
9	Galanakis, C. M. (Ed.). (2019). Innovations in traditional foods. Woodhead Publishing.

Date: Subject Committee Chairperson

Government of Karnataka

Curriculum

Program Name	**BSc Clinical Nutrition and Dietetics**		Semester	**Fourth Sem**
Course Title	**DIETETICS II (Theory)**			
Course No.	**CNDT4.1**	**DSC -10**	No. of Credits	**3+2**
Contact hours	**45 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. Learn the pathophysiology of gastrointestinal disorders and their dietarymanagement.
2. Understand the pathophysiology of diabetes mellitus, dietary management, andtreatment
3. Learn the pathophysiology of Hypertension and Cardiovascular diseases and its dietary management.

Content	**45 Hrs**
Unit–I Diet in gastrointestinal disorders	
Pathophysiology and MNT for Indigestion, peptic ulcer, constipation, diarrhea, lactose intolerance, gluten enteropathy, irritable bowel syndrome	10 Hrs
Unit -II - Diabetes Mellitus	
a) Definition, Types (IDDM, NIDDM, MODY, GDM) etiological classification (WHO), etiology, symptoms, tests (blood and urine) – GTT, RBS, FBS, PPBS, HbA1c (Normal and abnormal values), complications (long and short term) b) NutritionalandDietarymanagementofIDDM,NIDDMandGDM,useoffoodexchangelist, Glycemic index and glycemic load of foods, carbohydrate counting, carbohydrate load, Oral hypoglycemic drugs, Insulin – long acting, short acting, intermittentacting c) Importance of physicalactivity	20 Hrs
Unit -III Hypertension and Cardiovascular disorders	
a) Hypertension - Etiology, risk factors, symptoms, types, nutritional and dietary management, role of physicalactivity. b) Cardiovascular disorders– • Etiology, risk factors, nutritional and dietarymanagement	15 Hrs

• Atherosclerosis – role of fat in the development ofatherosclerosis • Congestive HeartFailure • Dyslipidemia • Importance of physicalactivity	

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

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Learn the pathophysiology of gastrointestinal disorders and their dietary management.		✓													
Understand the pathophysiology of diabetes mellitus, dietary management andtreatment		✓	✓												
Learn the pathophysiology of Hypertension and Cardiovascular diseases and its dietary management.			✓												

Pedagogy- Lecture, Group discussion, Demonstrations, Hands on training skills

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

Course Title	**DIETETICS –II (Practical)**	Practical Credits	**2**
Course No.	**CNDP4.1**		
Plan, prepare and evaluate			
1. A day's diet for pepticulcer 2. A day's diet forconstipation 3. A day's diet for diarrhoealcondition 4. Recipes for lactoseintolerance 5. Recipes for glutenenteropathy			
6. Prepare a list of low, medium, and high GIfoods 7. A day's diet for NIDDM (case profile) 8. A day's diet for GDM (caseprofile) 9. A day's diet for Hypertension (caseprofile) 10. A day's diet for atherosclerosis (caseprofile)			

Pedagogy- Lecture, Group discussion, Demonstrations Hands on training skills

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	05
Test 2	05
Participation & Involvement	10
Records	05
Total	25 Marks + 25 Marks = 50 Marks

References	
1	Modern Nutrition in Health and Disease 10th edition by Maurice E. Shils
2	Alfred H.Katz, Prevention and health, the Haworth, Press, New York 1999.
3	Nutritional biochemistry of vitamins David a bendor.
4	Achayya, K.T.:(1998) A Historical Dictionary of Indian Foods, Oxford Publishing Co.
5	Mahindru,S.N.(2002).FoodAdditivesCharacteristics,DetectionandEstimation,TataMcGraw-Hill Publishing Co. Ltd. NewDelhi.
6	Research Methodology By C.R Kothari
7	International Life Sciences Institute Present Knowledge in Nutrition – latest edition.
8	Krause's food and nutrition care process, 14th edition
9	Mahan, L K & Escott-Stump, (2000), Krause's food nutrition and diet therapy,12th edition
10	Sareen S, (2005) Advanced nutrition in human metabolism, 4th edition, USA

Date: Subject Committee Chairperson

Government of Karnataka

Curriculum

Program Name	**BSc Clinical Nutrition and Dietetics**		Semester	**Fourth Sem**
Course Title	**Community Nutrition (Theory)**			
Course No.	**CNDT4.2**	**DSC -11**	No. of Credits	**3+2**
Contact hours	**45 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. Learn the concept of malnutrition and nutritionalepidemiology
2. Understand major nutritional problems prevalence, prevention, andcontrol
3. Understand policies and programs to combat community nutrition programs discussed inclass.
4. Know the role of organizations working towards combatingmalnutrition.

Content	**45 Hrs**
Unit–I Introduction	
Meaningandscopeofcommunitynutrition;Multidisciplinaryapproachofpublichealthnutrition; Concept of food security, nutrition security, nutrition monitoring, nutrition surveillance, health economics, epidemiological studies, nutritionalepidemiology. Malnutrition: etiology, prevalence, vicious cycle of malnutrition, economics of malnutrition. MajorNutritionalproblems:Prevalenceatnationalandinternationallevel;Preventionandcontrol of: Vitamin A deficiency, IDD, Anaemia, Coronary heart disease, Hypertension, Diabetes Mellitus,Diarrhoea,lowbirthweight,Child,andmaternalmalnutrition;PrevalenceofZnandCu deficiency.	15 Hrs
Unit -II - Nutrition policy and programs	
National nutrition policy: need for nutrition policy, policy strategies and their implementations. National Nutrition programs- Objectives and functions of National Anaemia prophylaxis programs; Vitamin A prophylaxis programs; Goitre control program ; ICDS; SNP; ANP Sustainable development goals; National nutrition policy-Aims, Short term and long-term intervention, implementation, Vision for the 21st century.	15 Hrs

Unit -III Organizations to combat malnutrition	
Objectives and functions, National organizations concerned with Food and Nutrition- ICMR, NIN, CFTRI, DFRL, NIPCCD InternationalorganizationsconcernedwithFoodandNutrition-FAO,WHO,UNICEF,WORLD BANK Approaches and strategies for improving nutritional status and health: Health–based interventions, Food–based interventions including fortification and genetic improvement of foods, supplementary feeding, Nutrition education for behaviour change, environmental sanitation.	15 Hrs

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

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Learn the concept of malnutrition and nutritional epidemiology		✓			✓		✓								
Understand major nutritional problems prevalence, prevention, and control									✓	✓			✓		
Understand policies and programs to combat community nutrition programs discussed in class.									✓				✓	✓	
Know the role of organizations working towards combating malnutrition.													✓		✓

Pedagogy- Lecture, Group discussion, Demonstrations, Hands on training skills

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

Course Title	**Community Nutrition (Practical)**	Practical Credits	**2**
Course No.	**CNDP4.2**		

Plan, prepare and evaluate

1. Preparation of audio-visual aids: Poster, Chart, Flash card, power point presentation and one video clipping.
2. Planning and Preparation of low-cost recipes for IronDeficiency.
3. Planning and Preparation of low-cost energy rich and protein rich recipes.
4. Planning and Preparation of low-cost recipes for Vitamin A deficiency
5. Planning and preparation of Complementary Foods (emphasis of premixes and ARF).
6. Planning and preparation of indigenous low cost, nutritive recipes (using methods to enhance the nutritive value of foods at home level) suitable for various vulnerable groups.
7. Visit to Food and Nutrition Board and NIPCCD
8. Planning and conducting nutrition Health Education activity using various teaching aids for vulnerablegroups.
9. PlanningandconductinganExhibitionwithreportwritingontopicsrelatedtocommunitynutritionand health.

Pedagogy- Lecture, Group discussion, Demonstrations Hands on training skills

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	05
Test 2	05
Project	15
Total	25 Marks + 25 Marks = 50 Marks

References	
1	BamjiSM,RaoNPandReddyV,Textbookofhumannutrition,oxfordandIBHpublishingco.,New Delhi.
2	GopalanC,Combating undernutrition-basic issues and practical approaches, Nutrition Foundation of India,1987.

References	
3	GopalanC,Women and nutrition in India, NFI,New Delhi,1992.
4	Jelliffe D.D.1966. The assessment of Nutritional Status of the Community. WHO, monograph series.
5	Jelliffe D.D.1966. The assessment of Nutritional Status of the Community. WHO, monograph series.
6	Michael.J.G,Barrie.M.M:Public health nutrition,Blackwell publishing,2005.
7	Nweze Eunice Nnakwe., Community Nutrition – planning health promotion and disease prevention., Jones and Bartlett publishers, 2009.
8	Park.K,Park's textbook of preventive and social medicine.,12th edition.M/S Banarsidasbhanot publishers,2009.
9	Reddy V, PrahladRao N, Sastry G and Nath KK, Nutrition trends in India, Hyderabad, NIN,1993

Date: Subject Committee Chairperson

Government of Karnataka

Curriculum

Program Name	**BSc Clinical Nutrition and Dietetics**		Semester	**Fourth Sem**
Course Title	**Nutrition In Physical Activity (Theory)**			
Course No.	**CNDT4.3**	**DSC -12**	No. of Credits	**3**
Contact hours	**45 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. Learnhownutritioninfluenceshumandevelopment,exerciseperformance,recoveryandphysiological adaptations
2. Understand macronutrient metabolism during and after exercise and outline the requirements of these nutrients forathletes
3. Understand the physiological functions of vitamins, minerals, and major nutrients inathletes.
4. Learn the composition of common sports drinks and ergogenic aids and discuss how these can beused appropriately and safely before, during and after exercise

Content	**45 Hrs**
Unit–I Introduction to body composition	
Definition of physical fitness, Benefits of Fitness, Components of fitness. Conditioning by training – overload principle. Body's response to physical activity- Weight training, cardiorespiratory conditioning, muscle conditioning, Physical activity pyramid Balanced fitness program. Human Body Composition: Significance of studying body composition. Two compartment and multiple compartment models Methods of Assessment: Nutritional Anthropometry, BOD POD, Bioelectric impedance,DEXA, Whole body K counter. Factors affecting body composition: Age, Body weight, physicalactivity	10 Hrs
Unit -II - Macro Nutrients	
Carbohydrate as an energy source for sport and exercise. Carbohydrate stores, Fuel for aerobic and anaerobic metabolism, Glycogen re-synthesis, CHO Loading, CHO composition for pre-exercise, during and recovery period.	20 Hrs

Role of Fat as an energy source for sports and exercise. Fat stores, regulation of fat metabolism, factorsaffectingfatoxidation(intensity,duration,trainingstatus,CHOfeeding),effectoffasting and fatingestion Proteinandaminoacidrequirements,FactorsaffectingProteinturnover,Proteinrequirementand metabolism during endurance exercise, resistance exercise and recovery process. Protein supplement.	
Unit -III Important micronutrients for exercise	
Role of Vitamins and specific mineral needs during exercise, Dehydration, Exercise induced oxidative stress and role of antioxidants. Female athletic triad, sports anaemia Dietary supplements and ergogenic aids (nutritional, pharmacological and physiological). Popular and famous Ergogenic aids – Anti doping agency - list of banned drugs/substances	15 Hrs

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

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Learn how nutrition influences human development, exercise performance, recovery, and physiological adaptations		✓										✓			
Understand macronutrient metabolism during and afterexerciseandoutlinetherequirementsofthese nutrients forathletes			✓									✓			
Understand the physiological functions of vitamins, minerals and major nutrients inathletes.			✓									✓			
Learn the composition of common sports drinks and ergogenic aids and discuss how these can be used appropriately and safely before, during and after exercise.												✓			

Pedagogy- Lecture, Group discussion, Demonstrations, Hands on training skills

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

References	
1	Bucci, L., 1993 Nutrients as Ergogenic Aids for Sports and Exercise. Boca Raton, FL.:CRC Press.
2	Advances in Sport and Exercise Science: Nutrition and Sport , Edited by Don MacLaren. , ChPublished by Churchhill Livingstone, Elsevier. 2007
3	Sports Medicine: The school age athlete by Bruce Reider. 1996. Published by W.B. Saunders.
4	Nutrition for Serious Athletes. Dan Banardot. 2000; Human Kinetics.
5	Energy-Yielding Macronutrients and Energy Metabolism in Sports Nutrition. Edited by Judy A Driskell , Ira Wolinsky, CRC Press 2000.
6	Recommended Dietary Intakes for Indian Sportsman and Women. Satyanarayan, K; Nageshwar Rao. C; NarsingaRao,B.S.; Malhotra, M.S. (1985)., Hyderabad, National Institute of Nutrition.
7	Bucci, L., 1993 Nutrients as Ergogenic Aids for Sports and Exercise. Boca Raton, FL.:CRC Press.
8	Advances in Sport and Exercise Science: Nutrition and Sports, Edited by Don MacLaren, ChPublished by Churchhill Livingstone, Elsevier. 2007
9	Sports Medicine: The school age athlete by Bruce Reider. 1996. Published by W.B. Saunders.
10	Nutrition for Serious Athletes. Dan Banardot. 2000; Human Kinetics.
11	Energy-Yielding Macronutrients and Energy Metabolism in Sports Nutrition. Edited by Judy A Driskell, Ira Wolinsky, CRC Press 2000.
12	Recommended Dietary Intakes for Indian Sportsman and Women. Satyanarayan, K; Nageshwar Rao.

Date: Subject Committee Chairperson

Government of Karnataka

Curriculum

Program Name	**BSc Clinical Nutrition and Dietetics**		Semester	**Fourth Sem**
Course Title	**Nutrition in Weight Management (Theory)**			**OPEN ELECTIVE**
Course No.	**CNDT4.4**	**OE -4**	No. of Credits	**3**
Contact hours	**45 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. Learn about the concept health, nutrition, macro, andmicronutrients
2. Learn about the importance of nutrients, sources, anddeficiencies
3. Understand the basics of weight management, ideal body weight,BMI
4. Understand the role of physical activity in goodhealth

Content	**45 Hrs**
Unit–I	
Health - Definition a) Balanced diet- factors affecting food intake b) Food groups andServing c) My Plate d) Classification of Macro and micronutrients e) Functions, Food Sources and Deficiency ofnutrients	15 Hrs
Unit -II	
a) Weightmanagement b) Overweight,underweight c) Ideal body weight,BMI d) Dietary guidelines and health hazards- overweight and underweight e) Role of physical activity in weight management	15 Hrs

Unit -III Important micronutrients for exercise	
a) Components of Physicalfitness b) Health benefits offitness c) Types of physical activity- Structured andunstructured.	15 Hrs
d) Physical activitypyramid e) Yoga and meditation in health: Effect of Yoga and meditation on physical and mentalhealth	

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

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Learn about the concept health, nutrition, macro, and micronutrients	✓	✓										✓			
Learn about the importance of nutrients, sources, and deficiencies	✓	✓													
Understand the basics of weight management, ideal body weight, BMI												✓			
Understand the role of physical activity in good health												✓			

Pedagogy- Lecture, Group discussion, Demonstrations, Hands on training skills

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

References	
1	Melvin H Williams (2005) Nutrition for Health, Fitness and Sports 7thEdn
2	Mahan L K and Ecott-Stumps (2000) Krause's Food, Nutrition and Diet Therapy, 10thedn,W B Saunders Ltd
3	Whitney and Rolfers S R (1999) Understanding Nutrition, 8thEdn West/Wadsworth, An International Thomson Publishing Company
4	Jayaprakash. C.S 2003 Sports Medicine, Jaypee brother's medical publishers (P) ltd New Delhi.

Date: Subject Committee Chairperson