

SYLLABUS

B.Sc. HOME SCIENCE (CLINICAL NUTRITION AND DIETETICS)

3 YEAR DEGREE PROGRAM

ACCORDING TO NEP 2020 (Effective from 2024-25)



DEPARTMENT OF HOME SCIENCE

FACULTY OF SCIENCE

CHAUDHARY CHARAN SINGH UNIVERSITY, MEERUT

EXORDIUM

The objective of any programme at Higher Education Institute is to prepare their students for the society at large. Chaudhary Charan University envisions all its programmes in the best interest of their students and in this endeavor; it offers a new vision to all its Under-Graduate courses. It imbibes a Learning Outcome-based Curriculum Framework (LOCF) for all its Under Graduate programmes. The LOCF approach is envisioned to provide a focused, outcome-based syllabus at the undergraduate level with an agenda to structure the teaching-learning experiences in a more student-centric manner. The Under-Graduate Programmes will prepare the students for both, academia and employability. The new curriculum of B.Sc. Home Science (Clinical Nutrition & Dietetics) will offer the students to gain the requisite knowledge, skills and aptitude in the areas of Home Science focusing mainly on nutrition and dietetics. Home Science has adopted an ecological approach in its curriculum that engages the student through teaching, research and extension. They gain and provide employment in research organizations, food and textile industries, dietetic practices etc. They are prepared to take higher education in their specialization.



Convenor (II) BOS
Home Science
R.G.P.G. College, Meerut

Bindu Sharma

Ramesh

F. Him

Rashmi

B.Sc. HOME SCIENCE (CLINICAL NUTRITION & DIETETICS)

Home Science is an interdisciplinary field of study that provides scientific and systematic knowledge about various aspects of family and community living. As a discipline, Home Science integrates components from the sciences, social sciences and technology to facilitate the study and applies this knowledge to enhance the quality of human life. It is an interdisciplinary field which prepares the students to take up professional roles in multiple career fields. Adopting a rights-based approach which is so important for a developing nation like India, the field of Home Science has contributed immensely in shaping lives of children, women and communities at large.

The Bachelor of Science in Home Science with a specialization in Clinical Nutrition and Dietetics is an interdisciplinary program that integrates the principles of home science with the focused study of Nutrition and Dietetics. This 3-year Choice Based Credit System curriculum course which is multidisciplinary in nature, imparts knowledge of Social Sciences, Biological and Physical Sciences in addition to all the five areas of Home Science namely: Food and Nutrition; Development Communication and Extension; Resource Management Design Application; Human Development Childhood Studies and Fabric and Apparel Science.

The programme includes Core/Major Courses and Minor elective courses. The Major courses are all compulsory courses. Elective courses can be taken from interdisciplinary fields based in student's interest and abilities. Compulsory co-curricular courses are mandatory for all UG programs according to NEP guidelines. To enhance the skills of students Vocational courses will be offered according to the student's choice as well as availability in campus. In the B.Sc. Home Science (Clinical Nutrition & Dietetics) also, the students are exposed to all the five areas of Home Science. As part of the course, the students undergo theoretical as well as practical training. Field visits, trainings, community and extension work, internships and placements are an integral part of the programme.

Programme Learning Outcomes:

Programme outcomes for B.Sc. Home Science course are as follows:

- a) Understand and appreciate the role of interdisciplinary sciences in the development and wellbeing of individuals, families and communities.
- b) Enable students with knowledge, skills, attitudes and values to do community work in the area of Nutrition and healthcare.
- c) Understand the sciences and technologies that enhance the quality of life of people.
- d) Acquire professional and entrepreneurial skills for economic empowerment of self in particular and community in general.
- e) Develop professional skills in foods & Nutrition
- f) Take science from the laboratory to the people.

Learning Outcome Based Approach to Curriculum Planning

Nature and Extent of the Programme in B.Sc. Home Science

The degree is awarded on the basis of demonstrated achievement of outcomes of knowledge, skill and community interventions and academic standards expected from Home Science. Learning outcomes specify what graduates completing a particular programme of study are expected to know, understand and be able to do at the end of their program of study. This approach allows for flexibility and innovation in program design and syllabi development, teaching learning process, student assessment at different levels and periodic program review.

Aims of Bachelor Degree Programme in B.Sc. Home Science

The aims of the B.Sc.Home Science is to:

- a) Enable students with knowledge, skills, attitudes and values to do community work in the area of Foods & Nutrition.
- b) Ensure global competitiveness and excellence in theory and research.
- c) Prepare the students for master's program
- d) Train the students to take science from lab to community to improve quality of life of people.

Graduate Attributes in B.Sc. Home Science (Clinical Nutrition & Dietetics)

Some of the characteristics attributes of B.Sc. Home Science (Clinical Nutrition & Dietetics) include –

- ✓ Disciplinary Knowledge:
- ✓ Communication Skills:
- ✓ Research related skills:
- ✓ Cooperation/ team work:
- ✓ Self-directed learning:
- ✓ Multicultural competence:
- ✓ Moral and ethical awareness/ reasoning:
- ✓ Leadership qualities:
- ✓ Lifelong learning:

Qualification Descriptors for B.Sc Home Science (Clinical Nutrition and Dietetics)

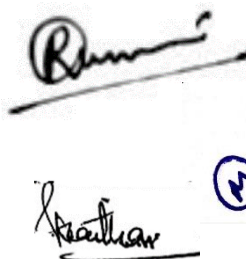
Following descriptors indicate the expectations from B.Sc Home Science (Clinical Nutrition and Dietetics) -

- ✓ Demonstrate systematic, extensive and coherent knowledge in the the branch of Home Science namely Food and Nutrition
- ✓ Ensure basic understanding of all five areas of Home Science to be able to work in national development programs with multi-disciplinary acumen.
- ✓ Demonstrate skill in profession, community outreach, policy and research in their specialization area.
- ✓ Demonstrate community and laboratory-based data collection, analysis and interpretation.
- ✓ Enhance communication skills for research findings and critique of life processes in community education.
- ✓ Demonstrate subject related skills for employment opportunities.

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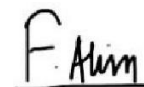
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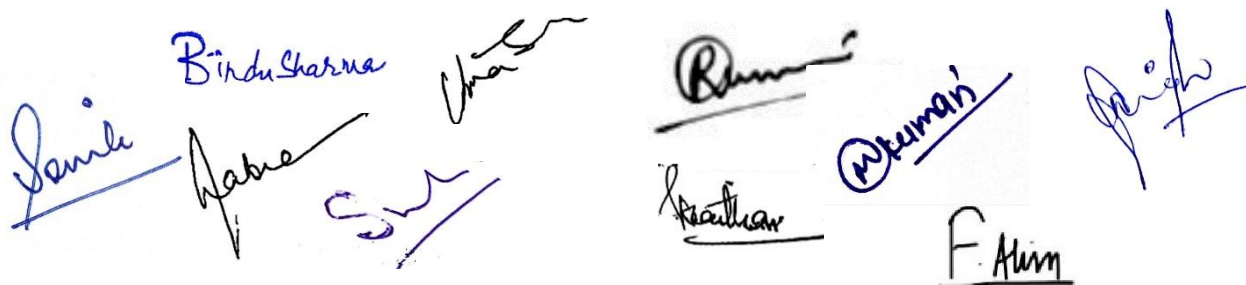
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SEMESTER-WISE TITLES OF THE PAPERS IN SUBJECT- B.Sc. HOME SCIENCE
(CLINICAL NUTRITION AND DIETETICS)

YEAR (Total Credits)	SEMESTER	COURSE CODE	PAPER TITLE	THEORY/ PRACTICAL	CREDITS
CERTIFICATE IN HOME SCIENCE					
1 (18 Credits)	I		Sanitation & Hygiene	Theory	2
			Introduction to Human Development	Theory	4
			Food Science	Theory	4
			Food Science Practical	Practical	2
			Communication & Instructional Technology	Theory	4
			Communication & Instructional Technology Practical	Practical	2
	II		Nutrition & Fitness	Theory	2
			Human Physiology	Theory	4
			Introduction to Textiles	Theory	4
			Introduction to Textiles Practical	Practical	2
			Introduction to Resource Management	Theory	4
			Introduction to Resource Management Practical	Practical	2
DIPLOMA IN HOME SCIENCE					
2 (18 Credits)	III		Consumer Economics	Theory	2
			Food Service Equipment Layout	Theory	4
			Nutrition through Life Cycle	Theory	4
			Nutrition through Life Cycle Practical	Practical	2
			Nutritional Biochemistry	Theory	4
			Nutritional Biochemistry Practical	Practical	2
	IV		Basic Dietetics	Theory	4
			Basic Dietetics Practical	Practical	2
			Food Product Development & Acceptance	Theory	4
			Food Product Development & Acceptance Practical	Practical	2
			Food Microbiology & Toxicology	Theory	4
			Food Microbiology & Toxicology Practical	Practical	2

DEGREE IN BACHELOR OF HOME SCIENCE (CLINICAL NUTRITION & DIETETICS)					
3 (20 Credits)	V		Food Material Management & Cost Accountancy	Theory	4
			Research Methodology in Home Science	Theory	4
			Advanced Dietetics	Theory	4
			Advanced Dietetics Practical	Practical	2
			Quantity Food Production & Services	Theory	2
			Quantity Food Production & Services Practical	Practical	4
	VI		Clinical Nutrition	Theory	4
			Management in Entrepreneurship	Theory	4
			Community Nutrition	Theory	4
			Community Nutrition Practical	Practical	2
			Food Preservation and Protection	Theory	4
			Food Preservation and Protection Practical	Practical	2



Course Structure – B.Sc. Home Science (Clinical Nutrition And Dietetics)

Year	Semester	Major/Core Courses	Minor	Co-Curricular	Skill/Vocational	Industrial Training/Survey/Research Project
1	1	Sanitation & Hygiene (2 Credits)	Any other interdisciplinary (4/5/6 Credits)	Food, Nutrition and Hygiene-Z0101017 (2 Credits)	Student's Choice and Campus Availability (3 Credits)	-
		Introduction to Human Development (4 Credits)				
		Food Science (4 Credits)				
		Food Science Practical (2 Credits)				
		Communication & Instructional Technology (4 Credits)				
		Communication & Instructional Technology Practical (4 Credits)				
	2	Nutrition & Fitness (2 Credits)	Basic Computer Or English Language Or Any other interdisciplinary (4/5/6 Credits)	First Aid and Health-Z020201T (2 Credits)	Student's Choice and Campus Availability (3 Credits)	-
		Human Physiology (4 Credits)				
		Introduction to Textiles (4 Credits)				
		Introduction to Textiles Practical (2 Credits)				
		Introduction to Resource Management (4 Credits)				
		Introduction to Resource Management Practical (2 Credits)				

AFTER SUCCESSFUL COMPLETION OF SEMESTER II (46 CREDITS) , A STUDENT HAS EXIT OPTION WITH CERTIFICATE IN HOME SCIENCE

Year	Semester	Major/Core Courses	Minor	Co-Curricular	Skill/Vocational	Industrial Training/Survey/Research Project
2	3	Consumer Economics (2 Credits)	Psychology Or Any other interdisciplinary (4/5/6 Credits)	Human values and Environment Studies- Z030301 (2 Credits)	Student's Choice and Campus Availability (3 Credits)	-
		Food Service Equipment Layout (4 Credits)				
		Nutrition through Life Cycle (4 Credits)				
		Nutrition through Life Cycle Practical (2 Credits)				
		Nutritional Biochemistry (4 Credits)				
		Nutritional Biochemistry Practical (2 Credits)				
	4	Basic Dietetics (4 Credits)	Basic statistics Or Any other interdisciplinary (4/5/6 Credits)	Physical Education and Yoga -Z040401 (2 Credits)	Student's Choice and Campus Availability (3 Credits)	-
		Basic Dietetics Practical (2 Credits)				
		Food Product Development & Acceptance (4 Credits)				
		Food Product Development & Acceptance Practical (2 Credits)				
		Food Microbiology & Toxicology (4 Credits)				
		Food Microbiology & Toxicology Practical (2 Credits)				

AFTER SUCCESSFUL COMPLETION OF SEMESTER IV (92 CREDITS), A STUDENT HAS EXIT OPTION WITH DIPLOMA IN HOME SCIENCE (CLINICAL NUTRITION AND DIETETICS)

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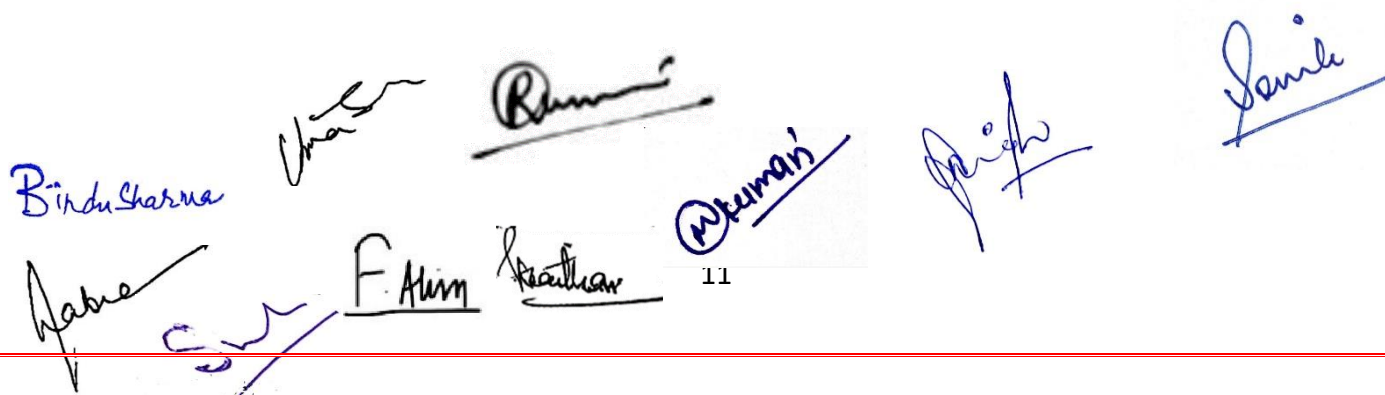
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Year	Semester	Major/Core Courses	Minor	Co-Curricular	Skill/Vocational	Industrial Training/Survey/Research Project
3	5	Food Material Management & Cost Accountancy (4 Credits)	-	Analytic ability and Digital Awareness - Z050501 (2 Credits)	-	Industrial Training/ Survey / Research Project (4 Credits) Qualifying
		Research Methodology in Home Science (4 Credits)				
		Advanced Dietetics (4 Credits)				
		Advanced Dietetics Practical (2 Credits)				
		Quantity Food Production & Services (2 Credits)				
		Quantity Food Production & Services Practical (4 Credits)				
	6	Clinical Nutrition (4 Credits)		Communication Skills and Personality Development - Z060601 (2 Credits)	-	Industrial Training/ Survey/ Research Project (4 Credits) Qualifying
		Management in Entrepreneurship (4 Credits)				
		Community Nutrition (4 Credits)				
		Community Nutrition Practical (2 Credits)				
		Food Preservation and Protection (4 Credits)				
		Food Preservation and Protection Practical (2 Credits)				

AFTER SUCCESSFUL COMPLETION OF SEMESTER VI (132 CREDITS) , A STUDENT HAS EXIT OPTION WITH BACHELORS OF SCIENCE IN HOME SCIENCE (CLINICAL NUTRITION AND DIETETICS) DEGREE.



 Bindu Sharma, Anurag, Ramesh, Numan, Sanika

Maximum marks in all the papers will be 100, and it will split as External Assessment of 75 marks and Internal Assessment of 25 marks.

Suggested Continuous Internal Evaluation Methods (25 Marks)

- File work/ Seminar/ Assignment-10 Marks (on any topic of the syllabus for that particular course)
- Class performance/ Participation- 5 Marks
- Tests - 10 marks

Suggested Equivalent Online courses :-

Courses running on MOOC platforms at National & International levels, study material by IGNOU and other Universities.

Important Note- Only one External examiner shall be appointed for all practical examinations in each semester. It is mandatory that the appointment of examiner should be from any field of home science only.

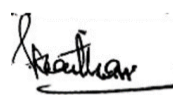
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CERTIFICATE IN HOME SCIENCE

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester I, Major 1

Programme/Class: Certificate in Home Science (CN&D)	Year: 1	Semester: 1
Course code:	Course Title: Sanitation and Hygiene	Credits: 2 C
Course Outcome : 1. Comprehending the significance of sanitation and hygiene in upholding public health standards within the context of clinical nutrition and dietetics. 2. Identifying and applying fundamental principles and practices of sanitation and hygiene in clinical settings. 3. Demonstrating a comprehensive understanding of prevalent pathogens and diseases associated with inadequate sanitation and hygiene, particularly as they relate to nutritional health. 4. Developing proficient skills in advocating for and implementing improved sanitation and hygiene protocols at individual, community, and policy levels, integrating nutritional considerations. 5. Analyzing the interplay between sanitation, hygiene, and health factors within clinical nutrition and dietetics contexts to optimize patient care and outcomes. 6. Developing skills in promoting and advocating for improved sanitation and hygiene practices at individual, community, and policy levels.		
Total No. of Lectures: 30	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper 1
Units	Topic	No of Lectures
1	Health • Concept of positive health, good health, mental health, school health. • Factors affecting health	5
2	Hygiene • School hygiene and industrial hygiene. • Health Hazards of industrial workers and safety measures.	5
3	Infectious Diseases- Symptoms, causes, care, and treatment • Water, foodborne diseases- cholera, dysentery, hepatitis, diarrhea. • Airborne and viral infection- influenza, cold, pneumonia, polio, measles, mumps. • Insect and rodent agencies – Malaria,	10

	Plague, Dengue • Direct contact through cuts and abrasions, skin disease, conjunctivitis, leprosy, tetanus.	
4	Food Sanitation • Control and inspection • Planning and implementation of a training program for health personnel.	5
5	Public health organization • W.H.O., central and state health activities, immunization programs (Triple vaccine – smallpox, polio, typhoid, cholera, tuberculosis, AIDS and hepatitis). • Municipal and district health services.	5

REFERENCES:

- Sperber, William H. "Food safety management." In Encyclopedia of Food Safety, pp. 1-9. Academic Press, 2014.
- Ryan, Kenneth J., Norkin, Leonard C., et al. Sherris Medical Microbiology. McGraw Hill Professional, 2018.
- Brooks, G.F., Carroll, K.C., et al. Jawetz, Melnick, & Adelberg's Medical Microbiology. McGraw-Hill Education, 2019.
- Mahan, L. Kathleen, and Janice L. Raymond. Krause's Food & the Nutrition Care Process. Elsevier Health Sciences, 2016.
- Park, K. "Park's Textbook of Preventive and Social Medicine." Banarsi Das Bhanot Publishers, 2019.

- E- Learning Resources:

<https://swachhbharatmission.gov.in/>.

<https://www.unicef.org/india/what-we-do/wash-schools>.

<https://www.nin.res.in/>

<https://www.nin.res.in/publications.html>

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester I, Major 2

Programme/Class: Certificate in Home Science (CN&D)	Year: 1	Semester: 1
Course code:	Course Title: Introduction to Human Development	Credits: 4 C
Course Outcome : 1. Understanding the major theories and perspectives in human development, such as psychosocial, cognitive, and ecological theories. 2. Exploring the various stages of human development from infancy through late adulthood. 3. Identifying key developmental milestones and transitions that occur over the lifespan. 4. Developing critical thinking and analytical skills to interpret research findings and theories related to human development.		
Total No. of	Max. Marks: 25+75	Core/Compulsory

Lectures: 60	Min. Passing Marks: 33	Paper II
Units	Topic	No of Lectures
1	Human Development • Definition and Importance of Human Development • Human Development and allied fields • Scope of Human Development • Methods of Child Study	12
2	Growth and Development • Concept and principles of development • Difference between growth and development • Factors affecting growth and human development.	12
3	Determinants of Development • Heredity and Environment • Maturity and Learning	12
4	Developmental Stages • Menstrual Cycle and Fertilization • Prenatal development stages and substages. • Factors Affecting Prenatal Development	12
5	Care of the Newborn • Reflexes of the newborn and neonatal assessment • IUGR (Intra Uterine Growth Retardation) and Premature babies • Immunization of the newborn	12

REFERENCES

- Hurlock E.B., (1972): Child development, McGraw Hill Book Company.
- Suriakanthi A., (1997): Child Development - An Introduction, Kavitha Publishers.
- Hurlock, E.B., (1995): Developmental Psychology-A life span approach, 5th Edition, McGraw Hill Book Co., New York.
- Nanda V.K., (1998): Principles of Child Development, Anmol Publications Pvt. Ltd., New Delhi.
- Berk L.E., (2004): Child Development, Pearson Longman New Delhi.
- Singh, A. (Ed). 2015. Foundations of Human Development: A life span approach. New Delhi: Orient BlackSwan.

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester I, Major 3

Programme/Class: Certificate in Home Science (CN&D)	Year: 1	Semester: 1
Course code:	Course Title:	Credits:

	Food Science	4 C
Course Outcomes :		
1. Understanding the basic principles of food science, including composition, structure, and properties of food components. 2. Analyzing the nutritional composition of food and its impact on human health. 3. Developing practical skills in food preparations, food analysis, sensory evaluation, and product development. 4. Applying principles of food safety and quality assurance in food.		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper III
Units	Topic	No of Lectures
1	Basic concepts in food and nutrition • Basic terms used in study of food and nutrition • Understanding relationship between food, nutrition and health • Functions of food-Physiological, psychological and social	10
2	Functions, dietary sources and clinical manifestations of deficiency/ excess of the following nutrients • Carbohydrates, lipids and proteins • Fat soluble vitamins-A, D, E and K • Water soluble vitamins – thiamin, riboflavin, niacin, pyridoxine, folate, vitamin B12 and vitamin C • Minerals – calcium, iron and iodine	10
3	Basic food groups: Composition and nutritive value. • Cereals • Pulses • Vegetables and fruits • Milk and milk products. • Meat, fish, poultry and eggs. Nuts and oils. • Spices and condiments. • Sugar and jaggery	15
4	Cooking • Various methods and principles of cooking various foods – (boiling, steaming, etc.) • Processing of foodstuffs before cooking. • Effect on nutritive and other values of foods during cooking.	15
5	Improving nutritional quality of foods. • Germination • Fermentation • Supplementation	10

	• Enrichment • Fortification	
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REFERENCES

- Krause, Food Nutrition & Diet therapy,(2016) 8th edition saunders.
- Srilakshmi, B,(2014) Dietetics, seventh edition, New age international publishers.
- Shakunthala Manay. N; Shadakshara Swamy.M; Foods Facts and Principles, 3rd edition, New Age International (P) Limited Publishers, 2014.
- Maureen Martaugh and Janet Issac, (2010) Nutrition through lifecycle,4th International edition.
- UG Regulations 2020-21 Page 33
- Judith.E.Brown,(2010) Nutrition through lifecycle, 4th edition, Cengage learning inc.
- Prakash Shetty, (2002), Nutrition through life cycle, Illustrated edition, Leatherhead food research association.
- Ruby R Puckett and Rebecca Ann Lucas,(2009), Food nutrition and medical nutrition therapy through the life cycle, 4th edition, Hunt Publishing Co.
- Dr. M. Mohammad Essa,(2016) Handbook of Nutritional Assessment through the life cycle,1st edition, Nova Science publishers.
- Jeff Lowenfels, (2013) Teaming with Nutrients The Organic Gardeners guide to optimizing plant nutrition, 13th edition, Timper press.
- Patricia Barnes, (2015), The Handy Nutrition handbook, Visible ink press.
- Judith Brown ,(2019), Nutrition through life cycle, 7th edition, Brooks and Cole

- **E-LEARNING SOURCES:**

www.nutrition.gov-

www.nal.usda.gov/fnic-

<https://www.medicalnewstoday.com/articles/160774>

<https://www.healthline.com/health/food-nutrition>

<https://nutrition.org/>

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester I, Major 4

Programme/Class: Certificate in Home Science (CN&D)	Year: 1	Semester: 1
Course code:	Course Title: Food Science Practical	Credits: 2 C
Course Outcomes : 1. Analyzing the nutritional composition of food and its impact on human health. 2. Developing practical skills in food preparations, food analysis, sensory evaluation, and product development. 3. Applying principles of food safety and quality assurance in food.		
Total No. of	Max. Marks: 25+75	Core/Compulsory

Lectures: 30 (60 hrs)	Min. Passing Marks: 33	Paper IV
Units	Topic	No of Lectures
1	Standardization of weights and measures of various food items.	10
2	Basic food preparation • Cereal preparation • Pulse preparation. • Vegetable preparation. • Milk preparation • Soups • Bakery preparation • Beverages • Egg, fish, and meat preparations	10
3	Specific Nutrient rich preparations • Carbohydrate-rich recipe • Protein-rich recipe • Fats-rich recipe • Vitamins-rich recipe • Calcium & Iron rich recipe • Fiber-rich recipe	10

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester I, Major 5

Programme/Class: Certificate in Home Science (CN&D)	Year: 1	Semester: 1
Course code:	Course Title: Communication & Instructional Technology	Credits: 4 C
Course Outcome 1. Understanding the role of communication in instructional technology and its impact on teaching and learning. 2. Exploring various communication and models applicable to educational settings. 3. Identifying different instructional technologies and their applications in diverse learning environments. 4. Analyzing the effectiveness of various communication tools and technologies for instructional purposes.		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper V
Units	Topic	No of Lectures
1	Communication: Concepts • Historical background, concept and nature • Functions of Communication	10

	• Types of Communication - communication transactions; Formal and informal communication; Verbal and Non-verbal Communication • Scope of Communication • Communication for social change	
2	Understanding Human Communication • Culture and communication- Signs, symbols and codes in communication • Postulates/Principles of Communication • Elements of Communication and their characteristics • Models of Communication • Barriers to Communication	15
3	Types of Communication • Intra Personal • Interpersonal • Group • Organizational • Public • Mass	15
4	Communication Receiver Relationship • Rapport • Empathy • Perception • Persuasion • Credibility • Motivation	10
5	Different types of audio-visual aids • Their meaning definition & advantage Limitation & use in communication	10

REFERENCES

- Dhama, O.P. Bhatnagar, O.P., Second Edition 1985, Education and Communication for Development, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
- Barker, L. (1990). "Communication", New Jersey: Prentice Hall, Inc; 171
- Devito, J. (1998) Human Communication. New York: Harper & Row.
- Patri and Patri (2002); Essentials of Communication. Greenspan Publications

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester I, Major 6

Programme/Class: Certificate in Home Science (CN&D)	Year: 1	Semester: 1
Course code:	Course Title: Communication & Instructional Technology	Credits: 4 C
Course Outcome 1. Understanding the role of communication in instructional technology and its impact on teaching and learning. 2. Identifying different instructional technologies and their applications in diverse learning environments. 3. Analyzing the effectiveness of various communication tools and technologies for instructional purposes.		
Total No. of Lectures: 30 (60 hrs)	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper V
Units	Topic	No of Lectures
1	To select, plan, prepare, and use different audio-visual aids	10
2	To develop the ability to prepare and present individualized and group instruction.	10
3	To familiarize the students with different types of accessories used for preparing communication media.	10

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester II, Major 1

Programme/Class: Certificate in Home Science (CN&D)	Year: 1	Semester: 2
Course code:	Course Title: Nutrition & Fitness	Credits 2 C
Course Outcome : 1. Understanding nutrition principles and how they relate to fitness and overall health. 2. Identifying the macronutrients (carbohydrates, protein, and fats) and micronutrients (vitamins and minerals) 3. Identifying common nutritional deficiencies and their implication for health and fitness. 4. Understanding the relationship between nutrition, physical activity, and chronic disease prevention.		
Total No. of Lectures: 30	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper I
Units	Topic	No of Lectures
1	Understanding Fitness • Definition of fitness, wellness, health, and related terms • Types of fitness • Assessment of fitness • Readiness and approaches to keeping fit	5
2	Importance of nutrition Role of Nutrition in Fitness	5

	- Applying Nutritional guidelines for recreational fitness programs - Use of Nutritional supplements for physical fitness	
3	- Nutrition for Sports - Importance of Nutrition in Sports - Energy Metabolism and Factors Affecting Energy Requirement in Athletes	6
4	- Carbohydrates Role of Carbohydrates Before. During and After Exercise, Carbohydrate Loading - Proteins - Requirements for Exercise, Factors Affecting Requirement	8
5	Yoga, Health & Fitness - Relationship Yoga, Nutrition & Health - Yogic Diet & Integrative Nutrition - Importance of Nutrition in Yoga Journey.	6

REFERENCES

- Cooper, R. K. (1991). Health and Fitness Excellence.
- Dakin & Burke, (2012). 4th Edition. Clinical Sports Nutrition. McGraw-Hill, Australia • Bean, A. (2017). The complete guide to sports nutrition. Bloomsbury Publishing. • Girard Eberle, S. (2000). Endurance sports nutrition. Champaign, IL, Human Kinetics.
- Srilakshmi, B., Suganthi V., and Kalaivani, C. (2017). Exercise Physiology, Fitness, and Sports Nutrition. New Age International (P) Ltd Publishers
- Baker, A. (2005). Essentials of nutrition for sports. Arnie Baker Cycling. • Brouns, F. (2003). Essentials of sports nutrition. John Wiley & Sons.
- Maughan, R. J. (2002). Nutrition in Sports. Blackwell Science
- Lanham SA. (2011). Sports & Exercise Nutrition. The Nutrition Society Textbook Series • Antonio, J., Kalman, D., Stout, J., Greenwood, M., Willoughby, D., & Gregory, G. (2008). Essentials of Sports Nutrition and Supplements. Texas, USA. Ed

• E-LEARNING RESOURCES

American College of Sports Medicine for Physical Fitness: www.acsm.org

Eating for exercises and sports: nutrition.org

Exercise Physiology: <http://www.ncbi.nlm.nih.gov/PubMed/>

Gatorade Sports Science Institute for Sports Drinks: www.gssiweb.com

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Programme/Class: Certificate in Home Science (CN&D)	Year: 1	Semester: 2
Course code:	Course Title: Human Physiology	Credits: 4 C
Course Outcome : - Understanding the fundamental principles and concepts of human physiology, including homeostasis and cellular function. - Identifying the structure and function of major systems in the human body such as cardiovascular, respiratory, nervous, digestive, and endocrine systems. - Exploring the mechanisms of physiological regulation and coordination within and between organ systems. - Communicating complex physiological concepts effectively through written and oral presentations.		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper II
Units	Topic	No of Lectures
1	- Basic Unit of Human Body-Cell - Structure of cell - Structure of tissues and types - Functions of tissues	12
2	Elementary anatomy, physiology, and functions of- - The skeleton system - The nervous system – Organs, sensation vision, hearing, sense of touch, smell, and taste.	12
3	Elementary anatomy, physiology, and functions of- - The circulatory system– human heart and other organs, Composition of blood and function - The respiratory system – respiratory organs and their functions.	12
4	Elementary anatomy, physiology, and functions of- - The digestive system – organs of the digestive system and their functions. - The excretory system –organs of the excretory system and their functions	12
5	Elementary anatomy, physiology, and	

	functions of- • The Endocrine system – The ductless glands and their functions. • The Reproductive system – elementary knowledge of male and female reproductive organs, and their function.	12
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- Indu Khurana. (2020). Medical physiology for undergraduate students. Second edition. Elsevier Publication.
- GK Pal. (2019). Textbook of human physiology, third edition, Elsevier publications.
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- Guyton and Hall. (2020) Textbook of medical physiology, third edition, Elsevier

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- Stuart Ira Fox. (2003). Medical physiology, Eighth edition, MC Graw Hill Publication
- AK. Jain. (2019). Human physiology. sixth edition. Avichal publication company.
- Vidya Ratan. (2004) Handbook of Human Physiology. Jaypee publication.

• E-LEARNING RESOURCES

<https://youtu.be/MZDy0RvA52Y>-Osmosis

<https://youtu.be/TgcyiVQnVBs>- Respiratory system

<https://youtu.be/44B0ms3XPKU>- nervous system

<https://youtu.be/xIZQRjkwV9Q>- Cardiac cycle

https://youtu.be/3a_aLsFvNWs -Autonomic nervous system

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester II, Major 3

Programme/Class: Certificate in Home Science (CN&D)	Year: 1	Semester: 2
Course code:	Course Title: Introduction to Textiles	Credits: 4 C
Course Outcome 1. Identify different types of textile fibers, including natural and synthetic fibers, and understand their properties and characteristics. 2. Comprehend various methods of fabric construction, such as weaving, knitting, and non-woven techniques, and their impact on fabric properties. 3. Identify fabric properties like strength, durability, texture, drape, and elasticity, and evaluate their influence		

on textile performance.

4. Familiarize with textile testing methods for assessing factors like fabric weight, colorfastness, abrasion resistance, and dimensional stability

Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper III
Units	Topic	No of Lectures
1	● Introduction to Textile fibers ● Morphology of textile fibers- Monomer, Polymer, Degree of ● Polymerization, Crystalline and Amorphous Regions, Orientation ● Primary and secondary properties ● Fiber classification	12
2	● Production, Chemistry, Properties, and Usage of Fibers ● Natural fibers: Cotton, Flax, Silk and Wool ● Man-made fibers: Rayon, Nylon, Polyester, Acrylic, Olefins (Polyethylene and Polypropylene) and Elastomeric fibers	12
3	● Production and Properties of Yarns ● Yarn construction ● Mechanical Spinning (Cotton system, Wool system, Worsted system) b. Chemical Spinning (Wet, Dry, Melt) ● Types of yarns: Staple and Filament, Simple yarns, Complex yarns ● Yarn properties-Yarn Numbering System, Yarn Twist ● Textured yarns: Types and properties ● Difference between Threads and Yarns	12
4	● Techniques of fabric construction ● Classification of weaves- construction, characteristics, usage ● Knitting ● Classification of knits ● Construction and properties of warp and weft knits Non-woven	12
5	● Basics of Wet Processing ● Dyeing ● Fundamentals of printing ● Difference between dyeing and printing, ● Methods of printing: ● Fiber Identification tests -Visual; burning ● Traditional embroideries	12

	• Statewise printing and traditional embroideries of India • Principles and elements of arts • Fashion Cycle	
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REFERENCES

- Rastogi, D. & Chopra, S. (Eds.) (2017). Textile Science. New Delhi, India: Orient Black Swan Publishing Limited.
- Sekhri S: (2013). Textbook of Fabric Science: Fundamentals to Finishing. Delhi, India: PHI Learning.
- Agrawal, B. P. Textbook of Fabric Science: Fundamentals to Finishing. S. Chand Publishing, 2013.

- E-Learning Resources:

<https://www.textilestudycenter.com/>

<https://www.textileschool.com/>

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester II, Major 4

Programme/Class: Certificate in Home Science (CN&D)	Year: 1	Semester: 2
Course code:	Course Title: Introduction to Textiles Practical	Credits: 2 C
Course Outcome 1. Identify different types of textile fibers, including natural and synthetic fibers, and understand their properties and characteristics. 2. Comprehend various types of weaves. 3. Identify fabric properties like fabric count and balance of cloth 4. Familiarize with textile testing methods for assessing factors like fabric weight, colorfastness, abrasion resistance, and dimensional stability		
Total No. of Lectures: 30 (60 Hrs)	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper IV
Units	Topic	No of Lectures
1	• Identification of textile fabrics by visual, burning, microscopic, and chemical tests. • Laboratory Identification of different types of weaves and collection of their sample.	10
2	• Laboratory tests on fabrics- Fabric count and balance of cloth. • Colorfastness to sunlight and washing of various fabrics. • Test for Shrinkage – Resistance, over starching & weighing	10
3	Preparation of Traditional Embroidery Samples	10

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B.Sc Home Science (Clinical Nutrition and Dietetics), Semester II, Major 5

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Programme/Class : Certificate in Home Science (CN&D)	Year: 1	Semester: 2
Course code:	Course Title: Introduction to Resource Management	Credits: 4 C
Course Outcome 1. Identify and comprehend different types of household resources. 2. Learn techniques for effective resource allocation within a household. 3. Develop skills to manage time efficiently in household activities. 4. Acquire knowledge of budgeting and basic financial planning for the household.		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper V
Units	Topic	No of Lectures
1	Home Management • Definition, Philosophy, and Concepts of Home Management. • The Management process- planning, organizing, controlling, and Evaluation.	12
2	Family Life Cycle • The Family life cycle and its stages. • Qualities and responsibilities of a good homemaker. • Motivation in home management- values, goals, and standards.	12
3	Decision Making • Importance and classification of decisions. • Decision-making process. • Conflicts during decision-making.	12
4	Family Resources • Classification and characteristics of resources. • Time Management- Time demand in different stages of the family life cycle. • Energy Management- Energy demands in different stages of the family life cycle, Work curve, and fatigue types.	12
5	Work Simplification • Definition of work simplification and its importance. • Techniques of work simplification.	12

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REFERENCES

- Susan M Winchip (2008) Fundamentals of light, Fairchild publications
- Pratap R.M (1988) Interior Design Principles and Practice, standard publishers distribution, New Delhi
- Project Management by S. Chaudhury. Publisher: McGraw Hill Education (India) Private Limited Punmia B.C. 2008," Building Construction", laxmi publication Pvt. Ltd. New Delhi
- Management for Modern Families: Gross and Crandall. 2. Management in Family Living: Nickel and Dorsey. 3. Home Furnishing: A.H.Rutt. 4. Grih Prabandh: Manju Patni.

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester II, Major 6

Programme/Class : Certificate in Home Science (CN&D)	Year: 1	Semester: 2
Course code:	Course Title: Introduction to Resource Management Practical	Credits: 2 C
Course Outcome 1. Learn techniques for effective use of resources within a household. 2. Develop skills to manage time efficiently in household activities.		
Total No. of Lectures: 30 (60 Hrs)	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper VI
Units	Topic	No of Lectures
1	• Time plans for different work situations	10
2	• Color Wheel, Colour Scheme • Making of the waste material article/ decorative article	10
3	• Flower arrangement	10

DIPLOMA IN HOME SCIENCE (CLINICAL NUTRITION AND DIETETICS)

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester III, Major 1

Programme/Class : Diploma in Home Science (CN&D)	Year: 1	Semester: 3
Course code:	Course Title: Consumer Economics	Credits: 2 C
Course Outcome : 1. Gain insight into consumer decision-making processes, including factors influencing purchasing choices, preferences, and behavior. 2. Develop skills in budgeting, financial planning, and money management to achieve personal financial goals and objectives. 3. Understand the functioning of markets, including supply and demand, pricing mechanisms, and market structures, and their implications for consumers. 4. Learn about consumer rights and responsibilities, including laws and regulations protecting consumers and their implications for consumer transactions.		
Total No. of Lectures: 30	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper I
Units	Topic	No of Lectures
1	Family Income • Family income- Meaning and definition. • Types of income and methods of handling income, Money income, real income, psychological income and supplementing family income.	5
2	Budget and Saving • Budget- Meaning and definition, Types of budget, Engle's law of consumption, factors influencing budget, steps in making budget. • Saving- Meaning of saving, objectives of saving, types of saving, investment schemes and agencies of saving and investment.	10
3	Consumer and consumer behavior • Meaning and definition, objectives and need for consumer education. • Definition of consumer characteristics, role of	5

	consumer in the economy. • Consumer behavior and educating consumer. • Consumer buying habits, choice and needs.	
4	Consumer in the Market • Concept and classification of market • Types of market- wholesale, retail, local, telemarketing global etc. • Changing nature of the business world i.e. e-business and e-commerce. • Consumer buying habits and consumer choice and needs.	5
5	Consumer buying problems • Adulteration and other malpractices. • Weights and measures. • Consumption • Wants, demand and supply laws. • Law of diminishing marginal utility and marginal utility	5

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- Mital M., Jain, S., & Mehta, C. (2015). Family finance and Consumer Studies: A Practical Manual, Second Edition. New Delhi: Elite Publishing House Pvt. Ltd.
- Mital, M., Sawhney, H. K. (2015). Family Finance and Consumer Studies. New Delhi: Elite Publishing House Pvt. Ltd.
- Seetharaman, P. and Sethi, M. (2001). Consumerism: Strength and Tactics. New Delhi: CBS Publishers. .

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester III, Major 2

Programme/Class : Diploma in Home Science (CN&D)	Year: 1	Semester: 3
Course code:	Course Title: Food Service Equipment Layout	Credits: 4 C
Course Outcome 1. Grasp the equipment needs for different food service establishments. 2. Learn to choose and size equipment based on menu, volume, space, and budget considerations. 3. Understand principles for efficient, safe, and ergonomic layout design. 4. Explore practices for eco-friendly and cost-effective equipment selection and usage.		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper II
Units	Topic	No of Lectures
1	Equipment in food service – Classification of equipment,	10

	Factors affecting selection of equipment- Electrical and nonelectrical equipment for food storage, preparation, service and dishwashing. Base materials and insulating materials	
2	Planning food service unit Layout of food plants Plans of areas of food (preparation) Cooking Cleaning Storing Serving and dining	20
3	Different work centers Their sizes and finishes Storage units Lighting and ventilation Working ways in relation to equipment selection and their relationship	10
4	Hygiene, Sanitation and safety in food service institution, garbage disposal, pest control.	10
5	FSSAI (Food safety standard authority of India), HACCP, VACCP (Vulnerability Assessment Critical Control Points) and TACCP (Threat Assessment Critical Control Point)	10
INTERNAL ASSESSMENT OF 25 MARKS BASED ON THE FOLLOWING PRACTICAL WORK		
S.No	Topic	
1	Visits of food service institution to study layout and food service equipment	
2	Studying food service equipment available in India – type, features and cost.	
3	Planning, physical layouts of a food service institution commercial and non-commercial.	

REFERENCES :

- Sethi, M and Malhan, S. (2015). Catering Management An integrated approach, 3rd edition, New age international publishers, New Delhi
- V.Suganthi and C.Premakumari (2017).Food Service Management, Dipti Press (OPC) Pvt.LTD
- Andrews S,Food and Beverage Service, (2009) 2 nd edition, Tata McGraw hill publishing company limited.
- Mary B. Gregoire, Marian C. Spears, (2007), Food Service Organizations, Pearson Prentice Hall
- Jyoti.S, Sharma, (2006), Food Service Modern Technique and Practices, Akansha Publishing House.
- Cousins, J.A, Lilicrap,D.R and Weekes,S. (2014).Food and Beverage Service, ELBS, 9th edition.
- Payne-Palacio,J and Theis,M. (2009).Introduction to Foodservice.11thedition, Pearson/Prentice Hall
- Andrews,S. (2008). Food and Beverage Management. Tata Mc Graw Hill Publishing, New Delhi
- Bali, P.S. (2011). Quantity food Production operations & Indian Cuisine, Oxford University Press, New Delhi, 2011
- Creed, P. G. (2001). The potential of foodservice systems for satisfying consumer needs. Innovative Food Science & Emerging Technologies

- UG Regulations 2020-21 Page 76

- E-LEARNING RESOURCES

<https://www.ccohs.ca/oshanswers/hsprograms>

<https://www.eatrightpro.org/practice/practice-resources>

<https://www.ers.usda.gov/topics/food-markets-prices/food-service-industry.aspx>

<https://theicn.org/>

www.fssai.gov.in

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester III, Major 3

Programme/Class : Diploma in Home Science (CN&D)	Year: 1	Semester: 3
Course code:	Course Title: Nutrition through Life cycle	Credits: 4 C
Course Outcome : 1. Learn to create balanced and varied menus tailored to nutritional needs, <u>pREFERENCES</u>, and dietary restrictions. 2. Develop skills in purchasing ingredients economically while adhering to budgetary constraints. 3. Grasp the specific nutritional requirements of pregnant women, infants, and children. 4. Learn about promoting healthy eating habits for expectant mothers to support fetal growth and development. 5. Understand the benefits of breastfeeding and provide guidance to breastfeeding mothers.		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper IV
Units	Topic	No of Lectures
1	• Relationship of nutrition to human health, growth and human welfare. Concept and definition of terms • Recommended dietary allowances for Indians, Normal Nutrition, malnutrition, under nutrition • dietary fiber • As a nutrient, functions, sources, requirements. Distribution of water in the body, composition of body fluids, water exchange between plasma and interstitial fluid. • Water and Electrolyte-Water, Sodium, Potassium: Distribution of water and	15

	Electrolytes, Functions, Sources, Requirements, Water balance, Maintenance of water balance, Water depletion, Water excess, Distribution of Electrolytes, Maintenance of Electrolyte balance.	
2	• Energy value of foods and energy requirement, • Basal metabolism, factors affecting basal metabolic rate, calorogenic effect of food, specific dynamic action of food.	10
3	Basic principles of meal planning and its importance. • Planning menu for individual and family • Factors affecting meal planning, food groups, their exchange and distribution	5
4	• Nutrition during infancy, preschool age, school age, Adolescence, Adults, and the elderly (for both genders, various activity levels, and all income groups).	15
5	• Nutrition during pregnancy and lactation, nutritional requirements, the effect of malnutrition on maternal health, and pregnancy outcome. • Common problems of pregnancy and their management are vomiting and nausea, pica, pregnancy-induced hypertension, obesity, and diabetes.	15

REFERENCES :

- Mathur P, Chadha R (Eds). Nutrition: A Lifecycle Approach. Publ Orient Blackswan 2015. (Reprint 2018) ISBN 9788125059301
- Khanna K, Textbook of Nutrition and Dietetics (2013) 2nd edition, Elite Publishing house Pvt. Ltd.
- Krause, Food Nutrition & Diet therapy,(2016) 8th edition saunders.
- Srilakshmi, B,(2014) Dietetics, seventh edition, New age international publishers.
- Judith.E.Brown,(2010) Nutrition through lifecycle, 4th edition, Cengage learning inc.
- Ruby R Puckett and Rebecca Ann Lucas,(2009), Food nutrition and medical nutrition therapy through the life cycle, 4th edition, Hunt Publishing Co.
- Dr. M. Mohammad Essa,(2016) Handbook of Nutritional Assessment through the life cycle,1st edition, Nova Science publishers.
- Patricia Barnes, (2015), The Handy Nutrition handbook, Visible ink press.

- Judith Brown ,(2019)Nutrition through life cycle, 7th edition, Brooks and Cole

- E-LEARNING SOURCES:

www.nutrition.gov-

www.nal.usda.gov/fnic-

<https://www.medicalnewstoday.com/articles/160774>

<https://www.healthline.com/health/food-nutrition>

<https://nutrition.org/>

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester III, Major 4

Programme/Class : Diploma in Home Science (CN&D)	Year: 1	Semester: 3
Course code:	Course Title: Nutrition through Life cycle	Credits: 4 C
Course Outcome : - Learn to create balanced and varied menus tailored to nutritional needs, p<u>REFERENCES</u>, and dietary restrictions. - Develop skills in purchasing ingredients economically while adhering to budgetary constraints. - Grasp the specific nutritional requirements of pregnant women, infants, and children. - Learn about promoting healthy eating habits for expectant mothers to support fetal growth and development. - Provide guidance on the use of bomb calorimeter		
Total No. of Lectures: 30 (60hrs)	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper V
Units	Topic	No of Lectures
1	Categorization of food as rich, moderate, and poor sources of energy, protein, fat carbohydrates, vitamins, and minerals.	10
2	Demonstration, understanding of principal and working of a bomb calorimeter	5
3	- Planning diets for different age groups, income groups, and activity levels. - Planning diet for pregnancy and lactation period. - Immunization Schedule for Infants and Children.	15




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Programme/Class: Diploma in Home Science (CN&D)	Year: 1	Semester: 3
Course code:	Course Title: Nutritional Biochemistry	Credits: 4 C
Course Outcome 1. Understand the biochemical pathways involved in the metabolism of carbohydrates, proteins, and fats, including digestion, absorption, and utilization in the body. 2. Learn about the roles of vitamins, minerals, and other micronutrients in biochemical processes essential for health, growth, and metabolism. 3. Explore the mechanisms of energy balance regulation, including the roles of hormones, enzymes, and metabolic pathways in energy metabolism. 4. Understand the interactions between nutrients and their impact on absorption, metabolism, and physiological functions in the body. 5. Identify the biochemical signs and symptoms of nutrient deficiencies and toxicities, and understand their implications for health and disease.		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper VI
Units	Topic	No of Lectures
1	• Introduction to biochemistry • Objectives and scope of biochemistry.	5
2	Carbohydrates • Introduction, composition, classification and functions of carbohydrates • Metabolism of carbohydrates	10
3	Lipids • Composition, classification, and functions of lipids • Digestion and absorption of lipids.	10
4	Proteins • Definition, composition, classification, and properties of proteins. • Digestion, absorption, and metabolism of proteins.	10
5	Micronutrients, Enzymes, Hormones	

	• Vitamins- Definition, classification, function, storage, absorption, and excretion of vitamins. (Fat soluble and water soluble) • Minerals – Classification digestion, absorption, storage, and excretion of • Enzymes- Definition, properties of enzyme, inhibition, factors minerals. Effecting function of enzyme action, Clinical importance of enzymes. • Hormones- Types, secretory glands, and biological role of hormones.	25
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- Sathyanarayan U. (2020) Biochemistry. 5th edition, New central book agency.
- Jain JL (2004) Fundamentals of biochemistry. 6th edition. S Chand publisher.
- DM. Vasudevan. (2019) Textbook of biochemistry for medical students, Ninth edition, Jaypee publishers.
- Rama Rao A.V.S.S. (1990) Text book of biochemistry. 5th edition, L K and Publishers. 2009.
- Prasad R. (2019) Biochemistry for medical students. 5th edition. Prasad Publication.
- Rodwell and Blender. (2018) Harpers Illustrated biochemistry. 31st edition, Mc Graw Publication.
- Shivananda Nayak. (2020) Handbook of biochemistry and nutrition. 1st edition. Jaypee publications.
- Ferrier. Lipincotts Illustrated Reviews in Biochemistry. (2017) 7th edition. Wolter and Kluwer publications.
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- E-LEARNING CONTENT

<https://youtu.be/vxDSI9XKB1A> -carbohydrate metabolism

<https://youtu.be/xZdTfhsypjM> -fatty acid synthesis

<https://youtu.be/JxK5rZxbyQY> -Cholesterol synthesis

<https://youtu.be/ubzw64PQPqM> - Krebs cycle

<https://youtu.be/0I8vaXqfElo> - urea cycle

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B.Sc Home Science (Clinical Nutrition & Dietetics), Semester III, Major 6

Programme/Class: Diploma in Home Science (CN&D)	Year: 1	Semester: 3
Course code:	Course Title: Nutritional Biochemistry Practical	Credits: 4 C
Course Outcome 1. Learn the methods of identification, detection and estimation of nutrients by various methods.		
Total No. of Lectures: 30 (60 Hrs)	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper VII
Units	Topic	No of Lectures
1	- Detection of glucose, fructose, sucrose, maltose and lactose. - Identification of protein- casein, egg albumin. - Separation of water and insoluble protein from egg proteins.	10
2	- Test of starch:- Iodine test for starch solution. - Preparation of stained slide of potato starch grains. Microscopic examination	10
3	- Estimation of chloride in table salt by titrimetric method. - Estimation of vitamin C content in food by titrimetric method.	10

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester IV, Major 1

Programme/Class: Diploma in Home Science (CN&D)	Year: 1	Semester: 4
Course code:	Course Title: Basic Dietetics	Credits: 4C
Course Outcome 1. Understand the basic principles of human nutrition, including macronutrients, and micronutrients, and their roles in maintaining health and preventing disease. 2. Learn methods for assessing dietary intake and nutritional status in individuals and populations, including dietary recall, food frequency questionnaires, and anthropometric measurements. 3. Develop skills in creating balanced and varied diets based on nutritional needs, <u>pREFERENCES</u> , cultural		

considerations, and health goals.

4. Gain knowledge of effective communication and counseling techniques to promote healthy eating habits and behavior change in diverse populations.

Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper I
Units	Topic	No of Lectures
1	Concept of Diet Therapy ● Purpose and Principles of Therapeutic Diets. ● Modifications of normal diet. ● Classification of Therapeutics diets.	10
2	● Routine Hospital Diets – Liquid diet, Soft Diet, Regular normal diet. ● Special feeding methods:- tube feeding, and parental feeding. ● Pre and Post-operative Diet.	15
3	Role of Dietitian ● Definition of Nutritional Care. ● Team Approach to Nutritional Care.	10
4	Modifications of Diet ● Febrile Condition – Short Duration and Chronic Fever, Intermittent fevers ● Gastro Intestinal Disease- Peptic Ulcer, Constipation, Diarrhea. ● Liver Diseases – Infective Hepatitis, Cirrhosis of Liver. ● Renal Diseases – Etiology, symptoms, dietary modifications in glomerulonephritis, nephrosis, acute and chronic renal failure. ● Diabetes Mellitus- Predisposing factors, types – Type I DM, Type II DM, Gestational diabetes mellitus, clinical features and biochemical changes, diagnostic tests – GTT and HbA1c, nutritional implications, dietary management of impaired glucose tolerance, Glycemic Index and Glycemic Load – definition and purpose, acute and chronic complications of diabetes. ● Cardiovascular Disease – Predisposing factors, etiology, clinical symptoms, dietary management in atherosclerosis, congestive cardiac failure, and hypertension. Classification of lipoproteins and role of fat in the development of atherosclerosis. ● Hyperlipidemia – definition, types, dietary management. Functional foods in the prevention of heart diseases	15

	Nutrition in Weight management - Etiology, assessment, grades of obesity, dietary management, types of obesity diet, and complications in Obesity and Underweight.	
5	Geriatrics Nutrition allowances - Dietary Guidelines - Nutrition and work efficiency modifications in diet. Physiological changes in aging – psycho-social and economical factors affecting eating behavior. Effects of aging on nutritional health.	10

REFERENCES :

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- Gopalan C., Rama Sastri B.V., Balasubramaniam S.C., (2006), Nutritive Value of Indian Foods, Hyderabad.
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- Wardlaw, GM., (2004), Contemporary Nutrition, 2nd edition, Mosby Publishing.
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• E-LEARNING RESOURCES:

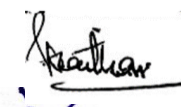
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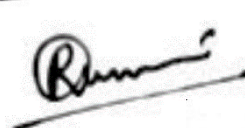


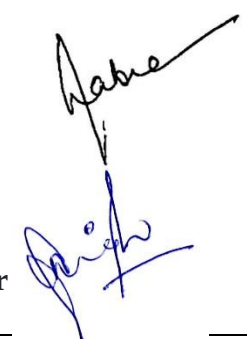

Home Science (Clinical Dietetics), Major 2

Programme/Class: Diploma in Home Science (CN&D)	Year: 1	Semester: 4
Course code:	Course Title: Basic Dietetics Practical	Credits: 2C
Course Outcome 1. Understand the basic principles of human nutrition, including macronutrients, and micronutrients, and their roles in maintaining health and preventing disease. 2. Develop skills in creating balanced and varied diets based on nutritional needs, preferences, cultural considerations, and health goals. 3. Gain knowledge of effective communication and counseling techniques to promote healthy eating habits and behavior change in diverse populations.		
Total No. of Lectures: 30 (60 Hrs)	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper II
Units	Topic	No of Lectures
1	Planning and Preparation • Normal Diet, Soft Diet, Liquid Diet. • Low-Calorie Diet for Obesity. • High Fibre Diet for Constipation. • Low fibre Diet for Diarrhea. • Bland Diet for Peptic Ulcer.	10
2	Planning and preparation of • Low Sodium Diet for Hypertension. • Low Protein Diet for Renal Disease. • Low fat Diet for Liver Disease. • Low Cholesterol Diet for CVD. • Diabetic Diet. • High Caloric Diet for fever patient.	10
3	Dietetics & Counselling • Practical consideration in giving dietary advice & Counselling & Educating patients • Teaching aids used by dieticians	10









B.Sc Home Science (Clinical Nutrition & Dietetics), 5th sem

Programme/Class: Diploma in Home Science (CN&D)	Year: 1	Semester: 4
Course code:	Course Title: FOOD PRODUCT DEVELOPMENT AND ACCEPTANCE	Credits: 4 C

Course Outcome :

1. Gain insight into the process of developing new food products, including concept ideation, formulation, and commercialization.
2. Learn to conduct market research to identify consumer pREFERENCES, trends, and opportunities for new food product development.
3. Develop skills in recipe development, ingredient selection, and formulation optimization to create food products that meet nutritional, sensory, and market requirements.
4. Understand sensory evaluation methods and techniques used to assess the sensory attributes of food products, including appearance, aroma, taste, texture, and overall acceptability.

Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper III
Units	Topic	No of Lectures
1	- Identifying the need for new products & designing a new product - Using the need-based perspective and application. - Types of products and use of food additives.	15
2	- Chemical and Physical properties of food - Packaging and product costing - Sensory Analysis - Definition, Sensory analysis in product evaluation, Factor affecting food acceptance.	10
3	- Food behavior concept – Factors affecting food behavior. Food behavior and linkage with health. - Food Health. - Knowledge, attitude, practice, Food habits, and dietary patterns in different regions and communities in India. - Food facts and beliefs.	15
4	Factors affecting food habits – family size, composition, structure, economic status, working	10

	status of mother, education.	
5	Health and Nutrition education. Role of Media in changing food behaviors.	10

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B.Sc Home Science (Clinical Nutrition & Dietetics), Semester IV, Major 4

Programme/Class: Diploma in Home Science (CN&D)	Year: 1	Semester: 4
Course code:	Course Title: FOOD PRODUCT DEVELOPMENT AND ACCEPTANCE PRACTICAL PRACTICAL	Credits: 2 C
Course Outcome : - Gain insight into the process of developing new food products, including concept ideation, formulation, and commercialization. - Learn to conduct market research to identify consumer <u>pREFERENCES</u>, trends, and opportunities for new food product development. - Develop skills in recipe development, ingredient selection, and formulation optimization to create food products that meet nutritional, sensory, and market requirements. - Understand sensory evaluation methods and techniques used to assess the sensory attributes of food products, including appearance, aroma, taste, texture, and overall acceptability.		
Total No. of	Max. Marks: 25+75	Core/Compulsory

Lectures: 30 (60 Hrs)	Min. Passing Marks: 33	Paper IV
Units	Topic	No of Lectures
1	Planning for the food product to be developed.	15
2	Standardization of food products and conducting sensory evaluation.	15

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester IV, Major 5

Programme/Class: Diploma in Home Science (CN&D)	Year: 1	Semester: 4
Course code:	Course Title: Food Microbiology & Toxicology	Credits: 4 C
Course Outcome : - Understand the diversity, behavior, and ecology of microorganisms in food environments, including their roles in food spoilage and preservation. - Learn the factors influencing microbial growth in food, and methods for controlling microbial contamination and growth through sanitation, preservation, and processing techniques. - Identify common foodborne pathogens, their sources, transmission routes, and the diseases they cause, and understand strategies for preventing foodborne illness. - Recognize signs of food spoilage caused by microbial activity, and understand the mechanisms underlying spoilage reactions and their impact on food quality and safety		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper V
Units	Topic	No of Lectures
1	Brief history of food microbiology and introduction to important microorganisms in food.	12
2	Cultivation of microorganisms – nutritional requirements of microorganisms, types of media used, methods of isolation.	12
3	Fundamentals of control of microorganisms in foods – use of high and low temperature, dehydration, freezing, irradiation, preservation, sterilization, and disinfection.	12
4	Food Spoilage – Contamination and microorganisms in the spoilage of different kinds of food and their preservation – cereals & cereal products, vegetables & fruits, fish & meat products, egg & poultry, milk and milk products, and canned food.	12
5	Public health hazards due to Contaminated & Adulterated foods	12

	● Microbes used in food ● Biotechnology ● Fermented foods. ● Residual chemicals utilized in food production & processing – chemicals preservations, pesticides, heavy metals.	
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B.Sc Home Science (Clinical Nutrition & Dietetics), Semester IV, Major 6

Programme/Class: Diploma in Home Science (CN&D)	Year: 1	Semester: 4
Course code:	Course Title: Food Microbiology & Toxicology Practical	Credits: 2 C
Course Outcome : 1. Understand the use and care of Microscope 2. Learn the factors influencing microbial growth in food, and methods for controlling microbial contamination and growth 3. Recognize signs of microbial activity in food.		
Total No. of Lectures: 30 (60 Hrs)	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper VI

Units	Topic	No of Lectures
1	Demonstration of the different parts of the microscope, the use and care of the microscope.	5
2	- Preparation of bacterial smear, simple staining. - Preparation of common laboratory media for the cultivation of bacteria, yeast, and mold.	10
3	- Morphological identification of important molds and yeast - Rhizopus, Mucor, Aspergillus, Penicillium, Saccharomyces, Alternaria - Demonstration of microbiological analysis of water, and milk.	15

BACHELORS OF HOME SCIENCE (CLINICAL NUTRITION AND DIETETICS)

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester V, Major 1

Programme/Class: Bachelors of Home Science (CN&D)	Year: 1	Semester: 5
Course code:	Course Title: Food material management and cost accountancy	Credits: 4 C
Course Outcome : - Gain knowledge of principles, concepts, and techniques related to food material management, including procurement, inventory control, storage, and distribution of food materials within food service operations. - Learn methods for analyzing food costs, including cost per portion, cost per serving, and cost per recipe, and understand their implications for menu pricing, profitability, and cost control. - Develop skills in inventory management practices, including inventory tracking, stock rotation, stocktaking, and order management, to ensure adequate stock levels while minimizing waste and spoilage. - Understand criteria for selecting food suppliers, negotiating contracts, and managing supplier relationships to ensure quality, consistency, and cost-effectiveness of food materials.		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper I
Units	Topic	No of Lectures
1	Food material management meaning, definition, importance food selection, purchasing, buying, receiving, budgeting, inventory and store room management Controlling: meaning, control process, need for control, control techniques, control in relation to the above operation	12

	Store-keeping, definition, objectives, functions, factors underlying successful store keeping, duties and responsibilities of a storekeeper, stores requisition, issue note, bin card, cardex system, daily stock balance, daily issue statement and cost thereof, cost of carrying and not carrying stores. System and quality control	
2	Food Cost Accounting Introduction, definition, objectives, scope, advantages and limitations Introduction to methods and techniques, cost classification, cost centre, cost unit, cost classification by function, by elements, by behaviour, direct and indirect costs, the build up of the total cost Cost sheet and statement, calculation of profit on cost or on selling price, fixing selling price Concept of cost benefit analysis	12
3	Budgeting and budgetary controls definition, meaning, purpose, advantages, key factor in Budgeting budgets- short term and long term, fixed and flexible, various functional budget like sales, purchase, production, stores, personnel, expense and master budget standard costing- meaning and types	12
4	Book keeping and accountancy Introduction, objects, principles and advantages of Book keeping, elements of transactions, double entry, identifying debit and credit effects, grouping of accounts Journal, source of journal entries like bills, cash memos, receipts, vouchers etc. journaling a transaction, narration to a journal entry Ledger, indexing account, opening accounts, classification of ledger, transferring journal entries in to ledger, preparing a trial balance	12
5	Introduction and advantages of subsidiary books, sales book, purchase book, return inward book, outward book, cash book, petty cash book, debit and credit notes, deposits in bank and payment in cheques.	12

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B.Sc Home Science (Clinical Nutrition & Dietetics), Semester V, Major 2

Programme/Class: Bachelors of Home Science (CN&D)	Year: 3	Semester: V
Course code:	Course Title: RESEARCH METHODOLOGY IN HOME SCIENCE	Credits: 4
Course Outcome 1. Compare and contrast quantitative and qualitative research approaches 2. Identify appropriate sampling methods, measurement scales and tools of data collection and appropriate uses of each 3. Demonstrate knowledge of the key steps of a research process in both experimental and observational research		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory II
Units	Topic	No of Lectures
1	Research- Meaning, purpose and approaches a) Exploration, Description, Explanation b) Scientific method and research c) Quantitative and Qualitative approaches d) Research Designs -Experimental and Observational	8

2	Conceptualization and Measurement a) Variables, concepts and measurement b) Levels of measurement c) Units of analysis	7
3	Sampling & Tools a) Role of sampling in research b) Types of sampling	15
4	Research Tools and Techniques a) Validity and reliability b) Data Gathering Instruments – Inquiry form, interview, observation, Sociometric techniques & Projective techniques c) Scales & scaling techniques	15
5	The Research Process a) Defining the problem, research questions, objectives, hypotheses b) Review of related literature and originality in writing c) Planning the research d) <u>REFERENCES</u> writing	15

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B.Sc Home Science (Clinical Nutrition & Dietetics), Semester V, Major 3

Programme/Class: Bachelors of Home Science (CN&D)	Year: 1	Semester: 5
Course code:	Course Title: Advanced Dietetics	Credits: 4 C
Course Outcome 1. Develop advanced skills in conducting comprehensive nutritional assessments, including dietary intake analysis, anthropometric measurements, biochemical markers, and medical history evaluation, to assess individual nutritional status and needs. 2. Learn advanced techniques for providing individualized nutritional counseling and interventions based on evidence-based guidelines, patient preferences, and health goals to promote optimal health outcomes and manage nutrition-related conditions. 3. Gain expertise in implementing medical nutrition therapy for various health conditions, including obesity, diabetes, cardiovascular disease, renal disorders, gastrointestinal disorders, and eating disorders, incorporating current research and best practices. 4. Understand the role of nutrition in pharmacology and medication management, including drug-nutrient interactions, nutrient depletions, and therapeutic nutrition interventions to optimize medication efficacy and minimize adverse effects.		

Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper III
Units	Topic	No of Lectures
1	An overview of Special Diets ● Purine-Restricted Diet ● Ketogenic Diet ● Paleo diet ● Mediterranean Diet ● Vegan Diet ● FODMAP Diet	10
2	Diet in disturbances of the small intestine and colon: Ulcerative Colitis, Diverticulitis, Irritable Bowel Syndrome, Malabsorption Syndrome – Crohns Disease, Sprue/ Tropical Sprue, Hemorrhoids, . – symptoms and dietary treatment	10
3	● Nutritional management in the liver, gall bladder, and Pancreatic diseases - Etiology, symptoms, nutritional implication and dietary management of Hepatic Encephalopathy, Cholecystitis, Cholelithiasis and Pancreatitis ● Diet in kidney diseases – Dialysis– principles, types and modifications of diet in dialysis. End stage renal disease and its dietary management. Urinary calculi –etiology, types, nutritional care and dietary modifications ● Diet in cardiovascular - Hyperlipidemia – definition, types, dietary management. Functional foods in the prevention of heart diseases	15
4	● Etiology, Symptoms, Dietary Treatment. ● Diet in Arthritis and Gout – Etiology, Symptoms, Dietary Treatment. ● Diet in Trauma, Burns.. ● Nutritional management in cancer – Etiology and risk factors, pathophysiology, symptoms, metabolic abnormalities, phases of carcinogenesis, goals of cancer treatment, nutrients for cancer prevention, managing cancer cachexia, dietary management, and nutritional problems of cancer treatments ● Diet in Diabetes mellitus- Pathophysiology of diabetes, Glycemic Index and Glycemic Load – definition and purpose, acute and chronic complications of diabetes, hyperglycemic drugs, insulin and its type.	15

5	• Diet in allergy and skin Disturbances Definition, Classification, Manifestation, Common food allergies, tests, dietetic treatment. • Nutrition and Diet Counseling – Techniques and patient education.	10
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B.Sc Home Science (Clinical Nutrition & Dietetics), Semester V, Major 4

Programme/Class: Bachelors of Home Science (CN&D)	Year: 1	Semester: 5
Course code:	Course Title: Advanced Dietetics Practical	Credits: 2 C

Course Outcome

1. Learn advanced techniques for providing individualized nutritional counseling and interventions based on evidence-based guidelines, patient REFERENCES, and health goals to promote optimal health outcomes and manage nutrition-related conditions.
2. Gain expertise in implementing medical nutrition therapy for various health conditions, including obesity, diabetes, cardiovascular disease, renal disorders, gastrointestinal disorders, and eating disorders, incorporating current research and best practices.
3. Understand the role of nutrition in pharmacology and medication management, including drug-nutrient interactions, nutrient depletions, and therapeutic nutrition interventions to optimize medication efficacy and minimize adverse effects.

Total No. of Lectures: 30(60 Hrs)	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper IV
Units	Topic	No of Lectures
1	Planning and Preparation of Diets:- • Diet for obesity and leanness. • Diet for Gastric Diseases. • Diet for Liver Diseases.	10
2	Planning and Preparation of Diets:- • Diet for Kidney Diseases. • Diet for CVD • Diet for Diabetes.	10
3	Planning and preparations of Diets in : • Allergy • Surgery • Burns and Trauma • Cancer	10

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester V, Major 5

Programme/Class: Bachelors of Home Science (CN&D)	Year: 1	Semester: 5
Course code:	Course Title: Quantity food Production & Services	Credits : 2 C
Course Outcome		
1. Understand the principles and practices of food safety and sanitation, including hygiene standards, sanitation procedures, cross-contamination prevention, and regulatory requirements to ensure safe food production and service.		

2. Develop skills in quality control and assurance processes, including monitoring, inspection, and testing of food products, ingredients, and equipment to maintain high standards of quality, consistency, and safety. 3. Learn advanced food production techniques, including cooking methods, recipe standardization, portion control, and presentation skills to produce high-quality and visually appealing food products. 4. Gain knowledge of menu planning and development concepts, including menu design, pricing strategies, nutritional analysis, and customer pREFERENCES to create diverse and appealing menus that meet quality and profitability objectives.		
Total No. of Lectures: 30	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper V
Units	Topic	No of Lectures
1	Food production Kitchen management, characteristics of food, food quality, menu planning, purchasing and storage, receiving and storage, cooking and presentation techniques	5
2	Production cycle, hygiene, sanitation and safety	5
3	Methods and styles of Food Service, table setting, food presentation, clearing and winding up, customer relations.	6
4	Starting a food service outlet-feasibility study, strategic planning, acquisition of resources, and organization for efficient use.	8
5	Laws governing food service institutions. Food laws concerning hygiene and safety, implementation.	6

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B.Sc Home Science (Clinical Nutrition & Dietetics), Semester V, Major 6

Programme/Class: Bachelors of Home Science (CN&D)	Year: 1	Semester: 5
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Course code:	Course Title: Quantity food Production & Services Practical	Credits : 4 C
Course Outcome - Understand the principles and practices of food safety and sanitation, including hygiene standards, sanitation procedures, cross-contamination prevention, and regulatory requirements to ensure safe food production and service. - Learn advanced food production techniques, including cooking methods, recipe standardization, portion control, and presentation skills to produce high-quality and visually appealing food products. - Gain knowledge of menu planning and development concepts, including menu design, pricing strategies, nutritional analysis, and customer <u>pREFERENCES</u> to create diverse and appealing menus that meet quality and profitability objectives.		
Total No. of Lectures: 60 (120 Hrs)	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper V
Units	Topic	No of Lectures
1	Organizing, preparing, and serving food for three different meals for 50 members.	30
2	Table layout, tray service	10
3	Order taking, making out checks bills presentation of bills Serving, and clearing practice.	20

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester VI, Major 1

Programme/Class: Bachelors of Home Science (CN&D)	Year: 1	Semester: 6
Course code:	Course Title: Clinical Nutrition	Credits: 4 C
Course Outcome - Develop skills in conducting comprehensive nutritional assessments, including dietary intake analysis, anthropometric measurements, biochemical markers, and medical history evaluation, to assess individual nutritional status and needs. - Learn methods for screening and diagnosing malnutrition, nutritional deficiencies, and nutrition-related diseases using validated screening tools, diagnostic criteria, and clinical assessments. - Acquire expertise in developing and implementing evidence-based medical nutrition therapy plans for managing nutrition-related conditions, including obesity, diabetes, cardiovascular disease, renal disorders, gastrointestinal disorders, and eating disorders. - Design individualized nutrition intervention plans tailored to patient needs, preferences, and health goals, incorporating dietary modifications, nutritional supplements, and lifestyle recommendations to optimize nutritional status and health outcomes. - Understand indications, contraindications, and administration techniques for enteral and parenteral nutrition support in clinical settings, including tube feeding, intravenous nutrition, and specialized nutrition formulas for		

critically ill or malnourished patients.

Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper I
Units	Topic	No of Lectures
1	Carbohydrates – Definition and composition classification, Review of digestion, absorption, and utilization -Regulation of blood sugar, Hormonal controls, and functions of carbohydrates in the body. Dietary Fiber- definition, soluble and insoluble fibers, sources of fiber, components, and physiological effects of dietary fiber, the role of fiber in human nutrition, sources, and requirements. Introduction to Prebiotics.	10
2	Lipids – Review of digestion, absorption, and metabolism of fats and fatty acids, energy yield from dietary fats, storage and mobilization of fat stores during exercise, and production of ketone bodies. Definition, Classification, Composition, sources, requirements, functions. Essential Fatty Acids (EFA) – definition, functions, sources and effects of deficiency. Characteristics of animal and vegetable fats, sterols - cholesterol - function, food sources, phospholipids - function, ketone bodies - fat requirements - food sources, dietary lipids and their relation to the causation of Atherosclerosis and Ischemic heart disease.	15
3	Energy Metabolism –Calories, Joules, determination of energy value of foods, using Bomb calorimetry , gross calorific values, Physiological energy, value of foods, relation between oxygen used and calorific value, determination of direct calorimetry. Basal metabolism - definition, determination - benedict Roth basal Metabolism Apparatus - factors affecting BMR - determination of energy metabolism during work - energy requirements for various types of activities, factorial methods for calculation of the daily energy requirements of an adult for varying degrees of physical activity - recommended allowances for calories, energy requirements of adults expressed in terms of Reference man and Reference woman - ICMR committee percent calories supplied by carbohydrates, fats and proteins in average Indian diets - Energy requirements for different age groups	10
4	Water and electrolyte balance	10
5	Nutrient and drug interactions – effect of drug therapy on intake, absorption, and utilization of nutrients. Proteins and amino acids: Digestion, absorption and metabolism. Definition, classification, Composition, sources, requirements and functions of protein. Amino acids -	15

	Indispensable and dispensable amino acids - special function of amino acids - protein deficiency	
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Information on Protein Energy Malnutrition: www.who.org

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester VI, Major 2

Programme/Class: Bachelors of Home Science (CN&D)	Year: 1	Semester: 6
Course code:	Course Title: Management in Entrepreneurship	Credits: 4 C
Course Outcome 1. Develop an entrepreneurial mindset, including creativity, innovation, adaptability, and resilience, to identify opportunities, solve problems, and drive business success. 2. Learn to develop comprehensive business plans, including market analysis, competitive analysis, financial projections, and marketing strategies, to launch and grow successful ventures. 3. Acquire skills in identifying and evaluating business opportunities, including market trends, consumer needs, industry gaps, and competitive advantages, to assess feasibility and potential for success. 4. Understand various sources of startup financing, including bootstrapping, angel investors, venture capital, crowdfunding, and loans, and learn to manage capital effectively to support business growth and sustainability.		

5. Gain knowledge of legal and regulatory requirements for starting and operating a business, including business registration, permits, licenses, contracts, intellectual property rights, and compliance with labor laws.		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper II
Units	Topic	No of Lectures
1	• Concept of Entrepreneurship. • Theories of Entrepreneurship. • Classification and types of Entrepreneurship.	12
2	• Entrepreneurial traits and competencies. • Entrepreneurial orientation. • Developing Entrepreneurship through training • Entrepreneurship and Economic Development.	12
3	Personnel Management • definition and importance • role of a personnel manager, manpower planning, importance of personal management • staff employment: Advertising, Recruitment, Selection, Orientation, Induction and training of personnel • Employee benefits: performance appraisal, motivation & motivational theories., incentives for effective performance, staff turnover, fringe benefits • Employee Discipline • Grievance Handling: nature, causes, and procedures	12
4	• Labor laws and policies • Personnel policies • Other emoluments, allowances, leave • Women's rights in the workplace	12
5	• Laws affecting food service operations • Trade Union Act • Indian Contract act • Sales of Goods Act • Environment Act • Shops and establishments • License and Permits	12

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B.Sc Home Science (Clinical Nutrition & Dietetics), Semester VI, Major 3

Programme/Class: Bachelors of Home Science (CN&D)	Year: 1	Semester: 6
Course code:	Course Title: Community Nutrition	Credits: 4 C
Course Outcome 1. Develop an understanding of the principles, concepts, and theories of community nutrition, including population health, social determinants of health, and nutrition-related disparities. 2. Learn methods for assessing community nutritional needs, including demographic analysis, health surveys, dietary assessment, and community asset mapping, to identify nutrition-related issues and priorities. 3. Acquire skills in planning, developing, and implementing community nutrition programs and interventions tailored to the needs and <u>REFERENCES</u> of diverse populations, including culturally appropriate and evidence-based approaches. 4. Learn strategies for providing nutrition education and counseling to individuals, families, and communities, including behavior change theories, communication skills, and health promotion strategies to promote healthy eating habits and lifestyle behaviors. 5. Understand the role of policy advocacy and systems change in promoting community nutrition and public health, including advocating for supportive policies, programs, and environments that promote access to healthy foods and nutrition education.		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper III
Units	Topic	No of Lectures
1	• Concept and scope of Community Nutrition. • Nutrition and health in National development • Nutritional problems confronting our country – The	12

	causes of malnutrition in India, Balance food production and population growth.	
2	• Factors affecting food, Availability, and intake. • Agriculture production, population, distribution, and industrialization.	12
3	• Meaning of nutrition education and its importance. • Organization of nutrition education programmers for the community.	12
4	Nutritional Anthropometry • Nutritional status assessment – meaning, need, objective. • Methods of assessment of nutritional status • Sampling techniques. • Identification of risk groups. • Direct assessment: • Anthropometry, Clinical, and Biochemical estimations. • Indirect assessment ○ Food balance sheets and Agricultural data, Ecological parameters, and vital statistics. ○ Use of growth charts. • Biochemical Assessment • Clinical signs ○ Identifying signs of PEM, Vit. A, Iodine, Iron deficiency Interpretation of descriptive list of clinical signs. • Diet Surveys	12
5	• Nutrition and health care programs in India. • National and International agencies in community nutrition ICDS, SNP, ANP, Midday meal program, FAO, WHO, UNICEF, CARE, AID, ICMR, CSIR, NIN, CFTRI.	12

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- Lawrence and Worsley. (2008) Public health nutrition. Third edition. Allen and Unwin publishers.
- VK Muthu. A short book on public health. (2014) Second edition. Jaypee publication.
- Sudip and Shailesh. (2020) Public health and management. Second edition. White Falcon Publishing.
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- Virginia Bridge. (2016). Public Health: A Very Short Introduction. II edition.
- E-LEARNING CONTENT

<https://youtu.be/sbMhQPS9GaM> -Public health

<https://youtu.be/8PH4JYfF4Ns> -malnutrition

<https://youtu.be/r7jTe4phFeM> -vaccination

<https://youtu.be/bqEicMMmj5M> - child malnutrition

<https://youtu.be/Fm15SkyOvtE> - Nutrition assessment

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester VI, Major 4

Programme/Class: Bachelors of Home Science (CN&D)	Year: 1	Semester: 6
Course code:	Course Title: Community Nutrition Practical	Credits: 2 C
Course Outcome 1. Understand the needs and problems of the underdeveloped areas of the society/city. 2. Have an understanding of the working of Community kitchens. 3. Acquire skills in planning, developing, and implementing community nutrition assessments.		
Total No. of Lectures: 30 (60 Hrs)	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper IV
Units	Topic	No of Lectures
1	• Visits to underdeveloped areas of the society/city (Jhuggi) • Visit to Community Kitchens (Hostels, mid-day meal distribution, etc.)	10
2	• Taking Anthropometric measurements.	10
3	• Formulation of questionnaire/ schedule. • Observation of Clinical signs.	10

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester VI, Major 5

Programme/Class: Bachelors of Home Science (CN&D)	Year: 1	Semester: 6
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Course code:	Course Title: Food Preservation and Protection	Credits: 4 C
Course Outcome 1. Gain knowledge of various food preservation methods, including thermal processing, refrigeration, freezing, drying, fermentation, canning, pickling, and irradiation, and their principles of operation. 2. Identify common microbial spoilage organisms and foodborne pathogens, understand their sources, growth conditions, and mechanisms of food spoilage, and learn strategies for preventing microbial contamination and growth. 3. Learn about chemical and physical preservation techniques used to inhibit microbial growth and enzymatic activity in food, including pH adjustment, water activity control, preservatives, antioxidants, and packaging technologies. 4. Understand the principles of heat processing and pasteurization in food preservation, including different heat treatments, time-temperature combinations, and equipment used for the thermal processing of foods. 5. Explore the principles of refrigeration and freezing in food preservation, including temperature control, cold chain management, freezing techniques, and equipment used for refrigeration and freezing of foods. 6. Acquire knowledge of drying and dehydration methods used to remove moisture from foods, including sun drying, air drying, freeze drying, and spray drying, and their applications in preserving fruits, vegetables, meats, and grains. 7. Learn about fermentation and pickling processes used to preserve foods through microbial fermentation, including fermentation principles, starter cultures, fermentation vessels, and safety considerations.		
Total No. of Lectures: 60	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper V
Units	Topic	No of Lectures
1	● Food Spoilage – its causes ● Perishable, semi-perishable, and non-perishable foods. ● Factors affecting the growth of micro-organisms in the food. ● Intrinsic and extrinsic parameters.	12
2	● Food Preservation ● Importance and principles of food preservation ● Methods of food preservation. ● Use of low temperature(Refrigeration and freezing) ● Use of high temperature(Pasteurization and sterilization) ● Use of preservatives. ● Drying. ● Radiation.	12
3	● Food Fermentation ● Microorganisms as food-SCP (Single cell Protein) ● Food Adulteration and its household methods of detection.	12

4	- Food Additives – definition and classification. - General principles of the use of food additives issued by FAO, WHO. - Natural and synthetic preservatives.	12
5	- Food Laws and Standards. - Responsible for national & international agencies for safe food (HAACP, FSSAI, FAO, WHO). - Present regulations/orders/standards related to food.	12

REFERENCES

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- E-LEARNING RESOURCES:

USDA FSIS - shelf stable food safety https://www.fsis.usda.gov/wps/wcm/connect/77ffde83-dc51-4fdf-93be-048110fe47d6/Shelf_Stable_Food_Safety.pdf?MOD=AJPERES

B.Sc Home Science (Clinical Nutrition & Dietetics), Semester VI, Major 6

Programme/Class: Bachelors of Home Science (CN&D)	Year: 1	Semester: 6
Course code:	Course Title: Food Preservation and Protection Practical	Credits: 2 C
Course Outcome - Gain knowledge of various food preservation methods - Learn about chemical and physical preservation techniques used to inhibit microbial growth and enzymatic activity in food, including pH adjustment, water activity control, preservatives, antioxidants, and packaging		

technologies.

3. Understand the principles of heat processing and pasteurization in food preservation
4. Learn about pickling processes used to preserve foods.

Total No. of Lectures: 30 (60 Hrs)	Max. Marks: 25+75 Min. Passing Marks: 33	Core/Compulsory Paper VI
Units	Topic	No of Lectures
1	Preparation of jams, jellies & marmalades	10
2	Preparation of murrabbas & pickles,	10
3	- Preparation of chutneys, squashes & sauce. - Bottling of fruit juices.	10

PAPER V PROJECT CUM INTERNSHIP ON ENTREPRENEURSHIP FULFILLING FOLLOWING OBJECTIVES (PROJECT REPORT + VIVA) (4 Credits)

Practical-

To develop skills in entrepreneurship in catering/hospitals/ sports center to understand the principles of planning, organizing, and controlling in different units

Gain knowledge to manage manpower and establish good human relations.

Gain experience in financial management

Internship: A phase of training where in a graduate is expected to conduct actual practice in a hospital /industry for a period of 30 Days so as to acquire job oriented skills

Assessment: Interns shall maintain a record book which shall be verified and certified by the training authority under whom he or she works during his/her internship period.

An objective evaluation of his/her knowledge, skills and attitude during training will be recorded by the center in-charge and monitored by faculty in-charge and marks shall be allotted accordingly.

