DEPARTMENT OF HOME SCIENCE AND RESEARCH CENTRE

UNIQUE FEATURES OF SYLLABI

- Nutrition Knowledge enriches life-oriented courses in the Home Science with strong foundation of nutrition science applications in different Home Science branches. Thus representing on interdisciplinary field that prefers young learners for achieving Goals in their – Profession.
- Skill Enhancement course such as Yoga for holistic health in I semester, Surface Embellishment practical in II semester, Kitchen garden practical in III semesters has been included. In Food Safety and Quality Control, the methods of evaluation of food adulterants and toxic constituents are included.
- Research Methodology and Statistics - Reference Management Software like Zotero/Mendeley, Software for paper formatting like LaTeX/MS Office, Software for detection of Plagiarism topics has been included and Usage of Statistical Package for Social Science (SPSS) Software - (Interpretation of Findings) has been included which is used to gather, assess, and analyze information about students' research interests.
- In Medical Nutrition Therapy I - The Atkins, Ketogenic, Paleo, Low-carb High-fat diet,Covid-19 and the Role of Immune Booster Food in the Management of Fever and Infection topics, as well as the Role of FODMAP diet included, to assist students in preparing and planning nutrition-rich foods that boost the immune system, which is highlyrecommended in the current situation.
- In Food Packaging Technology -Vaccum Packaging, Isothermal Packaging, Shrink packaging. Moisture Sorption Properties of Foods and Selection of Packaging Materials.
- In Nutraceuticals and Functional Foods - Quality Assurance of probiotics and safety topic and Immune boosting nutraceuticals for infections has been included.
- With the Integration of employability and entrepreneurship, the Indian fashion and apparel Industry needs design professionals with in-depth knowledge & skills relating to design innovation and technology. There is also a domestic and international requirement for Indian designers to come up with original inputs. The present challenges for the upcoming design professionals to demonstrate their personal design philosophy, perpetuate innovation and creativity. This will enable the industry to come up to the global standards to apply the knowledge of designing in various fields.
- Fashion Accessory Designing Practical the new experiments as Gloves and Face masks related to these current trends in fashion. It helps students to create an innovative face mask and gloves in this pandemic situation.
- The content of fabric Antimicrobial Finishing for COVID-19.Technical Textiles, Protective textiles for COVID- 19 included promoting innovative ideas for students to know the recent development of textiles.

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DEPARTMENT OF HOMESCIENCE AND RESEARCH CENTRE
PG and UG SYLLABUS
(With effect from June 2022)

Vision:
The Department of Home science and Research Centre aims to empower and uplift women through excellence in education, research and Promote Entrepreneurial spirit among youngsters to inculcate innovative and ingenious bent of mind to be job creators and nation builders in the field of Nutrition and Dietetics, Food Processing and Fashion Designing.

Mission:
- The Programme develops the wholesome personality of the students by unifying their knowledge through Home Science discipline
- Rendering the knowledge-based education to Nutrition and Dietetics, Fashion Designing, and Food Processing students through high-quality teaching, training, and research mentorship and contributing service to professional, governmental and local community organizations
- Transforming academic inputs to social benefits, nurturing the students for holistic development, extending community outreach for social upliftment, facilitating academia/ Industrial collaboration

Programme Educational Objectives:
PEO1: To create and strengthen women leaders through disciplinary knowledge, professional skills and ethical sensitivity
PEO2: To transform students as successful entrepreneurs to face the modern challenges
PEO3: To nurture the students to invent, innovate and create solutions for current moral, ecological and economic issues

Programme Outcomes:
On completion of all Under Graduates and Post Graduate degree programmes the student will be enable with
PO1: Disciplinary Knowledge and Critical Thinking: Acquiring the knowledge of different dimensions in the related areas of study and identifying the assumptions that frame our thinking and actions
PO2: Influential and Effective Communication: Ability to share thought ideas and applied skills of communication in its various preparations through LSRW
PO3: Social Interaction and Effective Citizenship: Ability to identify and follow ethical behavior appearing employment sustainability and adapting truthful action in all aspects of life
PO4: Research Skills and Scientific Reasoning: Ability to plan executes and reports the results of an experiment and to draw conclusions from evidences
PO5: Ethics: Understand the importance ofethical value and its application in professional life
PO6: **Information/Digital Literacy:** Capability to use ICT in case of need and their ability to access, evaluate and use the relevant information
PO7: Self Directed and Lifelong Learning: Acquire the ability to engage in independent and lifelong learning in the context of socio-technological changes

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M Sc HOMESCIENCE- NUTRITION AND DIETETICS
[Two Year Regular Programme]
(For Students Admitted from 2022-23)

Programme Specific Outcomes:
On completion of the Post Graduate Programme, the student will be able to gain

PSO1: Apply the knowledge of the nutrition care process and promotes a high standard of nutrition care to clients in the field of Nutrition & Dietetics
PSO2: Solve the complex problems in the field of Clinical Nutrition and dietetics with an understanding of the societal, legal, and cultural impacts of the solution
PSO3: Translate nutrition needs into food choices and plan menus for community settings taking into consideration psychosocial economic and life stages
PSO4: Reflect upon his own performance and be a self-directed and life-long learner
PSO5: Become a successful entrepreneur, professional and pursue higher education
PSO6: To construct their own food and baking units and understand and identify the food safety issues at micro and macro levels
PSO7: Organize educational internship in reputed hospitals and food industries

PREAMBLE

Following are the changes done in the 2021-22 syllabus and the candidates who will join from 2022 -23 onwards will follow this syllabus.

The following changes have been introduced in the curriculum:

- In Semester - I, Core I - Advanced Food Chemistry and Core II- Advanced Human Nutrition swapped to Core I- Advanced Human Nutrition and Core II- Advanced Food Chemistry.
- Core IX- Nutrition through life cycle, swapped from III semester to II semester, Core VIII -Food Analysis Practicals swapped from II semester to III semester.
- In Semester- I, Core III- Advanced Food Microbiology, the topic of food adulterants was removed.
- In Semester - I, Core II - Advanced Food chemistry the textbook Meyer (2006) Food Chemistry added.
- In Semester-III, Core XII - Food analysis Practicals visit to the animal study laboratory included in the syllabus.
- In Semester- II, Elective II- b) Food Packaging technology topics such as vacuum packaging, shrink packaging, Sorption Isothermal and ERH studies were included in Unit-I.
- In Semester - III, Elective III- a) Food safety and quality control, sensory evaluation topic replaced with topics related to Quality control, Microbiological Methods for determining shelf life like TPC, Serial dilution technique included.

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PROGRAMME CODE:PND
PROGRAMME STRUCTURE

Semester	Subject Code	Course	Subject Title	Hour/ Week	Credit	CIA	ESE	Total Marks
I	IMNDC11	Core I	Advanced Food Chemistry	6	5	40	60	100
	IMNDC12	Core II	Advanced Human Nutrition	6	5	40	60	100
	IMNDC13	Core III	• Integrated Course-Advanced Food Microbiology	6	5	40	60	100
	IMNDC14	Core IV	Research Methodology and Statistics	6	5	40	60	100
	IMNDE1A/ IMNDE1B	DSE I	a.Public Health Nutrition b.Sensory Evaluation	6	5	40	60	100
	IMNDX1/ IMNDX1O	Extra Credit	Institutional Food Service Management / *Online Course (Food Nutrition for Healthy Living-Swayam)	-	2	-	100	100
			TOTAL	**30**	**25+2**	**200**	**300+ 100**	**500+ 100**
II	IMNDC21	Core V	Medical Nutrition TherapyI	6	5	40	60	100
	IMNDC22P	Core VI	Medical Nutrition TherapyI Practicals	6	5	40	60	100
	IMNDC23	Core VII	Advanced Nutritional Biochemistry	6	5	40	60	100
	IMNDC24	Core VIII	Nutrition Through Life Cycle	6	5	40	60	100
	IMNDE2A/ IMNDE2B	DSE II	a.Guidance and Counselling in Nutrition Education / b.Food Packaging Technology	6	5	40	60	100
	IMNDX2PW/ IMNDX2O	Extra Credit	Scientific Writing for Project / *Online Course (Maternal Infant Young Child Nutrition- Swayam)	-	2	-	100	100
			TOTAL	**30**	**25+2**	**200**	**300+ 100**	**500+ 100**
III	IMNDC31	Core IX	Medical Nutrition Therapy II	6	5	40	60	100
	IMNDC32P	Core X	Medical Nutrition Therapy II Practicals	6	5	40	60	100
	IMNDC33	Core XI	• Integrated Course-Nutraceuticals and Functional Foods	6	5	40	60	100

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III	IMNDC34P	Core XII	Food Analysis Practicals	6	5	40	60	100
	IMNDE3A/ IMNDE3B	DSE III	a. Food Safety and Quality Control b.Sports Nutrition	6	5	40	60	100
	IMESX3/ IMNDX3O	Extra Credit	Employability Skills / *Online Course (Mental Health and Nutrition-EDX)	-	2	100	-	100
			TOTAL	**30**	**25+2**	**200+ 100**	**300**	**500+ 100**
IV	IMNDC41	Core XIII	Geriatric Nutrition	6	5	40	60	100
	IMNDC42P	Core XIV	# Dietetic Internship in Hospital	6	5	40	60	100
	IMNDC43PW	Core XV	Dissertation	16	5	100	100	200
	IMNDX4/ IMNDX40	Extra Credit	Diabetic Care and Education / *Online Course (Food science and Processing- Swayam)		2	-	100	100
			Library	2				
			TOTAL	**30**	**15 + 2**	**180**	**220+ 100**	**400+ 100**
			GRAND TOTAL	**120**	**90+ 8**	**780+ 100**	**1120+ 300**	**1900+ 400**

DSE –Discipline Specific Elective

*For online certification credit alone will be assigned on submission of certificate obtained through appearing for online examination from Swayam, SpokenTutorial, EDX, NPTEL etc.

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Core I - Advanced Food Chemistry

(For Students Admitted from 2022-23)

Semester: I **Hours/week:6**
Subject Code: IMNDC11 **Credit: 5**

Course Objectives:

1. To get a comprehensive understanding of food chemistry, including the composition of food, the role of each component, and their interactions
2. To have an effective understanding of the functions of food components and their role in food processing

Unit I **(18 hours)**

Food in relation to health: Introduction to food science as a discipline and modern developments, Different methods of cooking, Functions of cooking.

Functional properties of foods: Definition, Structure and properties of food hydrocolloids. Hydrocolloids as gelling, emulsifying, thickening, stabilizing and coating agents. Important roles of proteins (Denaturation and Browning),Carbohydrates (Caramelization and Crystallization) and Fats(Emulsification) in altering the functional properties of food.

Unit II **(18 hours)**

Carbohydrates: Polysaccharides-Structure, Composition of starch, Properties and characteristics of food starches, Effect of heat on food starch properties, Factors influencing gelatinization and dextrinization changes. Modified food starches-Structure, Composition and characteristics of non-starch polysaccharides such as Cellulose, Hemicellulose, Pectin and gums, Role of starch and non-starchpolysaccharides in food Industries.

Properties of sugars and sweeteners: Sugars syrups, Sugar alcohols, sweeteners, sugar products, Role of sweetener in food products.

Unit III **(18 hours)**

Proteins &Amino Acid-Classification, Structure and Properties, Composition of proteins. Effect of heat on physio-chemical properties of proteins, Role of proteins in food products, Texturized vegetable protein, Protein concentrate and isolate preparation methods.

Enzymes: Classification and its nature, Mechanism of action, Factors influencing enzyme activity, Role of enzymes in food products, Immobilized enzymes and its application in food industries.

Unit IV **(18 hours)**

Fat/Oil: Structure, Composition and Properties of fat. Method of oil extraction- Oil composition and the properties, refining of oil and winterization, Methods to determine the quality of fat /oil. Effect of processing on Physico-chemical properties of fat/oil, Sources of fat and its shelf life, Quality changes in fat/oil during storage and prevention of fat spoilage, Role of fat/oil in food products, Fat substitutes.

Unit V **(18 hours)**

Food colors and Flavors: Pigments-Classification, Structure and properties, Effects of processing on stability of pigments in foods and the factors influencing the stability of colors in foods.

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Role of colors in food products, Flavors, Taste and nonspecific saporous sensations. Flavor compounds in vegetables, fruits, and spices, Flavors produced from fermentation and volatiles on foods, Effect of processing on food flavors, Role of flavors in food products.

Course Outcomes:

After successful completion of this course, student will be able to

CO 1: Recall knowledge base of core food chemistry with an emphasis on chemical changes during processing and storage and explain the chemistry, structure, and properties of various food constituents

CO 2: Identify the nature of food components and their qualities in order to evaluate the changes in final products

CO 3: Distinguish the functions of various food-processing components.

CO 4: Discuss the effect of processing on the physiochemical and functional qualities of various food ingredients

CO 5: Prioritize the roles of several constituents in food storage and shelf-life extension

Text Books:

1. Shakuntala Manay.N, Shadaksharaswamy.M, *Food Facts and Principles,* New Age InternationalPublishers, 4th Edition, 2018.
2. Srinivasan Damodaran, Kirk L. Parkin, *Fennema's Food Chemistry*,CRC Press, 5th Edition, 2017.
3. L.H. Meyer, *Text Book of Food Chemistry*, CBS Publishing & Distributors, New Delhi, 2006.

Reference Books:

1. Jianquan Kan, KeweiChen, *Essentials of Food Chemistry,* Springer Publication, 2021.
2. Berk.z, *Food Process Engineering and Technology,* Elsevier Academic Press, Newyork, 3rd Edition, 2018.
3. John M.deMan, John W. Finley, W. Jeffrey Hurst, Chang Yong Lee, *Principles of Food Chemistry*, Springer Publishers, 4th Edition, 2018.
4. Fellows P J, *Food Processing Technology: Principles and Practice* , CRC Wood Head Publishing Ltd., Cambridge, 4th Edition, 2016.

Journals:

1. Journal of Food Science
2. Journal of Food Science and Technology
3. Journal of Agricultural and Food Chemistry

E-Resources:

1. http://www.uprtou.ac.in/other_pdf/MFN_008.pdf
2. http://www.fao.org/3/x5738e/x5738e06.htm#TopOfPage
3. https://www.pdfdrive.com/introduction-to-proteins-structure-function-and-motion- second-edition-e187940292.html
4. https://www.pdfdrive.com/the-chemistry-of-oils-and-fats-sources-composition- properties-and-uses-e156997107.html
5. https://www.pdfdrive.com/colour-additives-for-foods-and-beverages-e40299790.html

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Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	3	3	3	3	**33**
CO2	9	9	9	9	3	3	3	**45**
CO3	9	3	9	9	3	3	9	**45**
CO4	9	3	3	9	3	3	3	**33**
CO5	9	3	9	9	3	3	9	**45**
Total	**45**	**21**	**39**	**39**	**15**	**15**	**27**	**201**

Low-1 Medium-3 High-9

Core II - Advanced Human Nutrition

(For Students Admitted from 2022-23)

Semester: I **Hours/week: 6**
Subject Code: IMNDC12 **Credit: 5**

Course Objectives:

1. To learn the role of nutrients in the human body and provide in depth understanding of nutritional science related topics in preparation of further studies
2. To examine the features of nutrients including food sources, digestion, absorption, transport, metabolism, excretion, deficiency and toxicity

Unit I **(18 hours)**

Human Nutritional Requirements: Development and Recent concepts- Methods of determining human nutrient needs, Description of basic terms and concepts in relation to human nutritional requirements, Guidelines and Recommendations, Translation of nutritional requirements into dietary Guidelines.

Energy: Determination of energy value of food, Physiological fuel value, Benedict's Oxy-calorimeter, Relation between oxygen required and calorimeter value. Total energy requirement, Measuring total energy requirement. Factors affecting physical activity, Basal metabolic rate - Measurement of basal metabolism, Determination of basal metabolic rate by calculation energy requirement during work and thermic effect of food, Regulation of Energy Metabolism and Body Weight, Control of food intake.

Unit II **(18 hours)**

Carbohydrates: Review of nutritional significance of carbohydrates and changing trends in dietary intake of different types of carbohydrates and their implications, Dietary fibre - Types, Sources and role and mechanism of action. Chemical composition and physiological significance - Resistant starch, Fructo-oligosaccharides, Glycemic Index and Glycemic load.

Unit III **(18 hours)**

Proteins: Protein Metabolism in muscle, Liver and Gastro Intestine, Amino acid and peptide transporters, Requirements and dietary guidelines, Therapeutic applications of amino acids,

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Peptides of physiological and nutritional significance.

Lipids: Nutritional significance of fatty acids - Saturated fatty acid, Mono unsaturated fatty acid, Poly unsaturated fatty acid and Trans fatty acids. Functions and deficiency of Essential fatty acids, Role of n-3 and n-6 fatty acids, Nutritional Requirements and dietary guidelines for visible and invisible fats in diets.

Unit IV **(18 hours)**

Vitamins: Definition, Classification, Metabolism (Digestion, Absorption, Transport, Storage and elimination), Bioavailability and factors affecting bioavailability, Biochemical and physiological functions, Interaction with other nutrients, Pharmacological and therapeutic effects - Fat soluble vitamins: (A, D, E, K) and Water soluble vitamins (B1, B2, B3, B5, B6,B9, B12, Vitamin C).

Unit V **(18 hours)**

Minerals: Definition, Classification, Food Source, Metabolism (Digestion, Absorption, Transport, Storage and Elimination), Bioavailability and factors affecting bioavailability, Biochemical and physiological functions, Interaction with other nutrients, Pharmacological and therapeutic effects- Macro Minerals (Calcium, Phosphorous, Sodium, Potassium).Micro Minerals (Iron, Zinc, Selenium, Iodine and Fluorine).

Body fluid and electrolyte balance: Water distribution in the body, preformed and metabolic water; maintenance and regulation of fluid and electrolyte balance.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Relate human nutrition to the maintenance of health and the prevention of disease and understand the metabolic role of nutrients and their complex interrelationships

CO2: Identify the relationship between physiological structure, biochemical status and nutrient availability

CO3: Analyze the Bioavailability, excess and deficiency condition of all nutrients

CO4: Utilize current scientific literature to investigate nutrition and the valid use of supplements

CO5: Critically evaluate and derive requirements for specific nutrients and familiarize with the recent advances in human nutrition

Text Books:

1. Srilakshmi, *Nutrition Science*, New Age International Publishers, 8th Edition, 2019.
2. Bamji, M.S., Krishnaswamy K. Brahmam G.N.V ,*Textbook of Human Nutrition*, Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi, 4th Edition, 2017.

Reference Books:

1. Rhonda M. Lane, *Human Nutrition*: Navigating through the Maze, Kendall / Hunt PublishingCo, U.S, 3rd Edition, 2019.
2. Denis M Medeiros and Wildman, *Advanced Human Nutrition*, Jones & Bartlett Learning, 4thEdition,2018.
3. Kathleen Mahan and Sylvia Escort- Stump, *Food, Nutrition and Diet Therapy*, W.B.Saunders Company,11th Edition,2016.

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Journals:

1. American Journal of Clinical Nutrition
2. Indian Journal of Nutrition and Dietetics
3. Journal of Clinical Nutrition and Food Science

E-Resources:

1. https://www.pdfdrive.com/introduction-to-human-nutrition-2nd-edition- e1688125.html.
2. https://www.pdfdrive.com/introduction-to-human-nutrition-e8482943.html
3. https://www.pdfdrive.com/vitamin-and-mineral-requirements-in-human-nutrition- e28893.html
4. https://www.pdfdrive.com/vitamins-and-minerals-e162099106.html
5. https://www.pdfdrive.com/advanced-nutrition-and-dietetics-in-nutrition-support-e158466498.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	3	9	3	9	**51**
CO2	9	3	9	9	3	9	9	**51**
CO3	9	3	9	9	9	9	9	**57**
CO4	9	3	9	3	9	9	9	**51**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**27**	**45**	**33**	**39**	**39**	**45**	**273**

Low-1 Medium-3 High-9

Core III - Advanced Food Microbiology

(For Students Admitted from 2022-23)

Semester: I **Hours/week: 6**
Subject Code: IMNDC13 **Credit: 5**

Course Objectives:

1. To obtain knowledge about important genera of microorganisms associated with food and role of micro-organisms in health and disease
2. To study microbiological examination of foods, microbiological quality Control and quality schemes

Unit I **(18 hours)**

Introduction to Food Microbiology: History and development of Food microbiology, Scope of food microbiology, General characteristics of microorganisms, Morphology, Classification, Motility, Nutrition, Respiration and reproduction - Bacteria, Viruses, Yeasts, Molds, Algae and Protozoa.

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Unit II **(18 hours)**

Determination of microorganisms and their products in food: Sampling, sample collection, Transport and Storage, Sample preparation for analysis.

Microscopic and culture dependent methods: Direct microscopic observation, culture, Enumeration and isolation methods.

Chemical and Physical methods: Chemical, Immunological and nucleic acid based methods.

Culture independent techniques: PCR Based, DGGE, Metagenomics, Analytical methods for microbial metabolites - Microbial toxins and metabolites.

Unit III **(18 hours)**

Microorganisms and Food Preparation Fermentation process: Prebiotics,Probiotics and single cell proteins. Dairy products, Traditional Indian fermented foods and their health benefits. Fermented Beverages -Wine,Beer,Toddy and Vodka.

Natural Toxins in Food: Natural toxins of plant and animal origin, Microbial toxins (Algal toxins, Bacterial toxins and Fungal toxins).Natural occurrence, toxicity and significance. Food poisoning. Determination of toxicants in foods and their management.

Unit IV **(18 hours)**

Food borne diseases: Bacterial food borne diseases - Staphylococcal intoxication, Botulism, Salmonellosis, Shigellosis, Enteropathogenic Escherichia Coli Diarrhoea, Clostridium Perfringens gastroenteritis, Bacillus cereus Gastroenteritics.

Viral Food borne diseases: Norwalk virus, Norovirus, Reovirus, Rotavirus, Astrovirus, Adenovirus, Parvovirus, Hepatitis AVirus.

Animal Parasites Food borne diseases: Protozoa-Giardiasis, Amebiasis, Toxoplasmosis, Sarcocystosis, Cryptosporidiosis, Cysticercosis / Taeniasis. Roundworm: Trichinosis, Anisakiasis. Mycotoxins: Aflatoxicosis, Mycotoxicosis, Ergotism.

Unit V **(18 hours)**

Assessing the microbiological quality of food: Microbiological standards, Principles of GMP in food processing and Safety management at household and industrial level.

HACCP: An Effective Food Safety Assurance System, Need for HACCP, Benefits of HACCP, Principle of HACCP, Guidelines for Application of HACCP Principles, HACCP Status in India, HACCP Case studies.

Course Outcomes:

After successful completion ofthis course, student will be able to

CO1: Recall the types of microorganisms in food processing and compare their characteristics and behaviour and understand the knowledge of sample preparation in microbiological analysis

CO2: Identify microorganisms in food fermentation product and describe their roles

CO3: Differentiate the roles of bacteria, mycotoxin, viruses and parasites to food borne diseases and compare pathogens that cause infection and intoxication

CO4: Explain the principles of food microbiology to evaluate food related cases in daily Application

CO5: Familiarize the concept of HACCP in Food Industry

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Text Books:

1. William C.Frazier, *Food Microbiology*, Tata McGraw Hills Publishing Company Limited,Chennai,5th Edition, 2017.
2. Virendra Kumar Pandey, *A Text Book of Food Microbiology*,INSC InternationalPublishers,2021.

Reference Books:

1. Matthews.K.R, *Food Microbiologyan Introduction*, ASM Press, 4th Edition, 2017.
2. Adams, MR and Moss,MO,*Food Microbiology*, New Age International (P) Ltd, New Delhi,2015.
3. Ray, B. and Bhunia, A, *Fundamental Food Microbiology*, CRC Press, 5th Edition, 2018.

Journals:

1. Journal of Food Microbiology
2. Journal of Food & Industrial Microbiology
3. International Journal of Food Microbiology

E-Resources:

1. https://www.pdfdrive.com/food-microbiology-d55747381.html
2. https://www.pdfdrive.com/food-microbiology-e58597702.html
3. https://www.pdfdrive.com/fundamental-food-microbiology-fifth-edition- e175981800.html
4. https://www.pdfdrive.com/food-microbiology-an-introduction-e166783912.html
5. https://www.pdfdrive.com/foodborne-parasites-food-microbiology-and-food-safety- e15

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	9	3	9	9	**51**
CO2	9	3	9	3	9	3	9	**45**
CO3	9	3	9	9	9	9	9	**57**
CO4	9	9	9	9	9	9	9	**63**
CO5	9	3	9	3	9	9	9	**51**
Total	**45**	**21**	**45**	**33**	**39**	**39**	**45**	**267**

Low-1 Medium-3 High-9

Core IV-Research Methodology and Statistics

(For Students Admitted from 2022-23)

Semester: I **Hours /week: 6**
Subject Code: IMNDC14 **Credit: 5**

Course Objectives:

1. To give an overview of the research methodology and explain the technique of defininga research problem, sampling design and different methods of data collections
2. To develop practical knowledge and skills to understand and carryout research projects

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Unit I **(18 hours)**

Introduction to Research Methodology: Meaning, Objectives and Significance of research. Types of research and Research approaches and scientific methods. Criteria of good research. **Research process:** Selection and formulation of research problem, Specifying objectives, Formulating hypothesis and Deciding variables, Limitations and delimitations of the problem.

Unit II **(18 hours)**

Defining the Research Problem: Concept and need, Identification of Research problem, defining and delimiting Research problem.

Research Questions and Hypothesis: Variables and their linkages, characteristics of good Hypothesis. Research question and formulation of hypothesis-directional and non-directional hypothesis.

Research design: Purposes of research design -Fundamental, Applied and action, Exploratory and descriptive, Experimental, Ex-post facto - Longitudinal and Cross sectional and Co-relational.

Data collection instrument: Observation, Questionnaire, Interview, Scaling method, Case study and Home visits. Reliability and validity of measuring instruments.

Unit III **(18 hours)**

Sampling design: Population and sample, Steps in sampling design, Criteria for selecting a sampling procedure, Different types of sampling techniques - Probability sampling, Random sampling, Purposive sampling, Stratified sampling and Non-probability sampling. Advantages and disadvantages of sampling. Power analysis and sample size calculation in experimental design.

Unit IV **(18 hours)**

Research Tools: Scales of data measurements, Characteristics of good tool-Validity, usability and reliability. Types of tools and their uses - Questionnaire, Rating scale and Attitude scale - Interview-Structured and unstructured and - Observation-Participant and non- participant Concept of data - Types and analysis of Qualitative and Quantitative data.

Use of online tools for data Collection: Survey conducted through Google form, Form plus, Survey sparrow.

Use of tools / techniques for Research: Methods to search required information effectively, Reference Management Software like Zotero/ Mendeley, Software for paper formatting like LaTeX Office, Software for detection of Plagiarism.

Unit V **(18 hours)**

Statistical Testing of Hypothesis: Define Hypothesis, Hypothesis statement, Hypothesis testing, Null hypothesis

Parametric Tests: Definition, Merits and demerits. Types and it applications-Student T test (Independent, Paired,Two-Tailed and One-Tailed Tests), Anova and Z-Test.

Non-Parametric Tests: Definition, Merits and demerits. Types and it applications Chi- Square Tests and Spearman's Rank correlation. Usage of Statistical Package for Social Science (SPSS) Software - (Interpretation ofFindings).

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Course Outcomes:

After successful completion of the course, student will be able to

CO1: Define and identify the knowledge of the scientific method, purpose and approaches to research

CO2: Illustrate the statistical techniques to research data for analyzing and interpreting data

CO3: Explain the types of research, with research process and research designs

CO4: Assess the appropriate sampling techniques for research work

CO5: Summarize the sampling process for data collection

Text Books:

1. Kothari, C. R. and G. Garg , *Research Methodology: Methods and Techniques*, 4th Multi Colour Edition, New Age International Publishers,2019.
2. Gupta, S.P, *Statistical Methods*, Sultana Chand and Sons & Deep Publications, 2019.

Reference Books:

1. Donna Mohr William Wilson Rudolf Freund, *Statistical Methods*, Elsevier Publisher, 4thEdition, 2021.
2. Bordens, Kenneth; Abbott, Bruce Barrington, *Research Design and Methods: AProcess Approach*, McGraw-Hill Education, 11th Edition, 2021.
3. Das.N, *Statistical Methods*, McGraw Hill Education Publishers, 1st Edition, 2017.

Journals:

1. Journal of Advanced Research
2. Journal of Scientific Research
3. Journal of Research in Medical Sciences

E-Resources:

1. https://explorable.com/research- methodology
2. https://www.mbaknol.com/research-methodology/the-basic-types-of-research
3. https://www.pdfdrive.com/fundamental-of-research-methodology-and-statistics-e19853056
4. https://www.pdfdrive.com/spss-statistics-for-dummies-3rd-edition-e34460729.html
5. https://www.pdfdrive.com/spss-survival-manual-a-step-by-step-guide-to-data-analysis-using-spss-for-windows-version-10-e158709797.html7137947.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	9	3	**57**
CO2	9	9	3	9	3	3	1	**37**
CO3	9	3	9	9	3	9	3	**45**
CO4	9	3	1	9	1	1	3	**27**
CO5	9	1	9	9	1	1	3	**33**
Total	**45**	**25**	**31**	**45**	**17**	**23**	**13**	**199**

Low-1 Medium-3 High-9

XUTT ACADEMIC COUNCIL

Discipline Specific Elective I -a. Public Health Nutrition

(For Students Admitted from 2022-23)

Semester: I **Hours/week: 6**
Subject Code: IMNDE1A **Credit: 5**

Course Objectives:

1. To enable students to identify and contribute to the prevention of public health / social health problems in the country
2. To equip students with workable knowledge to treat common illnesses at home

Unit I **(18 hours)**

Concept of Public Health Nutrition: Relationship between health and nutrition, Population Dynamics - Demography and Demographic cycle. World population trend - Birth rates, Death rates, Growth rates and Demographic trends in India - Age pyramid, sex ratio and Human Development Index. Health care facility - Concept, functions. Role of public nutritionists in the health care delivery system, Primary Health Centre.

Unit II **(18 hours)**

Assessment of Nutritional Status: Methods of Nutritional Assessment - Nutritional anthropometry and Growth standards, Dietary and clinical assessment, Biochemical, Biophysical and Radiological assessment. Nutrition monitoring-Objectives and Agencies engaged in nutrition monitoring. Nutritional surveillance - Need for nutritional surveillance, Key indicators of nutritional surveillance programme.

Unit III **(18 hours)**

Nutrition Intervention Programmes in India: Objectives and operation of Feeding Programmes - Chief Minister Noon Meal Programme (CMNMP) and Integrated Child Development Service (ICDS). Primary Health Center (PHC) - Concept, Organization, Current status in India and delivery of service. National organization - ICMR, NIN, NNMB, CFTRI. International Organization - FAO, WHO, UNICEF, UNESCO, World Bank and package program of immunization.

Unit IV **(18 hours)**

Strategies to combat public nutrition problems: Protein energy malnutrition (PEM), Vitamin A deficiencies, Iron deficiency anemia (IDA), Iodine deficiency disorder (IDD), Zinc deficiency, Beriberi and Pellagra, Folic acid and B12 deficiency, Scurvy, Rickets, Osteomalcia, Fluorosis and Lathyrism. Nutritional guidelines for emergency situations.

Unit V **(18 hours)**

Nutrition Education: Need, Scope, Importance and Theories of nutrition education, Process of nutrition education. Nutrition education communication: Programme, Formulation, Implementation and evaluation. Primary Health Care (PHC) and its role in preventing communicable diseases - Role of Audio visual aids in Nutritional Education.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Define the concept of public health nutrition and discuss the challenges and scope of public health nutrition in India

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CO2: Select and use appropriate modes of communication to obtain and share evidence based public health nutrition knowledge

CO3: Assess the nutritional status by using direct or indirect methods

CO4: Summarize the global, national, regional and state level prevalence of protein energy malnutrition

CO5: Formulate various teaching aids for extension education and educate the people and family regarding nutritional care

Text Books:

1. Srilakshmi, B. *Nutrition Science*, New Age International Publisher, New Delhi,6th Edition, 2017.
2. Suryatapadas, *Textbook of Community Nutrition*, Academic Publishers, 2016.

Reference Books:

1. Park A, *Textbook of Preventive and Social Medicine*, Bhanot Publishers, 23rd Edition, 2015.
2. Boyle M.A, *Community Nutrition in Action: An Entrepreneurial Approach*. 7th Edition, Brooks Cole.2016.
3. SariEdelstein, *Nutrition in Public Health*, Jones and Bartlett Publishers, 4th Edition,2017.

Journals:

1. American Journal of Clinical Nutrition
2. International Journal of Behavioral Nutrition and Physical Activity
3. Journal of Public Health Nutrition

E-Resources:

1. https://www.pdfdrive.com/public-health-nutrition-e196546358.html
2. https://www.pdfdrive.com/community-and-public-health-nutrition-e60389853.html
3. https://www.pdfdrive.com/handbook-of-nutrition-and-immunity-e175896624.html
4. https://www.pdfdrive.com/handbook-of-anthropometry-physical-measures-of-human- form-in-health-and-disease-e165859751.html
5. https://www.pdfdrive.com/practical-public-health-nutrition-e191432662.html

Course Outcomes	**Programme Outcomes**							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	3	3	**51**
CO2	9	9	9	9	3	3	9	**51**
CO3	9	9	9	3	3	9	9	**51**
CO4	9	9	9	3	3	9	9	**51**
CO5	9	9	9	3	9	9	9	**57**
Total	**45**	**45**	**45**	**27**	**27**	**33**	**39**	**261**

Low-1 Medium-3 High-9

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Discipline Specific Elective I–b. Sensory Evaluation

(For Students Admitted from 2022-23)

Semester: I **Hours/week: 6**
Subject Code: IMNDE1B **Credit: 5**

Course Objectives:

1. To study the sensory measurement of foods and design appropriate methods for the sensory testing of foods
2. To enable students to develop their skills in applying sensory methods to product development and communicating sensory messages

Unit I **(18 hours)**

Introduction to quality attributes of food: Appearance, flavour, textural factors and additional quality factors.

Gestation: Introduction and importance of gestation - Structure and physiology of taste organs-tongue, papillae, taste buds, salivary glands. Mechanism of taste perception Chemical dimensions of basic tastes- sweet, salt, sour, bitter and umami - Factors affecting taste quality, reaction time, taste modification, absolute and recognition threshold. Taste measurement-Electronic Tongue, taste abnormalities

Unit II **(18 hours)**

Olfaction: Introduction and importance of odour and flavor, Anatomy of nose, physiology of odour perception, mechanism of odour perception, theories of odour classification, chemical specificity of odour.

Odour measurement techniques: Historical perspective and emphasis on recent techniques.Olfactory abnormalities.

Unit III **(18 hours)**

Colour: Introduction and importance of colour, dimensions of colour and attributes of colour; gloss etc.Perception of colour.

Colour Measurement: Munsell colour system, CIE colour system, Hunter colour system - Colour abnormalities

Unit IV **(18 hours)**

Texture: Introduction, definition and importance of texture, Phases of oral processing Texture perception, receptors involved in texture perception, rheology of foods.

Texture classification: Texture measurement - basic rheological models, forces involved in texture measurement and recent advances in texture evaluation. Application of texture measurement in cereals, fruits and vegetables, dairy, meat and meat products.

Unit V **(18 hours)**

Quality, Safety & Regulatory Aspects - Product Stability; evaluation of shelf life; changes in sensory attributes and effects of environmental conditions; accelerated shelf life determination; developing packaging systems for maximum stability and cost effectiveness; interaction of package with food; Regulatory Aspects; whether standard product and conformation to standards; Approval for Proprietary Product.

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Course Outcomes:

After successful completion of this course, student will be able to

CO1: Define sensory evaluation and understanding of sensory evaluation and consumer testing methods and of their underlying principles

CO2: Apply sensory evaluation techniques in sensory assessment situations

CO3: Analyze the standard methods of sensory evaluation using essential techniques

CO4: Explain the human sensory perceptions, particularly the chemical and trigeminal senses and their relevance to the evaluation of food and beverage sensory properties

CO5: Capacity to formulate foods that meet specified sensory requirements and which are intended to contribute to reduce community health concerns

Text Books:

1. Shakuntala Manay.N, Shadaksharaswamy.M, *Food Facts and Principles*, New Age InternationalPublishers, 4th Edition, 2018.
2. Gorden.W.Fuller W, *New food product development: from concept to market place*, CRC Press Publishers, 3rd Edition,2011.

Reference Books:

1. P.Carpenter, *Guidelines For Sensory Analysis in Food Product Development and Quality Control*, 2nd Edition, Springer Publication,2020.
2. Lawless H.T, Hildegarde Heymann, *Sensory Evaluation of Food Principles and Practices* , Springer Publisher, 2nd Edition, 2016 .
3. Rao E. S, *Food Quality Evaluation*, Variety Books Publication, 2013.

Journals:

1. Asian Journal of Science and Technology
2. Journal Food Quality and Preference
3. Journal of Sensory Studies

E-Resources:

1. https://en.wikipedia.org/wiki/Sensory_analysis
2. www.intropsych.com/ch04_senses/gustation.html
3. https://www.ffsqindia.org/sensory-analysis-in-quality-control.html
4. https://libguides.sjsu.edu/c.php?g=540267&p=3702020
5. https://library.stanford.edu/all/?q=%22Food+Sensory+evaluation.%22

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	9	9	3	9	**51**
CO2	9	9	9	9	9	9	9	**63**
CO3	9	3	9	3	9	9	9	**51**
CO4	9	3	9	9	9	3	3	**45**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**27**	**45**	**39**	**45**	**33**	**39**	**273**

Low-1 Medium-3 High-9

XVII ACADEMIC COUNCIL

Extra Credit - Institutional Food Service Management

(For Students Admitted from 2022-23)

Semester: I

Subject Code: IMNDX1 **Credit: 2**

Course Objectives:

1. To get acquainted with the various types of food service establishments and ability to plan meals and menus
2. To gain working knowledge of the main operating activities in a food institution and understand the rules for safety and sanitation in a food service

Unit I

Food service industries in India :Acts and responsibilities - Fables, foibles, fraud and fact - note on eating preference and misinformation, reliable information, source of reliable information, government information and regulations on healthful food program.

Unit II

Projecting and preserving nutrients during production, purchase, storage, cooking and serving. Types and function of menu, planning a menu according to food service type.

Unit III

Kitchen management: Principles of layout, determination of equipment - factors affecting the selection, criteria for selection, types of equipment, basic materials used in manufacture of equipment, installation and care of equipment, fuel saving techniques, physical planning – architectural features, floor, walls, lighting, plumbing and ventilation.

Unit IV

Food service: Methods and styles of service, table winding up, setting, presentation techniques, clearing and customer relations. Laws governing food service institutions -food laws, labour laws, laws concerning hygiene and safety.

Unit V

Environmental hygiene and sanitation: Hygiene in food plant hygiene, safety handling and Personal hygiene, to prevent procedure followed in food service establishment to prevent accidents, facilities and benefits to workers in each establishment.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Recall the various types of food services and gain the knowledge about the Institutional food service management

CO2: Identify a variety of managerial, production, and service positions that are typical of the food service industry

CO3: Analyze the steps involved in menu planning and menu designing

CO4: Distinguish between commercial and institutional food service facilities

CO5: Develop general knowledge on the origin and development of food service in hotels, restaurants and institutions

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Text Books:

1. Mohini Sethi, *Institutional Food Management,* New Age International Publishers, 2nd Edition, 2016.
2. Mohinini Sethi, Surjeet Malhan, *Catering Management an Integrated Approach*, Wiley Eastern Ltd, 3rd Edition, 2018.

Reference Books:

1. Newman, Jacqueline M. *Chinese Buffets: A Trend Worth Exploring,* Flavor &Fortune, 2014.
2. June Payne-Palacio, *Foodservice Management: Principles and Practices*, Pearson Education, 13th Edition, 2019.
3. Chef Parvinder Singh Bali, *Food Production Operation*, OUP India Publisher, 3rd Edition, 2021.

Journals:

1. Journal of Food Science and Technology
2. Journal of Food Measurement and Characterization
3. Journal of Food Service Equipment

E-Resources:

1. https://ncert.nic.in/textbook/pdf/lehe104.pdf
2. https://www.designcafe.com/guides/different-types-of-kitchen-layouts/
3. https://www.brainkart.com/article/Definition-and-Types-of-Equipment_35155/
4. https://www.hotelmanagementtips.com/types-of-food-service-styles/
5. https://psu.pb.unizin.org/hmd329/chapter/ch10/

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	3	9	9	3	9	**45**
CO2	9	9	9	3	9	9	9	**57**
CO3	9	9	9	3	9	3	9	**51**
CO4	9	9	3	9	9	3	9	**51**
CO5	9	3	9	9	3	9	9	**51**
Total	**45**	**33**	**33**	**33**	**39**	**27**	**45**	**255**

Low-1 Medium-3 High-9

XVIII ACADEMIC COUNCIL

Core V- Medical Nutrition Therapy I

(For Students Admitted from 2022-23)

Semester: II **Hours/week: 6**
Subject Code: IMNDC21 **Credit: 5**

Course Objectives:

1. To study the concept of Medical Nutrition Therapy and understand the importance of team approach in therapeutic nutrition
2. To apply their knowledge and identify the techniques of planning, preparation and execution of therapeutic diets for the patients

Unit I **(18 hours)**

Nutritional care process in disease: Nutritional screening tools-Nutritional Assessment of Hospitalized and outdoor patients based on Anthropometric, Biochemical, Clinical and diet history of the patients - Methods of Dietary assessment - Identification of high risk patients - Implementation of nutritional care -Techniques and feeding substrates - Nutrition Education and dietary Counseling - Evaluation ofnutritional care.

Unit II **(18 hours)**

Dietary management in obesity: Prevalence, Classification, Etiology complication, Diet modification, Dietary management and pharmacologytreatment in Obesity.

Nutrition in weight management: BMI and body composition, Weight imbalance – overweight, underweight, unintentional weight loss.

Macro modification for stubborn weight: Atkins, Ketogenic diet, Paleo, Low-carb High fat diet. Hormones that control hunger and fat storage-ghrelin, leptin, insulin, cortisol,estrogen. Nutritional management of hormonal imbalance – PCOD, hypo and hyperthyroidism

Dietary management in Underweight: Etiology, Limitation, Complication and dietary management in Underweight.

Unit III **(18 hours)**

Etiopathophysiology, metabolic and clinical aberrations, complications, prevention and recent advances in the medical nutritional management offever and infection.

Fever: Typhoid, Malaria, H1N1, Dengue fever and chicken guinea, Covid-19, Role of Immune booster food in management of fever and infection.

HIV infection and AIDS: Epidemiology, Transmission of HIV, Defense pathophysiology, Clinical manifestations, HIV infection and other disease, Immunity and AIDS virus, Dietary management prevention and control.

Unit IV **(18 hours)**

Etiopathophysiology, metabolic and clinical aberrations, complications, prevention andrecent advances in the medical nutritional management of GI Disease.

Diseases of Esophagus and Stomach: Esophagitis, Dyspepsia, GERD, Peptic Ulcer, Gastritis& Gastroectomy, Dumping Syndrome.

Diseases of small and Large Intestine: Flatulence, Diarrhoea, Constipation, Hemorrhoids, Diverticular disease, Duodenal Ulcer, Inflammatory Bowel Disease- Crohn's disease Ulcerative

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Colitis - Irritable bowel syndrome. Role of FODMAP diet.
Malabsorption Syndrome: Celiac Sprue, Tropical Sprue, Steatorrhoea, Intestinal brush border deficiencies and Protein Losing enteropathy.

Unit V **(18hours)**

Etiopathophysiology, metabolic and clinical aberrations, Complications, Prevention and recent advances in the medical nutritional management of Liver, Gall bladder and pancreatic disorders.
Disease of Liver: Viral Hepatitis, Cirrhosis of Liver, Hepatic Encephalopathy, Wilson's disease & Liver Transplant.
Diseases of Gall bladder: Biliary Dyskinesia, Cholelithiasis, Cholecystitis, Cholecystectomy.
Disease of Pancreas: Acute pancreatitis, Chronic pancreatitis and Zollinger- Ellison Syndrome and Gout.

Course Outcomes:

After successful completion of this course, student will be able to
CO1: Define medical nutrition therapy and recall the etiology, physiologic and metabolic anomalies of acute and chronic diseases
CO2: Explain the therapeutic role of diet and nutritional care concerning weight management, fevers & infections and diseases of the gastrointestinal tract and hepatobiliary system
CO3: Assess the nutritional status of critically illness patients
CO4: Evaluate the nutritional care based on pathophysiology, prevention/ and treatment of the various diet-related disorders/ diseases
CO5: Develop practical skills for modify the diet as per the disease condition

Text Books:

1. Srilakshmi, B., *Dietetics*, New Age International(P) Ltd, 8th Edition, Chennai. 2019.
2. Joshi .A.Shubhaangini, *Nutrition and Dietetics*, 4th Edition, McGraw Hill Publication, NewDelhi, 2015.

Reference Books:

1. L. Kathleen Mahan, Sylvia Escott Stump and Janice L Raymond, *Krause's Food &Nutrition Care Process*, 15th Edition, 2020.
2. Robinson, *Normal and Therapeutic Nutrition*, Oxford & LB Publishing, Calcutta &Bombay,17th Edition, 1990.
3. Kathleen Mahan and Sylvia Escort Stump, *Food, Nutrition and Diet Therapy*, W.B.Saunder's Company, London, 14th Edition, 2016.

Journals:

1. The American Journal of Clinical Nutrition
2. Nutrition Abstracts and Reviews
3. The Indian Journal of Nutrition and Dietetics

E-Resources:

1. https://www.pdfdrive.com/nutrition-dietetics-practice-and-future-trends- e176409703.html
2. https://www.pdfdrive.com/oxford-handbook-of-nutrition-and-dietetics- e185402365.html
3. https://www.pdfdrive.com/krauses-food-the-nutrition-care-process-e175336715.html

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4. https://www.pdfdrive.com/clinical-nutrition-e186572457.html
5. https://www.pdfdrive.com/nutrition-health-and-disease-a-lifespan-approach- e189164494.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	3	9	9	9	**57**
CO2	9	9	9	9	9	9	9	**63**
CO3	9	9	9	3	9	9	9	**57**
CO4	9	9	9	9	9	9	3	**57**
CO5	9	9	9	3	9	9	9	**57**
Total	**45**	**45**	**45**	**27**	**45**	**45**	**39**	**291**

Low-1 Medium-3 High-9

Core VI -Medical Nutrition Therapy I Practicals

(For Students Admitted from 2022-23)

Semester: II **Hours/week: 6**
Subject Code: IMNDC22P **Credit: 5**

Course Objectives:

1. To analyze and modify the menu to therapeutic demands
2. To develop the skills in selection of foods for modification of diet and plan menu for specific therapeutic conditions

List of Experiments: **(90 hours)**

1. Standardization of common food preparation
2. Planning and preparing diet for Obesity
3. Planning and preparing diet for Underweight
4. Planning and preparing diet for Dengue fever
5. Planning and preparing diet for Covid-19 and Omicron Infection
6. Planning and preparing diet for Tuberculosis
7. Planning and preparing diet for HIV and AIDS
8. Planning and preparing diets for Peptic ulcer
9. Planning and preparing diet for Diarrhoea
10. Planning and preparing diet for Constipation
11. Planning and preparing diet for Crohn disease

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12. Planning and preparing diet for Celiac Sprue
13. Planning and preparing diet for Viral hepatitis
14. Planning and preparing diet for Cholelithiasis
15. Planning and preparing diet for Cholecystitis

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Understand the importance of diet in health and disease conditions and explain the process of objective setting in the delivery of a nutritional care plan for a client

CO2: Emphasis skill development in planning therapeutic diets using food exchange lists

CO3: Explain the dietary essentials for recovery and maintenance of various systems

CO4: Compare and contrast derivated nutritive value with RDA using software

CO5: Develop practical skills for modify the diet as per the disease condition

Text Books:

1. Gopalan C, RN. Ramasastriand S.C. Balasubramanian, *Nutritive Value of Indian Foods*, National Instituteof Nutrition, Hyderabad, 2018.
2. V.Vimala, *Advances in Diet therapy-Practical Manual*, New Age International Private Ltd, 2020.
3. *Clinical Dietetics Manual*, Indian Dietetic Association, 2nd Edition, 2018.

Reference Books:

1. Mahan L.K., Sylvia Escott-Stump - *Krause's Food Nutrition and Diet Therapy*, W.B. Saunders Company London,14th Edition,2016.
2. Robinson, *Normal and Therapeutic Nutrition*, Oxford & LBM Publishing, Calcutta, Bombay,17th Edition, 1990.
3. Maimun Nisha, *Diet Planning For Diseases*, Kalpaz Publication, 2016.

Journals:

1. Asia Pacific Journal Clinical Nutrition
2. European Journal of Clinical Nutrition
3. Journal of Nutrition and Dietetics

E-Resources:

1. https://www.pdfdrive.com/manual-of-dietetic-practice-e175954283.html
2. https://www.pdfdrive.com/medical-nutrition-therapy-a-case-study-approach-e186656569.html
3. https://www.pdfdrive.com/applications-and-case-studies-in-clinical-nutrition- e185254994.html
4. https://www.pdfdrive.com/manual-of-dietetic-practice-e33501318.html
5. https://www.pdfdrive.com/manual-of-clinical-nutrition-management-e18838358.html

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Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	3	9	9	**57**
CO2	9	9	9	9	3	9	9	**57**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	9	3	9	9	**57**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**45**	**45**	**45**	**27**	**45**	**45**	**297**

Low-1 Medium-3 High-9

Core VII - Advanced Nutritional Biochemistry

(For Students Admitted from 2022-23)

Semester: II **Hours/week: 6**
Subject code: IMNDC23 **Credit: 5**

Course Objectives:

1. To learn the novel concepts of Enzymes and its application in various field
2. To upgrade the study of nutritional principles, biochemical metabolic pathways of proteins, carbohydrates, lipids, vitamins and minerals as related to human health and disease

Unit I **(18 hours)**

Enzymes: Definition, Classification, Properties, Coenzymes, Factors influencing enzyme action. Enzyme Specificity, Enzyme Kinetics, Enzyme Inhibition. Application of enzymes in different field.

Acid -Base Regulation: Definitions (Acid, Base, pH, Blood pH, Acid Base Balance, Buffer and Blood Buffers), Henderson- Hassel Balch Equation, Transport and buffering of CO2 in blood. Buffering of non-volatile acids, Acidosis, Alkalosis, Anion gap, Role of the kidney in acid base balance.

Unit II **(18 hours)**

Carbohydrates: Definition, Functions, Classifications, Structure, Physical and chemical properties, Biochemical importance. Metabolism and Regulation of Carbohydrates – Introduction to Metabolism, Metabolism of Carbohydrates-Glycolysis, PDH, TCA, Gluconeogenesis, Glycogenesis, Glycogenolysis, HMP Shunt, Uronic acid pathway. Glycogen storage disorders.

Unit III **(18 hours)**

Proteins: Definition, Functions, Classifications, Structure (primary, secondary, tertiary and quaternary), Physical and chemical properties, Biological importance of peptides. Metabolism and Regulation of Amino acids - Decarboxylation,Deamination, Transamination, Urea cycle. Metabolism of Phenyl Alanine, Tyrosine, Tryptophan, Histidine, Proline and Arginine.Inborn errors of amino acid metabolism.

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Unit IV **(18 hours)**

Lipids: Definition, Functions, classifications. Fatty acids-Definition, Classifications, Physical and chemical properties. Triglycerides, Phospholipids, Glycolipids, Steroids-outline study. Metabolism and Regulation of Lipids – Biosynthesis of fatty acids, Oxidation of fatty acids, Ketogenesis. Metabolism of cholesterol, Triglycerides and Phospholipids. Lipid storage disorders.

Unit V **(18hours)**

Nucleic acids: Definition, Functions and components -Nucleotides and Nucleosides, DNA-structure, types and function. Differentiate between DNA and RNA, Nucleic acid- Biosynthesis of DNA and RNA, Protein. Biological oxidation-ETC and Oxidative phosphorylation.

Course Outcomes:

After successful completion of this course, student will be able to

CO 1: Understand and augment the biochemistry knowledge at the postgraduate level
CO 2: Apply the knowledge to Insight the interrelationships between various metabolic pathways
CO 3: Inspect and understand the basics of genetic material and their metabolism
CO 4: Assess an elaborate knowledge on Acid-Base regulation
CO5: Integrate their ideas on the application of enzymes in various fields

Text Books:

1. Dr.Kondreddy Rambabu, Dr.Pendyala SivaKumar,Dr.PendyalaKameswari,*Text Book of Biochemistry*, AITBS publishers, 2nd Edition, 2014.
2. Dr.U.Satyanarayana, U.Chakrapani, *Biochemistry*, Elsiever Publication,5th Edition,2017.
3. J.L.Jain,Nithin Jain, Sunjay Jain, *Fundamentals of Biochemistry* (Multi Colour Ed), S.Chand Publisher, 7th Edition, 2017.

Reference Books:

1. Donald Voet, Judith G.Voet, *Biochemistry*, John Wiley and Sons Publishers,4th Edition, 2016.
2. David L. Nelson , Michale m cox, Lehninger, *Principle of Biochemistry*, Macmillan Publishers,7th Edition, 2017.
3. Victor Rod well, David Bender, P. Anthony Weil , Peter Kennelly , Kathleen Botham,*Harper's Illustrated Biochemistry*, Lange Publishers, 30th Edition, 2017.

Journals:

1. Journal of Biological Chemistry
2. Journal of Applied Biochemistry
3. Journal of Nutritional Biochemistry

E-Resources:

1. https://www.pdfdrive.com/nutritional-biochemistry-second-edition-e158739127.html
2. https://www.pdfdrive.com/introduction-to-nutrition-and-metabolism-fourth-edition-e167789063.html
3. https://www.pdfdrive.com/advanced-nutrition-and-human-metabolism- e186446303.html
4. https://www.pdfdrive.com/biochemistry-e187234482.html
5. https://www.pdfdrive.com/lehninger-principles-of-biochemistry-e158386180.html

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Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	3	3	1	9	9	**43**
CO2	9	9	3	9	1	9	9	**49**
CO3	9	9	3	9	1	9	9	**49**
CO4	9	9	3	3	1	9	9	**43**
CO5	9	9	3	9	1	9	9	**49**
Total	**45**	**45**	**15**	**33**	**5**	**45**	**45**	**233**

Low-1 Medium-3 High-9

Core VIII - Nutrition through Life Cycle

(For Students Admitted from 2022-23)

Semester: II **Hours/week: 6**
Subject Code: IMNDC24 **Credit: 5**

Course Objectives:

1. To obtain knowledge on various nutritional deficiency disorders
2. To understand the nutritional needs of members at different age levels

Unit I **(18 hours)**

Concept of different food groups, Recommended Dietary Allowances for Indians, Basis for requirement, Computation of allowances.

Nutrition in pregnancy: Stages of gestation, Maternal weight gain, Physiology of pregnancy, Nutritional requirements and Dietary guidelines during pregnancy, Nutrition related complications with special focus to adolescent pregnancy and general complications of pregnancy, HIV/AIDS during pregnancy - Dietary concerns, Role of Exercise and Fitness during pregnancy.

Unit II **(18 hours)**

Nutrition in Lactation: Physiological adjustments during lactation, Hormonal controls and reflex action, Lactation concerning growth and health of infants, Physiology of milk production, Problems of breast feeding, Nutritional components of colostrum and mature milk, Special foods during lactation, Nutritional requirements and dietary guidelines during lactation.Galactagogues, Lactation Management in normal & special conditions.

Unit III **(18 hour)**

Nutrition in Infants: Infant feeding and nutrient needs Feeding in early and late infancy and Feeding problems, Low birth weight and Preterm infants. Nutritional requirement, Supplementary feeding and weaning foods.

Nutrition in Preschool Children: Growth and development and Nutritional requirements, Nutrition for children with special health care needs, feeding problems, Factors to be considered for menu planning and packed lunch.

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Unit IV **(18 hours)**

Nutrition in School going Children: Early and middle childhood, Growth and development, food habits, Nutritional needs and feeding, Packed lunch.

Nutrition during Adolescence: Physical growth, Physiological and psychological problems associated with pubertal changes, Nutritional needs eating disorders - Anorexia nervosa and Bulimia.

Unit V **(18 hours)**

Nutrition in Adult: Physiological and Psychosocial changes, Common nutritional concerns Nutritional requirements and dietary recommendation, Physical Activity in adulthood.

Nutrition in Elderly: Physiological and Psychosocial changes during old age, Aging Process, Nutritional requirements of the Elderly, Nutrition care and nutrition needs during illness and chronic conditions- Sensory loss, Oral health and GI functions, Neuromuscular and skeletal functions, Renal and cardiac function, Immuno - competence.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Gain knowledge about food pyramid, vegetarian diet, menu planning and nutritional needs during infancy to adolescents and explain the nutrition education for specific lifecycle stages

CO2: Identify and describe potential diseases and disorders, and their risk factors affecting nutrient needs at each state of the life cycle

CO3: Assess nutrition issues/ conditions, and recommend nutrition intervention/ support

CO4: Evaluate and plan strategies and diets for improving nutritional status of individuals at each stage of the life cycle

CO5: Design food plans to meet the needs of humans at various life cycle stages

Text Books:

1. Bamji, M.S, Krishnaswamy K. Brahmam G.N.V, *Textbook of Human Nutrition*, Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi, 4th Edition, 2017.
2. Swaminathan, M. *Advanced Textbook on Food Science and Nutrition*,Vol:2, Reprinted, Bangalore Printing and publishing Co Inc., Bangalore, 2nd Edition, 2015.
3. Srilakshmi, *Dietetics*, New Age International Publishers, 8th Edition, 2019.

Reference Books:

1. Kathleen Mahan and Sylvia Escort- Stump, *Food, Nutrition and Diet Therapy*, W.B.Saunder's Company London, 11th Edition, 2016.
2. Susan G. Dudek, *Nutrition Essentials for Nursing Practice*, Lippincot Williams D Wilkias, Philadelphea, 2017.
3. Abraham, *Nutrition Through Lifecycle*, New Age International Private Limited, 2020.
4. Judith Brown, *Nutrition Through the Life Cycle*, Wadsworth Publication,6th Edition,2016.

Journals:

1. American Journal of Clinical Nutrition
2. Indian Journal Medical Research
3. Journal of Nutrition

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E-Resources:

1. https://www.pdfdrive.com/nutrition-through-the-life-cycle-nutrition-through-the-life- cycle-e58112526.html
2. https://www.pdfdrive.com/nutrition-through-the-life-cycle-e187862410.html
3. https://www.pdfdrive.com/essentials-of-life-cycle-nutrition-e185708272.html
4. https://www.pdfdrive.com/nutrition-through-the-life-cycle-fourth-edition- e157150036.html
5. https://www.pdfdrive.com/nutrition-through-the-life-cycle-e157415567.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	9	3	**57**
CO2	9	9	3	9	3	9	9	**51**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	3	3	9	9	9	**51**
CO5	9	9	9	3	9	9	9	**57**
Total	**45**	**45**	**33**	**33**	**39**	**45**	**39**	**279**

Low-1 Medium-3 High-9

Discipline Specific Elective - II a. Guidance and Counselling in Nutrition Education

(For Students Admitted from 2022-23)

Semester: II **Hours/week: 6**

Subject Code: IMNDE2A **Credit: 5**

Course Objectives:

1. To understand the need for guidance and counselling in educational settings
2. To enrich knowledge on counselling, its concept, purpose and importance of vocational guidance and counseling

Unit I **(18 hours)**

Guidance and Counselling: Meaning, Nature, Scope, Principles, Goals, Needs of Guidance and Counselling of different groups, Relationship between guidance and counselling.

Types and Techniques used in guidance: Educational, Vocational, Socio-personal, Leisure time guidance; Individual and Group Guidance - Meaning and needs, Advantages, Techniques used, Role of audio-visual aids in guidance.

Unit II **(18 hours)**

Counsellors: Characteristics, Qualification and qualities, Skills and Competencies; Ethics - Do's and Don'ts, Limitations and Professional growth of counsellors, Tips for becoming effective counsellors. Counselling Process – Preparation and Pre requisites for counselling stages in counselling process Follow up and Review.

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Unit III **(18 hours)**

Nutrition Counselling: Concept and importance of counseling in the nutrition care process, Understanding dietary patterns and food choices and their impact on counseling Behaviour Change, Communication and Models for behaviour change, Counseling strategies, Factors to be considered for Counseling, Conventional and non-conventional tools in counselling. Online Counselling Techniques tools used in Nutrition care process.

Processes involved in Dietary Counselling: Managing resources of the communicator/counselor, Designing of counseling plans - Goals and objectives, Evaluation instruments. Implementation: facilitating self-management of disease condition, Evaluation: evaluating adherence to dietary changes, Counseling approaches after evaluation.

Unit IV **(18 hours)**

Areas of Counselling: Premarital and marital counselling, Family counselling, Parental counselling, Adolescent counselling, Counselling for girls and children belonging to special groups. Special Concerns of School Counsellor - Issues related to academic achievement, School dropout, Child abuse, Sexual abuse, Substance abuse, Family relations and child's right.

Unit V **(18 hours)**

Guidance Strategies for Social and Personal Problems: Developing self-confidence, Assertive training, Improving communication skills, Mental and Physical Methods of Relaxation, Self- improving Programmes- study skills training, Problem Solving Techniques, Managing Motivation, Time Management, Remedies for Procrastination, Decision Making.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Define and outlining the concept of nutritional assessment and counselling using case studies
CO2: Examine the characteristics of counselors and counselling process
CO3: Analyze the counselling approaches and techniques
CO4: Assess the knowledge on various areas of counselling
CO5: Build a self-improving programmes for social and personal problems

Text Books:

1. Mahan, Mahan L.K., Sylvia Escott Stump,*Krause's Food Nutrition and Diet Therapy*,W.B.Saunders Company London,14th Edition,2016.
2. Gibson L Robert and Mitchel H Marianne, *Introduction to Counseling and Guidance*, Publisher, Pearson education, 7th Edition, 2015.

Reference Books:

1. Angela Collene; Gordon M. Wardlaw; Anne M. Smith; Colleen K. Spees, *Wardlaw's Contemporary Nutrition,* McGraw-HillEducation, 11th Edition,2019.
2. Holli B Betsy and Beto A Judith, *Nutrition Counseling and Education Skills for Dietetics Professionals,* Lippincot Williams and Wilkins; Wolters Kluwer USA, 6th Edition, 2014.
3. Betsy Holli *Nutrition Counseling and Education Skills for Dietetics Professionals*, Taxmann Publications Private Limited, 6th Edition, 2012.
4. Snetselaar L. *Nutrition Counseling Skills for the Nutrition Care Process.* Sudbury, Massachusetts: Jones Bartlett Publishers, 4th Edition, 2009.

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Journals:

1. Journal of Nutrition Education and Behavior
2. International Journal of Behavioral Nutrition and Physical Activity
3. British Journal of Guidance and Counseling

E-Resources:

1. http://csefel.vanderbilt.edu/modules/module2/script.pdf
2. http://www.counselorindelhi.in/marriage-counseling.p
3. https://www.eatrightpro.org/practice/quality-management/nutrition-care-process
4. http://www.wageningenportals.nl/nutritionsecurity/topic/behaviour-change-and-nutrition-education
5. https://egyankosh.ac.in/bitstream/123456789/43392/1/Unit-3.pdf

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	3	9	1	9	**49**
CO2	9	9	9	3	9	1	9	**49**
CO3	9	9	9	1	9	1	9	**47**
CO4	9	9	9	1	9	1	9	**47**
CO5	9	9	9	3	9	1	9	**49**
Total	**45**	**45**	**45**	**11**	**45**	**5**	**45**	**241**

Low-1 Medium-3 High-9

Discipline Specific Elective II –b. Food Packaging Technology

(For Students Admitted from 2022-23)

Semester: **II** **Hours/week:** 6
Subject Code: IMNDE2B **Credit:** 5

Course Objectives:

1. To study the concept of food packaging materials and their application in food industry
2. To impart knowledge and skills related to designing packaging system in food products

Unit I **(18 hours)**

Introduction to Food Packaging: Definitions, Functions of packaging, Types of Packaging- Green packaging, Active packaging, Intelligent packaging, Aerosol packaging, Antimicrobial packaging, Vaccum Packaging, Isothermal Packaging, Shrink packaging. Moisture Sorption Properties of Foods and Selection of Packaging Materials. Interactions between Packaging materials and Food and Equilibrium Relative Humidity (ERH) test of the food product.

Unit II **(18 hours)**

Metal Packaging Materials: Container – Making Process, End Manufacture – Three – piece Can Manufacture – Two- piece can Manufacture, Aluminum Foils and containers.

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Unit III **(18 hours)**

Glass Packaging Materials: Introduction, Forming process Blow and Blow (B&B), Press and Blow (P&B), Narrow Neck Press and Blow (NNPB). Closures for Glass Containers, Closure functions, Food Container Closures - Closure to retain internal pressure, Closure to contain and protect contents, Closure to maintain vacuum inside container, Closure to secure contents inside container.

Unit IV **(18 hours)**

Modified Atmosphere Packaging: Definitions, Principles, Gases used in MAP - Carbon dioxide, Oxygen, Nitrogen, Carbon monoxide, Noble gases, Gas mixtures. Methods for creating MAP conditions, Equipment for MAP, Packaging for MAP applications. Microbiology of MAP. Safety of MAP, Controlled Atmospheric storage (CAP).

Unit V **(18 hours)**

Bar coding and labeling: Printing of packages, bar codes and other marking. Sealing equipments, Labeling- RFID. Environmental and Eco issues and waste disposals, Packaging laws and regulations FDA, PFA.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Define food packaging and discuss the importance and functions of food packaging
CO2: Apply the principles of innovative packaging technologies for use with food products
CO3: Analyze the Chemical and physical properties of packaging materials
CO4: Evaluate different packaging materials based on various types of analysis in the laboratory
CO5: Create awareness on current issues related to quality and safety aspects of food packaging

Text Books:

1. Luciano Piergiovanni, Sara Limbo, *Food Packaging Materials*, Springer International Publishing, 2016.
2. Preeti Singh, Ali Abas Wani, Horst-Christian Langowski, *Food Packaging Materials:Testing &Quality Assurance*, CRC Press Publishers,2017.

Reference Books:

1. Alexandru Mihai Grumezescu, Alina Maria Holban, *Food Packaging and Preservation*, Academic Press Publishers, 2018.
2. DipakKumar Sarker, *Packaging Technology and Engineering: Pharmaceutical,*Applications, Wiley-Blackwell Publishers,2020.
3. Cornelia Vasile, Morten Sivertsvik, *Food Packaging: Materials and Technologies,*MDPI AG Publisher, 2019.

Journals:

1. Journal of Food Packaging
2. International Journal of Food Research
3. Journal of Packaging Technology and Research

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E-Resources:

1. https://www.pdfdrive.com/bio-based-materials-for-food-packaging-green-and- sustainable-advanced-packaging-materials-e176352009.html
2. https://www.pdfdrive.com/food-packaging-technology-sheffield-packaging- technology-e161258497.html
3. https://www.pdfdrive.com/food-packaging-and-preservation-e158425359.html
4. https://www.pdfdrive.com/food-packaging-and-preservation-e158425359.html
5. https://www.pdfdrive.com/food-packaging-principles-and-practice-3rd-edition-e175266330.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	9	3	3	9	**45**
CO2	9	3	9	9	9	3	9	**51**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	3	9	9	9	**57**
CO5	9	9	9	3	9	9	9	**57**
Total	**45**	**33**	**45**	**33**	**39**	**33**	**45**	**273**

Low-1 Medium-3 High-9

Extra Credit - Scientific Writing for Project

(For Students Admitted from 2022-23)

Semester: II

Subject Code: IMNDX2PW **Credit: 2**

Course Objectives:

1. To explain the structure of scientific writing, how to create a scientific writing, how to make poster for scientific writing, how to make presentation for scientific writing, how to present scientific writing and how to read a scientific writing
2. To provide students with knowledge and skills on scientific research starting from research proposal writing

Unit I

Scientific Writing as a means of communication: Different forms of scientific writing. **Articles in Journals**: Research notes and reports, Review articles, Monographs, Dissertations, Bibliographies, Books chapters and articles.

Unit II

How to formulate outlines: The reason for preparing outlines – as a guide for plan of Writing as skeleton for the manuscript.

Types of outline: Topic outline, Conceptual outline, Sentence outlines, Combination of topic and sentence outlines

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Unit III

Drafting titles, subtitles, tables, illustrations: Tables as systematic means of presenting data in rows and columns and lucid way of indicating relationships and results.
Formatting tables: Title, Bodystab, Stab column, Column head, Spanner head, Box head. Appendices: Use and guidelines.

Unit IV

The writing Process: Getting started, Use outline as a starting device, Drafting, Reflecting.
Re-reading: Checking organizations, Content, Clarity, Grammar, Brevity and precise in Writing, Drafting and re- drafting based on critical evaluation.

Unit V

Parts of dissertation/research report/article: Introduction, Review of literature, Methods, results and discussion, Summary and abstract, References.
Writing for grants: The question to be addressed, Rational and importance of the question being addressed, Empirical and theoretical framework, presenting pilot study/data or background information, Research proposal and time frame, Specificity of methodology, organization of different phases of study, expected outcome of study and its implications, Budgeting, Available infrastructure and resources and Executive summary.

Course Outcomes:

After successful completion of this course, student will be able to
CO1: Recall the strategies and reasons for publishing research and discuss the different types of scientific writing
CO2: Apply the knowledge on implementing outlines as a guide to plan the manuscript
CO3: Analyze and reflect on your thinking processes and growth to identify strategies for improving academic writing and language skills
CO4: Evaluate the drafting process based on the script outline and re- reading the content to precise the writing for project
CO5: Write a series of analytical, creative, and coherent writing projects, including original research with primary and secondary sources

Text Books:

1. Claudio Dr. Luz, *How to Write and Publish a Scientific Paper: The Step by Step Guide PaperBack*, Publisher, Dr. Luz Claudio, 2016.
2. Gastel Barbara and Day Robert, *How to Write and Publish a Scientific Paper*, Green wood Publisher, 8th Edition, 2016.

Reference Books:

1. Thomas C.George, *Research Methodology and Scientific Writing*, Ane Books Pvt.Ltd, 1st Edition, 2016.
2. Robert A. Day Barbara Gaste, *How to Write and Publish a Scientific Paper*, Green Wood Publisher,8th Edition,2016.
3. Wayne C. Booth Gregory G. Colomb Joseph M. Williams, *The Craft of Research*, 3rd Edition, Publisher University of Chicago, 2011.

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Journals:
1. Scientific Journal
2. Journal of Writing Research
3. International Journal of Education Research

E-Resources:
1. https://www.pdfdrive.com/from-research-to-manuscript-a-guide-to-scientific-writing-e185397339.html
2. https://www.pdfdrive.com/how-to-write-illustrate-a-scientific-paper-e158701474.html
3. https://www.pdfdrive.com/research-methodologies-for-beginners-e185804256.html
4. https://www.pdfdrive.com/handbook-of-scientific-proposal-writing-e165569300.html
5. https://www.pdfdrive.com/writing-convincing-research-proposals-and-effective- scientific-reports-e53393242.htm

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	9	9	1	9	**49**
CO2	9	3	9	9	9	3	9	**51**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	3	3	3	1	3	**31**
CO5	9	9	9	3	9	3	3	**45**
Total	**45**	**33**	**39**	**33**	**39**	**17**	**33**	**239**

Low-1 Medium-3 High-9

Core IX- Medical Nutrition Therapy II

(For Students Admitted from 2022-23)

Semester: III **Hours/week: 6**
Subject Code: IMNDC31 **Credit:5**

Course Objectives:
1. To gain knowledge on the physiological, metabolic and nutritional changes that occurs in non-communicable diseases
2. To assess the nutritional status and impart diet counseling to alleviate and cure communicable and non communicable diseases

Unit I **(18 hours)**

Nutritional needs in Critical illness: Normal cellular processes, injury and response of cells to injurious agents, cellular adaptations, stress and Physiologic Effects. Nutrition in wound healing, Surgery: Pre and post-surgical dietary management. Burns-Classification, Complication, Dietary management, Sepsis- Dietary management, Dietary management in Trauma, Physiological, metabolic and hormonal response to injury.

Inborn errors of metabolism: PKU, MSUD, Tyrosinemia, Homocystinuria, Glycogen storage Disorder Galactosemia, Glutaricaciduria.

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Unit II **(18 hours)**

Dietary management of Cardio Vascular Diseases: Prevalence, Etiology and Risk Factors, Clinical diagnostic tests and medical nutrition management for cardiovascular diseases - Dyslipidemias, Hypertension, Atherosclerosis and Myocardial Infarction (MI) and Congestive Cardiac Failure (CCF), Stroke Inter-relationship between Diet and risk factors of CVD. Dietary management of Cardio vascular disease - Low fat, low cholesterol and medium chain triglyceride diet, Mediterranean Diet, Prudent diet. Kempner's rice diet, Dietary Approach to Stop Hypertension (DASH), Sodium intake in Hypertension.

Unit III **(18 hours)**

Dietary management of Diabetes mellitus: Prevalence, Types, Etiology and Signs and Symptoms, Clinical diagnostic tests and medical nutrition management for Diabetes Mellitus- Types I, Type II Diabetes and Gestation diabetes. Factors affecting normal blood glucose levels, Impaired glucose homeostasis, Diagnostic test for diabetes, Long term complications of diabetes and its management - Macrovascular and microvascular, Dietary management of Diabetes- Meal planning, Food exchange system, Portion control, Glycemic index and glycemic load, Carbohydrate counting and Resistant starch, Sweeteners and sugar substitutes, Lifestyle modification and exercise to manage diabetes mellitus.

Unit IV **(18 hours)**

Dietary management of Renal disorders: Prevalence, Etiology and Risk Factors, Clinical diagnostic tests and nutrition management for renal disorders - Acute and chronic Glomerulonephritis, Nephrotic Syndrome, Acute Renal Failure (ARF), Chronic Renal Failure (CRF), End Stage Renal Disease (ESRD)-Dialysis and Kidney Transplant. Nephrolithiasis- Types of stones and diet in Nephrolithasis - Acid and Alkaline Ash diet. Importance of protein nutrition in renal failure and uremia. Role of low protein, fluid restricted diet. Sodium and Potassium exchange list in diet planning of renal disorder patients.

Unit V **(18 hours)**

Nutritional management in Cancer: Prevalence, Etiology and Risk Factors, Clinical diagnostic tests and nutrition management for cancer-Carcinogenesis - pathogenesis and progression of cancer, Types Cancer therapies and treatment - side effects and nutritional implications, Dietary management of cancer, Role of neutropenic diet.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Recall the etiology, symptoms and dietary management of degenerative disease and Integrate knowledge of research principles and methods associated with nutrition and dietetics practice

CO2: Apply the knowledge of medical terminology and medical abbreviations associated with nutrition related diseases and conditions

CO3: Assess the nutritional status of critically ill patients and formulate different therapeutic diets for various disease conditions

CO4: Demonstrate initiative and judgment using a professional, ethical and entrepreneurial approach advocating for excellence in nutrition and dietetics

CO5: Independently plan and execute a research project regarding nutrition and dietetics practice

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Text Books:

1. Srilakshmi, B., *Dietetics*, New Age International (P) Ltd, Chennai,8th Edition, 2019.
2. Shubhaangini Joshi, *Nutrition and Dietetics*, 4th Edition, McGraw Hill Publication, New Delhi,2015.
3. Antia F.P. And Philip Abraham, *Clinical Nutrition and Dietetics*, Oxford University Press,4th Edition,2002.

Reference Books:

1. L. Kathleen Mahan, Sylvia Escott Stump and Janice L Raymond, *Krause's Food& Nutrition Care Process*, Saunders Publishers, 15th Edition, 2020.
2. Robinson, *Normal and Therapeutic Nutrition*, Oxford & LBM Publishing, Calcutta,Bombay,17th Edition, 1990.
3. Kathleen Mahan and Sylvia Escort Stump, *Food, Nutrition and Diet Therapy*, W.B.Saunder's Company London, 14th Edition, 2016.

Journals:

1. Journal of Nutrition and Dietetics
2. Journal of Nutrition & Food Sciences
3. Journal of Nutrition and Metabolism

E-Resources:

1. https://www.pdfdrive.com/nutrition-dietetics-practice-and-future-trends- e176409703.html
2. https://www.pdfdrive.com/oxford-handbook-of-nutrition-and-dietetics- e185402365.html
3. https://www.pdfdrive.com/krauses-food-the-nutrition-care-process-e175336715.html
4. https://www.pdfdrive.com/clinical-nutrition-e186572457.html
5. https://www.pdfdrive.com/nutrition-health-and-disease-a-lifespan-approach- e189164494.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	3	9	9	9	**57**
CO2	9	9	9	9	9	3	9	**57**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	9	9	3	9	**57**
CO5	9	9	9	3	9	9	9	**57**
Total	**45**	**45**	**45**	**33**	**45**	**33**	**45**	**291**

Low-1 Medium-3 High-9

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Core X – Medical Nutrition Therapy II Practicals

(For Students Admitted from 2022-23)

Semester: III **Hours /week: 6**
Subject Code: IMNDC32P **Credit: 5**

Course Objectives:

1. To apply their knowledge and identify the techniques of planning, preparation and execution of therapeutic diets
2. To formulate and administer appropriate dietary modifications and counseling for the patients

List of Experiments: **(90 hours)**

1. Preparation of routine hospital diets in surgical conditions- Clear fluid, Full fluid and soft diet
2. Planning and preparing diet for Burns
3. Planning and preparing diet for Phenylketouria
4. Planning and preparing diet for Atherosclerosis
5. Planning and preparing diet for Myocardial Infarction
6. Planning and preparing diet for Hypertension
7. Planning and preparing diet for Type I diabetes Mellitus
8. Planning and preparing diet for Type II diabetes Mellitus
9. Planning and preparing diet for Gestational diabetes
10. Planning and preparing diet for Acute and Chronic Renal failure
11. Planning and preparing diet for Nephrolithiasis
12. Planning and preparing diet for Dialysis
13. Planning and preparing diet for Breast cancer
14. Planning and preparing diet for Lungs cancer
15. Planning and preparing diet for Cervical Cancer

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Relate the causes, symptoms and onset of various types of degenerative diseases and describe the acquired skill development in planning therapeutic diets using food exchange list

CO2: Apply the skills for preparing appropriate therapeutic diets

CO3: Analyze the nutrient content of therapeutic diet

CO4: Assess the nutritional status using various nutritional assessment tools

CO5: Plan menu for the given disease condition and compare and contrast with R.D.A using software

Text Books:

1. Gopalan C., RN. Ramasastriand S.C. Balasubra-manian, *Nutritive Value of Indian Foods,* National Institute of Nutrition, Hyderabad, 2018.
2. V.Vimala, *Advances in Diet therapy-Practical Manual*, New Age International Private Ltd,2020.

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3. *Clinical Dietetics Manual*, Indian Dietetic Association, 2nd Edition 2018.

Reference Books:

1. Mahan L.K, Sylvia Escott Stump, *Krause's Food Nutrition and Diet Therapy* W.B. Saunders Company London 14th Edition, 2016.
2. Robinson C.H.,*Normal and Therapeutic Nutrition*, Mac Millan Publishing Co. Inc, NewYork,17th Edition,1990.
3. L. Kathleen Mahan, Sylvia Escott-Stump and Janice L Raymond, *Krause's Food & the Nutrition Care Process*, Saunders Publishers, 15th Edition, 2020.

Journals:

1. Asia Pacific Journal Clinical Nutrition
2. European Journal of Clinical Nutrition
3. International Journal of Nutrition and Dietetics

E-Resources:

1. https://www.pdfdrive.com/manual-of-dietetic-practice-e175954283.html
2. https://www.pdfdrive.com/medical-nutrition-therapy-a-case-study-approach-e186656569.html
3. https://www.pdfdrive.com/applications-and-case-studies-in-clinical-nutrition- e185254994.html
4. https://www.pdfdrive.com/manual-of-dietetic-practice-e33501318.html
5. https://www.pdfdrive.com/manual-of-clinical-nutrition-management-e18838358.html

Course Outcomes	**Programme Outcomes**							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	9	9	9	9	**57**
CO2	9	9	9	3	9	9	9	**57**
CO3	9	3	9	9	9	9	9	**57**
CO4	9	9	9	3	9	9	9	**57**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**33**	**45**	**33**	**45**	**45**	**45**	**291**

Low-1 Medium-3 High-9

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Core XI-Nutraceuticals and Functional Foods

(For Students Admitted from 2022-23)

Semester: III **Hours /week: 6**
Subject Code: IMNDC33 **Credit: 5**

Course Objectives:

1. To enable students to understand the relation between functional foods and nutraceuticals
2. To impart knowledge on the role of functional foods and nutraceuticals in the areas of preventive dietetics

Unit I **(18 hours)**

Historical perspective, classification, scope & future prospects. Applied aspects of the Nutraceutical Science.Sources of Nutraceuticals. Relation of Nutraceutical Science with other Sciences: Medicine, Human physiology, genetics, foodtechnology, chemistry and nutrition.

Unit II **(18 hours)**

Microbes as Functional Foods: Prebiotics - Definition, the role of prebiotic as a functional ingredient.Probiotics-Role of probiotics as functional ingredient. Synbiotics - Role of synbiotics as functional ingredient. Health effects of probiotics including mechanism of action. Probiotics in various foods: fermented milk products, non-milk products, etc-Quality Assurance of probiotics and safety.

Unit III **(18 hours)**

Functional Components from Plant Sources: a. Dietary fiber - Types and sources -Physical and Physiological properties.Phenolic compounds – Phytoestrogens (Isoflavones, Lignans) Flavonoids – Quercetin, kaempferol, Flavones, Limonene, Flavonols-Catechin, Phenolic acid-Ellagic acid, Caffeic acid,Phytosterols and phytostenols,Saponins, Tannins, Carotenoids - Lycopene, Beta-carotene, Luteinand zeaxanthin.

Unit IV **(18 hours)**

Functional Components from Animal Sources: a. Proteins-Lactalbumin, Lactoglobulin, Lactoferrin, Immunoglobulins, b. Derived peptides-Casein, Phospho Peptides, Glycomacro peptides, c. Lactose. Mineral- Zinc, Selenium, Calcium.

Dietary lipids: Conjugated Linolenic Acid, Linoleic acid, Oleic acid, GLA, Omega 3 and Omega 6 Fatty Acids.

Unit V **(18 hours)**

Food as remedies: Nutraceuticals bridging the gap between food and drug, Nutraceuticals in treatment for cognitive decline, Obesity and Cardiovascular diseases, Nutraceutical remedies for common disorders like oral and gut health, Bone health and Diabetes mellitus, cancer. Immune boosting nutraceuticals for infections.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Retrieve the historical perspective of nutraceuticals and physiology of human nutrition and explain the importance of nutraceuticals in the context of the human well-being

CO2: Illustrate the occurrence, chemical nature and medicinal benefits of natural nutraceuticals belong to different phytochemical categories

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CO3: Explain the functional components from Plant, Animal and microbial Sources.
CO4: Evaluate the standards of evidence required for efficacy and safety assessment of nutraceutical and functional foods
CO5: Summarize the application of Food biotechnology for improving the formulation of potential functional ingredients / foods will be mastered

Text Books:

1. Bagchi & Debasis & Preuss & HarryG. & Swaroop & Anand, *Nutraceuticals and Functional Foods in Human Health and Disease Prevention,* CRC Press, 2016.
2. RobertE.C. Wildman, Robert Wildman,Taylor C.Wallace, *Handbook of Nutraceuticals andFunctional Foods,* by CRC Press, 2nd Edition, 2016.
3. Rotimi E. Aluko, *Functional Foods and Nutraceuticals*, Springer Science & Business Media, 2012.

Reference Books:

1. Kavitha Sharma, Kanchan Mishra,and Kamal Senapati and Corina Danciu, *Bioactive Compounds in Nutraceutical and Functional Food for Good Human Health,*Springer Science,2021.
2. Dilip Ghosh et al., *Innovation in Healthyand Functional Foods,* CRC Press, 2016.
3. Sareen S. Gropper, Jack L. Smith, *Advanced Nutrition and Human Metabolism*, Cengage Learning, 7th Edition, 2016.

Journals:

1. Nutraceuticals World
2. Journal of Medical Nutrition and Nutraceuticals
3. Journal of Nutraceuticals and Nutrition

E-Resources:

1. https://www.researchgate.net/publication/343846825_Nutraceuticals_History_Classification_and_Market_Demand
2. https://www.pdfdrive.com/beneficial-microbes-in-fermented-and-functional-foods-e166059146.html
3. https://www.pdfdrive.com/chemical-and-functional-properties-of-food-components-third-edition-chemical-functional-properties-of-food-components-e188029045.html
4. https://www.pdfdrive.com/omega-3-fatty-acids-and-the-dha-principle-e161329463.html
5. https://www.pdfdrive.com/nutraceuticals-and-functional-foods-in-human-health-and-disease-prevention-e167230386.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	3	3	9	9	**45**
CO2	9	3	9	3	9	9	9	**51**
CO3	9	3	9	3	3	9	3	**39**
CO4	9	3	9	3	3	9	3	**39**
CO5	9	3	9	9	9	9	9	**57**
Total	**45**	**15**	**45**	**21**	**27**	**45**	**33**	**231**

Low-1 Medium-3 High-9

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Core XII - Food Analysis Practicals

(For Students Admitted from 2022-23)

Semester: III **Hours/week: 6**
Subject Code: IMNDC34P **Credit: 5**

Course Objectives:

1. To develop skills on the quantification technique of various components present in food samples
2. To improve working ability in analytical laboratory instruments

List of Experiments: **(90 hours)**

1. Measurement of pH and preparation of buffer.
2. Determination of Acidity& pH in food sample/beverages.
3. Determination of Moisture in food sample.
4. Determination of Ash in food sample.
5. Determination of Fiber in food sample.
6. Determination of Total carbohydrates in food sample
7. Determination of Total Protein in food sample
8. Determination of Total Fat in food sample
9. Determination of Iodine Value in the food sample
10. Determination of Peroxide Value in the food sample
11. Tests for adulterants in the food sample.
12. Determination of Vitamin C in food sample
13. Estimation of calcium in food sample
14. Estimation of Iron in food sample
15. Estimation of phosphorous in food sample
16. Demonstrations - Chromatography, Electrophoresis
17. Visit to Animal Studies Laboratory

Course Outcomes:

After successful completion of this course, student will be able to

CO 1: Understand the technical terminology and scientific units related to food analysis
CO 2: Implement the principles behind analytical techniques associated with food and the importance of accuracy and reproducibility in analysis
CO 3: Analyze and compare various parameters such as pH, moisture, ash, nitrogen, protein, lipid, carbohydrate, etc. in food samples
CO 4: Evaluate the appropriate analytical technique whenpresented with a practical problem
CO 5: Design an appropriate analytical approach to solve a practical problem

Text Books:

1. J.Jayaraman, *Dietary Guidelines for Indians, National Institute of Nutrition,Laboratory Manual in Biochemistry,* New Age International Limited, 1st Edition, 2006.
2. S. Sadasivam & A. Manickam, *Biochemical Methods,* New Age International Limited, 2nd Edition, 2005.
3. Yeshajahu Pomeranz & Clifton E.Meloan, *Food Analysis: Theory and Practice,* Springer Publication, 2002.

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Reference Books:

1. David T Plummer, *An Introduction to Practical Biochemistry*, Tata McGraw- Hill Publishing Company Ltd., 3rd Edition, 2006.
2. Sathe A. Y, A *First Course in food analysis*, New Age International Limited,1st Edition, 2012.
3. S.Suzanne Nielsen, *Food Analysis Laboratory Manual*, Springer Publication, 2ndEdition, 2015.

Journals:

1. Journal of Food and Drug Analysis
2. Journal of Agriculture and Food Chemistry
3. Journal of Food Composition and Analysis

E-Resources:

1. www.ug.edu.gh/nutrition-dietetics/courses/diet-212-food-analysis-practical
2. www.fssai.gov.in/Portals/0/Pdf/Manual_Fruits_Veg_25_05_2016.pdf
3. https://www.elte.hu/en/Introduction-to-Food-Analysis
4. https://www.pdfdrive.com/chemical-food-analysis-practical-manual-e1091408.html
5. https://www.pdfdrive.com/manual-of-food-quality-control-e44738521.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	3	1	9	9	**49**
CO2	9	9	3	3	1	3	3	**31**
CO3	9	9	9	9	1	9	9	**55**
CO4	9	9	3	3	1	9	9	**43**
CO5	9	9	3	9	1	3	9	**43**
Total	**45**	**45**	**27**	**27**	**5**	**33**	**39**	**221**

Low-1 Medium-3 High-9

Discipline Specific Elective III a. Food Safety and Quality Control

(For Students Admitted from 2022-23)

Semester: III **Hours /week: 6**
Subject Code: IMNDE3A **Credit: 5**

Course Objectives:

1. To understand the importance of various issues related to food safety and quality control
2. To know about national and international food standards and their role in ensuring food quality and safety

Unit I **(18 hours)**

Food Spoilage: Definition, factors influencing food spoilage, Types of food, Spoilage such as microbes, enzymes and insects; Changes in food quality due to spoilage, Methods for detection of food spoilage; Concept of food preservation and the principles. Food Safety: Need and importance of food safety in food industries, Factors affecting food safety.

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Unit II **(18 hours)**

Methods of evaluation of food quality: Sensory evaluation -Discrimination tests-Triangle test, duo-trio test, paired comparison. Rating tests -ranking test, hedonic rating test, numerical Scoring test, composite scoring. Sensitivity tests-threshold test, dilution test.

Objective technique-Physical method Penetrometer,Compressimeter, Shortometer and Farinograph. Chemical Method- Nutrient Analysis. pH meter.

Microbiological methods of determining shelf life: Total plate count test and Serial dilution techniques.

Unit III **(18 hours)**

Common adulterants, tests to detect adulterants contaminants, naturally occurring toxins in food metallic pesticide and preservative contaminants. Non nutritive food components and their potential health effects, Polyphenols, Tannins, Phytoestrogens, Cyanogenic compounds, Lecithin, Saponins.

Unit IV **(18 hours)**

Government and trade standards for quality: food laws and regulations - PFA , FPO and Food Safety Act 2006. BIS standards, Agmark standards, Compulsory National legislation Act, Essential Commodities Act, Consumer protection Act. International Standards for export, Codex Alimentarius, WTO, ISO, WHO and FAO, FSSA, APEDA and MPEDA.

Unit V **(18 hours)**

Rules and regulations for setting up of a processing unit: Criteria for ingredients and finished products. Aspects of microbiological safety in food preservation technologies, Continuous assessment System, Total quality management and quality audits in food industries.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Learn standards related to food safety and quality and understand the knowledge about International food safety legislation

CO2: Apply the knowledge on the requirements for compliance with national and International food standards

CO3: Demonstrate knowledge of quality management systems, their implementation and the practical steps needed for implementation

CO4: Conduct risk assessments of food safety problems including genetic modification

CO5: Critically evaluate the recent developments in the control of food safety

Text Books:

1. Pulikat Mathur, *Text book of Food Safety and Quality Control*, Orient Blacks wan Publisher,2018.
2. Halde, *Objective Food Science and Safety standards*,Jain Brothers Publishers,2015.

Reference Books:

1. Alli, I, *Food quality assurance: principlesand practices*. CRC Press, 2019.
2. Alok kumar,*Fundamentals of food Hygiene, safety and quality*, Dream tech Press Publishers,2019.
3. Lásztity, R, *Food Quality and Standards*,Eolss Publishers Company Limited, Vol-3,2009.

Journals:

1. Journal of Food Quality and Hazards Control
2. International Journal of Food Safety, Nutrition and Public Health
3. Journal of Food Safety

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E-Resources:

1. https://www.cliffsnotes.com/study-guides/biology/microbiology/food- microbiology/food-spoilage
2. https://hmhub.me/methods-food-evaluation
3. https://www.vedantu.com/biology/food-adulteration
4. https://www.mondaq.com/india/food-and-drugs-law/244880/laws-governing- the-food-industry-in-india--revisited
5. https://food.unl.edu/seven-principles-haccp

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	3	9	3	9	**51**
CO2	9	3	9	9	9	9	9	**57**
CO3	9	9	9	3	9	9	9	**57**
CO4	9	9	9	9	9	9	3	**57**
CO5	9	3	9	9	9	9	9	**57**
Total	**45**	**33**	**45**	**33**	**45**	**39**	**39**	**279**

Low-1 Medium-3 High-9

Discipline Specific Elective III b. Sports Nutrition

(For Students Admitted from 2022-23)

Semester: **Hours /week: 6**

Subject Code: IMNDE3B **Credit: 5**

Course Objectives:

1. To understand the role of nutrients in athletic performance and provide an overview of dietary supplements to enhance performance
2. To study about the nutritional requirements of athletes with special needs

Unit I **(18 hours)**

Nutrition for strength sport athletes: Types and characteristics of strength or high intensity sports (sprinting, throwing, body building etc).Physiology of energy systems. Nutritional requirements- macronutrients- carbohydrates, fats proteins. Muscle building- post exercise anabolic window. Impact of resistance training on body composition of athletes in strength sports. Micronutrient requirements. Nutrient periodization in training and competition.

Unit II **(18 hours)**

Nutrition for weight class sports: Combat sports, individual events. Types and characteristics- physiological needs, body composition and energy systems used. Macro and micronutrient requirements in training and competition. Hydration guidelines in weight class sports. Making weight- weight loss and gain in training and competition. Strategies to promote healthy weight loss in athletes.

Unit III **(18 hours)**

Macronutrient requirements for sport athletes: Macronutrient needs of team sport athletes according to training and position on the field. Carbohydrate intake- pre, during and post event/training. Proteins and amino acids- Type, Amount and timing of ingestion. Fat requirements.

Unit IV **(18 hours)**

Micronutrient requirements for sport athletes: Role of vitamins and minerals in energy

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metabolism, Blood formation, Bone health, and Antioxidants. Fluid and electrolyte requirements. Hydration strategies in athletes based on rules of the sport, Available time and opportunities to hydrate on the field.

Unit V **(18 hours)**

Use of Nutritional supplements in strength/power sports: use, effects, efficacy and safety. Creatine monohydrate, Sodium bicarbonates, Nitrates, B-Alanine, Caffiene.

Protein supplements: Whey, Casein, Egg Albumen, Soy Protein, Pea Protein & Other Vegan Proteins/Protein Blends), Protein Bars, Protein shakes. Amino acids supplements - Amino Acid Supplements- BCAA, Glutamine, Arginine,Taurine. Fat burners, Ergogenic aids.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Outline evidence based nutritional strategies to enhance recovery and understand the knowledge of physiological response to exercise affects nutritional requirements

CO2: Explain the relationship between exercise, nutrition and energy balance for the control of body composition and chronic disease risk factors

CO3: Interpret data to assess body composition changes in elite athletes and demonstrate an ability to use these guidelines to provide general nutrition advice for achieving or maintaining a healthy bodyweight

CO4: Evaluate dietary strategies to influence the health and performance of elite and recreational athletes

CO5: Communicate sports nutrition advice accurately and effectively to non-specialist audiences

Text Books:

1. Dan Benardot, *Advanced Sports nutrition,* Champaign, IL: Human Kinetics, 2021.
2. Sumati R. Mudambi,*Fundamentals of Foods, Nutrition and Diet Therapy*, New Age International Private Limited, 2020.

Reference Books:

1. Marie Spano, Laura Kruskall, D. Travis Thomas, *Nutrition for Sport, Fitness and Health*, Human Kinetics, 2017.
2. Anita Bean,*The Complete Guide to Sports Nutrition, Bloomsbury Sport*, 8th Edition,2017
3. Don Mac Laren, *Advances in Sport and Exercise Science: Nutrition and Sport,* Published by Churchill Livingstone, Elsevier, 2007.

Journals:

1. British Journal of Sports Medicine
2. International Journal of Sport Nutrition and Exercise Metabolism
3. Journal of International Society of Sports Nutrition

E-Resources:

1. https://www.pdfdrive.com/nutritional-applications-in-exercise-and-sport-nutrition- in-exercise-sport-e163327830.html
2. https://www.pdfdrive.com/nutrition-in-sport-e9596094.html
3. https://www.pdfdrive.com/nutrition-and-metabolism-in-sports-exercise-and- health-e178549344.html
4. https://www.pdfdrive.com/essentials-of-sports-nutrition-and-supplements- e175251805.html
5. https://www.pdfdrive.com/sports-nutrition-vitamins-and-trace-elements- second- edition-nutrition-in-exercise-sport-e156737603.html

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Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	9	3	9	3	**45**
CO2	9	3	3	9	3	9	9	**45**
CO3	9	3	9	3	3	9	3	**39**
CO4	9	3	9	9	3	9	9	**51**
CO5	9	9	9	3	3	3	9	**45**
Total	**45**	**21**	**39**	**33**	**15**	**39**	**33**	**225**

Low-1 Medium-3 High-9

Core XIII -Geriatric Nutrition

(For Students Admitted from 2022-23)

Semester: IV **Hours /week: 6**
Subject Code: IMNDC41 **Credit: 5**

Course Objectives:

1. To provide in-depth knowledge on aging and nutrition care required during acute and chronic disease conditions
2. To provide an insight on the issues and problems related to geriatrics

Unit I **(18 hours)**

Introduction to Ageing: Introduction to geriatric care-concept of gerontology. Ageing - Biology of ageing- Theories of ageing, Disengagement theory, Activity theory, Selective theory and Continuity. Microscopic theories, Changes in ageing scenario-Interaction between biological and psychological in ageing. Interaction between physiological and social processes in ageing. Drug, food, and nutrient reaction. Dietetics of Geriatric Care-Nutritional requirement, Food requirement, dietary modification.

Unit II **(18 hours)**

Issues and challenges of Ageing: Economic dependence/ poverty, Elderly in rural/ urban area. Abuse, Neglect, Abandonment, Physical, Health and Sensory problems. Crime against elderly, Retirement and related issues. Ageing sensory system and issues with falling. Common complaints during ageing.

Unit III **(18 hours)**

Clinical Geriatric: Nutritional related problems of old age-osteoporosis, obesity, neurological dysfunction, Anaemia, Malnutrition and constipation. Infection and Immunity. Degenerative disorders in elderly-Dementia, Alzheimer, Parkinson's disease. Disorders of upper GIT, Disorders of lower GIT, Disorders of Liver, Disorders of Billiary system and pancreas. Infection of Respiratory system

Unit IV **(18 hours)**

Geriatric Guidance and Counselling: Definition, Principles, Dimensions, Process and techniques of counselling, Counseling the older person, Common problems requiring counselling, Counselling under special situation. Depression in old age. Exercise-yoga, meditation. Behavior therapy: Rational-emotive behavior therapy (REBT), Horticultural therapy. Music therapy, Art therapy, Bibliotherapy.

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Unit V **(18 hours)**

Social Geriatric: Role of Govt. and NGOs in Socio –economic status of the elderly. Geriatric service for the elderly in western countries and India. Structure of geriatric service, family as basic unit- models of geriatric service. Day hospital, day care centre, long stay care institution. Home for the aged, function of the day hospital staff and patients of day hospital. Ethical issues in geriatric medicine-age limits on health care. Life sustaining measures.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Gain Knowledge of Nutrition, Health and Gerontology and understand the process of physical and social changes taking place during the elderly people life

CO2: Identify the nutritional implications of these changes in terms of nutrient and dietary requirements

CO3: Determine different techniques of nutritional assessment of the elderly

CO4: Examine the sensory problems and chronic degenerative disease during ageing

CO5: Develop the knowledge about geriatric guidance and counseling and write the role of Government and NGOs in economic status of geriatrics

Text Books:

1. Gary Cheuk, *Advanced Age Geriatric Care*, Springer International Publishing, 2018.
2. Srilakshmi.B, *Dietetics*, New Age International(P) Ltd, Chennai,7 th Edition, 2014.
3. Barbara Resnick, *Essentials of Clinical Geriatrics*, McGraw Hill Professional Publisher, 2017.

Reference Books:

1. Dale Avers, Guccione's *Geriatric Physical Therapy*, Book Aid International,4th Edition, 2019.
2. Jacobs M, *Psychodynamic Counselling in Action*, Sage Publications, New Delhi,4th Edition, 2015.
3. Trower, P, Jones, J, Dryden, W and Casey, A, *Cognitive Behavioural Counselling in Action*, Sage Publication, New Delhi, 2nd Edition, 2011.

Journals:

1. Journal of the Indian AcademyofGeriatrics
2. Journal of Gerontology & Geriatric Research
3. Journal of Geriatric Psychiatry and Neurology

E-Resources:

1. https://samples.jbpub.com/9781284104479/Chapter_3.pdf
2. https://www.helpguide.org/home-pages/aging-issues.htm
3. https://www.bacp.co.uk/media/1968/bacp-counselling-older-people-systematic-review.pdf
4. https://www.brainkart.com/article/Nutrition-Related-Problems-Of- Elderly(Old-Age)_2611/pdf
5. https://www.jyotinivas.org/pdf/e_content/sociology/3rd%20YearsAgeing%20%E2% 80%93%20Role%20of%20NGO%E2%80%99S.pdf

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Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	3	9	3	9	**51**
CO2	9	3	9	3	3	3	3	**33**
CO3	9	3	9	3	3	3	3	**33**
CO4	9	3	9	3	9	3	9	**45**
CO5	9	9	3	3	3	3	9	**39**
Total	**45**	**27**	**39**	**15**	**27**	**15**	**33**	**201**

Low-1 Medium-3 High-9

Core XIV - Dietetic Internship in Hospital

(For Students Admitted from 2022-23)

Semester: IV **Hours /week: 6**

Subject Code: IMNDC42P **Credit: 5**

Course Objectives:

1. To gain knowledge in the functioning of a dietary department and hands-on experience in the roles and responsibilities of dietitians
2. To develop skills to assess patients' nutritional needs and plan suitable diets and diet counseling skills for patients

Aspects to be covered in the Dietary Internship training programs (90 hours)
Dietary internship training:

1. Assessing the nutritional status and diet history of patients.
2. Planning diet sheets, preparing and providing guidance in the production of therapeutic diet.
3. Supervising the preparation of diets.
4. Supervising the delivery of trays to the patient.
5. Getting feedback from patients regarding diets.
6. Understanding the layout of hospital dietary unit.
7. Acquiring practical knowledge in diet counselling.
8. Under taking 3 case studies at hospital situation.
9. Acquiring practical knowledge in Online Dietetic Counselling Techniques

Guidelines:

- It is compulsory for all the students to complete the given institutional training Programme in a reputed institution for a period of 30 days.
- At the end of the course, each student has to submit a report of the training
- Internal marks will be awarded by the faculty of the department with whose guidance the report is prepared.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Identify nutrition-related problems and determine nutrition interventions and describe the work of inter professional teams and the roles of others with whom the registered dietician nutritionist collaborates in the delivery of food and nutrition services

CO2: Interpret the relevance of food and nutrition for the disease

CO3: Analyze the food habits and brief about the dietary modification

CO4: Discuss the impact of health care policy and different health care delivery systems on

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food and nutrition services to the consultant and Graduates will be prepared to pass the national level Registered level dietician examination

CO5: Persuade the patients with appropriate online diet counselling techniques

Text Books:

1. Srilakshmi, B., *Dietetics*, New Age International(P) Ltd, Chennai,8th Edition,2019.
2. Antia F.P. And Philip Abraham, *Clinical Nutrition and Dietetics*, Oxford University Press, 4th Edition,2002.
3. A.Joshi Shubhaangini, *Nutrition and Dietetics*, 4th Edition, McGraw Hill Publication, New Delhi, 2015.

Reference Books:

1. L. Kathleen Mahan, Sylvia Escott Stump and Janice L Raymond, *Krause's Food &the Nutrition Care Process*, Saunders Publishers, 15th Edition, 2020.
2. Robinson, *Norma land Therapeutic Nutrition*, 17th Edition, Oxford & LBM Publishing,Calcutta, Bombay, 1990.
3. Kathleen Mahan and Sylvia Escort Stump, *Food, Nutrition and Diet Therapy*, W.B.Saunder's Company London, 14th Edition, 2016.

Journals:

1. Journal of Nutrition and Dietetics
2. American Journal of Clinical Nutrition
3. Journal of Nutrition and Metabolism

E-Resources:

1. https://www.pdfdrive.com/nutrition-dietetics-practice-and-future-trends- e176409703.html
2. https://www.pdfdrive.com/oxford-handbook-of-nutrition-and-dietetics- e185402365.html
3. https://www.pdfdrive.com/krauses-food-the-nutrition-care-process-e175336715.html
4. https://www.pdfdrive.com/nutrition-dietetic-internship-handbook-2012- 13-e24766595.html
5. https://www.pdfdrive.com/manual-of-dietetic-practice-e33501318.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	9	9	**63**
CO2	9	9	9	9	9	9	9	**63**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	9	9	9	9	**63**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**45**	**45**	**45**	**45**	**45**	**45**	**315**

Low-1 Medium-3 High-9

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Core XV-Dissertation

(For Students Admitted from 2022-23)

Semester: IV **Hours /week: 16**

Subject Code: IMNDC43PW **Credit: 5**

Course Objectives:

1. To develop skills in conducting a research study/ working project in the area of Nutrition and Dietetics
2. To learn the process of writing a dissertation/ project report

The dissertation is the final stage of the Master's degree and provides an opportunity to gain the necessary skills and knowledge in research project. It should demonstrate that students are skilled in area of research, setting research objectives, authoritative literature, devising an appropriate research methodology, analyzing the data, conclusions and if appropriate making relevant recommendations and indications of areas for further research.

The students will be guided and supervised by the teaching faculty of the Home Science department. After completing the dissertation, the report will be submitted for external evaluation. The students will have to appear for viva-voce for their thesis after the valuation by the external examiner

Course Outcomes:

After successful completion of this course, student will be able to

CO1: State a nutritional problem prevalent in local community settings and draft a research design for solving

CO2: Apply the appropriate nutritional concepts to research techniques.

CO3: Analyze the research problems in the field of nutrition and dietetics

CO4: Examine the statistical tools for data collection and interpret results

CO5: Create innovative solutions to existing nutrition problems in community

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	9	9	**63**
CO2	9	9	9	9	9	9	9	**63**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	9	9	9	9	**63**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**45**	**45**	**45**	**45**	**45**	**45**	**315**

Low-1 Medium-3 High-9

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Extra Credit - Diabetic Care and Education

(For Students Admitted from 2022-23)

Semester: IV

Subject Code: IMNDX4 **Credits: 2**

Course Objectives:

1. To learn the common types of complications associated with multiple forms of diabetes
2. To learn the importance of nutrition and diet for optimal management of diabetes symptoms and conditions

Unit I

Pathophysiology of Diabetes: Types and causes, Disease process, Diagnostic criteria, Screening for Diabetes – why, when and how? (Urine sugar and blood sugar), Continuum of care (Primary, Secondary)

Unit II

Long term complications: Macro vascular complication: It includes coronary artery disease, cerebral vascular and peripheral vascular disease – type, risk factors and intervention strategies. Micro vascular complication: Diabetes Eye disease, Neuropathy, Nephropathy – Disease stage, diagnosis and treatment. Other complications (foot, skin, gastrointestinal disorders, endocrine disease, psychological factors.

Unit III

Management of Diabetes: overview: Aims of treatment, the importance of overall metabolic control, internationally recognized standards of care. The evidence for good control, physical assessment and laboratory assessment.

Unit IV

Practical management of Diabetes: Dietary management, insulin and oral therapy, Avoiding and managing hypo and hyperglycemia, Self -management strategies during special situations (sick days, travel, hypoglycemic events, etc), Self-monitoring (glycemic control & complications related to diabetes), Lifestyle issues, Newer trends in management.

Unit V

Special considerations: Diabetes in children and adolescents, Diabetes in pregnancy, Diabetes in the elderly, Diabetes & infection, Diabetes in people living in poverty and surgical considerations in Diabetes.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Recite and relating the knowledge of diabetes pathologies

CO2: Examine the modifications in nutrients and dietary requirements for therapeutic condition

CO3: Categorize the recent concepts in the dietary management of diabetes

CO4: Reflecting the skills in planning and preparation of therapeutic diets for diabetes

CO5: Solve the complications by diabetic care and education

Text Books:

1. Richard I.G. Holt, *Text book of Diabetes*, WileyBlackwellPublication, UK,5th Edition, 2017.
2. David Levy, *Practical Diabetes Care*,John Wilney Publisher,4th Edition,2018.
3. Shashank R Joshi, *Text Book of Diabetes*, Jaypee Brothers Medical Publishers,2020

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Reference Books:

1. Kumthekar Ajit.B, *Practical management of Diabetes*, Jaypee Brothers Medical Publishers, 2011.
2. Rudy Bilous, Richard Donnelly, Iskandar Idris, *Handbook of Diabetes*, Wiley Black Well Publication, 5th Edition, 2021.
3. Janet Titchener, *Diabetes Management: A Manual for Patient-Centred Care*, CRC Press, 1st Edition, 2020.

Journals:

1. Journal of Clinical Nutrition
2. Journal of Neuro inflammation
3. Journal of Pharmaceutical Health Care and Sciences

E-Resources:

1. https://www.pdfdrive.com/american-diabetes-associations-standards-of-medical-care- in-diabetes-e38635770.html
2. https://www.pdfdrive.com/barriers-in-preventing-long-term-complications-among-patients-with-type-2-diabetes-mellitus-at-the-e75042570.html
3. https://www.pdfdrive.com/nutritional-management-of-diabetes-mellitus-practical- diabetes-e161197856.html
4. https://www.pdfdrive.com/nutritional-management-of-diabetes-mellitus-practical- diabetes-e161197856.html
5. https://www.pdfdrive.com/handbook-of-dsm-5-disorders-in-children-and-adolescents- e187750795.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	3	3	3	3	**39**
CO2	9	9	9	3	9	3	9	**51**
CO3	9	9	3	3	3	3	9	**39**
CO4	9	9	3	3	9	3	9	**45**
CO5	9	9	3	3	9	3	3	**39**
Total	**45**	**45**	**27**	**15**	**33**	**15**	**33**	**213**

Low-1 Medium-3 High-9

XVIII ACADEMIC COUNCIL

BSC HOME SCIENCE- NUTRITION AND DIETETICS
(Three Year Regular Programme)
(For students admitted from 2022-2023)

Programme Specific Outcomes:
On completion of the Under Graduate Programme, Student will be able to gain

PSO1: Acquiring knowledge in the discipline of Nutrition and Dietetics and applying the principles of the same to the needs of the community. Commitment to keep with current knowledge and practice guidelines relevant to Nutrition and Dietetics in order to enhance competency

PSO2: Develop research skills and scientific reasoning Skills in the field of Nutrition and Dietetics aimed at improving the quality of life of individuals and communities

PSO3: Ability to identify the National level Nutrition Health Issues, Fashion Psychology and promote awareness on Diet, Health and Design consultancy for the society

PSO4: Prepare students with professional competencies necessary for employment in institutions, industries and organizations related to their field of training or for self-employment and establish entrepreneurial activities in the areas of Foods, Nutrition and Dietetics

PSO5: Demonstrate knowledge, application and integration of principles of health promotion and disease prevention with Normal Nutrition, Medical Nutrition Therapy and Public Health Nutrition for varied populations

PSO6: Equip them to pursue higher studies leading to research and to become professionals in food science and dietetics

PSO7: Have a good scientific temper for the application of current scientific theories related to food science and nutrition

PREAMBLE

Following are the changes done in the 2021-22 syllabus and the candidates who will join from2022 -23 onwards will follow this syllabus.
The following changes have been introduced in the curriculum

- Allied paper renamed as Ability Enhancement Compulsory Course Core
- Elective renamed as Discipline Specific Elective
- Skill-Based Elective renamed as Skill Enhancement Course
- Non-major Elective renamed as Open Elective Course
- In Semester – V Discipline Specific Elective II-b, Post-harvest Technology, as the course content was vast it was revised to UG level.
- In Semester – VI Core- XV Food Safety and Quality Control under the topic Food Analysis, the methods of evaluation of food adulterants and toxic constituents are included in Unit –IV.
- In Skill Enhancement Courses new papers such as Yoga for Holistic Health Practicals in semester - I, Surface Embellishment Practicals in II semester, Nutrition Garden Practicals in III semester has been included.
- In Semester, – V General Interest Course - Women Studies has been renamed as Women Entrepreneurship.
- Extra Credit Course- The course Skills for Employability Development has been renamed as Employability Skills and shifted from VI semester to V semester. Waste Management in Food Industries course has been shifted from V semester to VI semester.
- In the Open Elective course, a new paper such as Basic and Advanced Hand Embroidery Practicals added in the IV semester

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PROGRAMME CODE:UND

PROGRAMMESTRUCTURE

Semester	Subject Code	Part	Course	Subject Title	Hours /Week	Credit	CIA	ESE	Total Marks
I	IBLT11 IBLA11 IBLH11	I	Language-I	Tamil I/ Basic Arabic-I /Hindi-I	5	3	40	60	100
	IBLEI12/ IBLEII12	II	Language-II	English I a orb	5	3	40	60	100
	IBNDC11	III	Core- I	Food Science	6	5	40	60	100
	IBNDC12P		Core-II	Food Science Practicals	5	4	40	60	100
	IBNDA13		AECCI	Basic Chemistry	5	4	40	60	100
	IBNDS14P	IV	SEC-I	Yoga for Holistic health Practicals	2	2		50	50
				Library/Browsing	1				
				Remedial/Games	1				
				TOTAL	**30**	**21**	**200**	**350**	**550**
II	IBLT21 IBLA21 IBLH21	I	Language-I	Tamil II / Basic Arabic-II/ Hindi-II	5	3	40	60	100
	IBLEI22/ IBLEII22	II	Language-II	English II a or b	5	3	40	60	100
	IBNDC21	III	Core–III	Human Nutrition	5	5	40	60	100
	IBNDC22P		Core-IV	Human Physiology Practicals	4	4	40	60	100
	IBNDA23		AECCII	Human Physiology	5	4	40	60	100
	IBES2	IV	GIC-I	Environmental Science	2	2		50	50
	IBNDS24P		SEC-II	Surface Embellishments Practicals	2	2		50	50
	IBNDX2/ IBNDX2O		Extra Credit	Food Hygiene and Sanitation /*Online Course(Maternal Infant Young Child Nutrition-Swayam)		2	-	100	100
				Library/Browsing	1				
				Remedial/Games	1				
				TOTAL	**30**	**23+2**	**200**	**400+ 100**	**600+ 100**
III	IBLT31 IBLA31 IBLH31	I	Language-I	Tamil III/ Basic Arabic III/ Hindi-III	5	3	40	60	100
	IBLEI32 / IBLEII32	II	Language-II	English III a or b	5	3	40	60	100
	IBNDC31	III	Core-V	Nutritional Biochemistry	4	4	40	60	100
	IBNDC32P		Core-VI	Nutritional Biochemistry Practicals	4	4	40	60	100
	IBNDA33		AECC-II	• Integrated Course -Food Microbiology	4	4	40	60	100

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			OEC		2	2		50	50
IV	IBNDS34P	IV	SEC-III	Nutrition Garden Practicals	2	2		50	50
	IBHR3		GIC-II	Human Rights	2	2		50	50
	IBXTN3	V	Extension Activities	NSS/CSS	2	2	100		100
	IBNDX3/ IBNDX3O		Extra Credit	Marine Food Processing /*Online Course (Nutrition, Therapeutic and Health-NPTEL)		2	-	100	100
				TOTAL	**30**	**26+2**	**300**	**450+ 100**	**750+ 100**
	IBLT41 IBLA41 IBLH41	I	Language-I	Tamil IV/ Basic Arabic IV/ Hindi-IV	5	3	40	60	100
	IBLEI42 / IBLEII42	II	Language–II	English IV a or b	5	3	40	60	100
	IBNDC41	III	Core–VII	Nutrition for Life Span	5	4	40	60	100
	IBNDC42P		Core VIII	Nutrition for Life Span Practicals	4	4	40	60	100
	IBNDA43		AECCII	Human Development and Family Relationships	5	4	40	60	100
		IV	OEC		2	2		50	50
	IBNDS44P		SEC-IV	Food Product Development Practicals	2	2		50	50
	IBLVE4		GIC-III	Life Skills and Value Education	2	2		50	50
	IBNDX4/ IBNDX4O		Extra Credit	Information, Education and Communication Material in Education. /*Online Course(Food and Nutrition for Healthy Living–Swayam)		2	-	100	100
				TOTAL	**30**	**24+2**	**200**	**450+ 100**	**650+ 100**
V	IBNDC51	III	Core-IX	Diet Therapy I	6	5	40	60	100
	IBNDC52P		Core-X	Diet Therapy I Practicals	6	5	40	60	100
	IBNDC53		Core-XI	Community Nutrition	6	5	40	60	100
	IBNDE5A/ IBNDE5B		DSE I	a.Family Resource Management / b.Basics of Textile and Apparel	4	4	40	60	100

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	IBNDE5C/ IBNDE5D		DSE II	a. Food Service Management/ b.Post-harvest Technology	4	4	40	60	100
	IBNDS54P	IV	SEC-V	Food Preservation Practicals	2	2		50	50
	IBWE5	IV	GIC - IV	Women Entrepreneurship	2	2		50	50
	IBESX5/ IBNDX5O		Extra Credit	Employability Skills /*Online Course (Mental Health and Nutrition- EDUX)		2	100		100
				TOTAL	**30**	**27+2**	**200+ 100**	**400**	**600+ 100**
VI	IBNDC61	III	Core-XII	Diet therapy II	6	5	40	60	100
	IBNDC62P		Core-XIII	Diet therapy II Practicals	6	5	40	60	100
	IBNDC63		Core-XIV	• Integrated Course Food Safety and Quality Control	6	5	40	60	100
	IBNDC64P		Core-XV	#Dietetic Internship	5	3	40	60	100
	IBNDE6A/ IBNDE6B		DSE III	a. Food Adulteration b. Nutrition for Sports and Physical Fitness	4	4	40	60	100
	IBNDS65P	IV	SEC-VI	Food Adulteration Practicals	2	2		50	50
	IBNDX6/ IBNDX6O		Extra Credit	Waste Management in food industries /*Online Course.(Food Science and Processing -Swayam)		2		100	100
				Library/Browsing Centre	1				
				TOTAL	**30**	**24+2**	**200**	**350+ 100**	**550+ 100**
				GRANDTOTAL	**180**	**145+10**	**1300 +100**	**2400+ 400**	**3700 +500**

AECC-Ability Enhancement Compulsory Course **SEC**-Skill Enhancement Course
DSE-Discipline Specific Elective **OEC**-Open Elective Course

*For online certification credit alone will be assigned on submission of certificate obtained through appearing for online examination from Swayam, Spoken tutorial, EDX, NPTEL etc.

XVIII ACADEMIC COUNCIL

Open Elective Course
(All students other than Home Science-Nutrition and Dietetics, Home Science–Fashion Designing)

Semester	Subject code	Subject Title	Hours/Week	Credit	CIA	ESE	Total Marks
III	IBOE3HS	Food Preservation Techniques	2	2		50	50
IV	IBOE4HSP	Basic and Advanced Hand Embroidery Practicals	2	2		50	50

Semester	Subject Code	Subject Title	Hours/Week	Credit	CIA	ESE	Total Marks
I	IBCHA14/ IBMBA13	AECC-I Biochemistry I	5	4	40	60	100
II	IBCHA24/ IBMBA23	AECC-II Biochemistry II	5	4	40	60	100

XVIII ACADEMIC COUNCIL

Core-I Food Science

(For Students Admitted from 2022-2023)

Semester: I **Hours/week:6**
Subject Code: IBNDC11 **Credit:5**

Course Objectives:

1. To gain knowledge of basic five food groups and nutritional composition
2. To learn about the factors influencing the cooking quality of different foods

Unit I **(18 hours)**

Methods: Food Groups - Basic Five, Food guide pyramid (ICMR) and Food plate (USDA). Classification of food based on nutrients.

Introduction to Food science: Preliminary preparation of food prior to cooking with special reference to conservation of nutrients and palatability.

Study of cooking methods: Dry heat method - broiling, grilling, frying and baking- its advantages and disadvantages; Moist method- boiling steaming, poaching, pressure cooking and stewing; Microwave cooking and solar cooking- merits and demerits.

Evaluation of food quality: Sensory characteristics of food, Food evaluation - Subjective method, Objective methods: chemical, physical, physicochemical, and microscopic examination.

Unit II **(18 hours)**

Cereals and Millets: Classification, Structure, composition and nutritive value of cereals (Wheat and Rice) and millets (Ragi, foxtail and Jowar), role of cereals and millets.

Cereal and millet cookery: Effect of moist heat method - Hydrolysis, Gelatinisation and factors affecting gelatinization, gel formation, retrogradation and syneresis, Effect of dry heat, Role of cereals in cookery

Pulses, Nuts and Oilseeds: Pulses - Classification, Structure, Nutritional Composition, Toxicants and nut allergies. Processing – Soaking, Germination and fermentation and its advantages.

Pulses Cookery - Effect of cooking, factors affecting cooking quality, Role of pulses in cookery.

Unit III **(18 hours)**

Meat: Classification, Nutritional Composition, Post-mortem Changes, Changes during cooking.

Egg: Types of eggs, Structure, Nutritional Composition, Quality of Eggs, Role of egg in cookery.

Poultry: Classification of Poultry, Nutritional Composition, Cooking Methods.

Seafood: Classification of Fish, Nutritive value, Selection Factors and principles of fish cookery.

Unit IV **(18 hours)**

Milk: Nutritional Composition, Types of milk. Processing – Pasteurization, Homogenization and Standardization of Milk.

Milk Products - Non fermented and fermented products**,** Changes during cooking and Role of milk in cookery

Fats and oils - Composition, Smoking Temperature, Rancidity, Role of fats and oils in cookery and different methods used for oil extraction from oil seeds.

Sugars and Jaggery: Classification, Sources, Sugar cookery: Crystallization and factors affecting crystallization, Stages of sugar cookery, Role of sugar in cookery.

Unit V **(18 hours)**

Vegetables and Fruits: Classification, Nutritional Composition, Pigments - Water soluble and fat soluble. Selection and cooking methods, Changes during Cooking - Enzymatic Browning - Causes, Prevention and conservation of nutrients.

Beverages: Types of Beverages and its health benefits. Spices and their medicinal importance.

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Course Outcomes:

After successful completion of this course, student will be able to

CO1: Recall the different types of food groups and discuss the cooking methods adopting best practices

CO2: Determine the composition and nutritive value of different food groups and role of cookery

CO3: Analyze the physical and chemical changes occurring in different foodstuffs during various cooking process

CO4: Assess the principles in cooking and its effect on sensory attributes and nutrients

CO5: Summarize the effect of processing and storage on nutritional composition of foods

Text Books:

1. Shakuntala Manay N, Shadaksharaswamy M, *Food Facts and Principles*, New Age InternationalPublishers, 4th Edition,2018.
2. Srilakshmi. B, *Food science*, New Age International Publishers, New Delhi, 7th Edition, 2018.

Reference Books:

1. Fellows P J, *Food Processing Technology: Principles and practice*, CRC Wood Head Publishing Ltd., Cambridge,4th Edition, 2016.
2. Berk.z, *Food Process Engineering and Technology*, Elsevier Academic Press, New York,3rd Edition, 2018.
3. John M. de Man, *Food process engineering and technology*, Academic Press, Elsevier:London and New York, 3rd Edition, 2018.

Journals:

1. Journal of Food Science
2. Journal Nutrition and Food Science
3. Journal of Food Science and Technology

E-Resources:

1. https://www.webstaurantstore.com/article/454/types-of-cooking-methods.html
2. https://millets.res.in/m_recipes/Nutritional_health_benefits_millets.pdf
3. https://www.pearsonhighered.com/assets/samplechapter/0/1/3/4/0134204581.pdf
4. https://www.slideshare.net/ektabelwal/milk-36869317
5. https://www.slideshare.net/Supta2013/fruits-vegetables-33840373

Course Outcomes	**Programme Outcomes**							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	1	3	9	3	1	9	35
CO2	9	3	1	3	3	1	3	23
CO3	3	3	3	9	9	1	3	31
CO4	9	3	3	9	3	3	1	31
CO5	3	3	9	9	1	1	9	35
Total	**33**	**13**	**19**	**39**	**19**	**07**	**25**	**155**

Low-1 Medium-3 High-9

XVIII ACADEMIC COUNCIL

Core-II Food Science Practicals

(For Students Admitted from 2022-2023)

Semester: I **Hours/week: 5**

Subject Code: IBNDC12P **Credit:4**

Course Objectives:

1. To develop skills and techniques in food preparation with conservation of nutrients and palatability using desirable cooking methods
2. To understand the scientific principles underlying in food preparation

List of Experiments: **(75 hours)**

1. **Principles of Food Safety and Lab Management Techniques:** Measurement of Ingredients, Determination of Edible Portion.
2. **Cereal Cookery:** Microscopic Examination of Starches, Gelatinization of starch
3. **Preparation of Fermented Foods by using Cereals and Millets:** Idli, Appam, Dosai, Bajra Porridge.
4. **Preparation of Granules:** Gluten Formation, Methods of Cooking - coarse and fine cereals.
5. **Different types of cooking methods:** Cooking Quality of Raw and Parboiled Rice by different methods - Pressure Cooker, Straining, Absorption, Steaming and Microwave Cooking.
6. **Pulse cookery:** Factors affecting Pulse Cookery – Hard water, Soft water, Soaking, Addition of acid, Alkali, Enzyme, pressure cooking- Any whole gram and any dhal
7. **Egg cookery:** Boiling and Parching, Omelet and Custard, Quality determination of Egg
8. **Meat, fish and poultry:** Methods of Cooking, Common Recipes, Tenderization.
9. **Milk cookery:** Problems in Milk Cookery and their Prevention, Milkpreparations:Cheese, Curds, paneer, butter and Milk Kafir.
10. **Frying of Foodsin Oil:** Smoking Temperature, Methods of Cooking.
11. **Stagesof sugar cookery:** White Sugar, Palm Jaggery, crystallization of sugar and Sugar Products.
12. **Vegetables and Fruits:** Effect of acid, alkali and over cooking on vegetables containing different pigment and enzymatic browning in vegetables and fruits and any four methods of prevention, Color and Textural Changes on Cooking, Preparation of selected recipes.
13. **Beverages:** Types and Preparation of beverage under the following types- refreshing, nourishing, stimulating, soothing and appetizing.
14. **Fireless Cooking**-Puffed Rice, Peanut butter balls, Chocolate truffles,Veg Hung curd Sandwich,Fruit Sushi.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Know the concept of cooking techniques and describe use of equipment for food preparation

CO2: Identify the different food groups and physical and chemical changes during cooking process

CO3: Link the acquired skills in food handling techniques

CO4: Evaluate the sensory analysis of recipes

CO5: Prepare different recipes using basic food groups

Text Books:

1. MohiniSethi and EramS Rao**,** *Food Science – Experiments and Applications,* CBS Publishers,New Delhi, 2nd Edition, 2019.
2. Srilakshmi. B, *Food Science – Laboratory Manual,* Scitech Pubisher Pvt Ltd, Chennai, 6th Edition, 2015.

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Reference Books:

1. Fellows P J, *Food Processing Technology: Principles and Practice*,CRC Wood head Publishing Ltd., Cambridge, 4th Edition,2016.
2. Brown A, *Understanding Food Principles and Preparation*, Wordsworth Publisher, London, 6th Edition, 2018.
3. ShaliniSehgal, *A Laboratory Manual of Food Analysis*,2016.

Journals:

1. International Journal of Food Science and Technology
2. Current Nutrition and Food Science
3. Advance Journal of Food Science and Technology

E-Resources:

1. www.myrecipes.com/recipe/cereal-milk-bars(Ex-2)
2. https://pulses.org/recipes/best-of-india(Ex-6)
3. https://www.slideshare.net/powerofknowledge3/egg-cookery(Ex-7)
4. https://in.pinterest.com/lindaruis/meat-fish-and-poultry/ (Ex-8)
5. https://www.tarladalal.com/recipes-using-milk-doodh-full-fat-milk-buffalo-milk-full-cream-milk-514(Ex-9)

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	1	9	3	9	3	**37**
CO2	3	9	1	9	1	1	3	**27**
CO3	9	9	1	3	1	3	3	**29**
CO4	3	9	1	9	1	1	1	**25**
CO5	3	3	9	3	1	1	9	**29**
Total	**27**	**33**	**13**	**33**	**07**	**15**	**19**	**147**

Low-1 Medium-3 High-9

Core-III Human Nutrition

(For Students Admitted from 2022-2023)

Semester: II **Hours/week: 5**
Subject Code: IBNDC21 **Credit: 5**

Course Objectives

1. To understand the role of nutrient in the maintenance of good health and acquire knowledge on functions of nutrients
2. To study nutrition deficiencies and their prevention and understand the principles of nutrition, understand the relationship between food, nutrition and health

Unit I **(15 hours)**

Energy: Unit of measurement, Direct and indirect calorimeter, Determination of energy value of food, Total energy requirement, Factors affecting physical activity. Basal Metabolic rate- determinants of Basal metabolic rate - Factors affecting basal metabolic rate - Resting energy expenditure, Thermic effects of food - Factors affecting the thermic effects of food - Recommended allowances for calories - Energy requirements of adults expressed in terms of Reference man and Reference woman, Energy requirements for different age groups.

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Unit II **(15hours)**

Carbohydrates: Classification, Functions, Source of carbohydrate. Digestion and absorption and requirements of Carbohydrates. Regulation of blood sugar, Hormonal controls of carbohydrates in the body.

Dietary Fibre-Soluble and Insoluble fibres, Sources of fibre. Role of fibre in human nutrition.

Unit III **(15hours)**

Proteins: Classification, Sources, Functions of proteins and amino acids. Digestion, Absorption and requirements of Protein. Evaluation of protein quality. Deficiency– PEM

Lipids - Definition, Classification, Functions, Sources of Fats. Digestion, absorption and requirements of fat

Essential fatty acids: Source, Role of EFA, Deficiency of Essential fatty acids.

Unit IV **(15 hours)**

Fat Soluble Vitamins: Vitamin A, D, E and K: Functions, requirements, sources, requirements and deficiency.

Water Soluble Vitamins: Thiamine, Riboflavin, Niacin, Vitamin B6, Folic acid, Vitamin B12 Biotin and Pantothenic acid, Vitamin C: Functions, requirements, sources, requirements and deficiency.

Unit V **(15hours)**

Macro Minerals: Calcium, Phosphorous, Magnesium, Potassium, Sodium and Chloride Distribution in the body, Sources, functions, requirements and deficiency.

Micro / Trace Minerals: Iron, Iodine, Zinc, Fluoride and Copper Distribution in the body; Food sources, functions, requirements and deficiency.

Water: Water balance, Water compartment and physiological variation. Dehydration, intoxication.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Find the basic nutrients for human wellbeing and summarizing the types and role of micro and macro-nutrients

CO2: Illustrate the metabolic role of nutrients and their complex interrelationships

CO3: Inspect the functions, sources and requirements of Basic Nutrients for human beings

CO4: Conclude the importance of Macronutrients and Micronutrients

CO5: Discuss the various methods of energy determination

Text Books:

1. Srilakshmi B., *Nutrition Science*, New Age International(P) Ltd, Publishers, 5th Edition,2019.
2. Mahtab.S.Bamji, Kamala Krishnaswamy and G.N.V Brahmam, *Text Book of Human Nutrition*, Oxford and IBH Publishing Company, 4th Edition.2019.

Reference Books:

1. Jim Mann, A. Stewart Truswell., Appetite: *Essentials of Human Nutrition*, Oxford University Press,2007.
2. Allison A. Yates, Bernadette P. Marriott, Diane F. Birt, Virginia A. Stalling., *Present Knowledge in Nutrition Basic Nutrition and Metabolism*,ElsevierScience,2020.
3. Swaminathan, M., *Essentials of Foods and Nutrition*, Volume I and II Ganesh and Co Publisher,2015.

Journals:

1. American Journal of Clinical Nutrition
2. British Journal of Nutrition
3. The Indian Journal of Nutrition and Dietetics

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E-Resources:

1. https://www.pdfdrive.com/introduction-to-human-nutrition-2nd-edition-e1688125.html.
2. https://www.pdfdrive.com/introduction-to-human-nutrition-e8482943.html
3. https://www.pdfdrive.com/vitamin-and-mineral-requirements-in-human-nutrition-e28893.html
4. https://www.pdfdrive.com/vitamins-and-minerals-e162099106.html
5. https://www.pdfdrive.com/advanced-nutrition-and-dietetics-in-nutrition-support-e158466498.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	3	9	**57**
CO2	9	9	9	3	9	3	9	**51**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	9	9	9	9	**63**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**45**	**45**	**39**	**45**	**33**	**45**	**297**

Low-1 Medium-3 High-9

Ability Enhancement Compulsory Course I - Human Physiology

(For Students Admitted from 2022-2023)

Semester: II **Hours/week: 5**
Subject Code: IBNDA23 **Credit: 4**

Course Objectives:

1. To understand the composition and functions of blood, blood coagulation, blood transfusion, bloodgroups
2. To understand and comprehend the anatomy and physiology of various human system and glands

Unit I **(15hours)**

Blood: Composition and Functions, Blood clotting and its Significance, Blood Groups, Blood Transfusion and its Importance.
Lymphatic system- Lymph, Lymph Glands and its Functions.

Unit II **(15hours)**

Heart: Structure of Human Heart and Functions, Cardiac Cycle, EGC and its Importance.
Respiratory System -Respiratory Organs -Structure and their Functions -Mechanism of Respiration.

Unit III **(15hours)**

Digestive System: Brief Description of Organs of the Gastrointestinal Tract, Accessory Organs of Digestion – Structure and function of Liver, GallBladder and Pancreas.
Excretory system: Structure and Function of Organs of Urinary System, Mechanism of Urine Formation.
Skin: Structure, Functions and Regulation of Body Temperature.

Unit IV **(15hours)**

Nervous system – Elementary Anatomy of Nervous System and Reflexes.
Brain: Brain Anatomy, Functions of Different Parts of the Brain in Brief, Autonomic, Sympathetic and Parasympathetic Nervous System.
Special Senses – Eye, Ear, Nose and Tongue - Structure and Functions.

Unit V **(15 hours)**

Reproductive system: Reproductive System of Male and Female, Menstrual Cycle, Menarche and Menopause, Fertilization.
Endocrine system: Listing of Endocrine Glands and Location, Functions of Thyroid, Parathyroid, Adrenal, Pancreas and Pituitary glands.

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Course Outcomes:

After successful completion of this course, student will be able to

CO 1: Recall the anatomy of various organs in the human system and explain their role in the maintenance of healthy individuals

CO 2: Apply the knowledge to understand the functions of various organs in the human system

CO 3: Analyze the Physiological changes at different stages of life

CO 4: Compare how the functions of organs are integrated to maximum efficiency

CO 5: Summarize the importance of hormones in various organs of the human system

Text Books:

1. Chatterjee C.C., *Human Physiology*, CBS Publishers & Distributors Pvt. Ltd, NewDelhi,11th Edition,2016.
2. H. Gurumurthy, H. K. Makari, S. V. Sowmya, H. S. Ravikumar Patil, *A Textbook of Human Physiology*, Dreamtech Press Publication, 1st Edition,2020.

Reference Books:

1. H. Gurumurthy, H. K. Makari, S. V. Sowmya, H. S. Ravikumar Patil , *A Textbook of HumanPhysiology*, Dreamtech Press Publication, 1st Edition,2020.
2. A.K.Jain, *Human Physiologyfor BDS*, Avichal Publication, 6th Edition, 2018.
3. Yalayyaswamy N.N, *Human Anatomy and Physiology for courses in Nursing and Allied Health Sciences*, CBS Nursing Publication, 4th Edition, 2018.

Journals:

1. European Journal of Applied Physiology
2. Journal of Medical Sciences
3. The Journal of Laboratory and Clinical Medicine

E-Resources:

1. https://www.pdfdrive.com/fundamentals-of-anatomy-and-physiology-for-nursing-and-healthcare-students-e176005292.html
2. https://www.pdfdrive.com/essentials-of-medical-physiology-6th-edition-e32299678.html
3. https://www.pdfdrive.com/essentials-of-anatomy-and-physiology-e25774384.html
4. https://www.pdfdrive.com/textbook-of-human-physiology-for-dental-students- d187617928.html.
5. https://www.pdfdrive.com/essentials-human-physiology-e1543905.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	3	3	1	9	3	**37**
CO2	9	9	3	9	1	9	3	**43**
CO3	9	9	3	9	1	9	3	**43**
CO4	9	9	3	3	1	9	3	**37**
CO5	9	9	3	9	1	9	3	**43**
Total	**45**	**45**	**15**	**33**	**5**	**45**	**15**	**203**

Low-1 Medium-3 High-9

XVIII ACADEMIC COUNCIL

Core-IV Human Physiology Practicals

(For Students Admitted from 2022-2023)

Semester: II **Hours/week:4**

Subject Code: IBNDC22P **Credit:4**

Course Objectives:

1. To acquire skills to analyze blood and urine samples
2. To get expertise in handling instruments and acquire basic knowledge onfirst aid

List of Experiments: **(60 hours)**

Blood Analysis

1. Determination of Haemoglobin
2. Determination of blood group, Clots and RH factor

Urine Analysis

3. Analysis of normal urine
4. Analysis of abnormal constituents in urine
5. Estimation of urine sugar
6. Estimation of urine albumin
7. Estimation of urine bile salt

Demonstrations

8. Clinical examination of B.P
9. Clinical examination of respiratory system
10. Enumeration of arterial pulse
11. Demonstration of first aid

Course Outcomes:

After successful completion of this course, student will be able to

CO 1: Understand the human physiological aspect of organs and distinguish the components of blood and urine

CO 2: Apply knowledge to practice to handle tools related to blood analysis

CO 3: Analyze the biochemical values on blood and urine by different experiments

CO 4: Compare the normal and abnormal biochemical values on blood and urine

CO 5: Create an awareness on First aid practice

Text Books:

1. Dr.U.Satyanarayana,U.Chakrapani, *Biochemistry*, Elsiever Publication, 5th Edition,2017.
2. D.M.Vasudevan, S.Sreekumari, Kannan Vaidiyanathan, *Textbook of Biochemistry for Medical Students*, Jaypee Publication, 9th Edition,2019.

Reference Books:

1. David L.Nelson,Michael M.Cox Lehninger, *Principle Biochemistry*, MacmillanPublishers,7th Edition, 2017.
2. VictorRodwell,DavidBender,P.AnthonyWeil,PeterKennelly,KathleenBotham,*Harper's Illustrated Biochemistry*, Lange Publishers, 30th Edition,2017.
3. Donald Voet, Judith G.Voet, *Biochemistry*, John Wileyand Sons Publisher, 4th Edition,2016.

Journals:

1. European Journal of Applied Physiology
2. Journal of Medical Sciences
3. The Journal of Laboratory and Clinical Medicine

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E-Resources:

1. https://www.pdfdrive.com/a-textbook-of-practical-physiology-e175223735.html
2. https://www.pdfdrive.com/practical-textbook-of-biochemistry-for-medical-students-e187182647.html
3. https://www.pdfdrive.com/laboratory-protocols-in-applied-life-sciences-d157736244.html
4. https://www.pdfdrive.com/textbook-of-human-physiology-for-dental-students-d187617928.html
5. https://www.pdfdrive.com/essentials-human-physiology-e1543905.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	3	3	1	3	9	**37**
CO2	9	9	3	3	1	3	3	**31**
CO3	9	9	3	3	1	3	3	**31**
CO4	9	9	3	3	1	3	3	**31**
CO5	9	9	3	3	1	3	9	**37**
Total	**45**	**45**	**15**	**15**	**5**	**15**	**27**	**167**

Low-1 Medium-3 High-9

Extra Credit-Food Hygiene and Sanitation

(For Students Admitted from 2022-2023)

Semester: II
Subject Code: IBNDX2 **Credit: 2**

Course Objectives:

1. To educate the students, ensuring the trace ability of food control and to protect the consumer from health hazards
2. To educate the students in helping the operating conditions for food business applications

Unit I

Introduction to sanitation and hygiene: Food Sanitation and Principles of Sanitation Personnel Hygiene.

Unit II

Personal hygiene & safety: Necessity for personal hygiene, Health of staff, Personal appearance,Sanitary practice habits-Protective clothing- Safety at the work place.

Unit III

Sanitary procedures in food industry: Importance of sanitary procedures in Food processing - Cleaning procedures – Cleaning in place cleaning out place. Cleaning and sanitizing and their importance.

Unit IV

Pest control with respect to food safety: Importance, Classification of pest, Effect of pesticides on pest&their methods of application, precaution to be taken while handling pesticides.

Unit V

Pre-requisite procedures in food industry: Good Manufacturing Practice (GMP), Good Hygienic Practice (GHP), Total Quality Management and Hazard Analysis and Critical Control Points (HACCP).

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Course Outcomes:

After successful completion of this course, student will be able to

CO1: Recall the importance of hygiene and sanitation in food industry and understand the knowledge relating to the significance of pest control

CO2: Identify measures/procedures that will reduce or eliminate accidents in food preparation and service areas

CO3: Analyze the pre-requisite procedures in food industry

CO4: Evaluate the standards and procedures for keeping the facilities and equipment sanitary

CO5: Provide the special Training of supervisory personnel in sanitation procedures

Text Books:

1. Marriott, N. G., & Gravani, R. B, *Principles of Food Sanitation*. New York, N.Y: Springer, 2018.
2. Forsythe, S. J., & Hayes, P. R, *Food Hygiene, Microbiology and HACCP*. Dordrecht: Springer Publisher,2020.

Reference Books:

1. In Hui, Y. H., In Bruinsma, B. L, In Gorham, J. R., In Nip, W., In Tong, P. S, & In Ventresca, P, *FoodPlant Sanitation*. London: CRC Press, 2017.
2. *Fundamentals of Food Hygiene, Safety and Quality* India, I K International Publishing House Pvt.Limited, 2019.
3. Norman G. Marriott and Robert B. Gravani, *Principles of Food Sanitation*, Aspen Publisher, 5th Edition, 2006.

Journals:

1. Journal of Food Safety and Hygiene
2. Journal of Food Safety
3. Journal of Health care and Hygiene

E-Resources:

1. www.food.gov.uk
2. www.foodsafetymagazine.com/
3. www.epathshala.nic.in
4. www.epgp.inflibnet.ac.in
5. https://archive.fssai.gov.in/home/safe-food-practices/Food-Safety-and-hygiene-Requirements.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	3	3	3	3	3	**27**
CO2	3	9	9	3	1	3	3	**31**
CO3	3	3	9	9	1	3	9	**37**
CO4	3	3	3	9	3	3	9	**33**
CO5	9	3	9	3	9	3	9	**45**
Total	**27**	**21**	**33**	**27**	**17**	**15**	**33**	**173**

Low-1 Medium-3 High-9

XVII ACADEMIC COUNCIL

Core V -Nutritional Biochemistry

(For Students Admitted from 2022-2023)

Semester: III **Hours /week:4**

Subject Code: **Credit:4**

Course Objectives: IBNDC31

1. To understand the chemical characteristics of different classes of nutrients with reference to their Physical Properties, and to relate this to their functions in the body
2. To establish the basic principles of metabolism and its regulation

Unit I **(12hours)**

Carbohydrates: Definition and Classification, Structure, Properties of monosaccharides. Monosaccharides- Glucose, Fructose, Galactose. Disaccharides – Maltose, Lactose, Sucrose. Polysaccharides– Starch, Glycogen. Carbohydrates Metabolism- Glycolysis, PDH pathway, TCA cycle.

Unit II **(12hours)**

Amino Acids : Definition, Classification, Structure, Properties and Functions. Metabolism of amino acid – General aspects (Transamination, Deamination, Decarboxylation), Metabolism of ammonia, Urea Cycle.

Proteins - Definition, Classification, Structure, Properties and Functions, Biological importance of Peptides.

Unit III **(12hours)**

Lipids: Definition, Functions, Classifications. Fatty acid – Definition, Classification, Physical and Chemical properties. Triglycerides, Phospholipids, Glycolipids, (Definition, Functions, Classifications, Properties) Steroid (Elementary Level).Beta oxidation of Fatty acids. Synthesis and utilization of ketone bodies.

Unit IV **(12hours)**

Nucleic acid: Structure of DNA & RNA. Biologicaloxidation – Electron transport chain,Oxidative phosphorylation.

Enzymes: Definition, classification, enzyme specificity, enzyme inhibition, factors affecting enzyme activity, Co-enzymes and Iso-enzymes.

Unit V **(12hours)**

Vitamins: Biochemical functions ofFat soluble and Water-soluble vitamins.

Minerals: Biochemical Functions of Macro nutrients (Ca,P,Mg,Na,K,Cl,S) and Micro nutrients (Fe, Cu, I, Mn, Zn, Mo, Co, Se, Cr,Fl).

Interrelationship between nutrients: Protein – Energy, Vitamin - Vitamin, Vitamin -Mineral and Mineral– Mineral.

Course Outcomes:

After successful completion of this course, student will be able to

CO 1: Recall the biochemical mechanisms of nutrition and metabolism and understand the knowledge of the principles of Biochemistry

CO 2: Apply the knowledge to recognize the classification, structure and functions ofmacromolecules

CO 3: Integrate the anabolic and catabolic pathways of all metabolic cycles

CO 4: Assess the chemistry of micronutrients and their biochemical role

CO 5: Summarize the activity of enzymes and co-enzymes in all metabolic pathways

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Text Books:

1. Dr.U.Satyanarayana,U.Chakrapani, *Biochemistry*, Elsiever Publication, 5th Edition,2017.
2. D.M.Vasudevan, S.Sreekumari, Kannan Vaidiyanathan, *Textbook of Biochemistry for Medical Students*, Jaypee Publication, 9th Edition, 2019.

Reference Books:

1. David L.Nelson , Michael M.Cox Lehninger, *Principle Biochemistry*, Macmillan Publishers,7th Edition, 2017.
2. VictorRodwell,DavidBender,P.AnthonyWeil,PeterKennelly,KathleenBotham, *Harper's Illustrated Biochemistry*, Lange Publishers, 30th Edition, 2017.
3. Donald Voet, Judith G.Voet, *Biochemistry*, John Wileyand Sons Publisher, 4th Edition, 2016.

Journals:

1. Journal of Biochemistry
2. Journal of Medical Biochemistry
3. Journalof Nutritional Biochemistry

E-Resources:

1. https://www.pdfdrive.com/biochemistry-e187234482.html
2. https://www.pdfdrive.com/textbook-of-biochemistry-for-medical-students-e186671773.html
3. https://www.pdfdrive.com/lippincotts-biochemistry-6th-edition-e41485405.html
4. https://www.pdfdrive.com/textbook-of-biochemistry-e14983388.html
5. https://www.pdfdrive.com/lehninger-principles-of-biochemistry-e189596394.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	3	3	1	9	9	**43**
CO2	9	9	3	9	1	9	9	**49**
CO3	9	9	3	9	1	9	3	**43**
CO4	9	9	3	3	1	9	9	**43**
CO5	9	9	3	9	1	9	3	**43**
Total	**45**	**45**	**15**	**33**	**5**	**45**	**33**	**221**

Low-1 Medium-3 High-9

Core VI Nutritional Biochemistry Practicals

(For Students Admitted from 2022-2023)

Semester: III **Hours /week:4**
Subject Code: IBNDC32P **Credit:4**

Course Objectives:

1. To develop skills in both qualitative and quantitative estimations
2. To expertise with instrument handling skills and its application

Unit I **(12 hours)**

pH and Buffer

1. Measurement of pH
2. Determination of the Moisture content
3. Determination of Total Ash Content

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Unit II **(12 hours)**

Carbohydrates:

Qualitative Test:

1. Reaction of Monosaccharide's–Hexoses- Glucose, Fructose,Galactose.
2. Reaction of Di-saccharides - Lactose, Maltose, Sucrose.
3. Reaction of Polysaccharides - Starch, Dextrin.

Unit III **(12 hours)**

Amino acids:

Qualitative Test:

1. Reactions of amino acids – Phenyl alanine, Tyrosine, Tryptophan, Cysteine, Methionine, Arginine.

Unit IV **(12 hours)**

Fats:

Qualitative Test:

1. Reactions of fats and oils – General reactions of lipids (Mustard oil, Coconut oil, Olive oil

Quantitative Test:

1. Determination of Acid value number
2. Determination of Saponification value
3. Determination of Iodine value

Unit V

Demonstration on Tools of Biochemistry: **(12 hours)**

1. Chromatography
2. Photometry—Colorimeter and Spectrophotometer
3. Ultra Centrifugation

Course Outcomes:

After successful completion of this lab course, student will be able to

CO 1: Understand and recognize the rule and regulations in the biochemistry lab to practice and perform the experiments in the safest way

CO 2: Apply the knowledge to execute the qualitative determination of macromolecules.

CO 3: Experiment with the parameters such as pH, Moisture, Ash, etc. in various food samples

CO 4: Measure the quantity of nutrients in the various food samples

CO 5: Create insight on advanced analytical instrument

Text Books:

1. Javin Bishnu Gogoi, *Simplified Practical Manual of Biochemistry*, Jaypee Publication, 2nd Edition, 2021.
2. Singh S.P *Practical Manual of Biochemistry,* CBS Publication, 2nd Edition, 2019.

Reference Books:

1. Soundravally Rajendran, Pooja Dhiman *Biochemistry Practical Manual*, Elsevier Publication, 1st Edition, 2019.
2. Geetha Damodaran K, *Practical Biochemistry*, Jaypee Brothers, 2nd Edition, 2016.
3. RafiMohammed, *Manual of Practical Biochemistry*, Orient Blackswan Pvt Ltd,3rd Edition, 2020.

Journals:

1. Journal of Analytical Biochemistry
2. The International Journal of Biochemistry
3. Journal of Nutritional Biochemistry

XVII ACADEMIC COUNCIL

E -Resources:

1. https://www.pdfdrive.com/practical-textbook-of-biochemistry-for-medical-students-e187182647.html
2. https://www.pdfdrive.com/principles-and-techniques-of-practical-biochemistry-and-molecular-biology-e188304313.html
3. https://www.pdfdrive.com/practical-biochemistry-e187196416.html
4. https://www.pdfdrive.com/laboratory-techniques-in-biochemistry-and-molecular-biology- vol-4-e184893598.html
5. https://www.pdfdrive.com/viva-in-biochemistry-e187670022.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	3	3	1	3	9	**37**
CO2	9	9	3	3	1	3	3	**31**
CO3	9	9	3	9	1	3	3	**37**
CO4	9	9	3	3	1	3	3	**31**
CO5	9	9	3	9	1	3	3	**37**
Total	**45**	**45**	**15**	**27**	**5**	**15**	**21**	**173**

Low-1 Medium-3 High-9

Ability Enhancement Compulsory Course II-Food Microbiology

(For Students Admitted from 2022-2023)

Semester: III **Hours /week: 4**
Subject Code: IBNDA33 **Credit: 4**

Course Objectives:

1. To understand the key concept of food microbiology and study in growth of microorganisms
2. To highlight the microorganisms present in food and study the methods for preservation of foods

Unit I **(12hours)**

Introduction to Food microbiology & Characteristics of Microorganisms in Food: History and Development of Food Microbiology -Definition and Scope of food microbiology. Classification of microorganisms and Nomenclature -Characteristics and morphology of microorganisms- Bacteria, Fungi, Algae, Yeast and Virus - Importance of microorganisms in food.

Unit II **(12 hours)**

Microbial Growth in Food: Microbial Growth Characteristics- Bacterial growth curve- Factors affecting the growth of microorganisms in food. Intrinsic Factors: Nutrient Content and pH, Redox Potential, Antimicrobial Barrier and Water Activity. Extrinsic Factors: Relative Humidity, Temperature and Gaseous Atmosphere.

Unit III **(12 hours)**

Microbiology spoilage in foods: Microbiology of Plant based Foods- Contamination, Spoilage and Preservation of Vegetables and Fruits, Cereals and Cereal Products, Pulses, Nuts and oilseeds, Sugar and Sugar Products, Microbiology of animal based Foods: Milk and Milk Products, Meat and Meat Products, Sea foods, Egg and Poultry and Canned Foods.

Unit IV **(12 hours)**

Control of Microorganisms in Foods: Principles and methods of preservation- High temperature, low temperature, drying, Fermentation- Importance of LAB, Saccharomyces cerevisiae, Radiation, chemical

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preservatives, Bio preservatives, Hurdle technology, Active packaging, Novel processing technology.

Unit V **(12 hours)**

Food Intoxication and Food infection: Classification of food borne disease, Foods involved, Diseases outbreak, Preventive and control measures.

Intoxication: Botulismand Staphylococcal intoxication.

Infection: Salmonellosis, Clostridium Perfringens illness, Bacillus cereus, Ecoli, Shigellosis,Yearsinia and Streptococcus faecalis.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Understand the different microorganisms that can cause spoilage of foods and be able to detect them and explain the occurrence and interactions of microorganisms with food

CO2: Illustrate the role of microorganisms in food safety

CO3: Experiment the techniques in control of food spoilage

CO4: Evaluate the methods of quality and microbiological control of foods

CO5: Develop skills useful to detect the microorganisms in food

Text Books:

1. William C. Frazier, *Food Microbiology*, Tata McGraw Hills Publishing Company Limited, Chennai,2017**.**
2. Virendra Kumar Pandey, *A Text Book of Food Microbiology*, INSC InternationalPublishers,2021.

Reference Books:

1. Matthews.K.R, *Food microbiology an Introduction*, 4th Edition, ASMPress,2017
2. Adams, MR and Moss, MO,*Food Microbiology*, New Age International (P) Ltd., NewDelhi,2015.
3. Ray, B. &Bhunia, A, *Fundamental Food Microbiology*, 5th Edition, CRC Press, 2018.

Journals:

1. Journal of Food Microbiology
2. Journal of Food & Industrial Microbiology
3. International Journal of Food Microbiology

E-Resources:

1. https://www.pdfdrive.com/food-microbiology-d55747381.html
2. https://www.pdfdrive.com/food-microbiology-e58597702.html
3. https://www.pdfdrive.com/fundamental-food-microbiology-fifth-edition-e175981800.html
4. https://www.pdfdrive.com/food-microbiology-an-introduction-e166783912.html
5. https://www.pdfdrive.com/foodborne-parasites-food-microbiology-and-food-safety-e157137947.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	9	9	**63**
CO2	9	9	9	9	3	9	9	**57**
CO3	9	3	9	9	9	9	9	**57**
CO4	9	3	9	9	9	9	9	**57**
CO5	9	9	9	3	3	9	9	**51**
Total	**45**	**33**	**45**	**39**	**33**	**45**	**45**	**285**

Low-1 **Medium-3** **High-9**

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Extra Credit - Marine Food Processing

(For Students Admitted from 2022-2023)

Semester: III
Subject Code:IBNDX3 **Credit: 5**

Course Objectives:

1. To comprehend the value and necessity of marine products, as well as the compositional and technological aspects of marine foods
2. To explore a processed marine product

Unit I

Marine Environmental Science: Marine Eco-system, Marine Pollution, Marine Food Sources.

Unit II

Evaluation of Marine Food Qualities: Processing of fish- crab, prawns, and seaweeds. Postharvest quality changes, post-harvest losses, Methods for assessing and preventing losses.

Unit III

Microbiology of fish products: Storage and Handling, Preservation – freezing techniques and irradiation process, value addition, preparation of fish products (fermented fish, fish products, fish soups, fish powder, prawn powder and cutlets), seaweed products like pickles and hydrocolloids.

Unit IV

Nutritional benefits of marine resources: fish, fish oil, seaweeds and other marine sources.

Unit V

Packaging and labeling: Importance of packaging and labeling, Packaging functions, Packaging materials, Requisites of good packages.

Course Outcomes:

After successful completion of this course, student will be able to

CO 1: Recall the factors that influence the quality and shelf-life of seafood and explaining the marine ecosystem
CO2: Identify losses due to post-harvest, processing, and storage
CO3: Analyze the nutritional advantages of marine products
CO4: Solve spoilage problem by using various preservation and packaging techniques
CO5: Evaluate the shelf life by experimenting with different processing and packaging methods

Text Books:

1. Ozogul, Y. *Innovative technologies in seafood processing.* CRC Press, 2016.
2. Borda, D., Nicolau, A. I., & Raspor, P, *Trends in fish processing technologies*. CRC Press.2017.

Reference Books:

1. Genç, İ. Y., Esteves, E., &Diler, A., *Handbook of Seafood*. Nova Science Publishers, 2016.
2. Sahoo, J., & Chatli, M. K., *Textbook on Meat, Poultry andfish technology*. Daya Publishing House.
3. Iqbal, A, *Microbiology of marine food products,* Burlington, Ontario: Delve Publishing,2021

Journals:

1. Journal of food processing and Technology
2. Journal of Fisheries Science.com
3. Journal of Aquatic Food Product Technology

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E-Resources:

1. https://www.slideshare.net/pramodgpramod/marine-pollution-76857615
2. https://www.slideshare.net/ShoebulIslam/methods-of-quality-assessment-of-fish-78011081
3. https://www.slideshare.net/sridevi244/contamination-preservation-spoilage-of-fish
4. https://www.powershow.com/view/12558ndiym/nutritional_value_of_seafood_powerpoint_ppt_presentation
5. https://krishi.icar.gov.in/jspui/bitstream/123456789/25122/1/16_Seafood%20packaging.pdf

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	3	3	1	1	3	**23**
CO2	9	3	9	3	1	1	3	**23**
CO3	3	3	9	9	3	3	9	**39**
CO4	3	3	3	9	3	1	9	**31**
CO5	9	3	3	9	3	1	3	**31**
Total	**33**	**15**	**21**	**33**	**11**	**7**	**27**	**147**

Low-1 **Medium-3** **High-9**

Core VII Nutrition for Life Span

(For Students Admitted from 2022-2023)

Semester:IV **Hours /week:5**

Subject Code:IBNDC41 **Credit:4**

Course Objectives:

1. To familiarize with the different methods of assessing nutritional status
2. To gain knowledge about the methods of assessment of nutritional problems and their implications

Unit I **(15 hours)**

Basic Principles of Meal Planning : Definition, principles involved in meal planning and factors affecting meal planning. Recommended allowance-RDA for Indians, basis for requirement, energy allowance for various activities. General concepts about growth and development through different stages of life.

Unit II **(15 hours)**

Pregnancy and lactation: Nutrition during Pregnancy - Weight gain, physiological changes, nutritional requirements, complications and nutritional problems in pregnancy. Nutrition during Lactation - physiology of lactation, hormonal control. Milk output and factors affecting it, nutritional components of colostrums and mature milk. Nutritional requirements of lactating women.

Unit III **(15 hours)**

Nutrition during Infancy: Growth and development, factors influencing growth, advantages of breast feeding, breast feeding vs bottle feeding, factors to be considered in bottle feeding. Weaning Foods - Weaning foods and commercial baby foods. Nutritional requirements of infants, feeding programme. Problems in feeding normal and premature infants.

Unit IV **(15 hours)**

Nutritional needs of pre-school children (1-5 year): Nutritional and food requirements of preschool children. Factors to be considered while planning meals for pre-school children. Eating problems of children and their management, preparation of supplementary foods using available low-cost foods. **Nutrition for School children** - Nutritional requirement, meal planning for school children, dental caries and packed lunch.

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Unit V **(15 hours)**

Nutrition during adolescence : Food and nutrient requirements, changes in growth pattern, puberty, menarche, changes in food habits, binge eating disorder, predisposition to osteoporosis, anaemia, premenstrual syndrome, malnutrition dueto early marriage, nutritional programmes.

Nutrition in adulthood: Food and nutrient requirements, changes in consumption pattern - physical, mental and social changes influencing meal pattern.

Nutrition in old age: Food and nutrient requirements, physical, physiological, biological and psychological changes influencing meal pattern.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Identifythe nutrient requirements during each stage of life cycle
CO2: Execute the diet plan for normal and special children
CO3: Explain the importance of nutrition during physiological stages
CO4: Evaluate the dietary pattern of adolescents, adult and old age
CO5: Summarize the physiological, biological and psychological changes throughout life cycle

Text Books:

1. Mc Mahon, Kimberley, and Bernstein, Melissa, *Nutrition across Life Stages*, United States, Jones& Bartlett Learning, 2022.
2. Srilakshmi,B., *Dietetics*, New Age International Pvt. Ltd, 8th Edition,2019.

Reference Books:

1. Shepherd, Sue, et al. *Food and Nutrition throughout Life: A Comprehensive Overview of Food and Nutrition in All Stages of Life*. United Kingdom, Taylor & Francis Group, 2021.
2. Swaminathan M, *Essentials of Food and Nutrition (An Advanced Text Book)*. India,Bangalore Printing & Publishing Company, Limited, 2015.
3. Willams S.R. *Basic Nutrition & Diet Therapy*, Mosby, Inc., St. Louis, 15th Edition, 2016.

Journals:

1. Journal of World Review of Nutrition and Dietetics
2. Journal of Nutrition Today
3. Journal of Nutrition and Dietetics

E-Resources:

1. www.scimagojr.com
2. www.foodandnutritionresearch.net
3. www.nutrition.gov
4. https://www.nutrition.org.uk/nutritionscience/life/880-preschoolchildren.html
5. https://pubmed.ncbi.nlm.nih.gov/5803053/

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	3	3	3	3	9	**39**
CO2	9	9	9	3	3	1	9	**43**
CO3	9	9	3	1	1	1	9	**33**
CO4	9	9	1	1	1	1	3	**25**
CO5	9	9	3	3	1	1	9	**35**
Total	**45**	**45**	**19**	**11**	**09**	**07**	**39**	**175**

Low-1 **Medium-3** **High-9**

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Core VIII -Nutrition for Life Span Practicals

(For Students Admitted from 2022-2023)

Semester: IV **Hours/week: 4**

Subject Code: **IBNDC42P** **Credit:4**

Course Objectives:

1. To help students to understand the basis of meal planning and describe the nutritional needs through life cycle
2. To gain knowledge on Therapeutic diet on appropriate nutritional management, develop anattitude and capacity for taking up dietetics as a profession

List of Experiments: **(60 hours)**

1. Planning, preparing and serving a meal for a Pregnant Woman.
2. Planning, preparing and serving a meal for a Lactating mother.
3. Planning and preparing an indigenous weaning mix, Indian Multipurpose food (CFTRI), win food, malted food.
4. Planning, preparing and serving a meal for an infant of1-3years.
5. Planning, preparing and serving a meal for a preschool child.
6. Planning, preparing and display a packed lunch for Preschool Children.
7. Planning, preparing and serving a meal for a school going children.
8. Planning, preparing and serving a meal for an adolescent girl and boy.
9. Planning, preparing and serving a meal for an adult in Sedentary Worker
10. Planning, preparing and serving a meal for an adult in moderate Worker
11. Planning, preparing and serving a meal for an adult in heavy worker.
12. Planning, preparing and serving a meal for low-income family
13. Planning, preparing and serving a meal for Middle income family
14. Planning, preparing and serving a meal for high-income family.
15. Planning, preparing and serving a meal for an old age person.

Course Outcomes

After successful completion of this course, the student will be able to

CO1: Define the terminologies of human life span and explain nutritional requirements at different stages of the lifespan

CO2: Prepare a menu planning for different age group

CO3: Calculate the nutrients in the planned diet chart

CO4: Validate the calculated nutrients to RDA

CO5: Construct the food guidelines for different age group

Text Books:

1. Nutrient requirements and Recommended Dietary Allowances for Indians, ICMR,National Institute of Nutrition, Hyderabad,2014.
2. Dietary guidelines for Indian**,** ICMR, National Institute of Nutrition, Hyderabad, 2014.

Reference Books:

1. Swaminathan M, *Advanced Textbook on Food and Nutrition* Volume-2, Bapcco Publisher, 2015.
2. AkanshaYadav,Monika Arora, Swayamsiddha, *Practical Manual of Nutrition and Dietetics*, Kalpaz Publications,2019.
3. JoanGandy, *Manual of Dietetic Practice*, Wiley- Blackwell Publishers, 6th Edition, 2019.

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Journals:

1. Journal of World Review of Nutrition and Dietetics
2. Journal of Nutrition Today
3. Journal of Nutrition and Dietetics

E-Resources:

1. www.scimagojr.com
2. www.foodandnutritionresearch.net
3. www.nutrition.gov
4. https://www.nutrition.org.uk/nutritionscience/life/880-preschoolchildren.html
5. https://pubmed.ncbi.nlm.nih.gov/5803053/

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	9	9	**63**
CO2	9	9	9	9	9	9	9	**63**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	9	9	9	9	**63**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**45**	**45**	**45**	**45**	**45**	**45**	**315**

Low-1 Medium-3 High-9

Ability Enhancement Compulsory Course- II
Human Development and Family Relationships

(For Students Admitted from 2022-2023)

Semester: IV **Hours /week:5**
Subject Code: IBNDA43 **Credit: 4**

Course Objectives:

1. To acquire an understanding of the stages of pre-natal development and influencing factors
2. To appraise the characteristics specific to every stages of life span

Unit I **(15 hours)**

The concept of growth and development, Factors that influence development. Principles of growth and development.

Prenatal Development: Conception, signs and stages of pregnancy. Prenatal and Postnatal care. Complications of Pregnancy. Management of normal pregnancy - hygiene, diet and medical supervision and hazards during pregnancy. Types of child birth.

Post-natal Care, prevention of gynecological complications and adjustment of the newborn to temperature, breathing, feeding and elimination.

Unit II **(15 hours)**

Infancy (Birth to 2 years) : Development - physical and motor, social, emotional, cognitive and language, Minor ailments, Care of infants, feeding, toilet training, bathing, clothing, sleeping and immunization, prevention of accidents, importance of mothering and emotional development. Importance of psychological needs.

Early childhood (preschool stage 2-6 years) -Physical and motor development, emotional, social, cognitive and language development, creativity, importance of play, importance of family relationship, behavior

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problems – causes and treatment.

Unit III **(15 hours)**

Late childhood (elementary school period 6-12 years) : Developments physical, social, emotional, cognitive and language. Children with special needs - identification and rehabilitation.

Unit IV **(15 hours)**

Adolescence (12-18 years) :Physical, emotional, intellectual and motor development, personal adjustment and maladjustment. Delinquency– causes, prevention and rehabilitation. Drug addiction and alcoholism -Rehabilitation.

Adulthood (18-60 years) :Characteristics and developmental tasks.

Old age (60 years and above) :Physical and psychological changes, problems of the aged, family attitude towards the aged, place of the aged in Indian Society.

Unit V **(15 hours)**

Human Relations: Marriage- Meaning, Functions and types, Motivate for marriage. Adjustments in marriage during early period and child bearing period – Personal adjustment, in-law's adjustment, sexual adjustment and adjustments to parenthood, marriage counseling.

Sex Education: Meaning, need for sex education.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: List out the stages of human development and demonstrate an understanding of the biological, psychological, social and cultural influences of lifespan human development

CO2: Examine the development aspects (both normal and exceptional) from conception to old age

CO3: Analyze the behaviour development of children

CO4: Conclude the knowledge on the importance of children with special needs

CO5: Compile complete knowledge about the family relations and sex education

Text Books:

1. Santrock, John W,*Child Development*, Mc Graw Hill Education Publishers,13th Edition,2017.
2. Hurlock Elizabeth B,*Child Development*, Tata McGraw Hill Education Publishers, 6th Edition,2017.

Reference Books:

1. Walsh Bridget A, et al. *Introduction to Human Development and Family Studies*, PsychologyPress.2017.
2. Papalia Diana et. al., *Human Development*, McGraw HillEducation Publishers,9th Edition,2017.
3. Hurlock Elizabeth B., *Developmental Psychology, A Life Span Approach*, Tata McGrawHill Education Publishers, 5th Edition, 2017.

Journals:

1. Journal of Young Investigator
2. Journal of Child and Family Studies
3. Journal of Family Communication

E-Resources:

1. www.familystudies.uconn.edu
2. www.humansciences.okstate.edu
3. www.hdfs.missouri.edu
4. https://www.healthychildren.org/English/ages-stages/teen/Pages/Stages-of-Adolescence.aspx
5. https://www.economicsdiscussion.net/human-resource-management/human- relations/human relations/32398

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Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	3	9	9	**57**
CO2	9	9	9	9	1	9	9	**55**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	9	3	9	9	**57**
CO5	9	9	9	3	3	1	9	**43**
Total	**45**	**45**	**45**	**39**	**19**	**37**	**45**	**275**

Low-1 **Medium-3** **High-9**

Extra Credit- Information Education and Communication Materials for Development

(For Students Admitted from 2022-2023)

Semester: V

Subject Code: IBNDX4 **Credit:2**

Course Objectives:

1. To familiarize the different types of audio- visual aids
2. To know the emerging trends in educational technology in their teaching field

Unit I

Concept of IEC Material: Meaning, objectives, characteristics of IEC Material - Importance and scope office material for development- Different types of IEC materials for development-Role of IEC material for development in various level.

Unit II

Guidelines for Development of IEC Materials: Selection of IEC material: Strength and Limitations of Various IEC materials - Criteria for selecting IEC material - IEC materials for combining for greater impact Developing a creative brief - Importance of creative brief. - Elements of creative brief Preparing prototype IEC materials.

Unit III

IEC Materials for Development: Graphics and audiovisual charts, posters, flashcards, flexes, flip books, pamphlets, leaflets, brochures, booklets, modules, manuals Mass Media: IEC materials for radio, television, newspapers and magazines - Radio scripts writing - T.V. programme scripts writing - Newspaper, magazine article writing.

Unit IV

Emerging Trends in Educational Technology: Educational Technology in Formal Education, Non-Formal Education, Informal Education, Distance Education and Open Learning Systems;

Uses of Communication Technology in Teaching: Videotape, Radio- Vision, Tele conferencing, CCTV, INSAT, Computer simulated Multimedia approach and problems of introducing new technologies in the Indian context.

Unit V

Using internet as pedagogical and communication tool: Using the Internet for teaching & research. - Website and web pages, Internet connectively – Browsing the Internet – Using Internet as an Educational Communication Tool: Online conferencing, Videoconferencing, Conferencing & internet forums, Newsgroups & Blog, Wiki, Discussion Board, Chat Rooms, E- Journal, Digital libraries, Online Examinations.

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Course Outcomes:

After successful completion of this course, student will be able to

CO1: Recall the process of preparing appropriate IEC materials and understanding the knowledge of communication

CO2: Illustrate the various types of IEC materials

CO3: Categorizing the emerging trends in educational technology

CO4: Examining the communication technology in teaching

CO5: Preparing the pedagogical tool for education

Text Books:

1. AgarwalJ.C, *Essential of Educational technology, Innovation learning*, Vikas Publishing House Pvt. Ltd, New Delhi,3rd Edition,2014.
2. *The Future of Innovation and Technology in Education: Policies and Practices for Teaching and Learning Excellence*. United Kingdom, Emerald Publishing Limited, 2018.

Reference Books:

1. Kumar SanjayPushp Lata, *Communication Skills***,** Oxford UniversityPress,2015
2. Rajaraman V, *Introduction to Information Technology*, PHI Learning Publisher, 3rd Edition, ,2018.
3. Kumar KevalJ, *Mass communication in India*, Jaico Publishing House, 5th Edition,2021.

Journals:

1. Journal of Education Reform
2. Journal of Information Systems Education
3. Journal of Communications in Information Literacy

E-Resources:

1. www.eric.ed.go
2. www.comminit.com
3. www.ncbi.nlm.nih.gov
4. https://elearningindustry.com/top-educational-technology-trends-2020-2021
5. https://www.theasianschool.net/blog/role-of-internet-in-education/

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	3	1	1	9	3	**34**
CO2	9	9	9	1	1	9	1	**39**
CO3	9	9	9	3	1	9	1	**41**
CO4	9	9	9	3	1	9	1	**41**
CO5	9	9	3	3	1	9	1	**35**
Total	**45**	**45**	**33**	**11**	**05**	**45**	**6**	**190**

Low-1 **Medium-3** **High-9**

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Core -IX Diet Therapy-I

(For Students Admitted from 2022-2023)

Semester-V **Hours/Week:6**

Subject Code: IBNDC51 **Credit: 5**

Course Objectives:

1. To understand the foundation sciences which underpin therapeutic dietetic practice, the principles of disease prevention and health promotion, the principles of therapeutic intervention practice
2. To understand the organization, management and provision of health care both in the hospital and in primarycare

Unit I **(18 hours)**

Diet therapy: Principles of planning diet, nutritional care process, Basic concepts of diet therapy. Therapeutic adaptations of normal diet, principles of therapeutic diets.

Routine Hospital Diets: clear fluid, full fluid, soft and normaldiet, Pre-operative and post-operative diets.

Special feeding techniques – Parenteral and Enteral feeding

Dietitian: Role of dietitians in Nutritional care, planning diet counseling.

Unit II **(18 hours)**

Nutritional care for weight management: Obesity - etiology, assessment, types, complications and principles of diet management.

Underweight: Etiology, limitations, complications and principles of diet management.

Unit III **(18 hours)**

Nutritional care for deficiency disorders: PEM and Vitamin A deficiency and Anemia- Causes, Types, symptoms and diet management.

Nutritional care for febrile condition: Typhoid, Malaria and Tuberculosis- Causes, symptoms, metabolic changes in fever and dietary management.

Unit IV **(18 hours)**

Nutritional care for diseases of the Gastro Intestinal tract: Peptic ulcer, Gastritis, Constipation, diverticulosis, Diarrhea, Mal absorption syndrome, Celiac sprue, Tropical sprue, Lactose intolerance, Inflammatory Bowel Disease, Irritable Bowel Syndrome, Gastro esophageal reflux disease (GERD)- Etiology, Symptoms, Complications and Principles of diet management.

Unit V **(18 hours)**

Nutritional care for diseases of liver and biliary system: Jaundice, Cirrhosis of liver, Viral Hepatitis, Hepatic Encephalopathy, Role of alcohol in liver disease- etiology, symptoms, complications and principles of diet management.

Diseases of Gall Bladder and Pancreas: Cholelithiasis, Cholecystitis, Cholecystectomy, Acute and chronic Pancreatitis- Etiology, Symptoms, Complications and Principles of diet management.

Course Outcomes:

After successfulcompletion of this course, student will be able to

CO1: Recollect the principles of planning diet and discuss the role of dietician and basic concept of diet therapy

CO2: Determine the routine hospital diets, special feeding techniques

CO3: Point out the etiology, symptoms and complications for any life style disease

CO4: Assess the nutritional requirement for acuteand chronic illness

CO5: Plana whole daymenu for the acute and chronic illness

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Text Books:

1. Srilakshmi, B, *Dietetics*, New Age International(P) Ltd, Chennai, 7th Edition,2019.
2. Shubhaangini Joshi, *Nutrition and Dietetics*, McGraw Hill publication, New Delhi, 3rd Edition, 2017.

Reference Books:

1. Sumati R. Mudambi, M. V. Rajagopal,*Fundamentals of Foods, Nutrition and Diet Therapy*, Published byNew Age International,2015.
2. Ann M. Coulston, Carol J. Boushey, Linda Delahanty, Mario Ferruzzi,*Nutrition in the Prevention and Treatment of Disease*, Published byElsevier Science,2017.
3. A. Sharma ,*Principles of Therapeutic Nutrition and Dietetics*, CBS Publishers & Distributors,2017.

Journals:

1. The American Journal of Clinical Nutrition
2. Nutrition Abstracts and Reviews
3. The Indian Journal of Nutrition and Dietetics

E-Resources:

1. https://itcollege.ac.in/itdc/wp-content/uploads/2020/10/DR-neelam-Kumari.pdf
2. https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/medical-nutrition-therapy-for-weight-loss
3. https://www.nhp.gov.in/healthlyliving/healthy-nutrition
4. http://www.lllnutrition.com/mod_lll/TOPIC12/m121.pdf
5. https://slideplayer.com/slide/6183777/

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	3	3	3	9	**45**
CO2	3	3	3	3	1	3	9	**25**
CO3	9	9	9	1	1	1	9	**39**
CO4	9	3	9	1	1	3	9	**35**
CO5	3	3	9	3	3	3	9	**33**
Total	**33**	**27**	**39**	**11**	**09**	**13**	**45**	**177**

Low-1 Medium-3 High-9

Core -X Diet Therapy - I Practicals

(For Students Admitted from 2022-2023)

Semester-V **Hours/Week:6**
Subject Code: IBNDC52P **Credit: 5**

Course Objectives:

1. To understand the modifications in nutrient requirements for various diseases
2. To acquire skills in the preparation of therapeutic diets

Unit I **(18 hours)**

1. Planning and preparation of fluid food preparation, clear fluid and full fluid.
2. Planning and preparation of recipes for soft diet, mechanical and pureed
3. Planning, preparationof recipes using protein concentrates and sugar substitutes.

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Unit II **(18 hours)**

1. Planning, preparation and calculationof diet in Obesity
2. Planning, preparation and calculationof diet in Underweight
3. Planning, preparation and calculation of diet in Protein EnergyMalnutrition

Unit III **(18 hours)**

1. Planning, preparationand calculation of diet in Anaemia
2. Planning, preparationand calculation of diet in Typhoid &Malaria
3. Planning, preparation and calculation of diet in Tuberculosis

Unit IV **(18 hours)**

1. Planning, preparationand calculationof diet in Peptic Ulcer
2. Planning, preparation and calculation of diet in Diarrhoea &Constipation
3. Planning, preparation and calculation of diet Inflammatory and Irritable BowelSyndrome

Uni V **(18 hours)**

1. Planning, preparationand calculation of diet in jaundice & Cirrhosis of liver
2. Planning, preparationand calculationof diet in Cholelithiasis and Cholecystitis
3. Planning, preparation and calculation of diet in Acute and Chronic Pancreatitis

Course Outcomes:

After successfulcompletion of this course, student will be able to

CO1: Describe the importance of menu for different illness and explain the need of menu modification

CO2: Apply the therapeutic diets using food exchange lists.

CO3: Structure the dietetic practices followed in Indian hospital

CO4: Detect the nutritive value of Indian foods

CO5: Calculate a whole day menu for acute and chronic illness

Text Books:

1. Amin Gasmi, *Diet Therapy for Digestive Diseases-Practical Guide for Nutritionists* Independently Published, 2020.
2. Gopalan C., RN. Ramasastri and S.C. Balasubra-manian, "*Nutritive Value of Indian Foods*‖ ,National InstituteofNutrition, Hyderabad, 2021.

Reference Books:

1. Brenda Davis,Kick *Diabetes Essentials: The Diet and Lifestyle Guide*, Healthy Living Publications, 2019
2. Joan Gandy, Manualof Dietetic practice published by Wiley,2019
3. Kathleen D. Bauer,Doreen Liou, *Nutrition Counselling and Education Skill Development*, Published by Cengage Learning,2020.

Journals:

1. The American JournalofClinical Nutrition
2. Nutrition Abstracts and Reviews
3. The Indian Journal of Nutrition and Dietetics

E-Resources:

1. www.mntinc.org
2. www.nutritionaltherapy.com
3. www.mnpgdpg.org
4. http://www.lllnutrition.com/mod_lll/TOPIC12/m121.pdf
5. https://slideplayer.com/slide/6183777/

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Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	3	3	3	9	**39**
CO2	9	3	9	3	3	3	9	**39**
CO3	9	3	9	3	3	3	9	**39**
CO4	3	3	3	1	3	1	9	**23**
CO5	9	3	9	3	3	3	9	**39**
Total	**39**	**15**	**39**	**13**	**15**	**13**	**45**	**179**

Low-1 **Medium-3** **High-9**

Core-XI - Community Nutrition

(For Students Admitted from 2022-2023)

Semester:V **Hours /week:6**
Subject Code: IBNDC53 **Credit:5**

Course Objectives:

1. To enable students to impart nutrition education among rural and needy people
2. To acquaint knowledge regarding food security and government and international program running in the field of community nutrition

Unit I **(18hours)**

Malnutrition: Nutrition and health in National development. Malnutrition- meaning, factors contributing to malnutrition, over nutrition. Nutritional disorders- Epidemiology, clinical features, prevention and dietary treatment for Protein Energy malnutrition, nutritional anaemia & vitamin deficiencydisorders.

Unit II **(18hours)**

Strategies to overcome malnutrition: Definition: IMR, NMR and MMR. Measures to overcome malnutrition, increased agricultural production and nutritious foods and nutrition gardens, food technology, food fortification and enrichment, nutrition education, nutrition intervention programmes.

Assessment of nutritional status: Direct assessment - Diet surveys, anthropometric, clinical and biochemicalestimation. Indirect assessment- Food balance sheet, ecological parameters and vital statistics.

Unit III **(18hours)**

Nutrition Education: Meaning, nature and importance of Nutrition education to the community and lessons to be taught. Methods of education- use of audiovisual aids Use of computers to impart nutrition education – power point presentation, e-learning, Organization of Nutrition education programmes: Principles of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes

Unit IV **(18hours)**

Role of National and International organizations: National Organization concerned with food and nutrition – ICMR, NIN, NNMB CFTRI, DFRL and NIPCCD. International Organization concerned with Food and Nutrition- FAO, WHO, UNICEF, World Bank, ICAR, ICMR, NIN, CFTRI, NIPCCD, FAO, WHO, UNICEF and NNMB.

Unit V **(18hours)**

Nutrition intervention programs: Genesis objectives and operation of nutrition intervention programmes in India – School Lunch Programme, CMNMP, ICDS, TINP organized by government for vulnerable sections of the population. National Nutritional Anaemia Prophylaxis Programme, National Prophylaxis Programme against Vitamin A Deficiency Diseases, Goitre Control Programme. National Nutrition policy, National food security, National nutrition policy- thrust areas and implementation at national level, Impact

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of National Nutrition policy, COVID-19 Guidelines.

Course Outcomes:

After successfulcompletion of this course, student will be able to

CO1: Identifythe nutritionalproblems in India and gain knowledge on measures to overcome malnutrition

CO2: Articulate the greater exposureto assessment of nutritional status

CO3: Analyze knowledge about assessment of nutrition education

CO4: Assess the concepts of health and epidemiology of communicable diseases

CO5: Create awareness on nutritional programmes in national and international organizations

Text Books:

1. Swaminathan, M., *Essentials of Food and Nutrition***,** Bangalore Printing and Publishing Co. Ltd, Bangalore,2017.
2. Srilakshmi, B., *Nutrition Science*, New Age InternationalPublication, New Delhi, 2019.

Reference Books:

1. Park, A. Park's, *Textbook of Preventive and Social Medicine* , Bharat Publishers, 19th Edition 2009.
2. Bamji M.S, Prahlad Rao N, Reddy V., *Text book of Human Nutrition***,** Oxford and PBH Publishing Co Pvt Ltd, New Delhi, 4th Edition,2019.
3. Norman J. Temple and Nelia Steyn, *Community Nutrition for Developing Countries*,AU Press and UNISA,2016.

Journals:

1. Journal of Nutrition and Health
2. Journal of Preventive Nutrition and Food Science
3. Journal of Nutrition Today

E-Resources:

1. https://www.medicosrepublic.co
2. https://ashesleftbehind.blogspot.com
3. https://www.ncbi.nlm.nih.gov
4. http://www.ignouhelp.in › ignou-mscdfs
5. https://guides.lib.utexas.edu

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	3	3	3	3	**39**
CO2	9	9	9	3	3	9	1	**43**
CO3	9	9	9	9	3	9	9	**57**
CO4	9	9	9	9	1	3	3	**43**
CO5	9	9	9	3	3	3	3	**39**
Total	**45**	**45**	**45**	**27**	**13**	**27**	**19**	**221**

Low-1 Medium-3 High-9

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Core-XII Diet Therapy-II

(For Students Admitted from 2022-2023)

Semester: VI **Hours/week: 6**
Subject Code: IBNDC61 **Credit:5**

Course Objectives:

1. To gain insight into the different nutrition related diseases and skills on preparation of different therapeutic diets, understand the basic concepts, principles, components and importance of health
2. To obtain knowledge about various diseases and control measures

Unit I **(18 hours)**

Diet in cardiovascular system: Etiology, Types, symptoms, complications, diagnostic test and principles of diet management for hyperlipidemia, Hypertension, Atherosclerosis, Ischemic Heart Disease, Congestive Cardiac Failure.

Role of fat in development of atherosclerosis- High fibre, low fat, sodium restricted diet. Nutrient and drug interaction in cardio vascular diseases

Unit II **(18 hours)**

Diet in Diabetes mellitus: Etiology, types, symptoms, complications, diagnostic test and principles of diet management for Diabetes Mellitus - IDDM & NIDDM

Dietary Modifications with and without insulin - Food Exchange List –Glycemic Index and its use. Macronutrient modification -dietary carbohydrate to protein ratio of the diet.

Unit III **(18 hours)**

Diet in Renal disorder and disease: Etiology, types, symptoms, complications, diagnostic test and principles of diet management for Glomerulonephritis- Nephrotic Syndrome, Acute and Chronic Renal failure. Dialysis.

Renal calculi, Acid and alkali producing foods - Use of sodium and potassium exchange lists.

Unit IV **(18 hours)**

Inborn errors of metabolism : Etiology, symptoms, complications, diagnostic test and nutritional management of Phenylketouria (PKU), Galactosemia and Maple syrup urine disease, Gout

Allergies: Food allergy and intolerance – Mechanism, Factors influencing, symptoms, tests for Allergy, Nutritional care and Elimination diet.

Burns: Degrees of burns and dietary management.

Unit V **(18 hours)**

Diet in Cancer: Etiology, types, symptoms, complications, diagnostic test and principles of diet management for Cancer- Nutritional problems of Cancer therapy - Role of food in prevention of cancer.

Therapeutic diet chart preparation & Dietary counseling: Clients and counselors, client responsibility, attributes of a successful counselor, steps in counseling process, counselling guidelines.

Diet in COVID and Omicron infection: Etiology, symptoms, complications, Diagnostic, Role of food in preventing COVID, Immune boosting foods for children and old age people, importance of vaccination.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Recall the clinical condition of therapeutic condition and describe the modifications in nutrients and dietary requirements for therapeutic condition

CO2: Implement the foods to specific disease pathologies that require diet modification in order to restore homeostasis in patients

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CO3: Analyze the nutritional and foodrequirements for different therapeutic conditions
CO4: Assess the knowledge on etiology, clinical manifestation, metabolic aberrations and complications linked with adverse food reactions
CO5: Build recent concepts in dietary management of different diseases and preparation of therapeutic diets for various disease

Text Books:
1. F.P. Antia , *Clinical Dietetics &Nutrition***,** OxfordUniversityPress, New Delhi,2018.
2. Srilakshmi, B., *Dietetics*, New Age International(P) Ltd, Chennai,7th Edition,2019.

Reference Books:
1. Shubhangini A. Joshi, *Nutrition and Dietetics***,** Oxford University Press, New Delhi,4th Edition, 2015.
2. Krause and Mahan, *Food, Nutrition and Diet therapy*, W.B. Saunders Company, London,6th Edition, 2016.
3. Akansha Yadav, Monika Arora, Swayam Siddha, *Practical Manual of Nutrition and Dietetics*, Kalpaz Publications, 2019.

Journals:
1. The American Journal of Clinical Nutrition
2. Nutrition Abstracts and Reviews
3. The Indian Journal of Nutrition and Dietetics

E-Resources:
1. https://www.nin.res.in
2. https://www.elsevier.com
3. https://www.barnesandnoble.com
4. https://www.ebooksread.com
5. https://www.cabi.org

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	9	9	**63**
CO2	9	9	9	9	9	9	9	**63**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	9	9	9	9	**63**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**45**	**45**	**45**	**45**	**45**	**45**	**315**

Low-1 Medium-3 High-9

Core - XIII Diet Therapy - II Practicals

(For Students Admitted from 2022-2023)

Semester: VI **Hours/week: 6**
Subject Code: IBNDC62P **Credit: 5**

Course Objectives:
1. To understand the therapeutic diets for various diseases – Diabetes, CVD, Hypertension, Renaldisease and GI problems
2. To knowthe importance and principles ofdietetics as a distinct therapyfor diseases and gainknowledge onthe types and role ofdietitians

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List of Experiments: **(90 hours)**

1. Planning, preparation and calculation of diet for Hyperlipidemia
2. Planning, preparation and calculation of diet for Hypertension
3. Preparation and calculation of diet in Atherosclerosis
4. Planning, preparation and calculation of diet for High fibre
5. Planning, preparation and calculation of diet for Type I Diabetes mellitus
6. Planning, preparation and calculation of diet for Type II Diabetes mellitus
7. Planning, preparation and calculation of diet for Low sodium diet
8. Planning, preparation calculation of diets for Glomerulonephritis
9. Planning, preparation and calculation of diet for Acute and chronic Renal Failure
10. Planning, preparation and calculation of diet for Renalcalculi
11. Planning, preparation and calculation of diet for Gout
12. Planning, preparation and calculation of diet in Allergy
13. Planning, preparation and calculation of diet in Cancer
14. Planning, preparation and calculation of diet in Burns
15. Diet preparation for immune boosting foods

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Identify the discovered diets during the different therapeutic conditions and interpret normal health to therapeutic conditions

CO2: Inspect skill development in planning therapeutic diets using food exchange lists

CO3: Choose an accurate dietary assessment, calculate the nutritional requirements, plan appropriate nutritional care, and explain the process of objective setting in the delivery of a nutritional care plan for a client

CO4: Compare the calculated nutrients with RDA

CO5: Generate the plan menu for low immunity people

Text Books:

1. *Clinical Dietetics Manual*, Indian Dietetic Association,2018.
2. Gopalan C., RN. Ramasastri and S.C. Balasubra-manian, "*Nutritive Value of Indian Foods"*, National Institute of Nutrition, Hyderabad, 1977.

Reference Books:

1. Shubhangini A. Joshi, *Nutrition and Dietetics*, Oxford University Press, 4th Edition,2015.
2. Krause and Mahan– *Food, Nutrition and Diet therapy*, W.B. Saunders company, London,6th Edition, 2016.

Journals:

1. The American Journal of Clinical Nutrition
2. Nutrition Abstracts and Reviews
3. The Indian Journal of Nutrition and Dietetics

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E-Resources:

1. https://www.nin.res.in
2. https://www.elsevier.com
3. https://www.barnesandnoble.com
4. https://www.ebooksread.com
5. https://www.cabi.org

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	9	9	**63**
CO2	9	9	9	9	9	9	9	**63**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	9	9	9	9	**63**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**45**	**45**	**45**	**45**	**45**	**45**	**315**

Low-1 Medium-3 High-9

Core XIV Food Standard and Quality Control

(For Students Admitted from 2022-2023)

Semester-VI **Hours/Week:6**
Subject Code: IBNDC63 **Credit:5**

Course Objectives:

1. To gain knowledge on food safety and food laws
2. To studyabout qualitycontroland common food standards

Unit I **(18 hours)**

Food Safety: Meaning, Concept, Importance of Safe Food, Factors affecting Food Safety, Current Challenges to Food Safety. Quality Control-Definition, concept, Importance and Functions. WHO assisted Activities in Food Safety, Role of Central Food Laboratory and State Food Laboratories, Duties of Public Analyst and Food Inspector.

Unit II **(18 hours)**

Food Quality Assurance: Meaning, Principles, Total Quality Management (TQM) – Meaning, Concepts, Need, Components, MP, GHP. HACCP – History, Principle, Guidelines for application ofHACCP.

Unit III **(18 hours)**

Food Laws and Regulations: Historyof Regulations in India, FAO, WHO, CODEX Alimentarius, BIS, AGMARK, Consumer Protection Act, FSSA, PFA, Essential Commodities Act, Export Act, FPO, ISO 22000, ISO 9000 Series, HALAL.

Guidelines for Food Labelling: Name of the food, weight, ingredients, date and storage conditions, preparation instructions, name and address of manufacturer.

Unit IV **(18 hours)**

Food Quality Indices: Meat and Meat Products, Fish and Fish Products, Milk and Dairy Products, Vegetables, Fruits and their Products, Grains, Pulses and Oil Seeds Coffee Tea and Spices Food Adulteration**:** Definition, Nature of Adulterants, Methods of Evaluation of Food Adulterants and Toxic Constituents.

Additives: Meaning, Classification, Types ofAdditives.

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Unit V **(18 hours)**

Sensory Assessments – Sensory Assessments on food quality (appearance, taste, texture,flavor). Different methods of sensory analysis- Difference test, Paired Comparison and Duo-trio Test, Ranking test -Ranking and hedonic rating- Sensitivity Test-Threshold and Dilution Test- Descriptive test and preparation of score card.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Recall the application of food quality and food safety system and explain the international systems of standards

CO2: Illustrate the importance of food quality standards

CO3: Examine the chemical and microbiological qualityof food samples

CO4: Evaluate the adulteration in food samples

CO5: Review oflegislative approaches for the management of food safety

Text Books:

1. Thomas Ohlsson, Nils Bengtsson, Minimal *Processing Technologies in the Food Industry – Business &Economics*, Publisher CBS,2002.
2. Gustavo V. Barbosa-Canovas, Maria S. Tapia, M. Pilar Cano, *Technology & Engineering*,CBS Publishers and Distributors,2004.

Reference Books:

1. Philip,A.C. *Reconceptualizing Quality*. New Age InternationalPublishers, Bangalore, 2001.
2. Bhatia,R. and Ichhpujan,R.L. *Quality Assurance in Microbiology*. CBS Publishers and Distributors, New Delhi, 2004.
3. Kher, C.P. *Quality Control for the Food Industry*. ITC Publishers, Geneva, 2000.

E-Resources:

1. www.fao.org
2. www.teaboard.gov.in
3. www.fssai.gov.in
4. https://www.eolss.net/Sample-Chapters/C10/E5-08-04.pdf
5. https://www.slideshare.net/shuchij10/sensory-assessment

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	9	9	3	9	**51**
CO2	9	3	3	3	3	1	9	**31**
CO3	9	9	9	3	1	1	9	**41**
CO4	9	9	3	3	3	1	9	**37**
CO5	9	3	1	1	3	1	9	**27**
Total	**45**	**27**	**25**	**19**	**19**	**7**	**45**	**187**

Low-1 **Medium-3** **High-9**

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Core XV Dietetic Internship

(For Students Admitted from 2022-2023)

Semester-VI **Hours/Week:5**

Subject Code: IBNDC64P **Credit: 3**

Course Objectives:

1. To develop practitioner skills for entry-level dietitians who are able to assume leadership roles to improve a maintain the nutritional care of diverse individuals, families and communities within national and global populations
2. To prepare graduates to be competent entry-level dietitians

Aspects to be covered in the Dietary Internship training programs (75 hours)

It is compulsory for all the students to complete the given institutional training programs in reputed institution for a period of 15 days. At the end of the final year, each student has to submita report of the training and undergo a viva voce examination.

Marking system is as follows: Internal marks will be awarded by the faculty of the department with whose guidance the report is prepared.

Dietary Internship Training:

1. Assessing the nutritional status and diet historyof patients.
2. Planning diet sheets, preparing and providing guidance in the production of therapeutic diet.
3. Supervising the preparation of diets.
4. Supervising the delivery of trays to the patient.
5. Getting feedback from patients regarding diets.
6. Understanding the layout of hospital dietary unit.
7. Acquiring practical knowledge in diet counseling.
8. Under taking two case studies at hospital situation.

Course Outcomes:

After successfulcompletion of this course, student will be able to

CO1: Identify nutrition-related problems and determine and evaluate nutrition interventions

CO2: Explain the work of inter professional teams and the roles of others with whom the registered dietitian nutritionist collaborates in the deliveryoffood and nutrition services.

CO3: Interpret and apply nutrition concepts to evaluate and improve the nutritional health of individuals with medical conditions

CO4: Applythe knowledge for diet counseling and competent to manage catering outlet

CO5: Determine and translate nutrient needs into menus for individuals and groups across the lifespan, in diverse cultures and religions

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	3	9	**57**
CO2	9	9	9	3	9	3	9	**51**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	9	9	9	9	**63**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**45**	**45**	**39**	**45**	**33**	**45**	**297**

Low-1 **Medium-3** **High-9**

XVII ACADEMIC COUNCIL

Extra Credit -Waste Management in Food Industries

(For Students Admitted from 2022-2023)

Semester: VI

Subject Code: IBNDX6 **Credit: 2**

Course Objectives:

1. To have a thorough understanding of the processing and management of waste products
2. To instill a fundamental understanding of waste disposal and sanitation

Unit I

Introduction: Classification of waste. Characterization of food industrial wastes from Fruit and vegetable processing industry, Beverage industry; Fish, Meat & Poultryindustry, Sugar industry and Dairy industry.

Unit II

Treatment methods for liquid wastes from food process industries; Design of Activated Sludge Process, Rotating Biological Contactors, Trickling Filters, UASB, Biogas Plant.

Unit III

Treatment methods of solid wastes: Biological composting, drying and incineration; Design of Solid Waste Management System: Landfill Digester,Vermi composting Pit.

Unit IV

Bio filters and Bio clarifiers, Ion exchange treatment of waste water, Drinking-Water treatment, Recoveryof useful materials from effluents by different methods.

Unit V

Waste disposal methods – Physical, Chemical & Biological; Economical aspects of waste treatment and disposal.

Course Outcomes:

After successfulcompletion of this course, student will be able to

CO1: Define and summarizing the agricultural waste and by products that are beneficial
CO2: Categorize a varietyof waste-treatment equipment
CO3: Establish various wastewater treatment and disposal technologies
CO4: Choose from a number of waste water treatment options, all of which are available from avarious sources
CO5: Evaluate how byproducts and waste materials are utilized

Text Books:

1. Thakur, M., Modi, V. K., Khedkar, R & Singh, K., *Sustainable Food Waste Management: Concepts and Innovations*. Springer. 2020.
2. Banu, R., Kumar, G., Gunasekaran, M., &Kavitha, S, *Food waste to valuable resources: Applicationsand management*, Academic Press.2020.

Reference Books:

1. Yaser, A. Z. , *Advances in Waste Processing Technology*, Springer,2020.
2. Bhat, R,*Valorization of Agri-food Wastes and By-products: Recent Trends, Innovations and Sustainability Challenges*, Netherlands: Elsevier Science.2021.
3. Galanakis C.M,*Food Waste Recovery: Processing Technologies, Industrial Techniques, and Applications*,Academic Press,2020.

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Journals:

1. InternationalJournal of Environment and Waste Management
2. Journal of Waste Management and Disposal
3. Journal of Waste Management

E-Resources:

1. www.omicsonline.org
2. www.imedpub.com
3. www.imedpub.com
4. https://www.slideshare.net/Ankit7733/biofiltration
5. https://byjus.com/biology/waste-disposal/

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	3	3	3	1	3	**25**
CO2	9	3	9	3	3	3	3	**33**
CO3	9	9	9	9	3	1	9	**49**
CO4	9	3	9	3	1	1	3	**29**
CO5	9	9	9	9	1	1	3	**41**
Total	**45**	**27**	**39**	**27**	**11**	**7**	**21**	**177**

Low-1 Medium-3 High-9

Discipline Specific Elective –I a. Family Resource Management

(For Students Admitted from 2022-2023)

Semester:V **Hours /week:4**
Subject Code: IBNDE5A **Credit: 4**

Course Objectives:

1. To educate student about management in the familyas well as in other sphere of life
2. To make student aware about maximum utilization of their resources to meet their goals

Unit I **(12hours)**

Management: Definition, principles and elements involved in management,
Process: planning, controlling and evaluation. Motivation in management. (Introduction to values, goals and standards)
Management Concepts- Goals and Values – their relationship to decision making.

Unit II **(12hours)**

Standard of Living: Definition, constituents – Means for raising the standard of living of families.
Decision Making: Steps, importance, types ofdecisions, Habitual versus Conscious decision making. Individual and group decisions, resolving conflicts in group decisions.
Resources: Human and non-human resources. Characteristics of Resources, how they are utilized to achieve family goals.

Unit III **(12hours)**

Family: Concept, Role, life cycle changes and stages offamily life cycle.
Work Simplification: Definition, importance, Mundel's classes of change
Time Management: Time Demands during different stages of the family life cycle, Time cost, Factors to be consider in making time and activities plans.

Unit IV **(12hours)**

Energy Management: Relation of energy to the stages of the family life cycle, Fatigue –Forms and effects of fatigue.

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Family Income: Definition, Types - Money, Real and Psychic income, various ways of improving the income of the family, Family finance management, family budget – Definition and meaning, importance ofbudgeting, steps, factors affecting the budget. Engle's Law ofConsumption.

Unit V **(12hours)**

Savings: Meaning, objectives, Needs for savings inthe family, types ofsavings institutions andschemes.
Consumer: Meaning and definitionofconsumer, consumer rights. Problems faced bythe consumer.

Course Outcomes:

After successful completion of this course, student will be able to
CO1: Define the principles and elements involved in management
CO2: Apply the concepts of management process in family
CO3: Distinguish the different aspects of human and non-human resources
CO4: Assess knowledge about the standardofliving and decision making process
CO5: Managethe different forms of resources

Text Books:

1. Varghese,M.A et al. – –*Home Management*", New Age International (P) Limited, Publishers New Delhi.2nd Edition, 2017.
2. Batra, Sonia, and Seetharaman P, *An Introduction to Family Resource Management* India, CBS Publishers & Distributors, 2015.

Reference Books:

1. Moore Tami James, Asay Sylvia M., *Home Management***,** SAGE Publications, Inc, 3rd Edition, 2017.
2. Seetharaman P.*et. al, An Introduction to Family Resource Management***,** Publisher CBS, 2019.
3. Tami James Moore, Sylvia M. Asay, *Family Resource Management***,** Publisher CBS,2017.

Journals:

1. Research Journal of Family, Communityand Consumer Sciences.
2. Journal of Family and Consumer Sciences
3. The JournalofAsian Regional Association for Home Economics

E-Resources:

1. www.joe.org
2. www.sciencelinks.jp
3. www.ecoursesonline.iasri.res.in
4. https://en.wikipedia.org/wiki/Energy_management
5. https://www.investopedia.com/terms/s/savings.asp

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	1	1	9	3	9	9	**41**
CO2	9	9	1	3	1	3	1	**27**
CO3	9	9	3	1	9	3	3	**37**
CO4	9	9	1	1	1	1	9	**31**
CO5	9	9	3	1	3	1	3	**29**
Total	**45**	**37**	**09**	**15**	**17**	**17**	**25**	**165**

Low-1 **Medium-3** **High-9**

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Discipline Specific Elective – I b. Basics of Textile and Apparel

(For Students Admitted from 2022-2023)

Semester: **Hours/Week:4**
Subject Code: IBNDE5B **Credit:4**

Course Objectives:

1. To familiarize the fashion design concepts and factors influencing fashion changes
2. To impart the knowledge of fibres, their sources, identification and properties

Unit I **(12 hours)**

Introduction to textile fiber to fabric

Textile fiber and its classification - properties, manufacturing process and their end uses of natural and man-made fibers. Fabric formation - woven, knitted and non-woven fabrics.Textile finishes and its classification.

Unit II **(12 hours)**

Textile Wet Processing

Textile preparatory processes -Dyeing and printing and its classification - Dyeing and printing Methods - Tie and dye, batik ,natural-Block, screen ,stencil, digital and Roller printing .

Unit III **(12 hours)**

Concepts of Apparel Designing:

Introduction to Apparel Designing- elements and principals of designing –Illustration and parts of garments - colour theories - fashion terminologies – fashion cycle and fashion theories, Haute couture and Pret - a - porter.

Unit IV **(12 hours)**

Introduction to Apparel

Introduction to sewing machine, parts and functions - body measurements. Principles of pattern making – and its Methods. Seams and Seam finishes - Process of apparel manufacturing. Quality, care and maintains of apparel.

Unit V **(12 hours)**

Traditionaltextiles and Embroidery

Introduction of Indian traditional textiles and embroidery -Tamil Nadu-Kerala, Karnataka -Andhra Pradesh-Madhya Pradesh-Uttar Pradesh-Gujarat-Rajasthan, Punjab-Jammu and Kashmir.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Recall the basic concept oftextile and apparel and understanding the knowledge of textile material
CO2: Identifying the methods offabric formation and processing
CO3: Analyzing the concept of apparel design elements and fashion cycle
CO4: Assessing the design development and apparel production
CO5: Develop knowledge about Indian traditional textiles and embroidery

Text Books:

1. HollyM. Kent ,—*Teaching Fashion Studies,* BloomsburyPublishing,2018
2. Sekhri, Seema, *Fabric science|| , fundamentals to finishing,* PHI Learning 3rd Edition Pvt LtdPublisher, 2020.
3. Janarthanan U –*World History of Textiles and Costumes,* Amazon Digital Services Publisher, US, 2020.

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Reference Books:

1. J N Shah, Guide to Wet Textile Processing Machines|| , Elsevier Science andTechnology,2015.
2. Angela, Damayanthie Eluwawalage, Laura Petican, Mariam Esseghaier,*New Developments in Fashion Studies*, BrillPublishing,2019.
3. Carolyn mair, *The Psychology of Fashion*, Taylor and Francis Publisher, 2018.

Journals:

1. Journal of Clothing and Textile
2. Journal of Designing Apparel For Consumers
3. International Journal of Textile Science Research

E Resources:

1. www.TextileLearner.com
2. www.Dyeing World.Com
3. https://www.brainkart.com/article/Seam-Finishes-and-Types-of-Seam-Finishing_35626/
4. http://textilelearner.blogspot.com/2014/11/the-basic-fundamentals-of-apparel.html
5. https://www.researchgate.net/publication/215616545_Decorative_Design_History_In_Indi an_Textiles_Costumes

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	3	3	3	3	3	9	9	**33**
CO2	3	3	3	9	3	3	9	**33**
CO3	9	9	3	9	3	9	9	**51**
CO4	3	3	3	9	3	3	9	**33**
CO5	9	9	9	9	3	3	9	**51**
Total	**27**	**27**	**21**	**39**	**15**	**27**	**45**	**201**

Low-1 Medium-3 High-9

Discipline Specific Elective II a. Food Service Management

(For Students Admitted from 2022-2023)

Semester:V **Hours /week:4**
Subject Code: IBNDE5C **Credit:4**

Course Objectives:

1. To create awareness on the organizational aspect and functioning of different types of food service institutions
2. To develop managerialskills among the students

Unit I **(12 hours)**

Food Service Institutions: Types of food service Institution, Commercial and Non-Commercial Institutions. Commercial -Hotel, Motel, Restaurant, Bar, Pub, Fast Food Restaurant, Popular Catering. Non-Commercial-Transport Catering, welfare catering, Industrial Catering, Leisure linked Catering.

Unit II **(12 hours)**

Food plant -Types of Kitchen. Layout of different food service units, Types of lighting and ventilation adopted in different units such as Kitchen, storageand dining area, Work simplification process.

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Unit III **(12 hours)**

Equipment used in Food service industries: Classification of equipment, Application of electrical and non-electrical equipment for food storage, Preparation, Serving, Dish-washing. Kitchen equipment's selection and care.

Unit IV **(12 hours)**

Quantity food preparation: Menu planning – Types of menu, Standardization and standardized recipes portion control. Quantity Food Service: Types of service, Styles of service - Waiter, waitress service, Counter service - snack bar, buffet service, Banquet.

Unit V **(12 hours)**

Buying and accounting procedures in food service institution: Budget preparation, Portion control, Methods of cost control, Cost accounting, Cost concepts- Types of cost, Food cost control factors, Break even analysis. System of book keeping - Cash book, Purchase book, Sales book and purchase returns book, Sales returns book and journals. HACCP -Definition, Principles ofHACCP.

Course Outcomes:

After successfulcompletion of this course, student will be able to

CO1: Explain the interdependent components of the international hospitality and tourism industry and understand the roles of national and state visitors' authorities, marketing and sales

CO2: Apply management skills needed in a food service production

CO3: Emphasize problemsolving tools with in food service careers

CO4: Evaluate the professional lodging specific technical skills, supervisory techniques and management skills in food service management

CO5: Monitor the quality control in food product and service

Text Books:

1. Sethi, M. Malhan,S, *Catering Management: An integrated approach*, New Age International Publisher,2010.
2. Sudhir Andrews, *Food and Beverage Service Training Manual*, Tata McGraw Hill Publishing Company Ltd New Delhi,2nd Edition,2011.

Reference Books:

1. Mohini Sethi and Surjeet Malhan, *Catering management- An integrated approach*,New Age International Publishers,3rdEdition, 2015.
2. Mohini Sethi, *Institutional food management*, New Age International Publishers. 2nd Edition, 2016

Journals:

1. Journal of Food Service
2. Journal of Food Service Management & Education
3. Journal of Food Service Business Research

E-Resources:

1. https://ncert.nic.in/textbook/pdf/lehe104.pdf
2. https://www.designcafe.com/guides/different-types-of-kitchen-layouts/
3. https://www.brainkart.com/article/Definition-and-Types-of-Equipment_35155/
4. https://www.hotelmanagementtips.com/types-of-food-service-styles/
5. https://psu.pb.unizin.org/hmd329/chapter/ch10/

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Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	1	3	3	1	9	**29**
CO2	9	3	1	3	3	3	9	**31**
CO3	9	9	3	3	3	1	9	**37**
CO4	9	3	1	1	3	1	9	**27**
CO5	9	9	3	9	9	3	9	**51**
Total	**45**	**27**	**9**	**19**	**21**	**9**	**45**	**175**

Low-1 Medium-3 High-9

Discipline Specific Elective II b. Post-Harvest Technology

(For Students Admitted from 2022-2023)

Semester:V **Hours/week:4**
Subject Code: IBNDE5D **Credit: 4**

Course Objectives:

1. To gainknowledge on food safetyand to reduce losses between harvest and consumption
2. To enhance the studentsto understand the environment, parameters, causes ofpost-harvest loss, management and value addition

Unit I **(12 hours)**

Introduction to Post harvest technology: Introduction to post harvest technology, Need, Scope and Importance. Post-Harvest technology for cereals, legumes, oilseeds, vegetables, and spices (cleaning, grading, milling), Hydrothermal treatment, and conditioning of grains, Drying Principles, Crop Drying methods, selection criteria for dryers.

Unit II **(12 hours)**

Unit Operations: Introduction to various post-harvest operations such as Primary, Secondary and Tertiary Operation, Cleaning, grading, Harvesting, Transportation, Handling and storage. Post- Harvest treatments-Pre-Cooling, Curing, Inhibition ofSprouting and Fungicide Application and Ripening

Unit III **(12 hours)**

Post-harvest processing of cereals, legumes and oil seeds: Introduction, need and importance, general principles of storage. Temperature and moisture changes during storage i.e. influence of moisture content, relative humidity, temperature, fungi etc. on stored product. Fungi, insect and other organism / Infections associated with stored grains. Types of storage structures. Deep and shallow bins. Traditional and modem storage structures. Management of storage structures. Losses during storage and their control, space requirement ofbag storage structure.

Unit IV **(12 hours)**

Post-Harvest Processing of fruits and vegetables: Methods of Harvesting and Post-harvest losses in fruits and vegetables. Introduction to the storage of fruits and vegetables. Principle of storage of fruits and vegetables. Recommended storage operation conditions for some important fruits and vegetables and their storage life. Introduction to Packaging of fruits and vegetables and types of packaging. Concept of modified atmosphere packaging.

Unit V **(12 hours)**

Post-Harvest Processing of Spices, condiments and Plantation crops: Methods of Harvesting; Cleaning, grading Threshing, Blanching, Drying of Black pepper, Curing and Garbling of Cardamom, Peeling, drying and polishing of Ginger, Post harvesting operations of Chilies, Nutmeg and Mace, Cinnamon, Seed spices- Stage of harvesting. Grading of tea; wet and dry method ofcoffee Processing-

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Packaging and storage. Post-harvest losses.

Course Outcomes:

After successfulcompletion of this course, student will be able to

CO1: Recall the principle underlying Post-Harvest Technology and understand the knowledgeof post-harvest management of foods

CO2: Classify the importance and methodsof post-harvest conservation of foods

CO3: Outline the post-harvest processing in Major crops

CO4: Estimate the shelf stability of product in storage and post-harvest processing of temperate crops

CO5: Determine the quality parametersof plantation crops during Post-harvest operations

Text Books:

1. Chakraborty,*Post-Harvest Technology of Cereals, Pulses and Oilseeds*, Oxford & IBH Publishing Co. Pvt Ltd, 3rd Edition,2019
2. Sergio Tonettode Freites and Sunil Pareek, *Postharvest Physiological Disorders in Fruits and Vegetables*, Innovations in Post harvest Technology Series, 2019.

Reference Books:

1. BrizzolaraS, *Postharvest Technology of Fruits and Vegetables* Hard cover, 2020.
2. Charis M. Ganalakis, *Food losses, Sustainable Post Harvest and Food Technologies*, Academic Press,2021.

Journals:

1. Journal of Post Harvest Technology
2. Journal of Processing and Post Harvest Technology
3. Journalof Horticulture and Post Harvest Technology

E-Resources:

1. http://ecoursesonline.iasri.res.in/course/view.php?id=164
2. http://www.fao.org/3/x5672e/x5672e08.htm
3. https://www.agrifarming.in/post-harvest-technology-of-cereals-pulses-and-oilseeds
4. https://onlinecourses.swayam2.ac.in/cec20_ag02/preview#:~:text=Post%2Dharvest%20technologies%20constitute%20an,food%20and%20nutritional%20requirements%20o
5. https://agritech.tnau.ac.in/postharvest/pht_spices.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	9	9	1	9	**49**
CO2	9	1	9	9	3	1	9	**41**
CO3	3	3	9	9	9	1	3	**37**
CO4	3	9	3	3	9	1	9	**37**
CO5	9	3	3	3	9	3	3	**33**
Total	**33**	**19**	**33**	**33**	**39**	**7**	**33**	**197**

Low-1 **Medium-3** **High-9**

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Discipline Specific Elective - III a. Food Adulteration

(For Students Admitted from 2022-2023)

Semester:VI **Hours/week:4**
Subject Code: IBNDE6A **Credit:4**

Course Objectives:

1. To impart knowledge in the legislatory aspects of adulteration.
2. To educate about standards and composition of foods and role of consumer

Unit I **(15 hours)**

Food adulteration: Definition, Classification, Healthhazardscaused byvarious adulterants - Critical levels of metals in various foods, Food Adulteration Act.

Unit II **(15 hours)**

Composition and quality criteria for plant foods: Food grains, Fruits & Vegetables, Fats and Oils, Spices and condiments, Beverages- Alcoholic & Non-Alcoholic.

Unit III **(15 hours)**

Composition and quality criteria for animal foods: Egg, Milk and Milk Products & Flesh Foods.

Unit IV **(15 hours)**

Composition & qualitycriteria for Sugar and Sugar products, Preserves & Tin Foods.

Unit V **(15 hours)**

Food additives: Introduction, Classification- Antioxidants, Preservatives, Emulsifiers, Stabilizers, sweeteners, thickening agents, chelating agents, curing agents, leavening agents, anti-caking agents, colouring agents, flavouring agents.

Course Outcomes:

After successfulcompletion of this course, student will be able to

CO1: Know the standards for qualityassessment and food safetyagainst adulteration for various foods and understand the adulterationof common foods and their adverse impact onhealth
CO2: Relate the concept of adulteration in food products.
CO3: Detect the adulteration in food samples
CO4: Comprehend certain skills of detecting adulteration ofcommon foods
CO5: Familiarize with critical assessment and control points for quality assurance.

Text Books:

1. JonathanRees, *Food Adulteration and Food Fraud*, published byReaktion Books,2020.
2. Jesse P. Battershall,*Food Adulteration*, Outlook Verlag Publisher ,2020.

Reference Books:

1. Colin Wrigley, *Cereal Grains: Assessing and Managing Quality*, Wood Head Publishing,2016.
2. ShaliniSehgal, *A laboratory Manual of Food Analysis*, Tata McGraw-Hill Publishers, 2016.
3. Madan L Verma, *Biotechnological Approaches inFood Adulterants*, CRC Press,2020.

Journals:

1. Journal of American Chemical Society
2. Journal of Food Science
3. International Journal of Food Studies

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E-Resources:

1. https://www.vedantu.com/biology/food-adulteration
2. https://www.slideshare.net/EshfaqBhatt/sensory-evaluation-of-fruits-and-vegetables
3. https://en.engormix.com/poultry-industry/articles/poultry-meat-quality-t34396.htm
4. https://www.czarnikow.com/blog/quality-control-measures-in-sugar
5. https://www.who.int/news-room/fact-sheets/detail/food-additives

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	3	3	3	9	**39**
CO2	9	3	9	9	3	3	9	**45**
CO3	9	3	3	3	3	3	3	**27**
CO4	9	3	9	9	3	3	9	**45**
CO5	9	3	3	3	3	3	3	**27**
Total	**45**	**15**	**33**	**27**	**15**	**15**	**33**	**183**

Low-1 Medium-3 High-9

Discipline Specific Elective –III b. Nutrition for Sports and Physical Fitness

(For Students Admitted from 2022-2023)

Semester: VI **Hours /week: 5**
Subject Code: IBNDE6B **Credit: 5**

Course Objectives:

1. To acquire knowledge in physical activity is essential for physical and mental health of children and adolescents taking part in sports have high demands ofnutrients
2. To understand the nutritional needs of members at different sport activities

Unit I **(15 hours)**

Importance of Health and Physical Fitness: Definition of Health, Health Education, Sports Nutrition, physical health, mental health & public health, Four Dimensions of Health. Hygiene – importance of hygiene, food hygiene & personnel hygiene. Needs and importance of Health Education. Types of exercises - Aerobic and anaerobic exercises. Yoga – types and health benefits. Health benefits of doing exercise regularly. Cardio respiratory and muscular assessment; Nutrition Assessment, Computerized Nutrition Assessment, Periodization and nutrition planning, health related fitness.

Unit II **(15 hours)**

Determination of Energy Expenditure in Sports and Exercise: Intensity of training impacting carbohydrate utilization; Type, timing and quantity of carbohydrate intake in Resistance training and Endurance training. Contribution of Resting metabolic Rate, Thermic effect of food and Exercise and Non-exercise activity thermogenesis (NEAT) towards energy expenditure; Energy and nutritional requirements for athletes; Identifying gaps in research for requirements among Indian athletes. Food sources from different types of carbohydrate; Recommendations of carbohydrate for varying intensities, level of training and for fitness & recreational sports.

Unit III **(15 hours)**

Protein and Body Building and Fat: Protein diet planning, Fats/Lipids- diet planning, Water and Electrolyte Balance, Temperature Regulation, Fluid Replacement Products. Assessment of Hydration.

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Hydration strategies: Beverage composition and formulation (isotonic, hypotonic and hypertonic); Only fluid versus fuelling with other macronutrients and electrolytes for exercise benefits; Beverage volume for maintaining dehydration with performance benefits; Beverage timing (Pre-exercise hydration, during exercise hydration protocol, Post-exercise rehydration); Factors that influence intake; Gastric emptying and absorption of fluids; Beverage palatability and fluid intake; Intravenous rehydration; Food versus fluid consumption during exercise.

Dehydration: Causes; Symptoms and its effects on cardiovascular system and muscle metabolism; Tolerable levels of dehydration; Synergistic effect of dehydration and hyperthermia; Effects of dehydration on endurance performance; Methods for determining degree of dehydration among athletes; Strategies for lowering hyperthermia.

Unit IV **(15 hours)**

Important Micronutrients for Exercise: B complex vitamin and specific minerals. Exercise induced oxidative stress and role of antioxidants. Sports injury and rehabilitation: Stress and strain, Basic injuries in upper and lower limb, neck, trunk and hip joint and nerve injuries, acute and chronic back ache, foot problem in sports, role of physiotherapy and yoga, preventive exercise program - How to avoid Sports Injuries, Role of Warm-up and CoolDown.

Antioxidant: Definition; Enzymatic and Non-Enzymatic antioxidants; Mode of action; Antioxidant effects to reduce oxidative stress; Effect on muscle contraction and exercise performance; Antioxidant deficiencies and exercise performance; Antioxidant requirements for exercise.

Unit V **(15 hours)**

Weight Management:Definition, Importance in weight management and exercise.Diet in weight management- Paleo diet, vegan diet, and low carbohydrate diet, low fat diet, Keto diet. Body Composition analysis, Weight reduction through nutrition and exercise, disordered - Eating Behaviours in Athletes / The Female Athlete Triad.Doping in athletes and its types.

Course Outcomes:

After successfulcompletion ofthis course, student will able to

CO1: Recallthe concept ofnutrition on sports and fitness and understanding ofthe relationship between nutrition and exercise performance

CO2: Applythe concept of fluid balance in sportsperson

CO3: Analyze the weight management in fitness and sports people

CO4: Assess on different types of micronutrients need for their fitness

CO5: Role-playon Antioxidant insports and Fitness

Text Books:

1. Dan Benardot,*Advanced Sports Nutrition.* Champaign, IL: Human Kinetics, 2021.
2. Sumati R. Mudambi,*Fundamentals of Foods, Nutrition and Diet Therapy*, New Age InternationalPrivate Limited, 2020

Reference Books:

1. Marie Spano, Laura Kruskall, D. Travis Thomas, *Nutrition for Sport, Fitness and Health*, Human Kinetics,2017.
2. Anita Bean,*The Complete Guide to Sports Nutrition, Bloomsbury Sport*, 8th Edition,2017
3. Don Mac Laren, *Advances in Sport and Exercise Science: Nutrition and Sport,* Published by Churchill Livingstone, Elsevier,2007.

Journals:

1. Journalof the International Society of Sports Nutrition
2. Journal ofSports Medicine
3. Clinical Journal of Sports Medicine

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E-Resources:

1. www.jissn.biomedcentral.com
2. www.topendsports.com
3. www.sportsnutritionsociety.org
4. www.scandpg.org
5. www.ais.gov.au

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	9	9	**63**
CO2	9	9	9	9	9	9	3	**57**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	9	9	9	9	**63**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**45**	**45**	**45**	**45**	**45**	**39**	**309**

Low-1 Medium-3 High-9

Skill Enhancement Course I-Yoga for Holistic Health Practicals

(For Students Admitted from 2022-2023)

Semester: I **Hours/week: 2**
Subject Code: IBNDS14P **Credit:2**

Course Objectives:

1. To enhance physical and mental health of the students
2. To develop discriminating mind through practicing meditation

Unit I **(6 hours)**

Asana : Rules, Types and Benefits, Loosening Exercises – Simplified yogic exercise, SuryaNamaskar

Unit II **(6 hours)**

Development of Physicalprosperity

Standing Asana -Thadasana, Arthachakrasana, Arthakadichakrasana, Pathahasthasana,Uttkatasana, Garudasana, Ekapathasana, and Veerapathrasana Trikonasa.na.

SittingAsana: Dhandasana,Padhmasana,Vajrasana,Sukasana,siddasanam,Parvathasanam, Yogamudra,Mandugasanam,Magamuthra,Jannuseerasanam,Pakchimoothasanam,ustrasanam,vakrasanam, Thoolungasanam,Komukasanam.

Unit III **(6 hours)**

Lying Asana: Prone Postures: Bhujangasana, Salabhasana,. Naukasana, Ardha Salabasana, Dhanurasana,.Sarpasana.

Supine Postures: Navasana, Pawanamuktasana, Viparitha Karani, Padma sarvangasana,UttanaPadasana,Halasana,Chakrasana,Marjariasan,Tolangulasana,Sarvangasana,Matsyasa na,Ardha Hanlasana ,Ardha Padma Halasana,Uttana Padasna,, Sethu Bandhasana

Mudra : Namaskar, Chin Mudra,Vayu Mudra, Suniya Mudra, Prithivi Mudra, Surya Mudra, Varuna Mudra, Prana Mudra, Apana Mudra, Apana Vayu Mudra, Linga Mudra, AdhiMudra, Kesari Mudra, Aswini Mudra.

Unit IV **(6 hours)**

Pranayama : Sugapoorva Pranayama, NadiSuthi, Ujjayi, Sheetali, Sheetkari, Kapalabhati.

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Bandha: Meaning and Importance
Kriyas -Meaning, Types and Importance

Unit V **(6 hours)**
Development ofMental prosperity
Meditation: Types of Meditation - Simple Meditation, Transcendental meditation, Benefits of Meditation.

Course Outcomes:
After successful completion of this course, student will able to
CO 1: Understand the physical body and health concepts
CO2: Apply and practice physical and mental stability in daily life
CO3: Outline self-discipline and self-control in modern culture
CO4: Integrate moral values
CO5: Attain a higher level of consciousness

Text Books:

1. BKS Iyengar, *Yoga the Path to Holistic Health: The Definitive Step-by-Step Guide*, DK Publisher, 1st Edition, 2016.
2. Thathuvagnani Vethathiri Maharishi, *Simplified Physical Exercise*,Vethathiri Publications, 48th Edition, 2018.
3. VethathiriMaharishi, *Yoga for Modern Age*, VethathiriPublications, 2015.

Reference Books:

1. Matthews, A., Kaminoff, L,*Yoga Anatomy*, United States: Human Kinetics, 2021.
2. Ashwani Kumar, *Yoga: A way of life*, New Delhi: Khel Sahitya Kendra, 2016.
3. Clark, B,*The Complete Guide to Yin Yoga: The Philosophy and Practice of Yin Yoga*, Canada: Wild StrawberryProductions,2019.

Journals:
1. International Journal of Yoga
2. Journalof yoga and Physiotherapy
3. International Journal of Yoga Therapy

E-Resources:
1. https://www.artofliving.org/in-en/yoga/yoga-poses/sun-salutation
2. https://www.sonakshidhamijayoga.com/
3. https://mysticalbee.com/types-of-yoga-mudras-their-significance-to-health/
4. https://www.easyayurveda.com/2012/11/11/types-of-pranayama-effect-on-health-through-an-ayurveda-microscope/amp/
5. https://www.insider.com/types-of-meditation

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	9	9	**63**
CO2	9	9	9	9	9	9	3	**57**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	9	9	9	9	9	**63**
CO5	9	9	9	9	9	9	9	**63**
Total	**45**	**45**	**45**	**45**	**45**	**45**	**39**	**309**

Low-1 **Medium-3** **High-9**

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Skill Enhancement Course II-Surface Embellishments Practicals

(For Students Admitted from 2022-2023)

Semester:2 **Hours/week: 2**
Subject Code: IBNDS24P **Credit:2**

Course Objectives:

1. To impart practical knowledge in various surface ornamentation techniques
2. To equip the students to analyze suitable surface embellishment used on different products

List of Experiments: **(10 hours)**

1. **Introduction to embroidery stitches**
2. **Basic embroidery stitches:**

a. Line stitches – running and its variation – whipped running – looped running – stepped thread–back stitch – stem stitch – couching.
b. Loop stitches – chain stitch and its variations – detached – lazydaisystitch – square chain
c. Filling stitch– satin – long and short – seeding – french knot – bullion knot – flystitch
d. Cross stitch– cross stitch– herring bone – double herring bone – close herringbone.
e. Edging stitch– buttonhole and its variations – blanket – closed buttonhole.
f. Feather stitch – fishbone

3. **Surface ornamentation techniques** **(10 hours)**

Applique work – cut work – patchwork– bead – sequins – ribbon works – aari– zardozi.

4. **Traditional embroidery:** **(10 hours)**

g. Kantha of Bengal
h. Kashida ofKashmir
i. Embroidery of Gujarat
j. Phulkhari of Punjab
k. Chikankari of Uttarpradesh
l. Kasuti of Karnataka

3. **Application of the surface Embellishment in thefollowing:**

a. Home furnishing
b. Garment

Course Outcomes:

After successful completion of this course, the student will be able to
CO1: Outline the basic embroiderystitches
CO2: Analyze the different methodsof surface ornamentation techniques
CO3: Identify and represent traditional embroideries of India using basic stitches
CO4: Recommend the appropriate surface embellishment techniques to enhance the value of home furnishing and apparel fabrics
CO5: Design and develop appropriate designs for embroidery in textile products

Text Books:

1. Yumiko Higuchi,Shambhala, *A Yearof Embroidery*,2018.
2. Jessisa Pile , *Fashion Embroidery*,Bats ford Publisher,2018

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Reference Books:

1. Dorling Kindersley, *Embroidery* , DKPublisher,2015.
2. BettyBarnden ,*Embroidery Stitch Bible* ,Search Press LTD Publisher,2017.
3. Jessika Pile , *Fashion Embroidery* , Bats ford Publishing,2018.

Journals:

1. Journal of Textile Science
2. Journal of Surface Design
3. Journal of Application Techniques

E Resources:

1. https://thedesigncart.com/blogs/news/the-beautiful-details-of-surface-ornamentation
2. https://thedesigncart.com/blogs/news/surface-ornamentation-history-and-types
3. https://sosopoetry.blogspot.com/2018/08/fabric-surface-embellishment-techniques.html
4. https://www.achievementlearn.com/cloth-surface-embellishment-techniques/
5. https://archive.hs.iastate.edu/past-exhibits/on-the-surface-textile-embellishment-techniques/

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	3	3	1	1	3	1	1	**13**
CO2	9	3	9	9	3	1	3	**37**
CO3	9	9	9	9	3	3	3	**45**
CO4	3	1	9	9	3	1	3	**29**
CO5	3	3	3	9	9	1	9	**37**
Total	**27**	**19**	**31**	**37**	**21**	**7**	**19**	**161**

Low-1 Medium-3 High-9

Skill Enhancement Course III-Nutrition Garden Practicals

(For Students Admitted from 2022-2023)

Semester: III **Hours /week: 2**
Subject Code: IBNDS34P **Credit:2**

Course Objectives:

1. To enjoygardening and have positive attitude towards agriculture
2. To create a successful, sustainable garden using organic methods

List of Experiments: **(30 hours)**

1. Planning and lay-out of kitchen garden. Types of garden –In ground, Vertical,Container, Raised - bed,etc.
2. Types of Soil, tools, manures, fertilizers, seed, water etc.
3. Methods of irrigation in kitchen garden.
4. Preparation of different beds for vegetables, Vegetables in kitchen garden - Cowpea, Cluster bean, Coriander, Brinjal, Onion, and Tomato.
5. Preparationof nursery bed and transplanting.
6. Identification and control ofvegetable pest and control of vegetable diseases.
7. Use of different pots for vegetable cultivation in terrace garden.
8. Preparations ofvermin composting, zero energy cool chambers.
9. Post-Harvest handling of plant procedure.

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10. Visit to different Nutri garden.

Course Outcomes:

After successful completion of this course, the student will be able to

CO1: Understand the importance of cultivation and discuss the various types layout.
CO2: Illustrate the various types of soil and fertilizers.
CO3: Explain the different beds for cultivation.
CO4: Experiment the different methodsof cultivation of plants
CO5: Develop the practical skills onpreparing their own nutria-garden

Text Books:

1. Richard Bird, *The Kitchen Garden Book Kitchen*, South water Publishing, 2015.
2. Ankur Tiwari, *Kitchen Gardening Mini Handbook*, Thought lytics Internet Pvt. Ltd; 1st Edition, 2019.

Reference Books:

1. Naqsh Mansoor, *The Beginners Gardening Guidefor Creating Your Own Kitchen Garden*,Wiley-Blackwell P, 2016.
2. Gomez, L. Thivant , *Training Manual for Organic Agriculture* ,Published by United book prints ,2017.
3. Jill Mc Sheehy, *Vegetable Gardening for Beginners:* A Simple Guide to Growing Vegetables at Home, Published byrock ridge Press,2021.

Journals:

1. Everyday Old House.com.
2. My Gardening Journal
3. Royal Horticultural Society

E -Resources:

1. www.finegardening.com
2. www.agritech.tnau.ac.in
3. www.kitchengarden.co.uk
4. www.kitchengardenseeds.com
5. www.savvygardening.com

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	3	9	9	**57**
CO2	9	9	9	9	3	3	9	**51**
CO3	9	9	3	9	3	3	9	**45**
CO4	9	9	9	9	3	3	9	**51**
CO5	9	9	9	9	3	3	9	**51**
Total	**45**	**45**	**39**	**45**	**15**	**21**	**45**	**255**

Low-1 Medium-3 High-9

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Skill Enhancement Course –IV Food Product Development Practicals
(For Students Admitted from 2022-2023)

Semester: IV **Hours /week: 2**
Subject Code: IBNDS44P **Credit: 2**

Course Objectives:

1. To know the notionof new product development.
2. To prepare new products based on unique dietaryneeds, utility, convenience of use, and adaptation ofcurrent traditional Indian meals.

List of Experiments: **(45 hours)**

1. Studyon Trends and innovation in food markets.
2. Study on New product development process - from concept to deployment including market analysis, product design, development, quality and sensory assessment, and marketing.
3. Experiment on Properties, roles and applications of coloring, flavoring, additives and functional ingredients in foods.
4. Experiment onProperties, roles and development offood packaging for food products
5. Experiment on Quality and sensory testing for food products and evaluation of food shelf life.
6. Formulate the new food product.
7. Preparing the new food Product.
8. Marketing the new food Product.

Course Outcomes:

After successful completion of this course, student will be able to
CO1: Define and interpreting the significance of dietary changes in the development of new products
CO2: Identify a product's qualityand sensory characteristics;
CO3: Examine the food packaging in foods
CO4: Construct the food product based on your knowledge of food ingredients and functional foods
CO5: Assess the theoretical and practical knowledge in order to reproduce existing food products

Text Books:

1. Fuller, G. W, *New Food Product Development: From Concept to Marketplace*, 3rd Edition,2016
2. Vieira, M. M. C.Sustainable Innovation in Food Product Design. L. Pastrana, & J. Aguilera (Eds.). Springer International Publisher,2021.

Reference Books:

1. Chávez-gonzález, M. L., Buenrostro-figueroa J & Aguilar, C. N, *Hand Book of Research on Food Science and Technology*, 2019.
2. Fuller, g. W, *New Food Product Development: from Concept to Marketplace*, 3rd Edition, 2016.
3. Beckley, J. H., Herzog, L. J., & Foley, M. M, *Accelerating NewFood Product Design and Development*, Wiley Publishers, 2017.

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Journals:

1. International Journal of Food Science and Technology
2. International Journal of Food Engineering
3. Food Technology

E -Resources:

1. https://iastate.pressbooks.pub/foodproductdevelopment/
2. http://www.brookfieldengineering.com/https://nzifst.org.nz/resources/foodproductdevelopment/Chapter-3-1-2.htm
3. https://worldwidescience.org/topicpages/s/shelf+life+determination.html
4. https://courses.lumenlearning.com/boundless-marketing/chapter/packaging/
5. https://forto.com/en/blog/modes-transportation-explained-best/

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	3	9	1	9	**43**
CO2	3	1	1	9	1	3	3	**21**
CO3	3	1	3	9	1	3	3	**23**
CO4	3	3	3	9	3	3	9	**33**
CO5	9	3	3	9	9	3	9	**45**
Total	**27**	**11**	**19**	**39**	**23**	**13**	**33**	**165**

Low-1 Medium-3 High-9

Skill Enhancement Course –V Food Preservation Practicals

(For Students Admitted from 2022-2023)

Semester:V **Hours /week: 2**
Subject Code: IBNDS54P **Credit: 2**

Course Objectives:

1. To study the importance microorganisms in food preservation and acquire knowledge on different preservation techniques used to enhance the shelf span of food product.
2. To know the household methods ofpreserving food.

Unit I **(9hours)**

Preservation by sugar

Preparation ofJam: Mixed fruit jam, Apple jam, Guava jam, Pineapple jam
Preparation of jelly: Apple jelly, Guava jelly, Tutti-frutti.

Unit II **(9hours)**

Preparation of Squash: Pineapple squash, Orange squash, Sappota squash and Grape squash.
Fruit preserves- Fruit bar, Ginger murabha.

Unit III **(9 hours)**

Preservation by salt: Pickles – Onion pickle, Mango pickle, Garlic Pickle, Dried fish *Vathalvadakam*- Cluster bean *vathal*, Brinjal, Bitter gourd, Ladies finger *Vadamkam*- Rice, sago.

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Unit IV **(9 hours)**

Preparation of Spice products: Tomato sauce, Tomato ketchup

Unit V **(9 hours)**

Preservation by fermentation Saurekaurat, Curd, Lassie, Wine

Course Outcomes:

After successful completion ofthis course, student will be able to

CO1: Define food preservation and indicate the different types natural and chemicalpreservatives used for food preservation

CO2: Apply the methodsof preserving foods by adding salt (*Vathal Vadakkam)*

CO3: Demonstrate on different methods of food preservation techniques

CO4: Evaluate the different preparation methods of spice products

CO5. Formulate the different preparation methods offermented products

Text Books:

1. *Laboratory Manual of Fruit and Vegetable Products* (Classic Reprint), Published by FB&C Limited,2018.
2. Mohammad U. H. Joardder,Mahadi Hasan Masud, *Food Preservation in Developing Countries: Challenges and Solutions*, Springer International Publisher,2019.

Reference Books:

1. GaryS. Tucker, *Food Preservation and Bio deterioration*, WileyPublishers,2016.
2. Fereidoon Shahidi, *Handbook of Antioxidants for Food Preservation*, Wiley-Blackwell,2015.
3. SrilakshmiB, *Food Science*, New Age Publication, Delhi, 8th Edition,2019.

Journals:

1. Journal of Food & Microbiology
2. Journal of Food Processing &Technology
3. Journal of Food Processing & Preservation

E-Resources:

1. www.newfoodmagazine.com
2. www.nzifst.org.nz
3. www.itrhd.com
4. https://www.tarladalal.com/tomato-ketchup-tomato-sauce-homemade-tomato-ketchup- 40725r
5. http://ecoursesonline.iasri.res.in/mod/page/view.php?id=5168

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	3	3	9	3	9	**45**
CO2	9	9	9	3	3	3	9	**45**
CO3	9	9	9	9	3	3	9	**51**
CO4	9	9	9	9	3	3	9	**51**
CO5	9	9	9	9	3	3	9	**51**
Total	**45**	**45**	**39**	**33**	**21**	**15**	**45**	**243**

Low-1 **Medium-3** **High-9**

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Skill Enhancement Course - VI Food Adulteration Practicals

(For Students Admitted from 2022-2023)

Semester: VI **Hour/week:2**

Subject Code: IBNDS65P **Credit: 2**

Course Objectives:

1. To educate about common food adulterants and their detection
2. To enable students to familiarize about the testing methods for adulteration

List of Experiments:

Unit I **(9 hours)**

1. Detectionof Vanaspati in ghee or butter.
2. Detectionof Kasseri flour in basin (gram flour).
3. Detectionof Metanil yellow inturmeric.

Unit II **(9 hours)**

1. Detectionof aregmone oil in edible oil.
2. Detection of chicory in coffee.
3. Detectionof adulteration in milk.

Unit III **(9 hours)**

1. Detectionof adulteration in spices.
2. Detection of adulteration in honey.
3. Detectionof adulteration in grains/grain-based flours.

Unit IV **(9 hours)**

1. Testing adulteration of cereal and cereal products
2. Testing adulteration of pulses
3. Testing adulteration of sugars &Preserves

Unit V **(9 hours)**

1. Testing adulterationof Beverages.
2. Testing adulteration of condiments

Course Outcomes:

After successfulcompletion of this course, student will be able to

CO1: Highlight the common food adulterants and discuss the advantage and disadvantages of food adulterants

CO2: Summarize the knowledge in the aspects of adulteration

CO3: Explain the various adulterants used in food samples by testing the samples

CO4: Investigate the food adulteration byits qualitative analysis

CO5: Create awareness about adulteration byfinding the chemical materials present in food substances

Text Books:

1. Shyam Narayan Jha, *Rapid Detection of Food Adulterants and Contaminants-Theory and Practice* Central Institute ofPost-Harvest Engineering and Technology, India, 2016.
2. Pearson D, *The Chemical Analysis of Foods*, Longman Group Ltd, 7th Edition, 2019.

VMU ACADEMIC COUNCIL

Reference Books:

1. Battershall Jesse P, *Food Adulteration and Its Detection*, Public,USA, 2017.
2. L. N. Hegde , *Quality Control in Fruits and Vegetables*, Discovery Publishing House Private Limited,2016.
3. R R Siva Kiran, *Manual for Detection of the Common Food Adulterants*, Create Space Publishers,1st Edition,2015.

Journals:

1. Journal of the International Society of Sports Nutrition
2. Journal of Sports Medicine
3. Clinical Journal of Sports Medicine

E-Resources:

1. ww.jissn.biomedcentral.com
2. www.topendsports.com
3. www.sportsnutritionsociety.org
4. http://egyankosh.ac.in/bitstream/123456789/33697/1/Practical%20-13.pdf
5. https://vikaspedia.in/health/health-campaigns/beware-of-adulteration/methods-for- detection-of-common-adulterants-in-food.

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	3	9	9	3	3	3	**39**
CO2	3	3	9	3	3	3	9	**33**
CO3	9	9	9	9	3	3	3	**45**
CO4	9	3	9	3	1	3	3	**31**
CO5	9	3	9	9	3	3	1	**37**
Total	**39**	**21**	**45**	**33**	**13**	**15**	**19**	**185**

Low-1 Medium-3 High-9

General Interest Course IV– Women Entrepreneurship

(For Students Admitted from 2022-2023)

Semester: III **Hours /week:2**
Subject Code: IBWE5 **Credit:2**

Course Objectives:

1. To promote women entrepreneurship and reduce the rate of unemployment
2. To elucidate the role ofvarious developmental schemes supporting women entrepreneurship

Unit I **(6 hours)**

Women Entrepreneurship: Meaning, Definition, Characteristics, Factors affecting Entrepreneurship Growth: Economic, Social, Cultural, Personality, Psychological, Sociological and Motivational Factors,Role ofEntrepreneurship in Economic Development.

Unit II **(6 hours)**

Entrepreneurship Competencies: Competence – Meaning, Components: Knowledge, Skill, Traits and Motives - Case Competency – Qualities of Entrepreneurs – Types of Entrepreneurs– Functions of Entrepreneurs.

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Unit III **(6 hours)**

Entrepreneurship Journey: Self –Assessment of Qualities, skills, Resources and Dreams, Generation of ideas, Business Ideas Vs Business Opportunities, Opportunity Assessment – Factors, Micro and Macro Environment, Feasibility Study, Business Plan Preparation-Case Study of Successful Entrepreneurs.

Unit IV **(6 hours)**

Start-up: Meaning-Types-Requirements for new Enterprise Creation-Family Business Management-SocialEntrepreneurship-Startup India Ecosystem-Schemes-Registration Process.

Unit V **(6 hours)**

Entrepreneurship Development Programmes: Objectives-Special Women EDPs-Micro Enterprises and Self Employment Opportunities-Supporting Schemes for Women Entrepreneurs- DIC-NABARD-Commercial Banks. Self-Employment LoanScheme: PMEGP-NEEDs-UYEGP.

Course Outcomes:

After successfulcompletion of this course, student will be able to

CO 1: Understand the role of women entrepreneurship in different facets ofsociety
CO 2: Knowthe various livelihood supports for women Employment opportunities
CO 3: Elucidate the role of various developmentalschemes supporting women entrepreneurship
CO 4: Examine the various governmental and non-governmental support offered to the entrepreneurs
CO 5: Criticallyanalyze various entrepreneurship schemes in India

Text Books:

1. Vasanth Desai, *Entrepreneurship Development*, Himalaya Publishing House, Mumbai, 1st Edition, 2019.
2. Kathleen R Allen, *Launching New Ventures, An Entrepreneurial Approach*, Cengage Learning,2016.

Reference Books:

1. Steven Fisher, Ja-nae Duane, *The Startup Equation -A Visual Guidebookfor Building Your Startup*, Indian Edition, Mc Graw HillEducation India Pvt. Ltd,2016
2. BruceR. Barringer, R.Duane, *Entrepreneurship successfully, Launching New Ventures*. Pearson,2019
3. Gordon E, Natarajan K, *Entrepreneurship Development*, Himalaya Publishing House, Mumbai, 6th Edition, 2017.

Journals:

1. Journal ofWomen's Entrepreneurship and Education
2. International Journal of Gender and Entrepreneurship
3. Journal of Innovation and Entrepreneurship

E-Resources:

1. www.dic.org
2. www.msme.tn.govt.in
3. www.nismsme.org
4. www.entrepreneur.com
5. http://www.entrepreneurship.org
6. http://www.forbes.com/forbeswoman.

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Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	3	3	1	3	9	**37**
CO2	9	9	3	3	1	3	3	**31**
CO3	9	9	3	9	1	3	3	**37**
CO4	9	9	3	3	1	3	3	**31**
CO5	9	9	3	9	1	3	3	**37**
Total	**45**	**45**	**15**	**27**	**5**	**15**	**21**	**173**

Low-1 Medium-3 High-9

Open Elective Course I-Food Preservation Techniques

(For Students Admitted from 2022-2023)

Semester: III **Hour/week: 2**
Subject Code:IBOE3HS **Credit: 2**

Course Objectives:

1. To impart basic knowledge of cold preservation and freezers, dehydration, irradiation, food packaging and thermal processing
2. To impart basic knowledge of heat and cold preservation and freezers, fermentation, current techniques in food preservation

Unit I **(6hours)**

Food preservation - Definition, importance, Principles and Methods of Food Preservation. Classification of foods for processing. Need for preservation, types of spoilage, role of micro-organism in food spoilage, prevention of food spoilage, shelf life of food products, Factors affecting shelf life.

Unit II **(6 hours)**

Preservation by addition of sugar - General Principles and methods of preparation of jams, jellies and Marmalades, theory of gel formation. Failure to jelly and jam to set. Preparation of squashes & syrups.

Preservation by addition of salt - Pickling and curing of meat & scope of food processing industry in India in developing Entrepreneur.

Unit III **(6 hours)**

Preservation by Use of High Temperature: Principle of dehydration-heat and mass transfer. Pasteurization, Sterilization and their types. Canning-steps, types of cans, advantages, disadvantages. Bottling - steps, advantages, disadvantages. Food dehydration - concept of dehydration and sun drying. Types of driers - advantages, disadvantages.

Unit IV **(6 hours)**

Preservation by use of Low Temperature - Types - Common types of cold storage, refrigeration-requirement of refrigerated storage, characteristic of refrigerant, refrigeration during transport, defects in cold storage. Freezing – types, Principles and methods of freezing, Freeze drying. Advantages and Disadvantages of freezing.

Unit V **(6hours)**

Mechanism of microbial inhibition, mechanism and action of preservatives in processed food: Inorganic &Organic preservatives – Antibiotics. Antioxidants and its role.

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Radiation of Foods: Sources of radiation, units of radiation- Mode of action of irradiation, radiation effect on proteins enzyme System. Microwave heating, properties of microwaves, applications in food processing and Preservation.

Preservation of Semi moist foods: Principles and Intermediate moist foods.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Recognize the principles of food preservation and explain the different types of preservation techniques

CO2: Practice the skills in methods of food preservation

CO3: Prioritize the perishable and non-perishable foods from microbial contamination and microbial spoilage

CO4: Critique the doses of preservatives and irradiation rays in foods to control the food spoilage

CO5: Formulate the preservation of foods using salt, sugar, and chemicals

Text Books:

1. Srilakshmi. B, *Food Science*, New Age International (P) Limited Publishers, 6th Edition,2015.
2. Sivasankar.B; *Food Processing and Preservation*, PHI Learning Private Limited,2011.

Reference Books:

1. Lillian Hoagland Meyer, Food Chemistry**,** CBS Publishers and Distributors, 2004.
2. Subbulakshmi. G and Shobha. A.U; Food Processing and Preservation, New Age International(P) Limited Publishers,2021.
3. Srivastava R.P. Sanjeev Kumar and Kumar S., Fruit and Vegetable Preservation: Principles and Practices. 3rd Edition, International Book Distributing Company, 2019.

Journals:

1. Journal of Food & Microbiology
2. Journal of Food Processing &Technology
3. Journal of Food Processing & Preservation

E-Resources:

1. www.newfoodmagazine.com
2. www.nzifst.org.nz
3. www.itrhd.comJournals
4. https://www.pdfdrive.com/food-microbiology-an-introduction-e166783912.html
5. https://www.pdfdrive.com/foodborne-parasites-food-microbiology-and-food-safety-e157137947.html

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	9	9	9	9	9	**63**
CO2	9	9	9	9	9	9	9	**63**
CO3	9	9	9	9	9	9	9	**63**
CO4	9	9	3	9	9	9	9	**60**
CO5	9	9	3	9	9	9	9	**60**
Total	**45**	**45**	**39**	**45**	**45**	**45**	**45**	**309**

Low-1 Medium-3 High-9

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Open Elective Course II-Basics and Advance Hand Embroidery Practicals

(For Students Admitted from 2022-2023)

Semester: **Hours/week:2**
Subject Code:IBOE4HSP **Credit:2**

Course Objectives:

1. To impart practical knowledge in various surface ornamentation techniques
2. To equip the students to analyze suitable surface embellishment usedon different products

List of Experiments: **(30 hours)**

1. **Introduction to Embroidery Stitches** **(6 hours)**

2. **Basic Embroidery Stitches:** **(14 hours)**
   a. Line stitches – running and its variation – whipped running – looped running– stepped thread –back stitch – stem stitch – couching.
   b. Loop stitches – chain stitch and its variations – detached – lazy daisy stitch – square chain
   c. Filling stitch – satin– long and short – seeding – Frenchknot – bullionknot – fly stitch
   d. Crossstitch– cross stitch – herringbone – double herringbone – close herringbone.
   e. Edging stitch– buttonhole and its variations – blanket – closed buttonhole.
   f. Feather stitch– fishbone

3. **Advance Embroidery Techniques** **(10hours)**
   Applique work – cut work – patch work– bead work – Sequins work – Ribbon works – Aariand Zardozi embroidery.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Outline the basic embroidery stitches
CO2: Analyze the different methods of surface ornamentation techniques
CO3: Identify the advance embroidery works
CO4: Recommend the appropriate surface embellishment techniques to enhance the value of home furnishing and apparel fabrics
CO5: Design and develop appropriate designs for embroidery in textile products

Text Books:

1. KimberlyIrwin , *"Surface Design for Fabric"*, BloomsburryAcademic,2015
2. Yumiko Higuchi—*A Year of Embroidery*‖ ,Shambhala Publisher,2018.
3. Jessisa Pile –*Fashion Embroidery*‖ **,** Bats ford Publisher, 2018.

Reference Books:

1. Dorling Kindersley*"Embroidery*‖ , DKPublisher,2015
2. Betty Barnden *"Embroidery Stitch Bible*‖ , Search Press LTD Publisher,2017
3. Jessika pile *"Fashion Embroidery*‖ , Bats ford Publisher, 2018.

Journals:

1. Journal ofTextile Science
2. Journal of Surface Design
3. Journal of Application Techniques

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E Resources:

1. https://thedesigncart.com/blogs/news/the-beautiful-details-of-surface-ornamentation
2. https://thedesigncart.com/blogs/news/surface-ornamentation-history-and-types
3. https://sosopoetry.blogspot.com/2018/08/fabric-surface-embellishment-techniques.html
4. https://www.achievementlearn.com/cloth-surface-embellishment-techniques/
5. https://archive.hs.iastate.edu/past-exhibits/on-the-surface-textile-embellishment-techniques

Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	3	3	1	1	3	1	1	**13**
CO2	9	3	9	9	3	1	3	**37**
CO3	9	9	9	9	3	3	3	**45**
CO4	3	1	9	9	3	1	3	**29**
CO5	3	3	3	9	9	1	9	**37**
Total	**27**	**19**	**31**	**37**	**21**	**7**	**19**	**161**

Low-1 Medium-3 High-9

FIRST SEMESTER

(Only For Microbiologyand ChemistryDepartment Students)

Ability Enhancement Compulsory Course Biochemistry –I

(For Students Admitted from 2022-2023)

Semester: **Hours/week:6**

Subject Code:IBCHA14/IBMBA13 **Credit:5**

Course Objectives:

1. To understand the chemical characteristics of different classes of nutrients with referenceto their physical properties, and to relate this to their functions in the body
2. To establish the basic principles of metabolism and its regulation

Unit I **(18 hours)**

Carbohydrates – Definition, Functions, classifications, structure, physical and chemical properties, Biochemical importance.

Unit II **(18 hours)**

Amino acids -Definition, Functions, Classifications, Structure, Physical and chemical properties, Biochemical importance.

Proteins - Definition, Functions, Classifications, Structure (primary, secondary, tertiary and quaternary), Physical and chemical properties, Biological importance of peptides.

Unit III **(18 hours)**

Lipids– Definition, Functions, classifications. Fatty acids-Definition classification, physical and chemical properties .Triglycerides, Phospholipids, glycolipids, steroid-outline study

Unit IV **(18 hours)**

Nucleic acids - Definition, Functions, and Components-Nucleotides and nucleosides. DNA&RNA – structure and function, types. Differentiate between DNAand RNA.

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Unit V **(18 hours)**

Vitamins-Definition, Classifications and Biochemical importance. **Minerals** - Definition, classifications and Biochemical importance. Interrelationship between Vitamin-Vitamin, Vitamin-Mineral**.**

Course Outcomes:

After successful completion of this course, student will be able to

CO 1: Relate the physical and chemical properties of various biomolecules andunderstand the knowledge of the principles of Biochemistry

CO 2: Apply the knowledge to recognize the classification, structure and functions of Macromolecules

CO 3: Integrate the properties of all Macromolecules.

CO 4: Inspect and understand the basics of genetic material

CO 5: Summarize the chemistry of micronutrients and their biochemical role

Text Books:

1. Dr.U.Satyanarayana, U.Chakrapani, *Biochemistry*, Elsiever Publication, 5th Edition,2017.
2. Dr.Kondreddy Rambabu, Dr.Pendyala Siva Kumar, Dr.Pendyala Kameswari, *Textbook ofBiochemistry*, AITBS Publishers, India, 2nd Edition, 2014.

References Books:

1. David L. Nelson, Michael M. Cox Lehninger *Principles of Biochemistry*, Macmillan Publishers, 7th Edition,2017.
2. Victor Rodwell, David Bender , P.AnthonyWeil, Peter Kennelly, KathleenBotham, *Harper's Illustrated Biochemistry***,** Lange Publishers, 30th Edition, 2017.
3. Donald Voet, Judith G.Voet, *Biochemistry*, John Wileyand Sons Publishers, 4th Edition,2016.

Journals:

1. International Journalof Biochemistry and Biophysics
2. International Journalof Biochemistry and Molecular Biology
3. International Journalof Biological and Chemical Sciences

E-Resources:

1. https://www.pdfdrive.com/biochemistry-e187234482.html
2. https://www.pdfdrive.com/textbook-of-biochemistry-for-medical-students-e186671773.html
3. https://www.pdfdrive.com/lippincotts-biochemistry-6th-edition-e41485405.html
4. https://www.pdfdrive.com/textbook-of-biochemistry-e14983388.html
5. https://www.pdfdrive.com/lehninger-principles-of-biochemistry-e189596394.html

Course Outcomes	**Programme Outcomes**							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	3	3	1	9	3	**37**
CO2	9	9	3	3	1	9	3	**37**
CO3	9	9	3	3	1	9	3	**37**
CO4	9	9	3	3	1	9	3	**37**
CO5	9	9	3	3	1	9	3	**37**
Total	**45**	**45**	**15**	**15**	**5**	**45**	**15**	**185**

Low-1 **Medium-3** **High-9**

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SECOND SEMESTER

(Only For Microbiology and Chemistry Department Students)

Ability Enhancement Compulsory Course - Biochemistry –II

(For Students Admitted from 2022-2023)

Semester:II **Hours/week: 6**

Subject Code:IBCHA24/IBMBA23 **Credit:5**

Course Objectives:

1. To understand the chemical characteristics of different classes of nutrients with reference to theirphysical properties, and to relate this to their functions in the body
2. To establish the basic principles of metabolism and its regulation

Unit I **(18 hours)**

Enzymes- Definition, classification, properties, Factors influencing enzyme action. Enzyme specificity, enzyme inhibition, Application of enzymes in different field.
Coenzyme, types of coenzymes and its role in carbohydrate metabolism.

Unit II **(18 hours)**

Metabolism of Carbohydrates :Introduction to Metabolism, Metabolism of Carbohydrates- glycolysis, PDH, TCA, Gluconeogenesis, Glycogenesis, Glycogenolysis, HMP Shunt, Uronic acid pathway.

Unit III **(18 hours)**

Metabolism of Amino acids and Proteins:Proteolytic enzymes –endopeptidase and exopeptidase. Decarboxylation, Deamination, Transamination, Urea cycle. Metabolism of phenyl alanine, tyrosine, tryptophan, histidine, proline and arginine.

Unit IV **(18 hours)**

Metabolism of Lipids: Biosynthesis of fatty acids, Oxidation of fatty acids, Ketogenesis. Metabolismof cholesterol, triglycerides and phospholipids.

Unit V **(18 hours)**

Nucleic acid : Biosynthesis ofDNA and RNA, Protein.
Biological oxidation : ETC and Oxidative phosphorylation.

Course Outcomes:

After successful completion of this course, student will be able to

CO 1: Recall the metabolic pathways of various biomolecules and understand the activity ofenzymes and co-enzymes in all metabolic pathways
CO 2: Apply the knowledge to recognize the anabolic and catabolic pathways of all metabolic cycles
CO 3: Calculate and understand the energy production in every metabolic pathway.
CO 4: Inspect and understand the dogma of life.
CO 5: Summarize the Energy calculation for all metabolic pathways

Text Books:

1. Dr.U.Satyanarayana, U.Chakrapani, *Biochemistry*, Elsiever Publication, 5th Edition, 2017.
2. Dr. Kondreddy Rambabu, Dr.Pendyala Siva Kumar, Dr.Pendyala Kameswari, *Textbook of Biochemistry*, AITBS publishers, India, 2nd Edition,2014.

ANNA ACADEMIC COUNCIL

References Books:

1. David L. Nelson, Michael M. Cox Lehninger, *Principles of Biochemistry*, Macmillan Publishers, 7th Edition,2017.
2. Victor Rodwell, David Bender , P.AnthonyWeil, Peter Kennelly, Kathleen Botham, *Harper's Illustrated Biochemistry*, Lange Publishers, 30th Edition, 2017.
3. Donald Voet, Judith G.Voet, *Biochemistry***,** John Wileyand Sons Publishers, 4th Edition,2016.

Journals:

1. International Journal of Biochemistry and Biophysics
2. International Journal of Biochemistry and Molecular Biology
3. International Journalof Biologicaland Chemical Sciences

E-Resources:

1. https://www.pdfdrive.com/biochemistry-e187234482.html
2. https://www.pdfdrive.com/textbook-of-biochemistry-for-medical-students-e186671773.html
3. https://www.pdfdrive.com/lippincotts-biochemistry-6th-edition-e41485405.html
4. https://www.pdfdrive.com/textbook-of-biochemistry-e14983388.html
5. https://www.pdfdrive.com/lehninger-principles-of-biochemistry-e189596394.html

Course Outcomes	**Programme Outcomes**							
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**Total**
CO1	9	9	3	3	1	9	3	**37**
CO2	9	9	3	3	1	9	9	**43**
CO3	9	9	3	3	1	9	3	**37**
CO4	9	9	3	3	1	9	3	**37**
CO5	9	9	3	3	1	9	3	**37**
Total	**45**	**45**	**15**	**15**	**5**	**45**	**21**	**191**

Low-1 Medium-3 High-9

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B SC. HOME SCIENCE - FASHION DESIGNING

[Three Year Regular Programme]

(For Students Admitted from 2022-23)

Programme Specific Outcomes:

On completion of the Under Graduate Degree Programme, student will be able to gain

PSO1: Create strong foundation in designing and have the ability to visually represent it by illustrations, photographs, graphics and visual display of merchandise.

PSO2: Apply the different methods of garment construction and create Apparel designing techniques

PSO3: Creating exposure by learning and designing trends through become an energetic entrepreneur to run own business

PSO4: Educate and practiced in all aspects of the designing process. Throughout their experience, students produce original designs and develop collections for their portfolio

PSO5: Apply to consumer design emphasis track as relevant, creative professionals prepared for the future direction and current trends of this exciting field

PSO6: Choosing Fashion designing employment areas are Design studio, Boutique house, Dyeing and Printing factories, Apparel Export houses, Jewelry houses, Fashion trend sector, Merchandising firms, Media, Research and development firms, Retail/stores, Textile processing mill

PSO7: Good job opportunities with government sponsored, TRB-Sewing Special Teacher. Handloom, Silk Board, Khadi, Jute and Craft development organizations.

PREAMBLE

The following changes introduced in the curriculum

Allied Paper renamed as Ability Enhancement Compulsory Course Core Elective renamed as Discipline Specific Elective

Skill-Based Elective renamed as Skill Enhancement Course

Non-major Elective renamed as Open Elective Course

- In Semester – I, Core I Fundamentals of apparel designing (Theory cum Practicals), the Theory and Practical Contents separated and mentioned as a List of Experiments in each unit. In this course content topics such as single lock stitch machine, chain lock machine and over edge stitch machine introduced under Sewing Machine terms.
- In Semester – III, Core VI –Wet processing (Theory cum Practicals) title changed as Wet Processing –Dyeing. Bleaching and Mercerization topics added in Unit –II.
- In Semester – II, Core IV – Indian Historic Costumes and Traditional design title changed as Historic Costumes and Traditional design.
- In Semester – IV, In Core VIII-Technical Textiles topics such as Agro textile, bulletproof textile, and Protective textiles were added in Unit IV
- In Semester V, Textile Dyeing and Printing Practicals have been renamed as Textile Printing Practicals, and dyeing terminologies w e r e removed fromthis course.
- In Semester – VI, In Core XIII-Fashion Photography and Modeling (Theory Cum Practicals) new topics such as video editing and mixing, creating posts for social media (Instagram, Pinterest, YouTube etc) were included in Unit-V.
- In Semester – VI Core XVII-Computer Aided Design (CAD) Practicals - II the experiments list was updated with new topic Mobile Apps for designing.

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PROGRAMME CODE: UFD

PROGRAMME STRUCTURE

Sem	Subject Code	Part	Course	Subject Title	Hours /Week	Credit	CIA	ESE	Total Marks
I	IBLT11 IBLA11 IBLH11	I	Language I	Tamil I/Basic Arabic-I / Hindi-I	5	3	40	60	100
	IBLEI12/ IBLEII12	II	Language II	English I a or b	5	3	40	60	100
	IBFDC11	III	Core I	Fundamentals of Apparel Designing [Theory cum Practicals]	6	5	40	60	100
	IBFDC12	III	Core II	Principles of Pattern Making	5	4	40	60	100
	IBFDA13P	III	AECC-I	Fashion Illustration I Practicals	5	4	40	60	100
	IBFDS14	IV	SEC-I	Fibre to Yarn	2	2		50	50
				Library/Browsing	1				
				Remedial/ Games	1				
				Total	**30**	**21**	**200**	**350**	**550**
II	IBLT21 IBLA21 IBLH21	I	Language I	Tamil II/ Basic Arabic-II /Hindi-II	5	3	40	60	100
	IBLEI22/ IBLEII22	II	Language II	English II a or b	5	3	40	60	100
	IBFDC21P	III	Core III	Fashion Illustration II Practicals	4	4	40	60	100
	IBFDC22		Core IV	Historic Costumes &Traditional Design	5	5	40	60	100
	IBFDA23P		AECC-II	Construction for Children's Apparel Practicals	5	4	40	60	100
	IBFDS24P	IV	SEC-II	Surface Embellishments Practicals	2	2	-	50	50
	IBES2	IV	General Interest CourseI	EnvironmentalScience	2	2	-	50	50
	IBFDX2P	-	Extra Credit	Fashion Accessory Designing Practicals	-	2	-	100	100
				Library/Browsing	1				
				Remedial/ Games	1				
				Total	**30**	**23+2**	**200**	**400+ 100**	**600+ 100**

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III	IBLT31 IBLA31 ILBH31		Language I	Tamil III/ Basic Arabic III / Hindi-III	5	3	40	60	100
	IBLEI32/ IBLEII32		Language II	English III a or b	5	3	40	60	100
	IBFDC31	III	Core V	Fashion Studies	4	4	40	60	100
	IBFDC32		Core VI	Wet Processing – Dyeing [Theory Cum Practicals]	4	4	40	60	100
	IBFDA33P		AECC I	Construction for Women's Apparel Practicals	4	4	40	60	100
	-	IV	OEC	-	2	2	-	50	50
	IBFDS34P	IV	SEC-III	Draping Techniques Practicals	2	2	-	50	50
	IBHR3		General Interest CourseII	Human Rights	2	2	-	50	50
	IBXTN3	V	Extension Activities	NSS / CSS	2	2	100	-	100
	IBFDX3P/ IBFDX3O	-	Extra Credit	Boutique Internship /*Online Course (Advanced Textile Printing Technology-NPTEL)	-	2	_	100	100
				Total	**30**	**26+2**	**300**	**450+ 100**	**750+ 100**
IV	IBLT41 IBLA41 IBLH41		Language I	Tamil IV / Basic Arabic III /Hindi-IV	5	3	40	60	100
	IBLEI42/ IBLEII41		Language II	English IV a or b	5	3	40	60	100
	IBFDC41P	III	Core VII	Construction for Men's Apparel Practicals	5	4	40	60	100
	IBFDC42		Core VIII	• Integrated Course - Technical Textiles	4	4	40	60	100
	IBFDA43		AECC-II	Fabric Structure & Design [TheoryCum Practicals]	5	4	40	60	100
		IV	OEC	-	2	2	-	50	50
	IBFDS44	IV	SEC-IV	Clothing Care and Maintenance	2	2	-	50	50
	IBLVE4		General Interest CourseIII	Life skills and Value Education	2	2	-	50	50
	IBFDX4P/ IBFDX4O		Extra Credit	Internship in Textile Processing-Manufacturing Unit/*Online	-	2	-	100	100

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				Course(Basic of Pattern Making and Sewing - Swayam)					
				Total	**30**	**24+2**	**200**	**450+ 100**	**650+ 100**
V	IBFDC51P		Core IX	Computer Aided Design (CAD) Practicals-I	4	3	40	60	100
	IBFDC52		Core X	# Internship- Fashion Merchandising and Marketing	5	5	40	60	100
	IBFDC53		Core XI	Boutique Management	5	4	40	60	100
	IBFDC54P		Core XII	Home Furnishing Practicals	4	3	40	60	100
	IBFDE5A/ IBFDE5B		DSE -I	a. Apparel Quality Control/ b. Apparel Production Management	4	4	40	60	100
	IBFDE5C/ IBFDE5D		DSE- II	a.Home Furnishing b.Apparel Business Accounting and Entrepreneurship	4	4	40	60	100
	IBFDS55P	IV	SEC-V	Textile Printing Practicals	2	2	-	50	50
	IBWE5	IV	General Interest Course IV	Women Entrepreneurship	2	2	-	50	50
	IBESX5/ IBFDX5O	-	Extra Credit	Employability Skills/*Online Course(Basics of Event Management- Swayam)	-	2	100		100
				Total	**30**	**27+2**	**240+ 100**	**460**	**700+ 100**
VI	IBFDC61	III	Core XIII	• Integrated Course – Fashion Photography and Modeling [Theory Cum Practicals]	5	5	40	60	100
	IBFDC62		Core XIV	Fashion Retailing & Research	5	5	40	60	100
	IBFDC63P		Core XV	Fashion Portfolio Presentation Practicals	5	4	40	60	100
	IBFDC64		Core XVI	Event design and Management	4	2	40	60	100
	IBFDC65P		Core XVII	# Internship- Computer Aided Design (CAD) Practicals-II	4	2	40	60	100

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	IBFDE6A/ IBFDE6B	DSE-III	a. Fashion Communication /b. Textile Testing	4	4	40	60	100
	IBFDS66P	SEC-VI	FashionStyling Practicals	2	2	-	50	50
	IBFDX6W / IBFDX6O	ExtraCredit	Mini Project / *Online Course (Textile & Quality Analysis-Swayam)	-	2	-	100	100
			Library/Browsing	1	-	-	-	-
			Total	**30**	**24+2**	**240**	**410+ 100**	**650+ 100**
			Grand Total	**180**	**145+ 10**	**1380 +100**	**2520 +400**	**3900+ 500**

AECC-AbilityEnhancement Compulsory Course
SEC-Skill Enhancement Course
DSE-Discipline Specific Elective
OEC-Open Elective Course

*For online certification credit alone will be assigned on submission of certificate obtained through appearing for online examination fromSwayam, Spoken tutorial, EDX, NPTEL etc.

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Core I – Fundamentals of Apparel Designing [Theory cum Practicals]

(For Students Admitted from 2022-23)

Semester: I **Hours /Week: 6**
Subject Code: IBFDC11 **Credit: 5**

Course Objectives:
1. To know about the sewing machine parts and functions
2. To enable students to know various types of seams, seam finishes, plackets, pockets, neckline, sleeves and collars

Unit I **(18 hours)**

Introduction to Sewing Machine : Parts and functions of a single needle lock stitch & double needle lock stitch machine, classification -Single thread-types of sewing machine, flat lock machine, over lock machine, three, four, five thread machines– special attachments. specialty sewing machines -fashion maker, button hole & button fixing machine, blind stitching machine, embroidery machines, faggoting. Problems in sewing machines - essential tools- cutting tools, measuring tools, marking tools, general tools, pressing tools.

Unit II **(18 hours)**

Seams and Seam finishes: Introduction to seams and seam finishes-types-plain, flat fell, french, piped seam, top stitched, overcast, hem, edge stitched, bound. Introduction to neckline finishes, types-bias facing, bound facing and decorative facing. Introduction to binding, types-single bias binding, double bias binding.

List of Experiments:
1. Seam-plain, Flat fell, French, piped seam,
2. Seam finishes-TopStitched, overcast, hem, edge stitched, bound.
3. Neckline finishes-bias facing, bound facing and decorative facing.
4. Binding-single bias binding, double bias binding.

Unit III **(18 hours)**

Fullness and Yokes: Introduction to fullness, types- darts, tucks -pin, cross, group tucking with scalloped effect. Introduction to pleats, types-knife, box, kick, cartridge, gathering by machine, elastic. Introduction to ruffles, types- single, double, flares and godets, gathers and shirrs flounces. Introduction to yoke, types-simple yoke, yoke supporting fullness.

List of Experiments:
1. Fullness-darts, tucks-pin, cross, group tucking with scalloped effect
2. Pleats-knife, box, kick, cartridge, gathering by machine, elastic
3. Ruffles-single, double, flares and godets, gathers and shirrs flounces.
4. Yoke-Simple yoke, yoke supporting fullness.

Unit IV **(18 hours)**

Plackets and Fasteners: Introduction to plackets-characteristics of a good placket, types-inconspicuous placket and conspicuous plackets. Method of construction. Introduction to fasteners-conspicuous (Button and button-holes, button loops, button with holes, shank buttons, eyelets and cords). Inconspicuous (press buttons, hooks and eyes, zips).

List of Experiments:

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1. Plackets-continuous, bound, faced and zipper plackets, Tailored Placket
2. Fasteners- button and buttonhole, Press button, hook and eye, Zips

Unit V **(18 hours)**

Sleeves, Collars and Pockets: Sleeves-types, modified armhole-squared, armhole. Cap sleeve and Magyar sleeve. Introduction to collar, types- peter pan – scalloped – square – full shirt collar– open collar – Chinese collar – shawl collar. Introduction to pockets- types- patch, bound, pocket in a seam, single or double lip pocket.

List of Experiments:

1. Sleeve- set-in-sleeves-plain sleeve, puff sleeve, bishop sleeve, bell, circular, raglan, kimono.
2. Collar – peter pan, scalloped, square, full shirt collar, open collar, Chinese collar, shawl collar
3. Pockets- patch, bound, pocket in a seam, single ordouble lip pocket.

Course Outcomes:

After successful completion of this course, student will be able to

CO 1: State the functions of sewing machines and identify the parts
CO 2: Applythe finishing method to the fabric
CO 3: Analyze the basic types of sleeves, collar and pockets.
CO 4: Experiment the components of apparel designing
CO 5: Createdifferent finishes and its applications

Text Books:

1. Chloe Russell, *Fundamentals of Apparel Design*, Independently Publisher, 2021.
2. Jennifer Lynne Matthews, *Pattern Design : Fundamentals*, Fair banks Publisher, 2018.

Reference Books:

1. Dueep Jyot Singh, JohnDavidSon, *Teach Yourself Stitch Craft and Dressmaking Volume V*, Mendon Cottage Books Publisher, 2016.
2. T Karthik, P Ganesan, D Gobalakrishnan, *Apparel Manufacturing Technology*, CRC Press Publisher, 2016.
3. Antonio Donnanno, *Fashion Pattern Making Techniques*, Hoaki Books SL Publisher, 2021.

Journals:

1. Journal of Clothing and Textile
2. Journal of Designing Apparel For Consumers
3. Journal of Textile Design

E- Resources:

1. https://www.bloomsbury.com/uk/the-fundamentals-of-fashion-design- 9782940373390/
2. https://www.brainkart.com/article/Seam-Finishes-and-Types-of-Seam- Finishing_35626/
3. http://textilelearner.blogspot.com/2014/11/the-basic-fundamentals-of-apparel.html
4. https://www.britannica.com/
5. https://www.kresent.com/types-of-collars/

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Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	9	3	1	3	3	3	3	**25**
CO 2	3	3	3	3	3	3	3	**21**
CO 3	3	3	1	3	3	3	3	**19**
CO4	9	9	3	3	3	9	3	**39**
CO5	9	3	1	9	9	9	3	**43**
Total	**33**	**21**	**9**	**27**	**21**	**27**	**15**	**147**

Low-1 Medium-3 High-9

Core II – Principles of Pattern Making

(For Students Admitted from 2022-23)

Semester: I **Hours /Week: 5**

Subject Code: IBFDC12 **Credit: 4**

Course Objectives:

1. To develop knowledge of basic information about patternmaking
2. To study the basic methodsof pattern alteration and fitting

Unit I **(15 hours)**

Body Measurement: Importance, preparing for measuring, ladies measurements, children and men's measurements. Standardizing body measurements – importance, techniques used. Preparation of fabric for cutting – Importanceof grain in cutting and construction.

Unit II **(15 hours)**

Pattern making: Methods of pattern making, drafting and draping merits and demerits – types of paper patterns, patterns for personal measurements and commercial patterns – principles of pattern drafting – pattern details – steps in drafting basic bodice front and back and sleeve.

Unit III **(15 hours)**

Pattern Alteration: Methods of identifying pattern alteration. General principles for pattern alteration. Common pattern alteration in a fitted bodice pattern. Garment fitting and assembling standards for a good fit, checking for good fit, solving fitting problems and remedies.

Unit IV **(15 hours)**

Pattern Layout: Definition, purpose, rules in layout, types of layouts for lengthwise striped designs, fabric with bold design, asymmetric designs, and one way designs. What can be done if cloth is insufficient, fabric cutting, transferring pattern marking, stay stitching, ease stitching.

Unit V **(15hours)**

Commercial Pattern and Pattern Grading: Commercial pattern: Definition, merits and demerits, Development of commercial pattern. Pattern grading: Definition, Grading terminology, selecting a grading system, grading techniques, advantages and disadvantages. Computer grading, grading procedures. Grading of basic blocks using draft grading systems.

Course Outcomes:

After successfulcompletion of this course, student will be able to

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CO 1: Understand the basics of pattern making and list out the types of pattern
CO 2: Illustrate the designs and selectionof pattern making principles
CO 3: Assessthe basic pattern setsusing pattern making techniques
CO 4: Examine thegarment fitting, alteration methodologies and assembling techniques
CO 5: Develop creative designs through draping, drafting, flat pattern method

Text Books:

1. Mae Gallagher, *Pattern Fitting,* IndependentlyPublisher,2020
2. Jennifer Lynne Matthews, Pattern Design: Fundamentals, Fairbanks Publisher, 2018

Reference Books:

1. T Karthik, P Ganesan, D Gobalakrishnan, *Apparel Manufacturing Technology,* CRC Press Publisher, 2016
2. Dueep Jyot Singh, John DavidSon, *Teach Yourself Stitch Craft and Dress making VolumeV,*Mendon Cottage Books Publisher,2016
3. Antonio Donnanno, *Fashion Pattern Making Techniques,* Hoaki Books SL Publisher, 2021

Journals:

1. Journal of International Research and Method ofEducation
2. Journal of Education Technology
3. Journal of Optimized Pattern Grading

E - Resources:

1. https://en.wikipedia.org/wiki/Pattern_(sewing)
2.http://dget.nic.in/upload/uploadfiles/files/Sewing_Technology_CTS.pdf
3.http://fashiondegreelink.com/introduction-pattern-drafting#formPage_1
4.http://www.fibre2fashion.com/industry-article/5658/basics-of-pattern-making
5.https://www.clothingpatterns101.com/pattern-grading.html

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	3	1	3	3	3	**19**
CO 2	3	3	3	3	3	3	3	**21**
CO 3	3	3	9	3	3	3	3	**27**
CO4	9	9	1	1	3	9	3	**35**
CO5	9	9	1	9	9	9	9	**55**
Total	**27**	**27**	**17**	**17**	**21**	**27**	**21**	**157**

Low-1 **Medium-3** **High-9**

Ability Enhancement Compulsory Course I
Fashion Illustration I – Practicals

(For Students Admitted from 2022-23)

Semester: I **Hours/ Week: 5**
Subject Code: IBFDA13P **Credit: 4**

Course Objectives:

1. To studythe fundamentals of color theory, the basic figure illustration and shading techniques
2. To impart practical knowledge insketching facial features and head theories

List of Experiments:

1. Lines and line drawings – object drawing and perspective view drawings **(5 hours)**

2. Enlarging and reducing motifs **(10 hours)**

3. Prepare different presentation of fashion illustration **(10 hours)**
   a. Water colour
   b. Poster colour
   c. Colour pencil
   d. Collage work

4. Prepare the Illustrations for the following:- **(10 hours)**
   a. Head theory– 8 ½ , 10½ , and 12
   b. Stick figure
   c. Block Figure
   d. Flesh Figure

5. Draw classic and innovative features of costume designs **(15 hours)**
   a. Collars
   b. Necklines
   c. Pockets
   d. Sleeves
   e. Waistlines, Cuffs, Skirts
   f. Trousers
   g. Yokes
   h. Center Front Line
   i. Princess Line
   j. SideSeam
   k. Bust Line Etc.,

6. Practicing the art of creating textures. **(5 hours)**

7. Illustrating different types of ornaments and accessories. **(10 hours)**

8. Illustrating details of ruffles, cowls, shirring, smocking, quilting, gathers, pleats, frills and flounces**.** **(10hours)**

Course Outcomes:

After successfulcompletion of this course, student will be able to

CO 1: Understand the basic fashion sketching and classifythe various head theories

CO 2: Illustrate the different texture and designs

CO 3: Draw the different styles of garment designing

CO 4: Experiment the coloring techniques- pencil drawing, posters, water colors

CO 5: Develop theown individualstyles

Text Books:

1. Kathryn Hagen, *Fashion Illustration for Designers*, Second Edition, Wavell and Publisher, 2017.
2. Irina Ivanovo, *Haute Couture Fashion Illustration*, Art Design Project, Incorporated Publisher,2018.

Reference Books:

1. Michele Wesen Bryant, *Fashion Drawing*, Second Edition, Laurence King Publisher, 2016.
2. Julius Wiede mann, *Illustration Now Fashion*, Taschen Publisher, 2017.
3. Anna Kiper, Fashion Illustration Inspiration and Techniques, David & Charles Publisher, 2016.

Journals:

1. Journal of Illustration
2. Journal of Illustration Solutions
3. Journal of design

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E-Resources:

1. https://en.wikipedia.org/wiki/Fashion_illustration
2. https://www.iskn.co/fashion-illustration-basics/
3. http://www.vogue.co.uk/gallery/fashion-illustration
4. http://www.purfe.com.au/top-5-fashion-illustration-books/
5. http://sewguide.com/ gather and frills

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	3	3	3	3	3	**21**
CO 2	3	1	3	3	3	9	3	**25**
CO 3	3	3	3	3	9	9	3	**33**
CO4	3	3	3	1	3	3	9	**25**
CO5	3	3	9	9	3	9	9	**45**
Total	**15**	**13**	**21**	**19**	**21**	**33**	**27**	**149**

Low-1 Medium-3 High-9

Core III – Fashion Illustration II Practicals

(For Students Admitted from 2022-23)

Semester: II **Hours /Week: 4**
Subject Code: IBFDC21P **Credit: 4**

Course Objectives:

1. To equip the students with sketching skill in fashion accessories
2. To impart practical knowledge in illustrating concept of inspiration for various garments styles

List of Experiments:

1. Concept offashion drawing **(4 hours)**
2. Drawing of Movement figures- legs &hands **(8 hours)**
3. Drawing of Bone Structure **(4 hours)**
4. Drawing of Muscle view **(4 hours)**
5. Drawing of Front view ½ sheet each **(8 hours)**
6. Drawing of Side view **(8 hours)**
7. Drawing ofBack pose **(8 hours)**
8. Drawing of Structure of hands, legs & foot **(4 hours)**
9. Drawing the face &Facial proportion **(8 hours)**
10. Drawing ofhair Styles **(4 hours)**

Course Outcomes:

After successful completion of this course, student will be able to

CO 1: Recall the different styles of illustrationthe classifying with accessories
CO 2: Sketch the movement of fashion figures
CO 3: Analyze the various proportions
CO 4: Develop skills inthe field of drawing
CO 5: Create the trendy fashion figures

Text Books:

1.Kathryn Hagen, *Fashion Illustration for Designers*, Press Publisher, Second Edition,2017.
2.Irina Ivanovo, *Haute Couture Fashion Illustration,* Art Design Project, Incorporated Publisher,2016.

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Reference Books:

1. Michele Wesen Bryant, *Fashion Drawing, Second Edition*, Laurence King Publisher, 2016.
2. Julius Wiedemann, *Illustration Now Fashion*, Taschen Publisher, 2017.
3. Anna Kiper, *Fashion Illustration Inspiration and Techniques*, David &Charles Publisher, 2016.

Journals:

1. Journal of Illustration
2.Journal of Illustration Solutions
3.Journal of design

E-Resources:

1.https://en.wikipedia.org/wiki/Fashion_illustration
2.https://www.iskn.co/fashion-illustration-basics/
3.http://www.vogue.co.uk/gallery/fashion-illustration
4.http://www.purfe.com.au/top-5-fashion-illustration-books/
5.https://www.shutterstock.com/search/women+hair+style+illustration

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	9	9	1	3	3	3	9	**37**
CO 2	9	3	1	3	3	3	9	**31**
CO 3	3	3	1	3	3	3	9	**25**
CO4	9	9	3	9	3	9	9	**51**
CO5	9	3	1	9	9	9	9	**49**
Total	**39**	**27**	**7**	**27**	**21**	**27**	**45**	**193**

Low-1 Medium-3 High-9

Core IV – Historic Costumes & Traditional Design

(For Students Admitted from 2022-23)

Semester: II **Hours/ Week: 5**
Subject Code: IBFDC22 **Credit: 5**

Course Objectives:

1.To develop knowledge regarding historic costumes used indifferent civilizations
2.To study the traditional designs and embroideries specific to each region

Unit I **(15 hours)**

Introduction to Indian Costumes: Indian costumes from the earliest times of the historical period Indus valley civilization costumes, Indo Aryans and Vedic ages, Mauryan and the Sunga period,Satavahana period, Kushan period, Mughalperiod.

Unit II **(15 hours)**

Traditional Costumes and Embroideries of India: Introduction to Indian dress. Costumes and embroideries of Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Madhya Pradesh, uttar Pradesh, Gujarat, Rajasthan, Punjab, Himachal Pradesh, Jammu and Kashmir. Kashmir embroidery, Kanthas of Bengal, Chamba rummal of Himachal Pradesh, Chickenkari of Uttar Pradesh, Pulkhari of Punjab, Kasuti embroidery, Kutch embroidery.

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Unit III **(15 hours)**

History of World Costume: Introduction: Pre-historic reference- development- adoption of fibrous apparel- initial manufacture of clothes. Earlier decoration of textiles .Costumes of European countries -Italy, France, Greece, roman, Sweden & Germany. Costumes of far Eastern Countries: Japan, Korea, Sri Lanka, Pakistan, Malaysia, China, Burma, Thailand & the Philippines. Costumes of American & Africans.

Unit IV **(15 hours)**

Traditional Woven Textiles: Introduction to woven textiles of India – Brocades of Banaras, Himrus, Amrus, Baluchari, Pithambar, Tamil nadu Saree. Types of woven Kashmir shawls – Do- shala, Do- rookha, Kasubha shawl.

Unit V **(15 hours)**

Traditional Prints and Dyes of Textiles: Printed textiles – Kalamkari, Block printing, Roghan printing and other printed and painted textiles (Mata-ni-pachedi, Pabuji-ka-pad) Dyed textiles – Ikat, Patola, Bandhani, Laharia, Mashru.

Course Outcomes:

After successful completion ofthis course, student will be able to

CO 1: Understanding the origin of costumes and classifying is history
CO 2: Determine theregional variationof costume and designs, motifs in different states
CO 3: Awareness about the historic and traditional costumes in various occasions
CO 4: Apprise the various traditional methods used for decorative designing
CO 5: Develop various dyeing and printing and their terminologies

Text Books:

1. Phyllis G. Tortora, Sara B. Marcketti, *Survey of Historic Costume*, Bloomsbury Publisher, 2015
2. Janarthanan U,*World History of Textiles and Costumes,* Amazon Digital Services LLC-KDP Print US Publisher,2020

Reference Books:

1.Giovanna Alessio, Johnna Rizzo,*The Culture of Cloth,*Templar Publisher,2020.
2.Anjali Karolia, *Traditional Indian Handcrafted Textiles*, NiyogiBooks Publisher, 2019.
3.Kristine Vejar,Adrienne Rodriguez, *Journeys in Natural Dyeing,* ABRAMS Publisher, 2020.

Journals:

1. Journal of Indian Textile History
2.Journal of Dress History
3.Journal of Medieval History

E-Resources:

1.https://en.wikipedia.org/wiki/History_of_clothing_in_India
2.https://www.researchgate.net/publication/215757088_Traditional_indian_Costumes_ and Textiles
3.https://www.researchgate.net/publication/215616545_Decorative_Design_History _In_Indian_Te xtiles_Costumes
4.https://www.slideshare.net/PriyalThakkar/fashion-history-of-india-56599569
5.https://www.josbd.com/what-do-you-know-about-prehistoric-dress-or-costume/

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Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	1	9	9	9	1	9	**41**
CO 2	3	3	3	9	3	3	3	**27**
CO 3	3	3	9	3	3	9	3	**33**
CO4	3	1	1	3	9	3	3	**23**
CO5	9	3	1	3	9	9	9	**43**
Total	**21**	**11**	**23**	**27**	**33**	**25**	**27**	**167**

Low-1 Medium-3 High-9

Ability Enhancement Compulsory Course II- Construction for Children's Apparel Practicals

(For Students Admitted from 2022-23)

Semester: II **Hours/Week: 5**
Subject Code: IBFDA23P **Credit: 4**

Course Objectives:

1. To impart knowledge on designing garments for kids
2. To enable the students to practice skills in drafting, pattern making and construction of selected garment and calculating cost of product

List of Experiments:

Designing, drafting and constructing the following garments for the features prescribed list the Measurements required and Materials suitable Calculate the cost of the garment Calculate the materialrequired –Layout method and direct measurements method.

1. Bib- Variation inoutline shape **(5 hours)**
2. Panty-plain or plastic lined panty **(5 hours)**
3. Jabla- without sleeve, front open or Magyar sleeve, back opens **(5 hours)**
4. Baba suit- knicker with chest piece attached or Romper **(5 hours)**
5. A-Line petticoat- double pointed dart, neckline and armhole finished with facing/ petticoat with gathered waist **(5hours)**
6. SchoolUniforms – Boy's and Girl's **(10 hours)**
7. Summer frock- with suspenders at shoulder line, without sleeve/collars Angel top with raglan sleeve, fullness at neckline **(5hours)**
8. Yoke frock- yoke at chest line, with open, puff sleeve, gathered skirt frock- **(10 hours)** with collar, without sleeve, gathered/ circular skirt at waist line or Princess line frock
9. Knicker- elastic waist, side pockets. **(5 hours)**
10. Shirt- opencollar, with pocket **(10 hours)**
11. Boy's short – flyopen with buttons, side pocket, pleats and dart. **(10 hours)**

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Understand the kid's costume and classified suitable wear for different age groups
CO2: Apply the pattern making techniques for constructing garment

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CO3: Estimate the layout and cost of the garment
CO4: Evaluate measurements required and materials suitable
CO5: Create different kids wear garments

Text Books:
1.Emma Hardy, *Making Children's Clothes*, Ryland Peters & Small Publisher, 2018
2.Mae Gallagher, *Pattern Fitting*, Independently Published, 2020

Reference Books:
1.Alison Smith, *Dress making*, Dorling Kindersley Limited Publisher, 2015.
2.Yoshiko Tsukiori, *Sewfor Your Girls, Tuttle* Publisher, 2015.
3.SaraMay Allington,Creative Media Partners, *Practical Sewing and Dress making*,LLC Publisher,2016

Journals:
1.Journal of Designing Comfort Garment For Children
2.Journal of Designing Apparel for Consumer
3.JournalofSewing Guide

E–Resources:
1.https://www. Sewing Divas.com
2.https://www.Universityoffashion.com
3.https://www.instructables.com/how-to-sew-a-baby-bib-pattern/
4.https://sewguide.com/frock-designs/
5.https://sewguide.com/shirt-designs/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	3	3	9	3	9	**33**
CO 2	9	3	9	3	1	1	3	**32**
CO 3	3	1	9	9	3	3	3	**31**
CO4	3	3	3	3	3	3	9	**27**
CO5	3	9	9	9	3	3	9	**45**
Total	**21**	**19**	**33**	**27**	**19**	**13**	**33**	**168**

Low-1 Medium-3 High-9

Extra Credit I – Fashion Accessory Designing Practicals

(For Students Admitted from 2022-23)

Semester-II
Subject Code: IBFDX2P **Credit: 2**

Course Objectives:
1.To impart knowledge on accessories and ornamentation
2.To develop skills inthe field of designing in different styles

List of Experiments:
Preparethe following Accessories using the available raw materials / anybase material in Traditional, Retro, Ethnic and Fusion styles.
1. Hand bags –4 varieties
2. Purses / Wallets / CellPhone covers -. 4 varieties
3.Chains I Necklaces - 5 varieties

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4.Bangles / Bracelets / Watches - 5 varieties
5.hats/caps- 5 varieties
6.Ear rings/Hair band - 5 varieties
7.Finger rings / toerings- 5 varieties
8.Belts- 5 varieties
9. Gloves – 3 varieties
10. Mask – 5 Varieties

Course Outcomes:
After successful completion ofthis course, student will be able to
CO1: Understand the fashion accessories; identify the recent trends and product development
CO2: Experiment motif based on different hand knitting methods
CO3: Prepare the accessories by refashioning fabrics
CO4: Develop the various styles of fashion accessories
CO5: Create innovative accessorydesigns

Text Books:
1. John Lau, *Basics Fashion Design 09: Designing Accessories*, Bloomsbury Publisher, 2021
2. Sarah Bellerose, *Jewelry*, Create Space Independent Publisher, 2017

Reference Book:
1. Gianni Pucci, *Hats and Caps: Fashion Accessory Design*, Promo Press Publisher, 2018.
2. CourtneyLegenhausen, *Fashion Jewelry*, Lark Books Publisher, 2017.
3. Gitte Blass, *Making Your Own Accessories and Jewelry*, Dorrance Publishing Company, 2017.

Journals:
1. Journal of Accessory Design
2. Journal of Designing
3. Journal of Fashion Designing

E- Resources:
1.https://www.thesewingdirectory.co.uk/bag-making/
2.https://www.craftscouncil.org.uk/learning/craft-careers/how-become-chain-maker
3.https://www.diys.com/bangle-designs/
4.https://www.craftionary.net/caps-hats-for-women-diy/
5.https://www.goldbarkleather.com/sourceblog/diy-belt-guide

Course Outcomes	**Programme Outcomes**							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	9	9	9	3	3	3	9	**45**
CO 2	3	1	1	3	9	3	3	**23**
CO 3	9	9	9	9	3	3	3	**45**
CO4	3	3	1	1	3	3	9	**23**
CO5	9	3	3	3	1	3	9	**28**
Total	**27**	**19**	**14**	**19**	**16**	**12**	**24**	**164**

Low-1 Medium-3 High-9

Core V-Fashion Studies

(For Students Admitted from 2022-23)

Semester: III **Hours/Week: 4**
Subject Code: IBFDC31 **Credit: 4**

Course Objectives:

1. To learnabout the fashionterminologies
2. To understand the fundamentals of design elements & principles

Unit I **(12 hours)**

Introduction to Fashion: Definition, Importance and designs-Principles, Elements. Terminologies of fashion, Nature of fashion, Myths about fashion, Fashion concepts in different regions, Leaders of fashion.

Unit II **(12 hours)**

Environment of Fashion: History of fashion, Adoption of fashion-trickle up, Trickle down & Trickle across theory, cultural value. Evaluation, Revolution of fashion- Vertical, Horizontal concepts, Environment of fashion, Factors influencing fashion- Psychological needs of fashion, Socio psychologyof fashion, Technological, Political, Legal and seasonal influence.

Unit III **(12 hours)**

Fashion Psychology: Principles of fashion- Fashion cycle, Movement of fashion, Role of costume as a status symbol, Costume as personality and sex appeal, Diffusion of fashion line, Historic costumes and evaluation of Indian costumes.

Unit IV **(12 hours)**

Figure Irregularities: Designing dresses for unusual figures-becoming and unbecoming-figure types-stout figure-thin figure-slender figure-narrow shoulders-broad shoulders-round shoulders – large bust- flat chest-large hip-large abdomen-round face-small face-prominent chin and jaw- prominent forehead.

Unit V **(12 hours)**

Colour Theory: Colour-definition-colour theories-prang colour chart and Mansell colour system- dimensions of colour-hue -value-intensity-standard colour harmonies-application in dress design-colour inprinciples of design-applicationofthe same in dress design.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Identify the meaning of fashion, understanding the fashion studies
CO2: Discover the current trends in fashion
CO3: Apply the fashion elements and design principles
CO4: Investigate fashion psychology and evaluation
CO5: Create a new design implementation of fashion

Text Books:

1. HollyM. Kent,*Teaching Fashion Studies*, BloomsburyPublishing,2018
2. Elizabeth Wissinger, Eugenia Paulicelli, Veronica Manlow, *The Routledge Companion to Fashion Studies*, Taylor & Francis Publisher, 2021

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Reference Books:

1. Angela Nurse, Damayanthie Eluwawalage, Laura Petican, Mariam Esseghaier, *New Developmentsin Fashion Studies",* Brill Publishing, 2019.
2. Carolyn Mair, *the Psychology of Fashion,* Taylor and Francis Publisher, 2018.
3. Heike Jenss, *Fashion Studies Research Methods,* Blooms bury Publishing, 2016.

Journals:

1. Journal of Fashion Marketing and Management
2. Journal of Fashion Studies
3. Journal of Color Tech

E-Resources:

1.www.vogue.com
2.www.businessoffashion.com
3.https://worlduniversityofdesign.ac.in/b-des-fashion-design.php?gclid
4.https://99designs.com/blog/tips/the-7-step-guide-to-understanding-color-theory/
5.https://www.michaelsolomon.com/fashion-psychology/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	1	9	3	3	3	**25**
CO 2	3	3	3	9	3	3	3	**27**
CO 3	3	3	9	3	3	9	9	**39**
CO4	3	9	9	9	3	9	9	**51**
CO5	9	3	3	9	3	9	9	**45**
Total	**21**	**21**	**25**	**39**	**15**	**33**	**33**	**186**

Low-1 Medium-3 High-9

Core VI – Wet Processing- Dyeing [Theory cum Practicals]

(For Students Admitted from 2022-23)

Semester: III **Hours/Week: 4**
Subject Code: IBFDC32 **Credit: 4**

Course Objectives:

1. To study the basic preparatory process
2. To study the processes required for dyeing and finishing

Unit I **(12 hours)**

Preparatory Processes: Preparatory process in wet processing. Sequences of wet processing-singeing. Desizing, scouring, and mercerization- objectives and types.

List of Experiments:

a. Scouring
b.Desizing

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Unit II **(12 hours)**

Bleaching and Mercerization Processes: Definition, Objectives, Types of bleaching - Oxidative and Reductive, Methods of bleaching- Batch, Semi continuous and Continuous bleaching. Mercerization – Definition, Objectives, Types- Tension and Slack mercerization, Process of mercerization.

Unit III **(12 hours)**

Dyeing Machineries: Dyeing-objectives-methods of dyeing-machineries used for dyeing process- batch, winch, jig, padding, package dyeing. Dyeing techniques - yarn dyeing and fabric dyeing. Dyeing machineries for garments and knitted fabrics, rotary dyeing, solvent dyeing.

Unit IV **(12 hours)**

Types of Dyes: Dyeing of textiles–natural-man made – synthetic fibers- vat, reactive dyes, acid dyes, disperse dyes. Yarndyeing – hank and package dyeing.

List of Experiments:

a. Cotton- reactive dye
b.Polyester –Disperse dye
c.Silk – acid dye
d.Wool– basic dye
e.Tie &dye

Unit V **(12 hours)**

Finishing Processes: Finishing- objectives-types of finishing-resin finish-acid finish-silicon finish-Teflon, soil repellent, flame retardant, water proofing. Recent finishes - herbal finishes. Finishes for denim, Anti-microbial finishing-COVID 19.

Course Outcomes:

After successfulcompletion of this course, student will be able to
CO1: State the dyeing and printing process, understand sequence of processing
CO2: Demonstrate the dyes and printing equipment and machineries
CO3: Estimate dyes for types of fabrics
CO4: Experiment thedyeing and printing methods
CO5: Create the fabric samples using dyeing, printing methods

Text Books:

1.FaheemUddin, *Textile Manufacturing Process,* Intech Open Publishing,2019
2.Sekhri, Seema, *Fabric Science*, PHI Learning PVT LTD Publisher, 2020

Reference Books:

1.J N Chakraborty, *Fundamentals and Practices in Coloration of Textile,* WPI India Publisher, 2015.
2.J NShah, *Guide to Wet Textile Processing Machines,* Elsevier Science and Technology Publisher, 2015.
3.Subramaniyan Senthilkannan Muthu, *Textiles and Clothing Sustainable Textile Chemical Processes,* Springer Singapore Publisher, 2016.

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Journals:

1. Journal of Dyes and Pigments
2. International Journal of Textile Science Research
3. Journal of Textile Finishing

E-Resources:

1.www.Textile Learner.com
2.www.Dyeing World. Com
3.https://study.com/academy/lesson/what-is-textile-finishing.html
4.https://www.contrado.co.uk/blog/printing-methods-differences/
5.https://textiletuts.com/types-of-dyeing-machines/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	9	9	3	9	3	1	3	**37**
CO 2	3	9	3	9	3	3	3	**33**
CO 3	3	3	1	3	1	3	3	**17**
CO4	3	9	3	9	1	3	9	**36**
CO5	9	3	3	9	3	1	9	**37**
Total	**27**	**33**	**13**	**39**	**11**	**11**	**27**	**160**

Low-1 Medium-3 High-9

Ability Enhancement Compulsory Course I- Construction for Women's Apparel Practicals

(For Students Admitted from 2022-23)

Semester: III **Hours/Week: 4**
Subject Code: IBFDA33P **Credit: 4**

Course Objectives:

1. To impart knowledge on designing garments for women
2. To enable the students practice skills in drafting, pattern making and construction of selected garment and calculate costing of product

List of Experiments:

Designing, drafting and constructing the following garments for the features prescribed List the Measurements required and Materials suitable Calculate the cost of the garment Calculate the material required –Layout method and direct measurements method

1. Saree Petticoat- Six Panel, Decorated bottom. **(5 hours)**
2. Camisoles **(5 hours)**
3. Skirts – Circular/umbrella/panel with style variations. **(5 hours)**

Blouse- front open, Princess cut, Fashioned neck, Waist band at front, with sleeve. **(10 hours)**

4.Salwar or Churidar – Lengthwidth Variation **(5 hours)**

5.Kameez – with /without slit, with or without flare, with /without opening, with or without panels, with/without yoke. **(5hours)**

6.Nightie –With yoke, front open, with sleeve, full length, Two piece night wear **(10 hours)**

7.Ladies Trouser- waistband, zip attached tight fitting / parallel pants. **(5 hours)**

8.Tunic top / top – Decorative / surface design in tailored placket, with or without collar. **(10hours)**

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Course Outcomes:
After successful completion ofthis course, student will be able to
CO1: Understand the body structure and identify the suitable fabric for women's wear
CO2: Interpret methods of drafting for different types of garments
CO3: Experiment the list out the measurements required and materials suitable
CO4: Estimatethe cost ofthe garment
CO5: Create the various designs in women's wear

Text Books:
1. Claire Wargnier,*Focuson Fashion Details*, Volume 1,ESMODPublishing, 2021
2. Laura Irene Baldt,*Clothing for Women*, Selection, Design, Construction, Creative Media PartnersLLC Publisher,2018

Reference Books:
1. Gillian Holman, *Bias -Cut Dressmaking*, Bats ford Publisher, 2015.
2. Annette Fischer, *Sewing for Fashion Designers*, Quercus Publisher, 2015.
3. Antonio Donnanno, *Fashion Pattern Making Techniques*, Hoaki Books Publisher, 2021.

Journals:
1.Journal of Drafting Techniques
2.InternationalJournal of Fashion Design
3.Journalof Pattern Design

E-Resources:
1.https://sewguide.com/sew-sari-petticoat/
2.https://sewguide.com/how-to-sew-skirts/
3.https://www.vibhasfashion.com/blouse-cutting-and-stitching
4.https://style2designer.com/pattern-cutting-cad-cam/cutting-sewing- techniques/straight-kameez/
5.https://sewguide.com/free-tunic-pattern/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	9	9	9	3	3	3	9	**45**
CO 2	3	3	1	1	3	1	3	**15**
CO 3	9	3	3	9	3	3	9	**39**
CO4	3	3	1	3	3	3	3	**19**
CO5	3	3	9	9	3	3	9	**39**
Total	**27**	**21**	**23**	**25**	**15**	**13**	**33**	**160**

Low-1 Medium-3 High-9

Extra Credit – Boutique Internship

(For Students Admitted from 2022-23)

Semester: III
Subject Code: IBFDX3P **Credit:2**

Course Objectives:
1. To gain knowledge about boutique field

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2. To develop entrepreneurial skills among students

Unit I

Literature Study Day 1: Learning about the boutique Structure, History and organization structure, Social media awareness and advertisement.

Unit II

On Site Study Day 2 - 3: Observation – Process, Procedures and product development. Client profile observation.

Unit III

Data Collection Day 4 - 5: Collection of Data about the industry process, statistics through survey / questionnaire / interview recording of data using pictures, videos, sketches & sample collection.

Unit IV

Internship Job Role Day 6 - 15: Working in the industry

Unit V

Documentation Post Internship: Preparation Of Internship Report Document & Ppt
Suggested Reads: Mean Average, Strength & Weakness analysis.

Course Outcomes:

After successful completion of this course, student will be able to
CO1: Understand the structure and, identifythe process ofthe boutique
CO2: Analyze the functions of various sections in the organization
CO3: Predict the short term and long terms targets of an organization
CO4: Justifythe impact oforganization for the Society
CO5: Create client data as per recruitments withplanning and execution

Text Books:

1. Alice Xavier, *Fashion Boutique*, ParragonPublisher, 2017
2. Greg Alexander, *The Boutique*, Advantage, Media Group, 2020

Reference Books:

1. ChristyWright,*Business Boutique*, Ramsey, Press Publisher, 2017.
2. Shawnie Grant, *Fashion Beyond Borders*, Tailored Boutique Incorporated Publisher, 2018.
3. Stephanie Polite, *Howto Start a Fashion Boutique*, Lulu.comPublisher, 2022.

Journals:

1. Journal ofTextile
2. Journal of Boutique Internship
3. My London Fashion Journal

E-Resources:

1. https://boutiqueeducation.asia/
2. https://www.websitebuilderexpert.com/
3.https://www.beginningboutique.com.au/pages/careers
4.https://www.apparelsearch.com/definitions/miscellaneous/boutique.htm
5.https://www.ilovefashionretail.com/copywriting/fashion-copywriting-13-tips-for- writing-product-descriptions-that-will-get-your-customers-to-say-yes/

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Course Outcomes	Programme Outcomes							
CO	**PO1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	9	9	3	3	9	**39**
CO 2	3	3	9	3	1	3	3	**25**
CO 3	3	3	3	3	3	3	9	**27**
CO4	3	3	9	9	3	3	3	**33**
CO5	3	9	9	9	3	3	9	**45**
Total	**15**	**21**	**39**	**33**	**13**	**15**	**33**	**169**

Low-1 Medium-3 High-9

Core VII– Construction of Men's Apparel Practicals

(For Students Admitted from 2022-23)

Semester: IV **Hours/Week: 5**

Subject Code: IBFDC41P **Credit: 4**

Course Objectives:

1. To impart knowledgeon designing garments for women
2. To enable the studentsto practice skill in drafting, pattern making and construction of selected garment and calculating costing of product

List of Experiments:

Designing, drafting and constructing the following garments for the features prescribed List the Measurements required and Materials suitable Calculate the cost of the garment -Calculate the material required –Layout method and Direct measurements method

1. Knickers-flap/cargo pockets **(10 hours)**
2. Bermuda's- waist elastic / sting **(5 hours)**
3. Shorts- fly/zipper **(5 hours)**
4. Trousers features to add Zip, Pleats, Bottom, Fit **(10hours)**
5. Shirt – Half/full sleeve **(10 hours)**
6. Kurtha – kalidar **(10 hours)**
7. Vest coats – S,B coat **(10 hours)**
8. Party Wear – pajama kurta **(15 hours)**

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Understand the men's apparel, identifying the suitable fabric

CO2: Interpret methods of drafting for different types of garments

CO3: Experiment the list out the measurements required and materials suitable

CO4: Estimatethe cost of the garment

CO5: Create avarious design in men's wear

Text Books:

1.Gareth Kershaw, *Patternmaking for Mens Wear*, Laurence King Publishing,2021

2.Claire Wargnier, *Focus on Fashion Details,* Volume 1, ESMOD Publishing, 2021

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Reference Books:

1. David Page Coffin, The Shirt Making, Quarry Books Publishing, 2015.
2. JacobGallagher, *the Mens Fashion Book*, Phaidon Press Ltd Publisher, 2021.
3. Adriana Gorea, Katya Roelse, Martha L, *A Practical Guidefor Fashion Designers*, Bloomsbury Publishing, 2020.

Journals:

1. Journal of Fashion Design
2. Journal of Pattern Making
3. Journal of Sewing Guide

E-Resources:

1. https://sewguide.com/free-underwear-tutorials/
2. https://sewguide.com/shorts-pattern/
3. https://style2designer.com/pattern-cutting-cad-cam/cutting-sewing-techniques/mens- shirt-drafting-sewing- tutorial/
4. https://sewguide.com/stitch-a-kalidar/
5. https://sewguide.com/stitch-a- kurtha/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	9	9	9	3	3	3	9	**45**
CO 2	3	3	1	1	3	1	3	**15**
CO 3	9	3	3	9	3	3	9	**39**
CO4	3	3	1	3	3	3	3	**19**
CO5	3	3	9	9	3	3	9	**39**
Total	**27**	**21**	**23**	**26**	**15**	**13**	**33**	**157**

Low-1 Medium-3 High-9

Core VIII – Technical Textiles

(For Students Admitted from 2022-23)

Semester: IV **Hours/Week: 4**
Subject Code: IBFDC42 **Credit: 4**

Course Objectives

1. To impart knowledgeon fibers used fortechnical textiles
2. To enable the students to understand the classification with application of technical textiles

Unit I **(10 hours)**

Introduction to Technical Textiles -Technical textiles – definition and scope of technical textiles – global scenario – applications of technical textiles.

Unit II **(12 hours)**

Fibers used in Technical Textiles - Technical fibers – conventional fibers – high strength and high modulus organic fibers –high chemical and combustion – resistant organic fibers –high performance inorganic fibers – ultra fine and novelty fibers.

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Unit III **(14 hours)**

Finishing for Technical Textiles - Mechanical finishes – calendaring – raising – cropping – shearing – compressive shrinkage – heat setting – chemical process – durable flame – retardant treatments – water repellent – anti static finishes – antimicrobial and antifungal finishes – coatings –chemicals used and method of application.

Unit IV: **(12 hours)**

Medical and Survival Textiles.- Introduction of medical textiles – implantable and non-implantable materials Health care and hygiene. Agro Textiles. Protective Textiles -Tents, helmets, gloves, sleeping bag, Bullet Proof, Survival bags and Suits.

Unit V: **(12 hours)**

Smart and Geotextiles- Classification of smart textiles – active smart – passive smart – ultra – smart textiles. Introduction of Geotextiles, Textiles in Cars, Road vehicles, Railways, Aircraft and Marine applications. Essential properties of geotextiles, applications of geotextiles.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Understand the technical textile, identify the applications
CO2: Implement the chemical composition of fibers
CO3: Differentiate various finishes intechnical textiles
CO4: Examine the fabrics suitable for protective and survival textiles
CO5: Develop the knowledge of smart and intelligent textiles

Text Books:

1. A R Horrocks, Subhash, C Anand,*Technical Textiles*,Elsevier Science Publisher,2016
2.RoshanPaul, *High Performance Technical Textiles*, WileyPublisher,2019

Reference Books:

1. Robert Koerner, *Geo Textiles*, Elsevier Science Publisher, 2016.
2. Yimin Qin,*Medical Textile Materials*, Elsevier Science Publisher,2015.
3. IbrahimH Mondal, *Antimicrobial Textilesfrom Natural Resources*, Elsevier Science Publisher, 2021.

Journals:

1. Journal of Textile Science
2. Journalof Modern Textile Science
3. InternationalJournals of Textile Science

E-Resources:

1. https://www.technical-textiles.net/
2. https://www.fibre2fashion.com/industry-article/2427/important-fibres-of-technical- textile-industry-
3. https://www.textileschool.com/165/finishing-technical-textiles/
4.https://www.technicaltextile.net/articles/medical-textiles-2587
5.https://www.technicaltextile.net/articles/selection-of-fiber-for-geotextiles-7134

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Course	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	1	1	1	3	3	3	**15**
CO 2	3	3	3	3	3	3	9	**27**
CO 3	3	1	3	3	3	3	3	**19**
CO4	9	3	3	9	3	9	3	**39**
CO5	9	3	3	9	3	9	3	**39**
Total	**27**	**11**	**13**	**25**	**15**	**27**	**21**	**139**

Low-1 Medium-3 High-9

Ability Enhancement Compulsory Course II- Fabric Structure and Design[Theory cum Practicals]

(For Students Admitted from 2022-23)

Semester: IV **Hours/Week: 5**
Subject Code: IBFDA43 **Credit: 4**

Course Objectives:
1.To understand the design, draft and peg plan and loops for different fabric structures
2.To study and compare different knitted and woven structures and textile designs

Unit I **(10 hours)**
Introduction to Weaving: Loom and its classification, Winding, Warping, Sizing. Loom operations – objectives - shedding, picking, beat-up, let-off, take-up motions.

Unit II **(20 hours)**
Woven fabric structure
ListofExperiments:
Design, draft and draw pegplan for the following weaves:
1.Pain weave and its variation
2.Twill weave and its variation
3.Satin weave
4.Sateen weave
5.Honeycomb weave
6.Huck-a-Back weave
7. Extrawarp and Extra weft figuring

Unit III **(15 hours)**
Special Woven Fabrics: Backed Fabrics - Warp and Weft, Difference between warp and weft backed fabrics. Extra warp and extra weft figuring – single and two colours, Difference between extra warp and extra weft figuring. End uses of the above weaves. Double Cloth-Classification, warp, Weft and center stitched double cloth. Self-Stitched- back to Face.
End uses ofthe above weaves.

Unit IV **(10 hours)**
Knitted Fabric Structure: Study of knitted structure – knit, tuck, miss stitch. Study of single jersey, plain, rib, interlock and purl structure. Common defects in knitted fabrics. Comparison between knitted and woven fabrics.

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List of Experiments:

1.Single Jersey
2.Plain
3.Rib
4.Interlock
5.PurlStructure.

Unit V **(20 hours)**

Introduction of Textile Designs: Design developments – motifs – repeats. Types of textile design – natural, geometric, conventional, abstract and historical. Study of repeat structures– spot reacts types – brick- drop – directional – non- directional. Study of turnings patterns and its types – flipping horizontal – flipping vertical- turnings spot rotation and angles. Study of diamond and ogee- based design.

List of Experiments:

1. Motif creation
2.Repeat Structures
a.Brick
b.Drop
c. Directional
d.Non-directional
3.Turning patterns
a.Flipping horizontal
b.Flipping vertical
c.turnings spot
d. Diamond and ogee-based

Course Outcomes:

After successful completion ofthis course, student will be able to
CO1: Understand the fabric structureand classifying the weaving, knitting processes
CO2: Illustrate the design, draft, pegplan of weaves and knit Structure
CO3: Apply the methods of compound fabric
CO4: Compare the different types of woven and knit structure
CO5: Create and develop textiles designs

Text Books:

1.T Karthik, P Ganesan, D Gobalakrishnan, *Apparel Manufacturing Technology*, CRC Press Publisher,2016
2. Product and Process, by Michael Hann, *Textile Design,* CRC Press Publisher, 2020

References Books:

1. J Hayavadana, *Woven Fabric Structure Design and Product Planning*, WPI India Publisher, 2016.
2. Yordan Kyosev, *Warp Knitted Fabrics Construction,* CRC Press Publisher, 2019.
3. KimGandhi,*Woven Textiles*, Elsevier Science Publisher,2019.

Journals:

1.Journal for weavers, Spinners and dyers
2.Knitting International (Open access)
3.Journal of Fabric

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E-Resources:

1.https://www.fibre2fashion.com/industry-article/3759/facts-about-weaving- loom- types
2.https://textilestudycenter.com/woven-fabric-structure/
3.https://www.fibre2fashion.com/industry-article/8087/weft-knitted-fabrics-and-derivatives
4.https://textilemerchandising.com/single-jersey-fabric-double-jersey/
5.https://thedesigncart.com/blogs/news/textile-designs

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	1	1	3	3	3	3	**17**
CO 2	3	1	1	1	9	9	3	**27**
CO 3	3	1	3	3	3	3	3	**19**
CO4	9	1	1	3	3	3	3	**23**
CO5	9	1	1	9	3	9	9	**41**
Total	**27**	**5**	**7**	**19**	**21**	**27**	**21**	**127**

Low-1 Medium-3 High-9

Extra Credit –Textile Processing Internship

(For Students Admitted from 2022-23)

Semester –IV

Subject Code: IBFDX4P **Credit:2**

Course Objectives:

1.To enable the students to gain knowledge in various processing methods
2.To educate the students on dyeing techniques

Internship with any textile processing industry or company for a minimum period of 15days. The report to be submitted for evaluation.

Textile Documentation Objectives

1. In depth knowledge of textiles processing
2. To learn research and documentation of various processing methods by visiting and meeting the workers personally.

Documentation should contain thefollowing

1.Introduction
2.Aim
3.Objectives
4.Processing
5.Procedure
6.Questionnaire for survey/ information collection.
7.Results and discussion
8.Summary and conclusion
9.Bibliography

Course Outcomes:

After successful completion ofthis course, student will be able to

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CO1: Understand the structure oftextile industry, identify the process unit
CO2: Analyze the methods adopted inthe training place
CO3: Predict the short term and long terms targets of an organization
CO4: Analyze the textile processing procedure
CO5: Create the report for end ofthetextile processing internship

Text Books:

1. T Karthik, P Ganesan, D GopalaKrishnan,*Apparel Manufacturing Technology,* CRCPress Publishers, 2016.

2. Inga Gehrke, Vadim Tenner, Volker Lutz, *Smart Textiles Production,* MDPI AG Publisher, 2019.

Reference Books:

1. Faheem Uddin, *Textile Manufacturing Processes,* Intech Open Publisher, 2019.
2. Solomon Tender, *Import and Export Guide*, Create space Independent Publishing, 2017..
3. Bernice M Hornbeck, *U.S.Cotton Textile Imports,* FBC Ltd Publisher, 2017.

Journals:

1.Journal of Textile Processing
2.Journalof Textile
3.Journalof Apparel Production

E-Resources:

1.www.Textile Learner.com
2.www.Dyeing World. Com
3.https://study.com/academy/lesson/what-is-textile-finishing.html
4.https://www.contrado.co.uk/blog/printing-methods-differences/
5.https://textiletuts.com/types-of-dyeing-machines/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	9	9	3	3	9	**33**
CO 2	3	3	9	3	1	3	3	**25**
CO 3	3	3	3	3	3	3	9	**27**
CO4	3	3	1	1	3	3	3	**17**
CO5	9	3	3	9	3	9	9	**45**
Total	**21**	**15**	**25**	**25**	**13**	**21**	**33**	**147**

Low-1 Medium-3 High-9

Core IX– Computer Aided Design CAD Practicals I

(For Students Admitted from 2022-23)

Semester: V **Hours/Week: 4**
Subject Code: IBFDC51P **Credit: 3**

Course Objectives:

1.To introduce students to software used for garment designing
2.To develop knowledge about tools used in various software

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List of Experiments: **(10 hours)**

1. Software Introductionand Keys
2. Elements of Design-Line - Shape - Colour - Texture - Form
3. Principles of Design -Emphasis - Harmony- Balance -Proportion – Rhythm
4. Motif Creation. - Natural - Stylish - Geometric - Abstract – Traditional
5. Accessory Design - Handbags - Footwear - Hats - Belts - Bow and Tie
6. Textile Designing weaves structure- Dobbyand jacquard designs

Create the following designs using Corel Draw Motifs

1. Embroidery Designs for Kerchiefs. **(15 hours)**
2. Necklines.
3. Chest Prints.
4. T-Shirt.
5. Textile Denim
6. Natural
7. Geometric
8. Abstract
9. Stylized

Children's Garments **(7 hours)**

1. Jabla
2. Frocks
3. SunSuit

Women's Garments **(10 hours)**

1. One Piece Dress
2. Middi & Tops
3. Salwar Kameez
4. House Coat
5. Nighty

Men's Garments **(10 hours)**

1. SB Vest
2. T-Shirt
3. Shirt
4. Kurta
5. Pant

I. Create Logos for Branded Companies. **(4 hours)**

II. Create Labels for Garments Companies. **(4 hours)**

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Understand thedesigning software, identifying the menus and tools

CO2: Develop elements and principles of design using software

CO3: Create motif design for embroidery

CO4: Illustrate a garment designing children, women's and men's garment

CO5: Create digital logo, label for branded garments

Text books:

1. Robert Hume, *Fashion and Textile Design with Photoshop and Illustrator*, Bloomsbury Publishing,2019
2. Jane Alvarado, *ComputerAided Fashion Design Using Gerber Technology*, Bloomsbury

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Publisher, 2018

References Books:

1. RuthHuoh, *Fashion Design*, New York Publisher, 2017.
2. Patrice Free burger George, Fashion Institute ofTechnology, *The Digital Dawn*, State UniversityofNew York Publisher, 2020.
3. Joanne Sherrow, *Photoshop and Illustrator for Fashion and Textile Design*, Fairchild Books Publisher, 2015.

Journals:

1. Journal of CAD
2. Journal of CAD Application
3. Journal of CAD Designing

E-Resources:

1.https://textilelearner.net/computer-aided-fashion-designing/
2.https://www.textileblog.com/cad-cam-in-textile-and-garment-industry/
3.https://textilelearner.net/application-of-cad-in-textile/
4.https://www.onlineclothingstudy.com/2018/10/cad-system-and-its-application-in.html
5.https://textilevaluechain.in/in-depth-analysis/5-ways-computer-aided-design- benefits-the-textile- industry/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	3	9	3	9	9	**39**
CO 2	9	1	1	9	3	9	9	**41**
CO 3	9	1	1	3	9	9	9	**41**
CO4	3	1	1	3	3	9	9	**29**
CO5	9	3	3	3	1	9	9	**37**
Total	**33**	**9**	**9**	**27**	**19**	**45**	**45**	**187**

Low-1 Medium-3 High-9

Core X – Fashion Merchandising and Marketing

(For Students Admitted from 2022-23)

Semester: V **Hours/Week: 5**
Subject Code: IBFDC52 **Credit: 5**

Course objectives:

1. To studythe challenges in apparel business, role ofplanning and forecast market strategy
2. To create as entrepreneurs in the field of production, marketing and merchandising by providing extensive knowledge and technical, behavioral skills

Unit I **(15 hours)**

Introduction to Apparel Business: International apparel business pattern, basic business concepts in Indian apparel export house, business operations in China and other south Asian countries. Business patterns for Indian apparel retail and home textiles. Understanding from concept board to finished product and its sequence.

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Unit II **(15 hours)**

Marketing for Apparel and Textile Products: Defining marketing, marketing mix the objectives of the marketing department, market research, different types of markets, marketing strategies concerning a product/brand, marketing models, B to B marketing, B to C marketing, direct marketing, digital marketing, Social media marketing blogs.

Unit III **(15 hours)**

Introduction to Merchandising: Definition-scope of merchandising-merchandising terminology-types of merchandising-functions of merchandising-responsibilities of the merchandiser-skill sets of the merchandiser. Creative and technical design in garments and accessories, new product development and seasons of sale, costing, coordination and communication with the production house and export house.

Unit IV **(15hours)**

Sourcing, Costing, And Pricing: Costing-elements of costing-importance of costing- pricing strategies-pricing formula-mark up and down-negotiations and order procurement- sourcing strategies-sourcing options-sourcing process-international sourcing and domestic sourcing-vendor identification.

Unit V **(15 hours)**

Export Documentation and Policies: Government policies, guidelines for apparel export and domestic trade, tax structures and government incentives in apparel trade. Export documents and its purposes, banking activities, Letter of credit, logistics and shipping, foreign exchange regulation, export risk management and insurance. Export finance and Special economic zones.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Understand the purpose of merchandising, identifying marketing strategies in the industries

CO2: Interpret merchandising plan and sales forecasting

CO3: Organize creative design process of merchandising

CO4: Analyze the elementsof costing, sourcing and pricing

CO5: Develop the production systems and implement quality control

Text Books:

1. James Clark, *Fashion Merchandising,* BloomsburyPublishing,2020

2. Rosy Boardman, Rachel Parker-Stark, Claudia E. Henninger, *Fashion Buying and Merchandising,* Taylor & Francis Publisher,2020

Reference Books:

1. Sarah Bailey, Jonathan Baker, *Visual Merchandising for Fashion*, Bloomsbury Publishing, 2021.

2. Mary G Wolfe, *Fashion Marketing and Merchandising,* Good Heard Wilcox Company Publisher, 2018.

3. Donna L Bade *Export /Import Procedures and Documentation,* American Management Association Publisher, 2015.

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Journals:

1. Journal of Fashion Marketing and Management
2. International Journal of Design Management and Professional Practice
3. Journalof Marketing

E-Resources:

1. https://www.apparelbusiness.com/
2. https://www.fibre2fashion.com/industry-article/4597/applying-marketing-mix- modeling in-the-apparel-business
3. https://www.investopedia.com/terms/m/merchandising.asp
4. https://future.aicpa.org/cpe-learning/course/costing-strategies
5. https://agriexchange.apeda.gov.in/Ready%20Reckoner/EXPORT_DOCUMENTATION.aspx

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	1	1	1	3	3	**15**
CO 2	3	3	3	9	3	9	9	**39**
CO 3	3	3	3	9	3	3	3	**27**
CO4	9	3	3	9	3	9	9	**45**
CO5	3	3	1	9	3	3	3	**25**
Total	**21**	**15**	**11**	**37**	**13**	**27**	**27**	**151**

Low-1 Medium-3 High-9

Core XI – Boutique Management

(For Students Admitted from 2022-23)

Semester: V **Hours/Week: 5**
Subject Code: IBFDC53 **Credit: 4**

Course Objectives:

1.To manage the small-scale business establishment
2.To understandthe marketing research and promotion

Unit I **(15 hours)**

Introduction to Boutique: Boutique-definition-management Skills required setting up a boutique-identifying target market and customer-selection of boutique name-types of boutique- low- end and high- end boutiques.

Unit II **(15 hours)**

Infrastructure and Visual Merchandising: Choice of location and space management – infrastructure requirement -fashion accessories in boutique-boutique interior-visual merchandising-store layout -types of display-exterior display-interior display-tools for visual merchandising-signage-props-mannequins-fixtures and lightings.

Unit III **(15 hours)**

Resource Management: Staffing-selection of generalists and specialists-Customer relationship management-Manpower planning-performance management-employee relations.

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Unit IV **(15 hours)**

Tools and Materials: Boutique marketing tools and promotional kit-material sourcing -book keeping for boutique and maintaining stock.

Unit V **(15 hours)**

Financial Management: Project finance-cash control and cash flow analysis-managing and startup the boutique business-boutique visit-boutique project report.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Understand the structure of boutique, identifying the management processes
CO2: Interpret a boutique infrastructure requirements and visual merchandising techniques
CO3: Organize and manage the human resources
CO4: Analyze boutique marketing tools and material sourcing
CO5: Prepare the financial resources for a boutique

Textbooks:

1.Nada R,Sanders,*Supply Chain Management,A Global Perspective,*Wiley , Publishing,2020
2.Michel Chevalier, Michel Gutsatz,*Luxury Retail and Digital Management,* Wiley Publishing,2020

Reference books:

1.Sarah Bailey, Baker, Visual *Merchandising for Fashion*, Bloomsbury Publishing, 2021.
2.Mary G Wolfe, *Fashion Marketing and Merchandising*, Good Heard Wilcox Company Publisher, 2018.
3.Donna L Bade *Export /Import Procedures and Documentation*, American Management Association Publisher, 2015.

Journals:

1.Journal of Fashion Marketing and Management
2.JournalofRetailing
3.Journal of Global Fashion Marketing

E- Resources:

1. https://retailminded.com/introducing-our-featured-boutique-section-she-boutique/#.YevfSNVByUk
2. https://www.business.qld.gov.au/industries/manufacturing-retail/retail- wholesale/retail-design/effective-displays/visual-merchandising
3. https://www.apm.org.uk/blog/what-is-resource-management/
4.https://smallbusiness.chron.com/equipment-need-start-clothing-store-10682.html
5.https://www.netsuite.com/portal/resource/articles/financial-management/financial-management.shtml

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Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	1	1	1	3	3	9	**27**
CO 2	9	3	9	9	3	3	9	**45**
CO 3	3	1	9	3	3	1	9	**29**
CO4	3	1	3	3	3	9	3	**25**
CO5	3	1	3	3	1	1	3	**15**
Total	**21**	**7**	**25**	**19**	**13**	**17**	**33**	**141**

Low-1 Medium-3 High-9

Core XII – Home Furnishing Practicals

(For Students Admitted from 2022-23)

Semester: V **Hours/Week: 4**
Subject Code: IBFDC54P **Credit: 3**

Course Objectives:

1. To studythe basic furnishings for home decoration
2. To know different materials which are suitable for home furnishings

List of Experiments:

1. Prepare samples for CurtainwithTie & Dyeing **(8 hours)**
2. Prepare samples for Cushion Cover with Smocking **(8 hours)**
3. Prepare samples for wallhanger withreusable **(6 hours)**
4. Prepare samples for Pillow Covers withPatch/ Applique Work **(6 hours)**
5. Prepare samples for Table Mat, Hand Towels with Block Printing **(8 hours)**
6. Prepare samples for Bedspreads with Natural dyes and mattress Protectors with Cordor Elastic **(8hours)**
7. Prepare samples for Mixie &Grinder Cover and Pot Holders withquilts. **(8 hours)**
8. Prepare samples for Table Runner set with traditionalEmbroideries **(8 hours)**

Course Outcomes:

After successful completion ofthis course, student will be able to
CO1: Understand the home furnishing, classifying materials and process.
CO2: Implement skills in creating their own home furnishing items
CO3: Experiment wall and floor covering materials
CO4: Choosea good fabrics for home furnishing
CO5: Manage aneffective home furnishing freelance designer

Text Books:

1. Suzanne McNeill, *Totally Awesome Tie-Dye*, Fox Chapel Publishing, 2021
2. V RameshBabu,S Sundaresan, *Home Furnishing*, WPI India Publishing, 2018

Reference Books:

1. Subramaniyan Senthilkannan Muthu, *Textiles and clothing Sustainable Textile Chemical Processes*,Springer Singapore Publisher, 2016.
2. AlisonSmith, *The Sewing Book*, Dorling Kindersley Ltd Publishing, 2018.
3. Alex Russell, *The Fundamentals of Printed Textile Design*, Bloomsbury Academic, 2016.

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Journals:

1. Journal of Dyes and Pigments
2. International Journal of Textile Science Research
3. Journal of Textile Finishing

E-Resources:

1. https://homeguides.sfgate.com/tiedye-techniques-curtains-89274.html
2.https://www.foamandcovers.co.uk/post/different-types-of-cushion-covers
3.https://www.archilovers.com/stories/27445/types-and-specific-uses-of-wall- hangings.html
4.https://educalingo.com/en/dic-en/table-runner 5.https://www.fibre2fashion.com/industry-article/3871/dyeing

Course Outcomes	Programme Outcomes							
CO	**PO**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	1	1	1	3	3	9	**21**
CO 2	9	3	9	9	3	3	3	**39**
CO 3	3	1	3	3	1	3	3	**17**
CO4	3	3	1	9	3	3	9	**31**
CO5	9	3	3	9	3	9	9	**45**
Total	**27**	**11**	**17**	**31**	**13**	**21**	**33**	**153**

Low-1 Medium-3 High-9

Core XIII – Fashion Photography and Modeling [Theory cum Practicals]

(For Students Admitted from 2022-23)

Semester: VI **Hours/Week: 5**
Subject Code: IBFDC61 **Credit: 5**

Course Objectives:

1.To impart knowledge on fashion photography under different lightings
2.To acquire knowledge about fashion designer photo gallerypreparation

Unit I **(15hours)**

Introduction to Photography and Camera: Principles of Photography – Types of photography- Basics of digital photography – Shutter speed, Aperture, ISO – Components involved in Photography – Types of cameras – Camera handling – support and accessories – Lenses – Lens filters.

Unit II **(15hours)**

Composition and Basic Lighting: Nature of light – light source – Understanding the camera and Lighting Techniques –Primary Lighting – Soft, Accent or Secondary Lighting, Atmosphere. Lighting – types of colour – controlling intensity of light – Over and under exposures.

List of Experiments:

i) Photographs with various lightings
ii) Photographs with various backgrounds
iii) Goldenratio

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Unit III **(15hours)**

Understanding Human Anatomy: Introduction – Concept of Posing – Body language and Attitude – Types of modeling walk: Catwalk and Ramp Walk Technique – Personal style and Photogenic Skills – Grooming Etiquette.

Unit IV **(10hours)**

Modeling in Advertising: Introduction to Fashion Modeling-Ethics of modeling- Psychology in advertising-Understanding the minds of people- Exploiting the weakness of Humanism – Modeling in advertisements.

Unit V **(20hours)**

Strategies of Fashion Photographer: Techniques to be a successful fashion photographer-Revealing the fashion sense, expressions emotions-Importance of background of the object-Highlighting techniques of textures -Photo editing, photo sharing – Video editing and mixing techniques. Creating post for social media (Instragram, Pinterest, Youtube etc.,)

List of Experiments:

a.Close-Up shots
b.Long shots
c.Modeling snaps
d.Action photographs
e. Highlighting the features of a designer costume
f. Flat photography
g.Product photography
h.Ghost – Mannequin photograph

CourseOutcomes:

After successful completion ofthis course, student will be able to
CO1: Understand the basics of photography, identifying elements and principles
CO2: Demonstrate the part of camera parts and types ofDSLR camera
CO3: Compare natural and artificial lights in camera
CO4: Develop knowledge in modeling walk, photogenic skills
CO5: Prepare fashion photographs in various angles and types of photography

Text Books:

1. Dixie Dixon, *Fashion and Lifestyle Photography*, Octopus Publisher, 2017
2. Ryan Shebeeb, *Fashion Photography,Handling Camera*, Independently Publisher, 2017

Reference Books:

1. Thomas Werner, *The fashion Image*, BloomsburyPublishing,2019
2.Susanna Brown, Elizabeth Anne McCauley, Michal Raz-Russo, Shaw, Icons *of Style*, Paul Martineau Publishing, 2018.
3. Tatiana Kurnosova,*All You Need to Know about Model Test Shoots*,IndependentlyPublished,2019.

Journals:

1. International Journal of Design Management and Professional Practice
2. Textile Magazine
3. Journal of Fashion Photography

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E-Resources:

1.https://expertphotography.com/principles-of-design-photography/
2.https://photodoto.com/photography-lighting-techniques/
3.https://thehhub.com/2018/10/10/types-of-modeling/
4.https://www.scribd.com/presentation/55633437/Introduction-to-Fashion-Modelling
5.https://expertphotography.com/the-complete-guide-to-fashion-photography-tip

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	1	1	3	9	3	**23**
CO 2	3	3	1	3	1	9	9	**29**
CO 3	3	3	1	9	3	9	9	**37**
CO4	9	9	9	3	9	3	9	**51**
CO5	3	3	1	3	1	3	3	**17**
Total	**21**	**21**	**13**	**19**	**17**	**33**	**33**	**157**

Low-1 Medium-3 High-9

Core XIV- Fashion Retailing & Research

(For Students Admitted from 2022-23)

Semester: VI **Hours/Week: 5**
Subject Code: IBFDC62 **Credit: 5**

Course Objectives:

1. To know about the retailbusiness and the visual merchandising techniques
2. To acquire knowledge in the field of advertising and promotional activities

Unit I **(15 hours)**

Retail Merchandising: Retail organization structures, The Marketing Channel, Retailing Formats-Department stores specialty stores , hard – to – classify stores, Depth and breadth, discounting , Other Retailing Formats – non store retailers.

Unit II **(15 hours)**

Retail Locations: Unplanned shopping districts, planned shopping centers, and the mix of stores in a shopping center. Retail growth and expansion – Retail ownership. International retailing, Retailing advertising.

Unit III **(15 hours)**

Brands and private labels: Branded merchandising, Licensing, Private labels, and Private labels as brands. Merchandise e-Resources – Manufacturers, Merchant wholesaler – Distributors, Trade shows.

Unit IV **(20 hours)**

The financial aspects of Merchandising: Measures of Productivity –Productivity, turnover, Stock - to – sales Ratio, sales per Square foot, Space Management. Retail pricing –Mark-up. Markdowns, Residue merchandise, maintain Mark-up. Tactical price changes, Managing Markdowns, Promotional Pricing, Deceptive pricing, Resale price Maintenance.

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Unit V **(10 hours)**

Store Layout and Merchandise Presentation: Store planning and design, Visual merchandising, Store layout, Fixtures, Merchandise presentation, signs.

Course Outcomes:

After successful completion ofthis course, student will be able to

CO1: Identify fashion product retailing; understand a theoretical and technological knowledge of current business

CO2: Determine the retail business and retail stores, professionalpractices leading to marketing and merchandising fashion products both locally and globally

CO3: Analyze the retail merchandising private brand labels and trade shows

CO4: Evaluate the measures of productivity, merchandising and pricing

CO5: Arranged retail store layout and visual merchandising for presentation

Text Books:

1. Dimitri Koumbis, *Fashion Retailing, from Managing to Merchandising*, BloomsburyPublishing,2020.

2. John Fernie, David B Grant, *Fashion Logistics*,Kogan Page Publisher, 2019.

Reference Books:

1. Tsan-Ming Choi, Bin Shen, *Luxury Fashion Retail Management*, Springer Singapore Publisher, 2016.

2. RosemaryVarley, Ana Roncha, Natascha Radclyffe-Thomas, Liz Gee, *Fashion Management*,BloomsburyPublishing ,2018.

3. Peter Bug, *Fashion and Film*, Springer Singapore Publisher,2019.

Journals:

1.AUTEX Research Journals

2.Journal of Fashion Technology

3.Journal of Fashion Marketing and Management

E-Resources:

1.https://www.retaildoc.com/retail-101/retail-merchandising

2.www.Fashion Era.com

3.https://www.investopedia.com/terms/p/private-brand.asp

4.https://corporatefinanceinstitute.com/resources/knowledge/other/merchandising/

5.https://www.handystorefixtures.com/store-planning-design

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	9	9	9	3	3	3	**39**
CO 2	9	9	3	9	3	3	9	**45**
CO 3	3	9	9	9	3	1	3	**37**
CO4	3	3	1	3	3	9	3	**25**
CO5	9	1	3	9	3	3	3	**31**
Total	**27**	**31**	**25**	**39**	**15**	**19**	**21**	**177**

Low-1 **Medium-3** **High-9**

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Core XV– Fashion Portfolio Presentation Practicals

(For Students Admitted from 2022-23)

Semester: VI **Hours/Week: 5**
Subject Code: IBFDC63P **Credit: 4**

Course Objectives:

1.To build up the theme and inspiration based designing skills.2.To develop portfolio boardswith computer application

Portfolio Development Technique

Collection for portfolio: Research, Forecast study **(5 hours)**
1. Theme description and mood board with research study **(5 hours)**
2. Brand and logo designing according to theme **(5 hours)**
3. Fashion illustration presentation **(5 hours)**
4. Design development and Flat sketches- Manual& CAD **(5 hours)**
5. Tech Pack/ Specification sheet presentation **(5 hours)**
6. Preparation of pattern according to the design selected garment **(15 hours)**
8. Constructing the garment according to the customer profile. Garments in the collection of4-6 garments children's, women & men. **(20 hours)**
9. Portfolio presentation: Soft copy, Hard copy, modeling withPhoto-shoot **(10 hours)**

Assessment scheme

Portfolio Presentation Technique:

I. Theme board, Mood board, Storyboard, Fabric board, Colour board, Customer Profile, Tech Pack/Specification board, Flat sketch board, Accessory board, Photographic board.

II. Portfolio presentation showonramp

Project Viva Voce

1. Innovative and current topics must be selected bythe students.
2. Studentsshould submit their project with swatches and end uses.
3. Project should be evaluated by internal and externalexaminers.

Course Outcomes:

After successful completion ofthis course, student will be able to

CO1: Understand the development of portfolio presentation techniques, identifying researchand forecasting of recent themes
CO2: Apply the inspiration to thetheme portfolio
CO3: Create portfolio board according to an individual theme
CO4: Researchand relate fashion design to a broader socio economic, historical, and environmental context
CO5: Create a collection of portfolio garments in various season

Text Books:

1.Linda Tain,*Portfolio Presentation for Fashion Designers*, BloomsburyAcademic,2018
2.Lance Derrick, *Fashion Design Project Planner*, Independently Publisher, 2020

Reference Books:

1. Janace E. Bubonia, Phyllis Borcherding, *Developing and Branding the Fashion Merchandising Portfolio*, BloomsburyPublisher, 2016.

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2. Sharon Rothman,*The Fashion Designers Sketchbook*, BloomsburyPublisher,2020.
3.Tamara Albu, Michelle Nahum-Albright, *Fashion Portfolio,Create, Curate,Innovate,* Laurence King Publisher,2020.

Journals:

1.The Journalof Design, Creative Process & the Fashion Industry
2.The Journal of Dress, Bodyand Culture
3.Journal of Fashion Portfolio

E-Resources:

1.https://www.creativeworkers.net/by-program/services-and-training/services-for- your-organization/research-and-survey-services
2.https://www.swatchgroup.com/en/swatch-group/boards
3.https://www.arts.ac.uk/subjects/accessories-footwear-and-jewellery/short-courses/accessories/fashion-accessories-design-online-short-course-lcf
4. https://www.lcca.org.uk/blog/careers/what-is-the-difference-between-graphic- design-and-illustration/
5. https://design.studio/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	9	3	9	3	3	9	**39**
CO 2	9	3	3	9	3	9	9	**45**
CO 3	3	3	9	9	3	3	3	**33**
CO4	9	3	9	9	3	3	3	**39**
CO5	9	3	9	9	3	3	9	**45**
Total	**33**	**21**	**33**	**45**	**15**	**21**	**33**	**201**

Low-1 Medium -3 High-9

Core XVI --Event Design and Management

(For Students Admitted from 2022-23)

Semester: VI **Hours/Week: 4**
Subject Code: IBFDC64 **Credit: 2**

Course Objectives:

1.To understand the concept of event design and management
2.To understand the event layout and event organizing skills

Unit I **(12hours)**

Principles of Project Event Management from Concept to Reality: Understanding event management-types of events-corporate events-promotional events and celebrity events principles of event management-project selection-role of the event manager seeking sponsors-different types of sponsorship-writing sponsorship letter-budget-break-even point- profit and loss statement-balance sheet-panic payments.

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Unit II **(12hours)**

Setting the Scene: Background effects creating magic with fabrics – types of fabric and specific uses – room draping and backdrops – chair and table drapery – customizing fabric effects to specific ceremonies.

Unit III **(12hours)**

Event Design Planning: First client meeting – building a bond and rapport –asking the right questions – presenting design brilliant strokes of inspiration – tools and resources – décor design outline – indoor and outdoor décor – lighting – choreography and audiovisualtools – designpresentation process – renderings – vision / mood boards –textiles – colors.

Unit IV **(12hours)**

Furnishing and Décor Customizing the furniture: Different styles and layouts – flower decorations – significations and selection of flowers – different types of arrangements – table arrangements – different styles and layouts – accent décor – audio visual tools.

Unit V **(12hours)**

Organizing the Event and Safety Purpose: Venue- timing- guest list- invitations- food drink – green room dressing and management - equipment - guest of honor - speakers-media – photographers – podium – exhibition – security – occupational safety – crowd management – major risks and emergency planning.

Course Outcomes:

After successfulcompletion of this course, student will be able to

CO1: Understand the principles of event management, identifying the theme base event
CO2: Construct a suitable background effect using different fabrics
CO3: Compose and plan for various events
CO4: Illustrate different styles and layout for furniture and flower arrangement
CO5: Organizethe event skillfully

Text Books:

1. Vladimir Antchal, Olivia Rams bottom, *The Fundamentals of Event Design*, Taylor& Francis Publisher,2019
2. Ruth Dowson, David Bassett, *Event Planning and Management*, Kogan Page Publisher 2018

Reference Books:

1. Alex Genadinik, *Event Planning*, Create Space Independent Publishing 20152.Donald Getz, Stephen E*vent Studies*, Taylor & Francis Publisher, 2016.
3.RoelFrissen, Ruud Janssen, Dennis Luijer, Dave Gray, *Event Design*, BIS Publishers, 2016.

Journals:

1. Journal of Event Studies
2. Journal of Research and Policy For Planned Events
3. InternationalJournal of Event and Festival Management

E-Resources:

1. https://www.thebalancesmb.com/what-is-event-management-4067066
2.https://www.picocleaners.com/blog/the-12-different-types-of-fabric/

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3.https://www.eventmobi.com/blog/outdoor-event-planning-8-practicals- considerations/
4.https://www.forbes.com/sites/amandalauren/2020/10/21/accessible-custom- furniture-and-decor-is-the-next-big-interior-design-trend/?sh=54352a34e71d
5.https://www.eventbrite.co.uk/blog/guide-health-and-safety-for-events-ds00/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	1	3	3	3	3	3	**19**
CO 2	9	3	3	9	3	9	9	**45**
CO 3	3	3	9	3	9	9	9	**45**
CO4	3	3	1	3	1	9	9	**29**
CO5	9	9	9	9	3	9	9	**57**
Total	**27**	**19**	**25**	**27**	**19**	**39**	**39**	**195**

Low-1 Medium-3 High-9

Core XVII - Computer Aided Design CAD Practicals II

(For Students Admitted from 2022-23)

Semester: VI **Hours/Week: 4**
Subject Code: IBFDC65P **Credit: 2**

Course Objectives:
1.To instill the designing abilities of students using Adobe Illustrator
2.To impart knowledge on patternmaking, grading, marker planning

List of Experiments:

Adobe Photoshop Illustrator
1. Design a garment for children - any3 designs **(5 hours)**
2. Design a garment for women - any3 designs **(5 hours)**
3. Designa garment for men- any3 designs **(5 hours)**
4. Designa visiting card and brochure **(5 hours)**
5. Textile Design: Weave Structure **(10 hours)**

a) Dobby Design
b) Jacquard Design
c) Saree Border
d) Pallu

Technical Software
1. Create a pattern, grading and prepare a marker plan for children – Bib, Summer Frock, Romper **(5hours)**
2. Create a pattern, grading and prepare a marker plan for women – Salwar Kameez, middi & midditop, maxi **(10 hours)**
3. Create a pattern, grading and prepare a marker plan for men- Full sleeve shirt, Kalidar Kurta, Pyjama **(10 hours)**
4. Mobile Apps for designing **(5 hours)**

Course Outcomes:
After successfulcompletion ofthis course, student will be able to
CO1: Identifythe variety ofdigital image making techniques, understanding the technical

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illustration, pattern manipulation and design layout

CO2: Applythe pattern, grading and design development to the fashion industry
CO3: Analyze the pattern grading for children, women and men
CO4: Design digital textile weave structure and jacquard design
CO5: Prepare digital business card and customer profile

Text books:

1. StacyStewart Smith,*CAD for Fashion Design and Merchandising Studio Access Card*, BloomsburyUSA Academic Publisher, 2015
2. Jane Alvarado, *Computer Aided Fashion Design Using GerberTechnology*,Bloomsbury Publisher, 2018

References Books:

1. Ruth Huoh, *Fashion Design*, New York Publisher,2017
2. Patrice Free burger George, *The Digital Dawn*, Fashion InstituteofTechnology, State University of New York Publisher,2020.
3. Joanne Sherrow,*Photoshop and Illustrator for Fashion and Textile Design* , Fairchild Books Publisher, 2015.

Journals:

1. Journal of CAD
2. Journal of CAD Application
3. Journalof CAD Designing

E-Resources:

1.https://textilelearner.net/computer-aided-fashion-designing/
2.https://www.textileblog.com/cad-cam-in-textile-and-garment-industry/
3.https://textilelearner.net/application-of-cad-in-textile/
4.https://www.onlineclothingstudy.com/2018/10/cad-system-and-its-application-in.html
5.https://textilevaluechain.in/in-depth-analysis/5-ways-computer-aided-design-benefits-the-textile- industry/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	9	1	9	1	9	9	**41**
CO 2	9	3	3	9	3	9	9	**45**
CO 3	3	3	9	3	9	9	9	**45**
CO4	3	3	1	3	1	9	9	**29**
CO5	9	9	9	9	3	9	9	**57**
Total	**27**	**27**	**23**	**33**	**17**	**45**	**45**	**217**

Low-1 **Medium-3** **High-9**

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Extra Credit –Mini Project

(For Students Admitted from 2022-23)

Semester:VI

Subject Code: IBFDX6PW **Credit: 2**

Course Objectives:

1. To anticipate consumer trends
2.To create clothing designs

Design Development in form of Portfolio

a. Design brief
b.Design inspiration – Mood board/ theme board
c. Sourcing of Fabrics
d. Development of Design e.
Feedback and improvement
f. Exam as portfolio and viva –voce

Course Outcomes:

After successful completion ofthis course, student will be able to
CO1: Understand the working structureofcompany identifying the design development department
CO2: Analyze the methods of design development
CO3: Assess the process through work experience within the company
CO4: Develop the portfolio boards regarding project theme
CO5: Create thereport for complete project

Text Books:

1.Seive wright Simon, Basics, *Fashion-Research and Design*, Bloomsbury Publisher,2016
2.Robert Hume, *Fashion and Textile Design with Photoshop and Illustrator*, Bloomsbury Publishing, 2019

Reference Books:

1. RuthHuoh,*Fashion Design*, New York Publisher, 2017
2. Patrice Freeburger George,*The Digital Dawn*, Fashion Institute of Technology, State University of Newyork Publisher, 2020
3. Joanne Sherrow,*Photoshop and Illustrator for Fashion and Textile Design*, Fairchild Books Publisher, 2015

Journals:

1. Journal of Design
2. Journal of Portfolio Application
3.Journal of CAD Designing

E-Resources:

1.https://textilelearner.net/computer-aided-fashion-designing/
2.https://www.textileblog.com/cad-cam-in-textile-and-garment-industry/
3.https://textilelearner.net/application-of-cad-in-textile/
https://www.onlineclothingstudy.com/2018/10/cad-system-and-its-application-in.html
4.https://textilevaluechain.in/in-depth-analysis/5-ways-computer-aided-design-benefits-the- textile-industry/

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5.https://textilevaluechain.in/in-depth-analysis/5-ways-computer-aided-design-benefits-the-textile-industry/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	9	3	9	3	9	9	**45**
CO 2	3	3	3	9	3	3	9	**33**
CO 3	9	3	9	9	3	9	9	**51**
CO4	9	3	3	9	3	9	3	**39**
CO5	3	3	3	3	3	9	9	**33**
Total	**27**	**21**	**21**	**39**	**15**	**39**	**39**	**201**

Low-1 Medium-3 High-9

Discipline Specific Elective I a- Apparel Quality Control

(For Students Admitted from 2022-23)

Semester: V **Hours/Week: 4**

Subject Code: IBFDE5A **Credit: 4**

Course Objectives:

1. To gain knowledge in system of apparel quality
2. To understand the qualityparameters of the apparel industry

Unit I **(12 hours)**

Apparel Quality: Quality-Definition-Objectives-Importance of quality-Quality terminologies-No Inspection-100% Inspection-Spot checking-Arbitrary Sampling-statistical sampling –specifications sheet.

Unit II **(12 hours)**

Quality Standards: Standards-Introduction- Benefits of Standards-Levels of Standards-Sources of Standards-ASTM-AATCC- ANSI-BSI-ISO-OEKO.

Unit III **(12 hours)**

Inspection: Inspection- Raw material inspection-fabric inspection- 4 point system, 10 point system - Sewing thread-Zippers- Buttons, Buckles and snap fasteners interlining. In process inspection- Spreading-Cutting-Sewing-Control of fusing Operation-Control of screen printing operation- Control of embroidery operation-Pressing, Final inspection.

Unit IV **(12 hours)**

Managing Quality: Managing quality through inspection- Managing quality through testing-Seven tools of quality-Cause and effect diagram-Check sheet-Control chart-Flow chart-Histogram-Pareto chart-Scatter diagram.

Unit V **(12 hours)**

Fabric Defects: Definition-Self descriptive defects-Types of defects-Baggy-Bar -Balk-Bowed filling-chafe-Fly-Hitch back-Jerked in filling- Pick out mark-Shaded- Smash - Temple marks- Tendering.

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Course Outcomes:

After successful completion ofthis course, student will be able to

CO1: Understand the importance of quality control, identifying the apparelquality control process

CO2: Integrate consumer, aesthetic and quantitative trend information into the product development process

CO3: Estimate the new value into anexisting product or line while holding costs

CO4: Evaluate the fabric and sewing defects

CO5: Manage the fabric quality and standards

Textbooks:

1. Stanley Bernard Brahams,*The Fundamentals of Quality Assurance in the Textile Industry*,CRC Press Publisher,2016.
2. T. Karthik, P. Ganesan, D. Gopalakrishnan,*Apparel Manufacturing Technology*,CRC Press Publisher, 2016.

Reference Books:

1. Rajiv Padhye, Rajkishore Nayak,*Automation in Garment Manufacturing*, ElsevierScience Publisher, 2017.
2. Douglas C,Montgomery,*Introduction to Statistical Quality Control*, Wiley Publisher, 2020
..3.Pradip,V.Mehta,Dr.Rajesh Bheda, Rakhi Handa, Paul F.Bowes, G.Jayapal Nair and Late Dr.Rams,*Quality Tools Implementation in Apparel Manufacturing*, Apparel Design PVT ltd Publisher , 2020.

Journals:

1.Online Journal of the International Fashion and Apparel Industry
2.Research Journal of Fashion Technology
3.Journalof Quality Control in ApparelSectors

E-Resources:

1.https://www.hqts.com/apparel-quality-control-standards-and-procedures/
2.https://asq.org/quality-resources/learn-about-standards
3.https://www.intertek.com/textiles/inspection/
4.https://www.woolwise.com/wp-content/uploads/2017/05/07.2-Textile-Quality-Management-Notes.pdf
5.https://www.onlineclothingstudy.com/2019/02/classification-of-fabric-defects.html

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	3	3	3	9	3	**27**
CO 2	3	3	9	9	3	1	9	**37**
CO 3	3	3	3	9	1	3	3	**25**
CO4	3	1	1	1	1	1	3	**11**
CO5	3	3	3	3	1	1	3	**17**
Total	**15**	**13**	**19**	**25**	**9**	**15**	**21**	**117**

Low-1 **Medium-3** **High-9**

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Discipline Specific Elective I. b -Apparel Production Management

(For Students Admitted from 2022-23)

Semester: V **Hours/Week: 4**

Subject Code: IBFDE5B **Credit: 4**

Course Objectives:

1. To familiarize more about processofapparel manufacturing unit
2. To enable studentsto studyproduction and planning process

Unit I **(12 hours)**

Human Resource Development: Introduction to Structure and Sectors of Clothing Industry- Job Analysis and Description-Job Specification-Recruitment and Selection-Kinds of Interview-Purpose of Appraisal-Criteria of Appraisal-Methods of Appraisal Methods-Limitations-Human Resource Development Methods and Processes-Sewing Room Supervisor's Job and Training Needs - Human Resource Development in Indian Apparel Industry.

Unit II **(12 hours)**

Plant Engineering & Line Balancing: Introduction to garment industry plant location - Location economics - Plant layout- Process layout- Product layout -Combination Layout - Introduction to balancing theory- Balance control- Balancing exercises for garment industry.

Unit III **(12 hours)**

Work Study Concept and Need: Method Study and work measurement –Techniques-Process chart symbol -Process flow chart -Flow diagrams- String diagrams – Multiple activity chart -Principles of motion economy- SIMO chart - Time study methods - Standard time data -Ergonomics with specialreference to garment industry.

Unit IV **(12 hours)**

Methods of Production Systems: Production and productivity methods of production systems – Job, Mass & Batch –Section systems, Progressive bundle system & Synchrony system – Conveyor systems – Unit production system – Quick response.
Productivity concepts – Measurement of productivity– –Man Machine Material"– Criteria for increasing productivity.

Unit V **(12 hours)**

Production Planning and Control: Function, Qualitative and quantitative analysis of production - Coordinating departmental activities - Basic production systems - Evaluating and choosing the system- Flow process and charts for garment - Scheduling calculations -Assigning operators optimally - Setting up complete balanced production lines to produce given amount of garments.

Course Outcomes:

After successful completion ofthis course, student will be able to

CO1: Understand the production structure, identifying production management of the global textile/apparel industries

CO2: Demonstrate effective leadership, teamwork, and communication skills

CO3: Explain the plant locationand balance the garment industry

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CO4: Evaluate the work measurement of apparel production management
CO5: Developthe present merchandise lines for identified market segments

Text Books:

1.R. Rathinamoorthy, R. Surjit, *Apparel Machinery and Equipment*, CRC Press Publisher, 2015

2.Richard Blackburn, *SustainableApparel: Production, Processing and Recycling,* Wood head publishing, 2015

References Books:

1. T. Karthik, P. Ganesan, D. Gopalakrishnan, *Apparel Manufacturing Technology*,CRC Press Publisher, 2016.

2. Miguel Angel Gardetti, Subramanian Senthilkannan Muthu, *Sustainability in theTextile and Apparel Industries, Production Process Sustainability*, by Springer International Publishing, 2020.

3. Rajiv Padhye, Raj Kishore Nayak, *Automation in Garment Manufacturing*, ElsevierScience Publisher, 2017.

Journals:

1. Journal of Textile and Apparel, Technology and Management. (JTATM)
2. Research Journal of Textile and Apparel(RJTA)
3. Journal of Clothing Science and Technology

E-Resources:

1. https://unevoc.unesco.org/home/human+resource+development&context=
2.https://apparelresources.com/business-news/manufacturing/apparel-plant-layout- basics/
3. https://www.businessmanagementideas.com/production-management/work-study- definition-need-and-advantages-production-management/9592
4. https://www.britannica.com/technology/production-system
5.https://www.managementstudyguide.com/production-planning-and-control.html

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	1	1	1	3	1	3	**7**
CO 2	3	9	3	3	1	1	3	**23**
CO 3	3	3	1	1	3	1	3	**15**
CO4	3	1	1	1	3	1	3	**13**
CO5	3	3	3	3	3	3	3	**21**
Total	**15**	**17**	**9**	**9**	**13**	**7**	**15**	**79**

Low-1 Medium-3 High-9

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Discipline Specific Elective II a. Home Furnishing

(For Students Admitted from 2022-23)

Semester: V **Hours/Week: 4**
Subject Code: IBFDE5C **Credit: 4**

Course Objectives:
1. To study the various fabrics used for furnishings
2. To know different materials which are suitable for home furnishings

Unit I **(12 hours)**
Introduction to Home Furnishing: Introduction to home furnishing-different types of furnishing material- selection of furnishing material for various interior designs.

Unit II **(12 hours)**
Draperies and Curtains: Doors and windows-different types and functions-styles in draperies-curtains and valances and its different types -care and maintenance.

Unit III **(12 hours)**
Floor Coverings: Floor coverings and its classification -carpets and rugs and its different type -Floor covering-hand floor coverings, soft floor coverings-care and maintenance.

Unit IV **(12 hours)**
Linens: Bed linen-pillow-pillow covers-bed covers-kitchen linen-apron-table linen and hand towel-bathroom linenand its different types.

Unit V **(12 hours)**
Market Overview: Overview of home furnishing industries-market view-recent trends-sourcing of materials

Course Outcomes:
After successfulcompletion of this course, student will be able to
CO1: Understandthe home furnishing, identifying suitable materials and products
CO2: Apply care and maintenance of home furnishing products
CO3: Analyze the types of floor coverings and its maintenance
CO4: Evaluate the recent trends in home furnishing
CO5: Prepare the doors and windows coverings

Textbooks:
1. V. Ramesh Babu, Sundaresan, Home *Furnishing*, WPI India Publisher, 2018.
2. T Karthik, D GopalaKrishnan, *Home Textiles*, Daya Publishing House, 2016.

Reference Books:
1. Anne Hildyard, *Cushions, Curtains and Blinds Step by Step*, Dorling Kindersley Ltd Publisher,2017.
2. Razaq AAdekunle,*Furnishings and Supplies*, Amazon KDP PrintUS Publisher, 2020.
3. Jessica Probus, *Home Decor Cheat Sheets*, Ulysses Press Publisher, 2016.

Journals:
1. Home Textiles Today

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2. Journal of Textile Research
3. InternationalJournal of InterdisciplinaryResearch

E-Resources:

1. https://blog.fieldtexcases.com/woven-and-non-woven-textiles/
2. https://www.britannica.com/technology/floor-covering
3. https://www.thespruce.com/what-are-curtains-drapes-shades-and-blinds-4067656
4. https://www.hometown.in/home-furnishings
5. https://www.merriam-webster.com/dictionary/bed%20linen%28s%29

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	3	3	1	3	3	**19**
CO 2	3	3	1	1	3	3	9	**23**
CO 3	3	3	1	1	3	3	9	**23**
CO4	3	3	9	9	3	9	9	**45**
CO5	3	1	1	1	3	3	9	**21**
Total	**15**	**13**	**15**	**15**	**13**	**21**	**39**	**131**

Low-1 Medium-3 High-9

Discipline Specific Elective II
b. Apparel Business Accounting and Entrepreneurship

(For Students Admitted from 2022-23)

Semester: V **Hours/Week: 4**
Subject Code: IBFDE5D **Credit: 4**

Course Objectives:

1.To understand the fundamental concept and principles of business accounting
2.To impart knowledge about various institutions supporting entrepreneur

Unit-I **(12 hours)**

Accounting Principles: Introduction to accounting principles – meaning and scope of accounting – double entry system – advantages – difference between double entry and single entry– accounting concepts, principles and conventions – journal, ledger and trial balance.

Unit-II **(12 hours)**

Introduction to Cost and Financial accounting: Fundamental principles of cost accounting -nature and scope- elements of cost-classification of cost-preparation of cost sheet- marginal costing-fixation of selling price-make or buy decisions-selection of a suitable product mix. Preparation of financial accounts- trading and profit and loss account-balance sheet-adjustmententries. Uses and limitations of financial accounting.

Unit-III **(12 hours)**

Introduction to Apparel Entrepreneurship: Definition of entrepreneur – Meaning – qualities of a successful entrepreneur in textile and apparel industry – functions - types of apparel entrepreneurs- entrepreneurs and managers- role of entrepreneurship in economic development– barriers ofentrepreneurship.

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Unit-IV **(12 hours)**

Entrepreneurial development programs: Phases of entrepreneurial development programs - content of training program - Steps for starting a small industry – sources of support for entrepreneurs - institution assisting entrepreneurs. Management and the entrepreneur- Equipment management, Inventory control- production Control- quality control, cost control and business communication.

Unit-V **(12 hours)**

Entrepreneurship in apparel industry: Business planning – Starting a new venture related to apparel industry, essentials of a successful center; Location & plant layout-factors, influencing plant location, building, structure, lighting, ventilation, material handling, availabilityof labor, material management and transportation.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Identify the business accounting, understanding entrepreneurship skills among thestudents in the textile/apparel field

CO2: Explaining the accounting procedure and process of setting up new enterprises to the students

CO3: Analyze the managing role of the entrepreneur

CO4: Developing awareness inthe rules and policies of the enterprises

CO5: Organizing production process and business support to entrepreneur

Text Books:

1. Debasish Biswas, Chanchal Dey, *Entrepreneurship Development in India*, Taylor & Francis Publisher 2021

2. Mads Faurholt,Lars Tvede, *Entrepreneur*, WileyPublisher,2018

Reference Books:

1.Andreas Masouras, Androniki Kavoura, Georgios Maris, *Entrepreneurial Development and Innovation in Family Businesses andSMEs*, IGI Global, Business Science Publisher,2020.

2.M. Y. Khan, P. K. Jain, *Financial Management*, McGraw-HillEducationPublisher,2018.

Journals:

1. JournalofEntrepreneurship
2. International journalof Entrepreneur and Innovation
3. Academic of Entrepreneurship Journal

E-Resources:

1. https://thegrittifund.com/entrepreneurship-definition/describe-principles-concept- scope-entrepreneurship/
2. https://textilevaluechain.in/news-insights/policies-that-led-to-the-growth-of-textile- and-garment-industry-in-india/
3. https://www.apparelentrepreneurship.com/about-us/ 4.https://textilevaluechain.in/news-insights/design-management-in-textile-industry/5.https://news.gcase.org/2011/10/24/what-is-entrepreneurial-management/

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Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	9	3	3	3	3	3	9	**33**
CO 2	3	3	1	1	1	3	3	**15**
CO 3	9	9	9	9	3	3	9	**51**
CO4	3	3	3	1	1	3	9	**23**
CO5	3	3	3	3	1	3	9	**25**
Total	**27**	**21**	**19**	**17**	**9**	**15**	**39**	**147**

Low-1 Medium-3 High-9

Discipline Specific Elective III a. Fashion Communication

(For Students Admitted from 2022-23)

Semester: VI **Hours/Week: 4**
Subject Code: IBFDE6A **Credit: 4**

Course Objectives:

1. To study the basic communication in fashion industry
2. To plan and develop communication strategies, promote events, and write articles as fashion journalists

Unit I **(12 hours)**

Fashion and the communication process: Define fashion process, Theories of fashion adoption need for promotion of fashion, need for the communication process and communication through different media.

Unit II **(12 hours)**

Written Communication: Fashion writing, creative writing reporting features, editing, printing techniques, image management and advertising, public relations, press laws and media ethics.

Unit III **(12 hours)**

Visual Communication: Fashion photography, window display and multimedia – audio, still images, animation, video footage and interactivity.

Unit IV **(12 hours)**

Communication: Communication in practice, Scripting shows, conducting interviews, reporting events, fashion critics, planning PR campaigns, formulating case studies, designing catalogs and brochures. Visualization of décor and ambience, preparing short films/audio-visuals, choreography of fashion events.

Unit V **(12 hours)**

Fashion Magazine: Designing of own fashion magazines/Designing of own fashion brochures by the students/designing a look book/designing a line planning.

Course Outcomes:

After successful completion ofthis course, student will be able to

CO1: Identify the clothing and fashion classify the fashion communication

CO2: Applythe fashion design workofothers and providing constructive criticism forongoing

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work

CO3: Justifying ideas suitable for photography and fashionpublication

CO4: Compose fashion articles and future for digital media

CO5: Create knowledge of fashion magazines and brochures for advertisement

Text Books:

1. Francesca Cominelli, Lorenzo Cantoni, Nadzeya Kalbaska, Teresa Sádaba, *Fashion Communication in the Digital Age*,Springer Publisher,2019
2. EmilyHuggard,Jon Cope,*Communicating Fashion Brands*,Taylor Francis Publisher,2020

ReferencesBooks:

1. Caline Anouti, Barbara Graham, *Promoting Fashion*, Laurence King Publishing, 2018.
2. Gwyneth Moore, *Fashion Promotion*, Bloomsbury Publishing, 2021.
3. Byoungho Jin, Elena Cedrola, *Fashion Branding and Communication*, Palgrave Macmillan US publisher, 2017.

Journals:

1. Journal of Berlin Fashion
2. Journal of Dress, Bodyand Culture
3. Journal of Fashion Communication in the digitalage

E-Resources:

1.https://killervisualstrategies.com/blog/category/visual-communication-2
2.https://www.inc.com/encyclopedia/written-communication.html
3.https://www.quora.com/What-is-fashion-communication
4.https://photographycourse.net/the-4-different-types-of-fashion-photography/
5.https://www.magazineline.com/blog/best-fashion-magazines

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	9	9	9	3	3	1	9	**43**
CO 2	9	1	1	3	9	1	3	**27**
CO 3	3	1	1	3	3	1	1	**13**
CO4	3	1	1	3	3	1	1	**13**
CO5	9	3	3	3	3	3	3	**27**
Total	**33**	**15**	**15**	**15**	**21**	**7**	**17**	**123**

Low-1 Medium-3 High-9

Discipline Specific Elective III b. Textile Testing

(For Students Admitted from 2022-23)

Semester: VI **Hours/Week: 4**

Subject Code: IBFDE6B **Credit: 4**

Course Objectives:

1. To acquire knowledge and learn to handle textile testing instruments
2. To analyze the fiber, yarn and fabric properties and results with statistical tools

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Unit I **(12 hours)**

Introduction to testing: Terminology of testing - Selection of samples for testing: fibre, yarn and fabric sampling. Standard RH and temperature for testing - Measurement of Moistureregain - Conditioning oven & ShirleyMoisture meter.

Unit II **(12 hours)**

Fiber Testing: Cotton fiber length - Baer Sorter, Fineness Sheffield micronaire, Maturity, Caustic Soda swelling, Strength - Pressley bundle strength tester, Stelometer. Determination of trash and lint in cotton - Shirleytrash analyzer.

Unit III **(12 hours)**

Yarn Testing: Determination of yarn count – quadrant, Analytical & Beesley balance. Twist – Direction of twist and amount of twist, Twist effect on fabric properties. Strength of yarn- Single yarn strength tester. Crimp – Shirley crimp tester. Yarn appearance tester. Evenness – Uster Evenness tester, Hairiness – Uster Hairiness tester.

Unit IV **(12 hours)**

Fabric Testing: Fabric Testing: Fabric strength tester – Tensile strength, tearing strength & bursting strength. Abrasion – Types of abrasion – pilling – Martindale pill box tester. Drape – Drape meter, Fabric stiffness - Shirley stiffness Tester, crease recovery – Shirley crease recoverytester. Thermal conductivity, water absorbency test, Water repellency tester.

Unit V **(12 hours)**

Garment Testing: Seam strength, Dimensional Stability, Spirally; Accessories Testing: Zipper, Buttons, Sewing thread, Peel bond strength. Colour Fastness of Textiles - Crocking test, perspiration test, sunlight, laundering, dry-cleaning, Computer Colour Matching – Colour measurement and Whiteness Index.

Course Outcomes:

After successful completion ofthis course, student will be able to

CO1: Understand the testing terminologyand identifying the statisticaltools in textile testing
CO2: Apply the varies testing for fiber to fabric
CO3: Analyze the garment testing method
CO4: Evaluate the fiber and yarn properties
CO5: Develop the Knowledge of textile testing methods

Text Books:

1.Abher Rasheed, Ali Afzal, Faheem Ahmad, Sheraz Ahmad, *Advanced Textile Testing Techniques*, CRC Press Publisher,2017
2.T Karthik, P Ganesan, D Gobalakrishnan, *Apparel Manufacturing Technology*,CRC Press Publisher,2016

References Books:

1. KimGandhi, *Woven Textiles*, Elsevier Science Publisher, 2019.
2. L Ashok Kumar, M Senthil Kumar, *Automation in Textile Machinery*, CRC PressPublisher, 2018.

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3. Patricia Dolez, Olivier Vermeersch, Valerio Izquierdo, *Advanced Characterization and Testing of Textiles*, Elsevier Science Publisher, 2017

Journals:

1. Journal of Textile Research
2. International Journal of Textile Science Research
3. Journal of Industrial Textile

E-Resources:

1.https://study.com/academy/lesson/textile-testing-terminology.html
2.https://textilelearner.net/classification-of-textile-testing-fiber-testing-yarn-testing- fabric-testing/
3.https://textilelearner.net/classification-of-textile-testing-fiber-testing-yarn-testing- fabric-testing/
4.https://textilelearner.net/classification-of-textile-testing-fiber-testing-yarn-testing- fabric-testing/
5.https://atira.in/fabric-garment-testing/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	1	1	3	1	3	3	**15**
CO 2	9	1	1	3	9	1	3	**27**
CO 3	3	3	3	1	3	1	3	**17**
CO4	3	1	1	3	3	1	1	**13**
CO5	9	3	3	3	3	3	3	**27**
Total	**27**	**9**	**9**	**13**	**19**	**9**	**13**	**99**

Low-1 Medium-3 High-9

Skill Enhancement Course I - Fiber to Yarn

(For Students Admitted from 2022-23)

Semester: I **Hours per Week: 2**
Subject Code:IBFDS14 **Credit: 2**

Course Objectives:

1. To study the natural and manmade fibers properties.
2. To know the different types of yarnand manufacturing method

Unit I **(6 hours)**

Introduction to Textile Fibers: Introduction to the field of textiles- classification of fibers - natural and synthetic-according to their nature and origin-essential and desirable properties of textile fibers-staple and filament-comparisonof naturaland manmade fibers.

Unit II **(6 hours)**

Natural Fibers: Cotton fibers-properties and uses-jute fiber-extraction, properties and uses-flax fiber, hemp fibers-properties and uses-silk fiber-life cycle of silk worm-silk reeling and throwing-properties and uses-wool fiber-varieties of wool -differences between -worsted and wool fiber- properties and uses- brief study of hair fibers.

Unit III **(6 hours)**

Man-made Fibers: Regenerated fibers – viscose rayon – manufacturing process - properties and uses-modal, Lyocell, bamboo - synthetic fibers – polyester manufacturing process –

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properties and uses-nylon 6 and 6, properties and uses – polypropylene, acrylic.

Unit IV **(6 hours)**

Yarn Manufacturing Process: Spinning –Definition, Classification – Chemical and mechanical spinning –blending, opening, cleaning, doubling, carding, combing, drawing, roving, spinning.

Unit V **(6 hours)**

Yarn and its classifications: Definition, Classification – yarn twist , types and effects, simple and fancy yarns-Qualityparameters while sourcing yarn - Sewing threads and its properties.

Course Outcomes:

After successfulcompletion ofthis course, student will be able to

CO 1: Understand the natural and man-made fibers, identifying their uses
CO 2: Determine the properties and manufacturing process of textile fibers
CO 3: Analyze the yarn development process
CO 4: Compare the Sewing thread with textile yarn
CO 5: Summarize the classification and quality offiber and yarn

Text Books:

1. T Karthik, P Ganesan, D Gobalakrishnan, *Apparel Manufacturing Technology*, CRC Press Publisher, 2016
2. Jonathan Y Chen, *Activated Carbon Fiber and Textiles*, Elsevier Science Publisher, 2016

Reference Books:

1. FaheemUddin, *Textile Manufacturing Processes*, Intech Open Publisher, 2019.
2. H V Sreenivasa Murthy, *Introduction to Textiles Fibers*, WPI India Publisher, 2018.
.3.R.Senthilkumar, *Fancy Yarn - Types, Manufacturing Techniques, Applications*, Create Space Independent Publisher, 2017.

Journals:

1.Journal of Textile Design Research and Practice
2.Journal of Natural Fibers
3.Journal of Textile Testing

E-Resources:

1. https://edurev.in/studytube/Class-Notes-Fibre-to-Fabric/5dc96315-111b-4625-bc82-d1777f820f9a_t
2. http://www.fibre2fashion.com/industry-article/7650/fibre-to-fabric-manufacturing- process-of-wool
3. https://www.leichtfried-loden.com/en/from-fibre-to-fabric/#step-dyeing
4.http://www.nios.ac.in/media/documents/SecHmscicour/english/Home%20Science%20(Eng)%20Ch-10.pdf
5. https://textilelearner.net/concept-of-yarn-manufacturing-process/

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Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	1	1	3	1	1	**13**
CO 2	9	3	9	9	3	1	3	**37**
CO 3	9	9	9	9	3	3	3	**45**
CO4	3	1	9	9	3	1	3	**29**
CO5	3	3	3	9	9	1	9	**37**
Total	**27**	**19**	**31**	**37**	**21**	**7**	**19**	**161**

Low-1 Medium-3 High-9

Skill Enhancement Course II – Surface Embellishment
Practicals

(For Students Admitted from 2022-23)

Semester: II **Hours/week: 2**
Subject code: IBFDS24P **Credit: 2**

Course Objectives:

1. To impart practical knowledge in various surface ornamentationtechniques
2. To equip the studentsto analyze suitable surface embellishment used ondifferent products

List of Experiments: **(15 hours)**

1. **Introduction to embroidery stitches**
2. **Basicembroidery stitches:**

a.Line stitches – running and its variation – whipped running – loopedrunning –stepped thread –back stitch – stem stitch – couching.
b.Loop stitches – chain stitch and its variations – detached – lazydaisy stitch –square chain
c.Filling stitch – satin – long and short – seeding – French knot – bullion knot – fly stitch
d.Cross stitch – cross stitch – herringbone – double herringbone – close herringbone.
e.Edging stitch– buttonhole and its variations – blanket – closed buttonhole.
f. Feather stitch– fish bone

3. **Surface ornamentation techniques** **(10 hours)**

Applique work – cut work – patch work– bead – sequins – ribbon works – aari – zardozi.

4. **Traditionalembroidery:** **(5 hours)**

a. Kantha of Bengal
b. Kashida ofKashmir
c. Embroideryof Gujarat
d. PhulkhariofPunjab
e. Chikankari of Uttar Pradesh
f. Kasutiof Karnataka

Course Outcomes:

After successful completion ofthis course, student will be able to
CO1: Understand the basic embroidery stitches and classifying the variations
CO2: Analyze the different methods of surface ornamentation techniques

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CO3: Analyze the traditionalembroideries of India
CO4: Recommend the appropriate surface embellishment techniques to enhance the value of home furnishing and apparel fabrics
CO5: Design and develop appropriate designs for embroidery in textile products

Text books:
1.KimberlyIrwin, *Surface Design for Fabric*, Bloomsbury Academic Publisher,2015
2.Jessica Pile, *Fashion Embroidery*, Bats ford Publisher, 2018

Reference books:
1. Dorling Kindersley, *Embroidery*, DKPublisher,2015
2. Betty Barnden, *Embroidery Stitch Bible*, Search Press LTD Publisher,2017
3. Jessica pile, *Fashion Embroidery*, Bats ford Publishing, 2018

Journals:
1. Journalof Textile Science
2. Journal of Surface Design
3. Journal ofApplication Techniques

E-Resources:
1. https://thedesigncart.com/blogs/news/the-beautiful-details-of-surface-ornamentation
2.https://thedesigncart.com/blogs/news/surface-ornamentation-history-and-types
3.https://sosopoetry.blogspot.com/2018/08/fabric-surface-embellishment-techniques.html
4.https://www.achievementlearn.com/cloth-surface-embellishment-techniques/
5.https://archive.hs.iastate.edu/past-exhibits/on-the-surface-textile-embellishment- techniques/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	3	3	1	1	3	1	1	**13**
CO 2	9	3	9	9	3	1	3	**37**
CO 3	9	9	9	9	3	3	3	**45**
CO4	3	1	9	9	3	1	3	**29**
CO5	3	3	3	9	9	1	9	**37**
Total	**27**	**19**	**31**	**37**	**21**	**7**	**19**	**161**

Low-1 Medium-3 High-9

Skill Enhancement Course III -Draping Techniques Practicals

(For Students Admitted from 2022-23)

Semester: III **Hours/Week: 2**
Subject Code: IBFDS34P **Credit: 2**

Course Objectives:
1. To provide skills of draping and understand the human body proportion to get the required shape and fit of the garments
2. To inculcate knowledge on basic patterns and draping skills in fashion

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List of Experiments:

Draping Techniques: **(20 hours)**

1. Introduction to draping and dress forms
2. Preparation of fabric and dress form for Draping
3. Draping of bodice blocks variation: Bustier, Asymmetric bodice, off shoulder design,halter.
4. Draping basic skirts- onepiece basic skirt, gored skirt, flared skirt, pleated skirt.
5. Draping collars- Peter pan and Shirt Collar
6. Draping Sleeves- plain, Kimono, RaglanSleeve
7. Waist line variation: Empire, lowered, pointed andprincess bodice.
8. Draping a Shirt for men

Draping a Garment formen, women and children's wear in various sized dress forms

I. Converting or Truing the Pattern **(10 hours)**

II. Pattern Development

III. Construction of Garment

Course Outcomes:

After successfulcompletion ofthis course, student will be able to

CO1: Acquire the skills of draping on dress form by an introduction to terminology, understanding fundamentals and advanced techniques of draping

CO2: Identifyabout custom fitted, basic pattern to prepare manydifferent styles

CO3: Analyze the various parts of the garments

CO4: Manipulate the basic draping into designer costumes drape

CO5: Developthe structure of a garment design using draping techniques

Text Books:

1. Francesca Sterlacci,*Draping Techniquesfor Beginners*, Laurence King Publishing,2019
2. Danilo Attardi,*Fashion Draping Techniques Vol. 1*, Hoaki Books SLPublisher,2021
3.Connie Amaden Crawford, *The Art Of Fashion Draping*,BloomburryAcademic,2018

Reference Books:

1. Helen Joseph Armstrong-Susan P Ashdown, *Draping for Apparel Design*, Fairchild BooksPublisher,2021
2. SallyM DiMarco, *Draping Basics*, BloomsburyAcademic,2016
3. Francesca Sterlacci, *Draping Techniques for Beginners*, Laurence King Publishing,2019

Journals:

1. Textile Research Journal
2. International Design Journal
3. Journal of Pattern Making

E-Resources:

1.https://style2designer.com/apparel/draping-mannequin/what-is-draping-technique- and-its-process/
2.https://fabricalchemist.com/2017/06/11/draping-3-sleeves/
3.https://www.universityoffashion.com/wp- content/uploads/2013/06/StraightSkirtSloper.pdf
4.https://www.universityoffashion.com/wp- content/uploads/2013/06/YokeDirndlSkirt.pdf
5.https://www.moodfabrics.com/blog/intro-to-draping-dress-form-muslin-basics/

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Course Outcomes	Programme Outcomes							
CO	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	Total
CO 1	9	3	3	1	3	1	3	23
CO 2	3	3	3	3	3	1	1	17
CO 3	9	3	3	9	3	9	9	45
CO4	9	3	1	3	3	1	9	29
CO5	9	3	3	9	9	3	41	37
Total	39	15	13	25	21	15	23	151

Low-1 Medium-3 High-9

Skill Enhancement Course IV - Clothing Care and Maintenance

(For Students Admitted from 2022-23)

Semester: IV **Hours/Week: 2**
Subject Code: IBFDS44 **Credit: 2**

Course Objectives:

1. To impart knowledge onclothing care practices
2. To enable them to know about care labelsymbols used to maintain different types of fabric

Unit I **(6 hours)**

Water and Soap: Types- soft water-hard water- purification of water. Soaps, detergents-types- manufacturing-properties.

Unit I **(6 hours)**

Laundering: Objects – methods -laundering of white - coloured, cotton, silk, wool, synthetic fabrics, lace materials, carpets. Clothing storing- mending - darning- seasonalcare.

Unit III **(6 hours)**

Dry cleaning: Chemicals used - sequence - method - commercial drycleaning. Washing machines – types - working principles.

Unit IV **(6 hours)**

Ironing andpressing: Hot air, steam, permanent pressing, and tumble drier –hydro extractor - working principle.

Unit V **(6 hours)**

Stain and care: Classification – removal of known and unknown stains - rules in removing fresh and old stains. Stain removers - grease solvents – absorbents - washing soda - borax. Care labels – importance- symbols – uses. Packing – importance – care of import & export packing.

Course Outcomes:

After successful completion ofthis course, student will be able to

CO 1: Understand the care and maintenance of fabrics, classifying the process.
CO 2: Determine the suitable methodsofwashing, drying, ironing and storing ofthe fabric
CO 3: Appraise the types of equipment used inthe cleaning fabrics

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CO 4: Evaluate the methods of caring to be used for a better life of clothes
CO 5: Developthe care and maintenance of fabric packaging and finishing

Text Books:
1. Raj Kishore Nayak, *Care and Maintenance of Textile Products Including Appareland Protective Clothing*, Saminathan Ratnapandian,2018
2. Karen, *The Care and Display of Historic Clothing*,M.Depauw,Rowman & Littlefield Publishers ,2017

Reference Books:
1.Sally Chivers , *Care Home Stories*,Ulla Kriebernegg,transcript Verlag Publisher,2018.
2.Patric Richardson, Karin B,Miller, *Laundry Love*, Flatiron Books Publisher,2021.
3.MarySchenck Woolman, *Clothing*, FB&C LTD Publisher, 2016.

Journals:
1. Journal of Clothing Science
2. Journal of Clothing Care
3. Journal of Laundry Care

E-Resources:
1.https://www.slideshare.net/indianeducation/care-and-maintenance-of-fabrics.
2.https://blog.utsavfashion.com/how-to/fabric-maintenance.
3. https://www.hermanmiller.com/content/dam/hermanmiller/documents/materials/reference_info/Care_Textiles.pdf.
4. https://fabriclore.com/blogs/news/fabric-care-guide
5.https://www.heirloomcreations.net/pressing-or-ironing/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	9	3	3	1	3	1	3	23
CO 2	3	3	3	3	3	1	1	17
CO 3	9	3	3	9	3	9	9	45
CO4	9	3	1	3	3	1	9	29
CO5	9	3	3	9	9	3	1	37
Total	**39**	**15**	**13**	**25**	**21**	**15**	**23**	**151**

Low-1 **Medium-3** **High-9**

Skill Enhancement Course V – Textile Printing Practicals

(For Students Admitted from 2022-23)

Semester: V **Hours/Week: 2**
Subject Code: IBFDS55P **Credit: 2**

Course Objectives:
1.To learn about various dyeing and its techniques
2.To develop the knowledge onprinting

List of Experiments:
1. Preparation of samples and printing paste for printing. **(5 hours)**

- Cotton
- Polyester
- Silk.

2. Create Designwith Block printing – Vegetable/ wooden blocks **(5 hours)**
3. Create Design for Chest print/ Neck /Yoke designs with Stencil printing. **(5 hours)**
4. Tie and Dye Designs with anythree methods with single/double/ Multicolor. **(5 hours)**
5. Batik printing with any three methods with single/ double/ Multicolours. **(5 hours)**
6. Print a Design using Screenprinting methods. **(5 hours)**

Course Outcomes:

After successful completion ofthis course, student will be able to

CO1: Identify the wet processing, understanding the various textile printing and dyeing processes
CO2: Prepare preliminaryprocess of printing and dyeing methods
CO3: Experiment the printing and dyeing methods used in a varietyof fabrics
CO4: Applythe printing and dyeing to the fabric
CO5: Create Printing and dyeing structures on fabric

Text Books:

1. Aminoddin Haji, Luqman Jameel Rather, Mohd Shabbir,*Innovative and Emerging Technologiesfor Textile Dyeing and Finishing*, WileyPublishing,2021
2. FaheemUddin,*Textile Manufacturing Process*, Intech Open Publishing, 2019

Reference Books:

1. J N Chakra borty, *Fundamentals and Practicesin Coloration of Textile*, WPI India Publisher,2015.
2. N Shah, *Guide to Wet Textile Processing Machines*, Elsevier Science and Technology, 2015.
3.Subramanian Senthilkannan Muthu, *Textiles and clothing Sustainable Textile Chemical Processes*, Springer Singapore Publisher, 2016.

Journals:

1. Research Journal ofTextile and Apparel (RJTA)
2. Journal of Colour research & Application
3. Journal of Textile Dyeing and Finishing

E-Resources:

1. https://textilelearner.net/typical-preparatory-process-of-dyeing/
2.https://www.textilestudent.com/the-functions-of-ingredients-are-used-in-printing- paste/
3.https://www.printing.com/nz/services/2018/06/27/5-ways-beat-creative-block/
4.https://www.printing.com/nz/services/2018/06/27/5-ways-beat-creative-batik/
5.https://www.printing.com/nz/services/2018/06/27/5-ways-beat-creative-screen print/

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Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	9	1	1	1	9	3	3	**27**
CO 2	3	1	1	1	3	1	1	**10**
CO 3	3	1	3	9	9	3	9	**28**
CO4	9	3	1	1	3	3	9	**29**
CO5	9	1	9	9	3	3	9	**43**
Total	**33**	**7**	**15**	**21**	**27**	**13**	**31**	**147**

Low-1 Medium-3 High-9

Skill Enhancement Course I – Fashion Styling Practicals

(For Students Admitted from 2022-23)

Semester: VI **Hours/Week: 2**
Subject Code: IBFDS66P **Credit: 2**

Course Objectives:
1. To instill students interest towards various beautycare regimes
2. To learnthe different techniques of makeup and hairstyles

List of experiment
1. **Introduction to Fashion Styling:** Design collection and presentation on various styles of fashion. **(2hours)**
2. **Concept ofStyling:** Color Matching, Accessories Coordination, Mix and match **(2hours)**

3.Hairdo:(10 hours)
a) Highlighted Messy bun with Long Side – Swept Bang
b) Side Fish-tailbraided hairdo
c) French braid
d) French twist
e) Poof voluminous ponytail

3. **EyeMakeup:** Classic, Smokey, Retro, Lashy, Golden shadow, Lens and shine. **(4 hours)**

4.Fashion theme makeover: **(10hours)**
a) Classic
b) Retro
c) Rustic
d) Vibrant colors
e) Dewy

5.Back Stage Activity of Various Events (Fashion shows, Advertisements, Cultural events, wedding)**:** **(2hours)**
a) Situation handling
b) Technical tips – Ironing, Tacking, Quick stitches and draping.

Course Outcomes:
After successful completion ofthis course, student will be able to
CO1: Understand the skills to develop design capability in lifestyle, classifying the products and styles
CO2: Acquire the beauty products and identify recent trends

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CO3: Cultivate aesthetic sensibilities and build on craftsmanship skills
CO4: Analyze the various events and situation handling
CO5: Develop personal grooming and makeup skills

Text Books:
1.Alexandra Fullerton, *Howto Dress*, Pavilion Books Publisher,2018
2.Christian Allaire, *The Power of Style*, Annick Press Publisher,2021

Reference books:
1. Jacqueline McAssey, Sophie Benson, Clare Buckley, *Fashion Styling*, Bloomsbury Publisher, 2021.
2. Steph Adams, *Fashion and Style*, Amazon Digital Services LLC-KDP Print USPublisher, 2020.
3. Victoria Magrath, *The New Fashion Rules*, HarperCollins Publisher,2018

Journals:
1. Journal of Styling
2. Journal of International Fashion Designing
3. Journal of Fashion Studies

E-Resources:
1. https://alexandrastylist.com/define-stylists-what-do-they-really-do/
2.https://www.medicinenet.com/what_are_the_four_types_of_hair/article.htm
3.https://www.maybelline.com/eye-makeup
4.https://www.jdinstitute.edu.in/what-is-fashion-/
5. https://jdinstitute.co/why-is-fashion-styling-important/

Course Outcomes	Programme Outcomes							
CO	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**Total**
CO 1	9	3	3	9	9	9	9	**51**
CO 2	9	9	9	9	9	9	3	**57**
CO 3	3	9	9	9	9	3	3	**45**
CO4	9	9	9	3	3	1	1	**35**
CO5	9	9	9	3	3	3	9	**45**
Total	**39**	**39**	**39**	**33**	**33**	**25**	**28**	**236**

Low-1 Medium-3 High-9

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CERTIFICATE PROGRAMME IN APPAREL DESIGNING & CONSTRUCTION

[For Students Admitted from 2022-23]

Programme Structure

S.No	Subject Code	Subject title	Duration	Contact Hours	External Marks
1.	FCAD1P	Apparel Designing& Construction Practicals	12 weeks	40	100
		Total			**100**

Subject Code: FCAD1P **Hours: 40**

Course Objectives:

1. To impart knowledge on designing garments for women
2. To enable the studentsto practice skill in drafting, pattern making and constructionof selected garment and calculating costing of product

Basic Apparel Designing

I. List of Experiments **(10 hours)**

1. Sewing machine –parts and functions of a single needle machine
2.Seams and seam finishes types
3. Hemming and itstypes
4. Fullness –Yokes-Darts, tucks, pleats, flares, godets, gathers, shirrs frills and flounces5.Plackets-facing and binding, piping.
6.Sleeves-type of sleeve-plain, puff, bell, circular, cap, Magyar, raglan and petal sleeves
7.Closures – fasteners – conspicuous –Button and button holes, button and loops,eyelets, Press buttons, hooks, eyes and zippers.

Pattern making and Garment Construction

II. List of Experiments **(30 hours)**

Designing, drafting and constructing the following garments for the features prescribed List the Measurements required and Materials suitable Calculate the cost of the garment Calculate the material required –Layout method and direct measurements method

1. Bib- Variation in outline shape
2. Jabla- without sleeve, front open or Magyar sleeve, back opens
3.Frock- A-line frock, summer frock, yoke frock.
4.Skirt/midi-Circular/umbrella/panel with style variations.
5.Tops-Asymmetric bodies, neck variations, sleeve variations
6. Kameez - with/without slit, with or without flare, with /without opening, with or without panels, with /without yoke.
7. Salwar - Length width Variation
8. Ladies shirt – with or without collar, sleeves variations.
9.Ladies pant - waistband, zip attachedtight fitting / parallel pants.
10. Saree blouse- front open, Princess cut, Fashioned neck, Waist band at front, with sleeve.

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Course Outcomes:
After successful completion of this course, student will be able to
CO1: State the functions of sewing machines and identify the parts
CO2: Interpret methods of drafting for different types of garments
CO3: Experiment the components of apparel designing.
CO4: Estimate the cost of the garment.
CO5: Create a various design in women's wear

TextBooks:
1.K.R Zarapker, Zarapker system of cutting, Navneet Publication ltd,2008
2.Claire Wargnier,Focuson Fashion Details, Volume 1,ESMOD Publishing, 2021

Reference Books:

1. Practicals Clothing Construction – Part I and II, MaryMathews, Cosmic Press, Chennai,1986
2. Sewing and Knitting – A Readers Digest, step- by – step guide, Readers Digest Pvt Ltd, Australia.
3. Laing R M and Webster J, –Stitches and Seams‖ , The Textile Institute, 2006.

Journals:
1. Journal of Designing Comfort Garment for Children
2. Journal of Drafting Techniques
3. Journal of Sewing Guide

E-Resources:
1. https://sewguide.com/sew-sari-petticoat/
2. https://sewguide.com/how-to-sew-skirts/
3. https://www.vibhasfashion.com/blouse-cutting-and-stitching
4. https://style2designer.com/pattern-cutting-cad-cam/cutting-sewing- techniques/straight-kameez/
5. https://sewguide.com/free-tunic-patter /

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CERTIFICATE PROGRAMME IN FOOD PROCESSING AND PRESERVATION

(For Students Admitted from2022-2023)

(Six Months Programme)

Paper	Subject Code	Subject title	Contact Hours	ESE Marks
I	HCFP1	Food Processing and Preservation	30	100
II	HCFP2P	Food Processing and PreservationPracticals	50	100
		Total	**80**	**200**

Paper I - Food Processing and Preservation

(For Students Admitted from 2022-2023)

Subject Code: HCFP1 **Hours:30**

Course Objectives:

1. To develop skill and techniques in food preparation with conservation of nutrients and palatability using desirable cooking methods
2. To understand the scientific principles underlying food preparation.

Unit I **(6hours)**

Food preservation: Meaning, Definition and objectives, Importance, Brief history and traditional methods of food preservation, Asepsis and aseptic handling of foods.

Unit II **(6 hours)**

Microbial application in food preservation: Principles involved in the microbial decompositionof food and self-decompositionof foods. Growth curve of microbial culture and its application in food preservation.

Unit III **(6hours)**

Asepsis techniques: Asepsis or keeping out micro organisms – Definition and different Techniques applied for asepsis

Unit IV **(6 hours)**

Removal of microorganisms - Use of different filters and other techniques to remove microorganisms. Maintenance of anaerobic conditions to create and prevent the entryof oxygen in foods.

Unit V **(6hours)**

Heat Applications and preservative methods: Use of high temperature, Use of low temperature, Drying or dehydration. Use of chemical preservatives and food additives and Irradiation. Other methods of food preservation, Definitions and differentiation between food poisoning and infection, causes and types of food poisoning and infections.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Define food preservation and understand the basic knowledge of microbial application infood preservation

CO2: Apply the knowledge in preserving foods by laboratory and household measures

CO3: Demonstrate on different methods of food preservation techniques

CO4: Evaluate the microbial quality of foods

CO5: To make the students understand the basic principles underlying food Preservation

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Text Books:

1. Shakuntala Manay.N, Shadaksharaswamy.M, *Food Facts and Principles,* New Age International Publishers, 4th Edition, 2018.
2. Srilakshmi.B, *Food science,* New Age International Publishers, New Delhi, 8th Edition, 2019.
3. Anju singh, Handbook food preservation, Agrotech Press, 2017.

Reference Books:

1. Fellows P J, *Food Processing Technology: Principles and Practice,* CRC Wood head Publishing Ltd.,Cambridge, 4th Edition, 2016.
2. M. Shafiur Rahman, *Handbook of food preservation,*CRC Press, 2nd Edition,2007.
3. Megyesi, Jennifer Lynn, *The joy of keeping a root cellar: canning, freezing, drying, smoking,and Preserving the harvest,* Skyhorse Publication,2010.

Journals:

1. Journal of Food & Microbiology
2. Journal of Food Processing & Technology
3. Journal of Food Processing & Preservation

E-Resources:

1. www.newfoodmagazinecom
2. www.nzifst.org.nz
3. www.itrhd.com
4. https://www.tarladalal.com/tomato-ketchup-tomato-sauce-homemade-tomato- ketchup-40725r
5. http://ecoursesonline.iasri.res.in/mod/page/view.php?id=5168

Paper II- Food Processing and Preservation Practicals

(For Students Admitted from 2022-2023)

Subject Code: HCFP2P **Hours:50**

Course Objectives:

1. To develop skills and techniques in food preparation with conservation of nutrients and palatabilityusing desirable cooking methods
2. To understand the scientific principles underlying in food preparation.

Unit I **(10 hours)**

Preservation by Sugar Preparation of Jam: Mixed fruit jam, Apple jam, Guava jam, Pineapple jam Preparation of jelly: Apple jelly, Guava jelly

Unit II **(10 hours)**

Preparation of Squash: Pineapple squash, Orange squash, Sappota squash and Grape squash. Fruit preserves- fruit bar,Petha (Pumpkin sweet), Ginger murabha.

Unit III **(10 hours)**

Preservation by salt: Pickles – Onion pickles, Mango pickle, Garlic Pickle, Dried fishVathal vadakam- cluster bean vathal, brinjal, bittergourd, ladies finger Vadamkam- Rice, sago

Unit IV **(10 hours)**

Preparation of Spice products: Tomato sauce, tomato ketchup

Unit V **(10 hours)**

Preservation by fermentation: Vinegar, Curd, Lassi, Thokla

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Course Outcomes:

After successful completion of this course, student will be able to

CO1: Define food preservation and understand the basic knowledge of microbial application infood preservation

CO2: Apply the knowledge in preserving foods by laboratory and household measures

CO3: Analyze the practical knowledge on principles and methods of preservation

CO4: Enable students to do recipes based on preservation methods

CO5: Make the students understand the basic principles underlying food preservation

Text Books

1. Nirmal K.Sinha and Jiwan S.Sidhu, Handbook of fruits and fruitprocessing",Wiley-lackwell,2012.
2. Anju singh, Handbook food preservation, Agrotechpress,2017.
3. Srilakshmi.B, Food science, New Age International Publishers,NewDelhi, 8th Edition, 2019.

Reference Books:

1. Verma L.R and Joshi V.K, *Post harvest technology of fruits and vegetables, Handling, Processing,fermentation and waste management*,Wiley-Blackwell Publishers,2011.
2. Nirmal K.Sinha and Jiwan S.Sidhu,, *Handbook of vegetables and vegetables processing*‖ ,Wiley-Blackwell Publishers,2012.
3. Fereidoon Shahidi, Handbook of Antioxidants for Food Preservation, Wiley- Blackwell Publishers,2015.

Journals:

1. Journal of Food &Microbiology
2. Journal of Food Processing &Technology
3. Journal of Food Processing & Preservation

E-Resources:

1. www.newfoodmagazine.com
2. www.nzifst.org.nz
3. www.itrhd.com
4. https://www.tarladalal.com/tomato-ketchup-tomato-sauce-homemade-tomato- ketchup-40725r5.http://ecoursesonline.iasri.res.in/mod/page/view.php?id=516

CERTIFICATE PROGRAMME IN CLINICAL DIETETICS

(For Students Admitted from 2022-2023)

(Six Months Programme)

Paper No	Subject Code	Subject Title	Contact Hours	External Marks
I	HCCD1	Clinical Dietetics	30	100
II	HCCD2P	Clinical Dietetics Practicals	50	100
		Total	**80**	**200**

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Paper I – Clinical Dietetics

(For Students Admitted from 2022-2023)

Subject Code: HCCD1 **Hours:30**

Course Objectives:

1. To understand the foundation sciences which underpin therapeutic dietetic practice, the principles of disease prevention and health promotion, the principles of therapeuticintervention practice.
2. To understand the organization, management and provision of healthcare both in the hospital andin primarycare.

Unit I **(6 hours)**

Diet therapy: Principles of planning diet, nutritional care process, Basic concepts of diet therapy Therapeutic adaptations of normal diet, principles of therapeutic diets

Routine Hospital Diets: clear fluid, full fluid, soft and normal diet, Pre-operative and post-operative diets Special feeding techniques - parenteral and enteral feeding

Dietitian: Role ofdietitians in Nutritional care, planning diet counseling.

Unit II **(6 hours)**

Nutritional care for weight management: Obesity - Aetiology, assessment, types, complications andprinciples of diet management

Underweight: Aetiology, limitations, complications and principles ofdiet management.

Unit III **(6 hours)**

Nutritional care for deficiency disorders: PEM and Vitamin A deficiency and Anemia- Causes,Types, symptoms and diet management.

Nutritional care for febrile condition: Typhoid, Malaria and Tuberculosis- Causes, symptoms,metabolic changes in fever and dietary management.

Unit IV **(6 hours)**

Nutritional care for diseases of the Gastro Intestinal tract: peptic ulcer, gastritis, constipation, diverticulosis, Diarrhea, Mal absorption syndrome, celiac spur, tropical spur, lactose intolerance, Inflammatory Bowel Disease, Irritable Bowel Syndrome - Aetiology, symptoms, complications and principles of diet management.

Unit V **(6 hours)**

Nutritional care for diseases of liver and biliary system: Jaundice, Cirrhosis of liver, Viral Hepatitis, Hepatic Encephalopathy, Role of alcohol in liver disease- Aetiology, symptoms, complications and principles ofdiet management .

Diseases of Gall Bladder and Pancreas – Cholelithiasis, Cholecystitis, Cholecystectomy, Acute and chronic Pancreatitis- Aetiology, symptoms, complications and principles ofdiet management.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Recollect the principles of planning diet and discuss the role of dietician and basicconcept ofdiet therapy

CO2: Determine the routine hospital diets, special feeding techniques

CO3: Point out the etiology, symptoms and complications for any life style disease

CO4: Assess the nutritionalrequirement for acute and chronic illness

CO5: Plan a whole day menu for the acute and chronic illness

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Text Books:

1. Srilakshmi, B., *Dietetics,*New Age International (P) Ltd, Chennai.8th Edition, 2019.
2. Antia F.P. And Philip Abraham, *Clinical Nutrition and Dietetics*, Oxford University Press,4thEdition.2002.
3. Shubhaangini Joshi, *Nutrition and Dietetics,* 4th Edition, McGraw Hill Publication, New Delhi,2015.

Reference Books:

1. L. Kathleen Mahan, Sylvia Escott-Stump and Janice L Raymond,*Krause's Food &the Nutrition CareProcess,* Saunders Publishers, 15th Edition,2020.
2. Robinson, *Normal and Therapeutic Nutrition,* Oxford & LBM Publishing, Calcutta, Bombay, 17th Edition,1990.
3. Kathleen Mahan and Sylvia Escort- Stump, *Food, Nutrition and Diet Therapy*, W.B.Saunder's Company London, 14th Edition, 2016.

Journals:

1. Journal of Nutrition and Dietetics
2. Journal of Nutrition & Food Sciences
3. Journal of Nutrition and Metabolism

E-Resources:

1. https://www.pdfdrive.com/nutrition-dietetics-practice-and-future-trends-e176409703.html
2. https://www.pdfdrive.com/oxford-handbook-of-nutrition-and-dietetics-e185402365.html
3. https://www.pdfdrive.com/krauses-food-the-nutrition-care-process-e175336715.html
4. https://www.pdfdrive.com/clinical-nutrition-e186572457.html
5. https://www.pdfdrive.com/nutrition-health-and-disease-a-lifespan-approach-e189164494.html

Paper - II Clinical Dietetics Practicals

(For Students Admitted from 2022-2023)

Subject Code: HCCD2P **Hours: 50**

Course Objectives:

1. To understand the modifications in nutrient requirements for various diseases.
2. To acquire skills in the preparation of therapeutic diets.

Unit I **(10 hours)**

Plan appropriate diets to fulfill nutritional needs in pregnancy, Lactation, preschoolchildren Adolescent boys and girls, adult and old age groups.

Unit II **(10 hours)**

Plan appropriate Routine Hospital Diets - clear fluid, full fluid, soft and normal diet, Pre-operative and post-operative diets, Special feeding techniques - parenteral and enteral feeding.

Unit III **(10 hours)**

Plan appropriate diet for PEM and Vitamin A deficiency, Anemia and Fever conditions.

Unit IV **(10 hours)**

Planappropriate diet for Obesity, Underweight, Jaundice, and liver diseases.

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Unit V **(10 hours)**

Plan appropriate diet for Peptic ulcer, Heart disease and Diabetic patients.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Describe the importance of menu for different illness and explain the need of menu modification

CO2: Apply the therapeutic diets using food exchange lists.

CO3: Structure the dietetic practices followed in Indian hospital

CO4: Detect the nutritive value of Indian foods

CO5: Calculate a whole day menu for acute and chronic illness

Text Books:

1. Gopalan C., RN. Ramasastri and S.C. Balasubra-manian, *Nutritive Value of Indian Foods*, National Institute of Nutrition, Hyderabad, 2018.
2. V.Vimala, *Advances in Diet therapy-Practical Manual*, New Age International Private Ltd, 2020.
3. *Clinical Dietetics Manual*, Indian Dietetic Association, 2nd Edition,2018.

Reference Books:

1. Mahan L.K., Sylvia Escott-Stump - *Krause's Food Nutrition and Diet Therapy* W.B. SaundersCompany London 14th Edition, 2016.
2. Robinson C.H., *Normal and Therapeutic nutrition*, Mac millan Publishing Co. Inc,Newyork,17thEdition,1990.

Journals:

1. Asia Pacific Journal Clinical Nutrition
2. European Journal of Clinical Nutrition
3. International journal of Nutrition and Dietetics

E-Resources:

1. https://www.pdfdrive.com/manual-of-dietetic-practice-e175954283.html
2. https://www.pdfdrive.com/medical-nutrition-therapy-a-case-study-approach-e186656569.html
3. https://www.pdfdrive.com/applications-and-case-studies-in-clinical-nutrition-e185254994.html
4. https://www.pdfdrive.com/manual-of-dietetic-practice-e33501318.html
5. https://www.pdfdrive.com/manual-of-clinical-nutrition-management-e18838358.html

CERTIFICATE PROGRAMME IN YOGA FOR HOLISTIC HEALTH

(For Students Admitted from 2022-2023)

Six Months Programme

Paper No	Subject Code	Subject Title	Contact Hours	External marks	Credit
I	HCYH1	Introduction to yoga	30	100	5
II	HCYH2P	Yoga Practical	50	100	5
		Total	**80**	**200**	**10**

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Paper I - Introduction to Yoga
(For Students Admitted from2022-2023)

Subject Code: HCYH1 **Hours:30**

Course Objectives:
1. To prepare the students physically and mentally for the integration of their physical, mental wellness.
2. To help the students in self discipline and self-control, leading to immense amount of awareness, concentration and higher level of consciousness

Unit I
History of yoga **(6Hours)**
Origin of Yoga & its brief development.- Meaning of Yoga & its importance, Yoga as a Science and Art (Yoga Philosophy), Misconceptions about yoga and their solutions, Difference between yogic and non-yogic system of exercises, Relevance of Yoga in modern age and Scope.
Classification of Yoga/Types of Yoga-Hatha Yoga , Raja Yoga, Laya Yoga, Bhakti Yoga, Gyan Yoga, Karma Yoga, Asthanga Yoga.

Unit II
Maintenance of physical health **(7 Hours)**
Purpose of Life: - Healthy Life - Self, Society, Nature - Body is container of imprints - vehicle for life - force. **Current life style and Physical health** - Scientific development and mechanical life - competitive world - mental stress.
Three forms of body: Physical body- Astral body - Causal Body
Importance of physical exercises: Maintenance of the cell structure - Uniform circulation ofbio - magnetism-Liberation from sinful imprints
Causes for disease: Naturaland artificial causes - Immunity
The three circulations: Blood, heat and air circulations - pain, disease and death. Relationship between body, life-force and mind - Harmonious relationship - Mutual disturbances. Structure of Human Body-Three Functional Bodies – Harmony Between body and Life force. Reason for Disease –Limit and Methods.

Unit III
Food and Medicine **(7 Hours)**
Yoga and Diet: Satvic, Rajasic and Tamasic food, Simple food habits, Fasting and its benefits, Balanced diet - fruits, vegetables, greens – vegetarian food.
Foods as a medicine: Natural food - impact of food on cure of diseases, Food habits and diseases, Planned Diet.
Moderation in five aspects: Food, Work, Sleep, Sensual Pleasure and Thoughts
Various methods of Medical system: Allopathy - Siddha - Ayurveda - Unani – Homeopath

Unit IV **(5 Hours)**
Rules for asana: Time, Place, Dress, Age, Posture, Gender, Food habits, Breath etc.
Asana, Mudra and Bandha - Meaning and Importance
Pranayama - and Kriyas -Meaning, Types and Importance

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Unit V **(5 Hours)**

Development of mental prosperity

Meditation – Types of Meditation,Benefits of Meditation.

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Understand the physical body and health concepts

CO2: Possess the basic Knowledge on Loosening Exercises and Asana and Pranayama

CO3: Impart the Knowledge on Kriyas and Meditation.

CO4: Introspect to improve the behavioural changes

CO5: Develop the mentalprosperityof human

Text Books:

1. Clark, B,*The Complete Guide to Yin Yoga: The Philosophy and Practice of Yin Yoga*,Canada: WildStrawberry Productions,2019.
2. BKS Iyengar, *Yoga the Path to Holistic Health: The Definitive Step-by-StepGuide*, DKPublisher,1st Edition, 2016.
3. ThathuvagnaniVethathiri Maharishi, *Simplified Physical Exercise*, VethathiriPublications,48th Edition,2018.

Reference Books:

1. Matthews, A., Kaminoff, L,*Yoga Anatomy*, United States: Human Kinetics, 2021.
2. Ashwani Kumar, *Yoga: A way of life*, New Delhi: Khel Sahitya Kendra, 2016.
3. Clark, B,*The Complete Guide to Yin Yoga: The Philosophy and Practice of YinYoga*,Canada: Wild Strawberry Productions,2019.

Journals:

1. International Journal of yoga therapy
2. International Journal of yoga
3. Journal of yoga and physiotherapy

E-Resources:

1. https://www.easyayurveda.com/2012/11/11/types-of-pranayama-effect-on-health- through-an-ayurveda- microscope/amp/
2. https://www.insider.com/types-of-meditation
3. https://www.artofliving.org/in-en/yoga/yoga-poses/sun-salutation
4. https://www.sonakshidhamijayoga.com/
5. https://mysticalbee.com/types-of-yoga-mudras-their-significance-to-health/

Paper II –Yoga Practicals

(For Students Admitted from 2022-2023)

Subject Code: HCYH2P **Hours:50**

Course Objectives

1. To enhance physical and mental fitness ofthe students through asanas, mudras,etc
2. To attain higher level of consciousness

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List of Yoga Practices:

1. Loosening Exercises : Simplified yogic exercise, SuryaNamaskar**.** **(10 Hours)**

2. 2.Asanas **(20Hours)**

Standing Asana

Thadasana, Arthachakrasana,
Arthakadichakrasana,Pathahasthasana,Uttkatasana,Garudasana,Ekapathasana, Veerapathrasana Trikonasana

Sitting Asana Dhandasana, Padhmasana, Vajrasana, Sukasana, Siddasanam, Parvathasanam, Yogamudra, Mandugasanam, Magamuthra, Jannuseerasanam, Pakchimooth asanam, ustrasanam,vakrasanam, Thoolungasanam, Komukasanam.

Lying Asana

Facing the Earth Bhujangasana, Salabhasana,Danurasanam,Navukasanam,Makrasana,

Facing the Earth Arthapavanamukthasanam,Pavanamukthasanam, Subthavajrasanam, Machasanam, Utthitapadasana,Navasanam, Sarvangasana, Halasana,Cakrasanam, Savasana.

3.Mudras **(5Hours)**

Namaskar, Chin Mudra,Vayu Mudra, Suniya Mudra, Prithivi Mudra, Surya Mudra, Varuna Mudra, Prana Mudra, Apana Mudra, Apana Vayu Mudra, Linga Mudra, Adhi Mudra, Kesari Mudra, Aswini Mudra.

4.Pranayama **(5Hours)**

Suga poorva Pranayama, NadiSuthi, Ujjayi, Sheetali, Sheetkari, Kapalabhati,

5.Meditation **(10Hours)**

Simple Meditation, Transcendental meditation

Course Outcomes:

After successful completion of this course, student will be able to

CO1: Promote Positive Health in the Student through Yoga

CO2: Impart skills in them to practice yoga

CO3: Regulate the inter-personal, behavioural concepts of human life overcome various physical and mental stress of life activities

CO4: Impart skills in them to introduce Yoga for health to general public and Yoga fortotal personality development of students

CO5: Promote positive health, prevention of stress related health problems and rehabilitation through Yoga

Text Books:

1. Yoga Practise –I Vethathiri Maharishi Institute for spiritual and Institutional Education, WCSC,Veththathiri Publication, Erode.4th Edition 2012.
2. Yoga Practise –II Vethathiri Maharishi Institute for spiritual and Institutional Education,WCSC,Veththathiri Publication, Erode.15th Edition 2017.

Reference Books:

1. Matthews, A., Kaminoff, L,*Yoga Anatomy*, United States: Human Kinetics, 2021.
2. Ashwani Kumar, *Yoga: A way of life*, New Delhi: Khel Sahitya Kendra, 2016.
3. Clark, B,*The Complete Guide to Yin Yoga: The Philosophy and Practice of Yin Yoga*,Canada: WildStrawberry Productions,2019.

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Journals:

1. International Journal of Yoga Therapy
2.International Journal of Yoga
3.Journal of Yoga and Physiotherapy

E-Resources:

1. https://www.artofliving.org/in-en/yoga/yoga-poses/sun-salutation
2. https://www.sonakshidhamijayoga.com/
3. https://mysticalbee.com/types-of-yoga-mudras-their-significance-to-health/
4. https://www.insider.com/types-of-meditation
5. https://www.easyayurveda.com/2012/11/11/types-of-pranayama-effect-on-health-through-an- ayurveda- microscope/amp/

XVIII ACADEMIC COUNCIL

DIPLOMA IN BAKERY AND CONFECTIONERY SYLLABUS
One year Programme (2022-2023)

One year60 credit
Per semester30 credit
Semester I
18 Credit -SkillEducation
12 Credit -General Education
SemesterII
18 Credit -SkillEducation
12 Credit -Project

PROGRAMMESTRUCTURE

Sem	Subject Code	Subject	Credit	Hours/ week	CIA	ESE	Total Marks
I	IDBC11	Bakery Theory I	5	5	40	60	100
	IDBC12	Confectionery Theory I	5	5	40	60	100
	IDBC13P	BakeryPracticals I	4	8	40	60	100
	IDBC14P	Confectionery Practicals I	4	8	40	60	100
	IDBC15	Entrepreneurial Skills and Productivity	4	4	-	50	50
	IDBC16PW	Mini Project	8	8	-	100	100
	Total		**30**	**38**	**160**	**390**	**550**
Sem	**Subject Code**	**Subject**	**Credit**	**Hours/ week**	**CIA**	**ESE**	**Total Marks**
II	IDBC21	Bakery Theory II	6	6	40	60	100
	IDBC22	ConfectioneryTheory II	6	6	40	60	100
	IDBC23P	BakeryPracticals II	3	6	40	60	100
	IDBC24P	ConfectioneryPracticals II	3	6	40	60	100
	IDBC25PW	Major project	12	12	-	100	100
	Total		**30**	**36**	**160**	**340**	**500**
	GRAND TOTAL		**60**	**74**	**320**	**730**	**1050**

Bakery Theory I

(For Students Admitted from 2022-23)

Semester: I **Hours/week: 5**
Subject Code: IDBC11 **Credit: 5**

Course Objectives:
1. To acquire properties and functions ofthe basic ingredients used in baked goods
2. To enable students to employsafe food handling practices using contemporary guideline

Unit I **(18 hours)**
Introduction: Scope of Bakery & Confectionery; Bakeryterms; Organization chart of Bakery. Role ofbakery ingredient.

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Wheat and wheat processing and role of bran and germ: Flours: Different types of flours available, constituents of flours, PH Value of flour, water absorption power of flour, glutin, diastatic capacity of flour, grade of flour; Raw material required for bread making: Role of flour, water, yeast, salt - Sugar, milk and fats.

Unit II **(18 hours)**

Bread making process: Straight dough method; Characteristics of good bread - External characteristics - volume, symmetry of shape; internal characteristics - color, texture, aroma, clarity and elasticity; Bread faults and their remedies; Yeast – An elementary knowledge of Baker's yeast; Effect of over and under fermentation; Bread improvers Oven & Baking. Baking temperatures for bread.

Unit III **(18 hours)**

Rheological science: Dough rheology; Rheological measurements; Fundamental rheological measurements; Factors affecting dough rheology; Wheat grains and rheology; Composite flour technology and rheology; Influence of ingredients towards rheology; Rheological effect on proofing, baking and final texture ofbread.

Unit IV **(18 hours)**

Cake and Cookie making: Production of cakes and cookies/biscuits; Types of biscuit dough's – Developed dough, short dough's, semi-sweet, enzyme modified dough and batters –importance ofthe consistency ofthe dough.

Unit V **(18 hours)**

Bakery layout – The required approvals for setting up of a Bakery – Government procedure and laws - Selection of site - Selection of equipment. - Layout design - Electricity. Quality control of raw material and finished products.

Course Outcomes:

After successful completion ofthis course, student will be able to

CO1: Outline the various properties of raw materials in bakeryand confectionery industries
CO2: Discuss methods involved in manufacture of bakery products
CO3: Compile technical knowledge in bakery
CO4: Explain the physical factors ofdough
CO5: Know the importance ofproper food plant design and safety

Text Books:

1. Ashokkumar, Y, *Textbook Of Bakery And Confectionery*, PHI Learning Pvt. Ltd.2018.
2. Mathuravalli, S. M. D, *Handbook of Bakery and Confectionery*, CRC Press, 2021.
3. Bali, P. S., *Theory of Bakery*, Oxford University Press, 2018.

Reference Books:

1. In Matz, S. A, *Bakery: technology and engineering.* New Delhi: Medtech Scientific International Pvt. Ltd, 2019.
2. *The Complete Technology Book on Bakery Products Baking Science with Formulation & Production*, 4th Revised Edition, by NIIR Board ofConsultants &Engineers, 2020.
3. Gupta, A. K, *Textbook of Bakery and Confectionery*, Daya Publishing House, a division of Astral International Pvt. Limited,2021.

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E- Resources:

1. https://pediaa.com/
2. https://opentextbc.ca/ingredients/chapter/milling-of-wheat/
3. https://www.delish.com/cooking/g21790771/types-of-bread/
4. https://www.britannica.com/topic/baking
5. https://www.slideshare.net/OdeyemiBayonle/theory-of-baking

Confectionery Theory I

(For Students Admitted from 2022-23)

Semester: I **Hours/week: 5**
Subject Code: IDBC12 **Credit: 5**

Course Objectives:

1. Illustrate advanced classical and contemporarypastryand confectionery techniques
2. To study the basic principles involved in different ingredients used in confectionery products

Unit I **(15 hours)**

Confectionery products: Definition, importance of sugar confectionery and flour confectionery. Types of confectionery products-chocolate boiled sweets caramels toffees. Fondant manufacturing process. Spoilage of confectionery products. Good manufacturing practices (GMP) in baking and confectionery industries. Sanitation and safety

Unit II **(15 hours)**

Chocolate work: Uses of cocoa and chocolate in confectionery. Sugar boiled confectionery. Different types of sugar candies and jellies. Amorphous confectionery; crystalline confectionery: candy. Role of flour, sugar, shortening & eggs- An elementary knowledge of properties and use of moistening agents

Unit III **(15 hours)**

Icings and frozen dessert: importance and varieties of icings; Fondants; Ganache; Filling and frostings. Churned frozen desserts; Ice cream: Composition, types, making process; still frozen desserts.

Unit IV **(15 hours)**

Sugar confectionery: Nutritional significance; manufacture and forms of sugar; different stages of sugar cookery; Principles of sugar confectionery production; Types of sweets; Gelatin sweets; Toffee and caramels; Hard-boiled sweets; Cooling.

Unit V **(15 hours)**

Food additives: Introduction to food additives; Role of food additives in confectionery; Food colors; Artificial sweeteners; Preservatives; Anti-caking agents; Flavoring agents.

Course outcomes:

After successful completion of this course, student will be able to
CO1: Explain the different ingredients used in confectionery
CO2: Demonstrate working knowledge of Chocolate and Sugar confectionery
CO3: Understand Food Microbiology, Food Contamination and Spoilage
CO4: List down the steps in preparing Icings and frozen dessert
CO5: Elaborate the role offood additives in bakeryand confectionery

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Text Books:

1. Hofberger, R., Hartel, R. W., von Elbe, J. H., *Confectionery Science and Technology*, Springer International Publishing, 2017.
2. Ashokkumar, Y., *Textbook of Bakery and Confectionery*, PHI Learning Pvt.Ltd., 2018.
3. Mathuravalli, S. M. D., *Handbook of Bakeryand Confectionery*. CRC Press, 2021.

Reference Books:

1. Edwards, W. P. *The Science of Bakery Products*, United Kingdom: Royal Society of Chemistry, 2015.
2. Bali, P. S., *Theory of Bakery*, Canada: Oxford University Press, 2018.
3. Gupta, A. K., *Textbook of Bakery and Confectionery*, Daya Publishing House, a division ofAstral International Pvt. Limited, 2021.

E- Resources:

1. https://www.emsland-group.de/product-solutions/food-innovation/confectionery
2. http://www.corbion.com/food/confectionery/applications/soft-sugar-confectionery
3. https://www.bettycrocker.co.uk/how-to/how-to-make- fondant-icing
4. https://www.who.int/news-room/fact-sheets/detail/food-additives
5. https://india.oup.com/product/theory-of-bakery-and-patisserie

Bakery Practical I

(For Students Admitted from 2022-23)

Semester: I **Hours/week: 8**
Subject Code: IDBC13P **Credit: 4**

Course Objectives:

1. To gain the workingprinciple of equipments used in baking
2. To understand the working criteria of different factors involved in setting up and operating a baking unit

List of Experiments:

1. Study of bakery equipment - Identification and uses of equipment – large, small and utilities.
2. Study of bakery ingredients- Types of flour, Sugar, Nuts and Dry fruits, Shortenings, leavening etc.
3. Experiment on Quality Checking of Flour and Yeast.
4. Practicing Mixing Methods - Kneading, stirring, whipping, creaming.
5. Preparationof Bread Loafs- Whole wheat bread, Brown bread, Fruit bread and milk bread.
6. Preparationof Simple yeast fermented products- Bread Rolls and Sour dough.
7. Preparation of Cakeswith and without icing (Rubbing, Creaming, Whisking).
8. Preparationof Flavored Breads- Basic Buns &Tomato Rolls.
9. Preparation of Rich Yeast Fermented Breads - Fermented doughnuts.
10. Visit to bakery unit.

Course Outcomes:

After successful completion of this course, student will be able to
CO1: Identify anddifferentiate the small and large equipment in bakery
CO2: Identifyand check for quality of different types ofingredients used in bakery
CO3: Prepare and Present yeast fermented products

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CO4: Prepare and Present flavored breads
CO5: Prepare and Present Breakfast breads

Text Books:
1. Jagarlamudi, L., *Bakery and Confectionery Products: Processing, Quality Assessment Packaging and Storage Techniques*, New India Publishing Agency, 2019.
2. Chlebana, R. A., *TheAdvanced Art of Baking and Pastry*. United Kingdom: Wiley, 2017.

Reference Books:
1. Sharma, D., *Experimental andAnalytical Bakery*, Daya Publishing House, 2016.
2. O'Donnell, K, *Bakery Production Handbook*. Xlibris US, 2016.

E- Resources:
1. https://www.ckitchen.com/blog/2019/1/bakery-equipment-lists.html
2. https://www.kingarthurbaking.com/recipes/the-easiest-loaf-of-bread-youll-ever-bake-recipe
3. https://www.bakingkneads.com/how-to-decorate-a-cake-without- frosting/
4. https://www.wiley.com/en-us/Practical+Baking%2C+5th+Edition-p
5. https://www.bakersjournal.com/company/practical-baker-2543/

Confectionery Practical I

(For Students Admitted from 2022-23)

Semester: I **Hours/week: 8**
Subject Code: IDBC14P **Credit: 4**

Course Objectives:
1. To acquire core concepts in Confectionery products and methodology through hands-on development
2. To study the basic principles in sweet-based products

List of Experiments:
1. Preparation of Basic Cake Making- Plain Sponge &Swiss Rolls.
2. Preparation of Biscuits & Cookies.
3. Preparation ofBasic Pastry- Puff Pastry& Jamtart.
4. Preparation of Icings and Toppings - Fondant &Fudge.
5. Preparation of caramels and candies.
6. Preparationof Indian confectionery: Rasgulla, Gulab Jamun, Barfi, Kheer.
7. Preparation of Puddings and Desserts.
8. Preparation of Ice Cream.
9. Preparation of Marshmallow & lemon meringue.
10. Preparation of Toffees.

Course outcomes:
After successful completion of this course, student will be able to
CO1: Defineand explain different pastries andderivatives
CO2: Make plan & identify the different ingredients to prepare different icing
CO3: Prepare and Present international cakesand puddings
CO4: Prepare and Store Ice Creams, Toffees and Indian Sweets
CO5: Abilityto work with chocolate and sugar to create design, plates and show pieces

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Text Books:

1. Davidson, I., *Biscuit, Cookie and Cracker Production: Process, Production and Packaging Equipment,* Elsevier Science, 2018.
2. Chlebana, R. A., *The Advanced Art of Baking and Pastry*, Wiley, 2017.

Reference Books:

1. Hartel, R. W., Vonelbe, J. H., Hofberger, R., *Confectionery Science and Technology,* Springer International Publishing, 2017.
2. *Hand Book of Confectionery With Formulations*, Engineers India Research Institute, 2007.

E- Resources:

1. https://www.brainkart.com/article/Preparation-of-Biscuits-and-Cookies_35199/
2. https://www.thekitchn.com/how-to-make-soft-chewy-caramel-candies-cooking-lessons-from-the-kitchn-180832
3. https://www.thebookseller.com/feature/recipe- lemon- meringue-marshmallows-338733
4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4573112/
5. https://www.shiksha.com/hospitality-travel/bakery-confectionery-chp

Entrepreneurial Skills and Productivity

(For Students Admitted from2022-23)

Semester: I **Hours/week: 4**
Subject Code: IDBC15 **Credit: 4**

Course Objectives:

1. To understand the importance of entrepreneurship in enterprise
2. To acquire the concept ofinvestment in Business

Unit I **(12 hours)**

Concept of Entrepreneurship- Entrepreneur - Entrepreneurship - Enterprises: Conceptual issue Entrepreneurship vs. management, Entrepreneurial motivation. Performance &record, Role &function of entrepreneurs in relation to the enterprise & relation to the economy, Sourceofbusiness ideas, Entrepreneurial opportunities, the process of setting up a business.

Unit II **(12 hours)**

Project Preparation &Marketing Analysis- Qualities of a good entrepreneur, SWOT and risk analysis. Concept Application of PLC, Sales &Distribution management. Difference between small scale &large scale business, Market survey, Method of marketing, Publicity and advertisement, Marketing mix.

Unit III **(12 hours)**

Institution's Support- Preparation of project. Role of various schemes and institutes for self- employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/non-financing support agencies to familiarize with the policies /programmes, procedure & the available scheme.

Investment Procurement-Project formation, Feasibility, Legal formalities i.e., Shop act, Estimation &costing, Investment procedure - Loanprocurement -Banking processes.

Unit IV **(12 hours)**

Benefits- Personal/ Workman - Incentive, Production linked Bonus, Improvement in living

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standard.
Affecting Factors- Skills, Working aids Automation, Environment and Motivation - How it improves or slows down productivity.

Unit V **(12 hours)**

Comparison with Developed Countries- Comparative productivity in developed countries (viz. Germany, Japan and Australia) in select industries, e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.
Personal Finance Management- Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and insurance.

Course Outcomes:
After successful completionof this course, student will be able to
CO1: Acquire the knowledge to create a new business plans
CO2: Understand the functions ofentrepreneur
CO3: Improve theentrepreneurship skills
CO4: Risk assessment of entrepreneur
CO5: Explore the financial management in an enterprise

Text Books:

1. Neck, C. P., Murray, E. L., Neck, H. M. *Entrepreneurship :The Practice and Mindset,* SAGE Publications, 2020.
2. *Entrepreneurship: Concepts, Methodologies, Tools, and Applications,* IGI Global, 2017
3. Bygrave, W. D., Zacharakis, A., *Entrepreneurship,* Wiley, 2019.
4. Organisation for Economic Co-operation and Development, *Better Use of Skills in the Workplace-Why It Matters for Productivity and Local Jobs*. Paris: OECD Publishing, 2017.

Reference Books:

1. Shepherd, D. A., Hisrich, R. D., Peters, M. P. *Entrepreneurship*. McGrawHillEducation, 2018.
2. Bamford, C. E., & Bruton, G. D., *Entrepreneurship: The art, science, and process for success*. McGraw-Hill Education, 2016

E- Resources:
1. https://leverageedu.com/blog/entrepreneurship-development/
2. https://www.vedantu.com/commerce/entrepreneurship-development-process
3. https://edurev.in/studytube/Concept-of-Entrepreneurship-Development-Entreprene/deddfbd8-e29e-4e4c-8375-0968debc7bb3_t
4. https://www.unido.org/our-focus/advancing-economic-competitiveness/entrepreneurship-development.
5. https://harappa.education/harappa-diaries/introduction-to-entrepreneurship-development/

Mini Project

(For Students Admitted from 2022-23)

Semester: I **Hours/week: 8**
Subject Code: IDBC16PW **Credit: 8**

Course Objectives:
To mentor the students with contemporary guidelines to design and conduct original and

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ethical research. They should be able to write a dissertation in the APA format. The research done can either be empirical/data based [quantitative/qualitative] or it can be in the form of a critical review of research and theory.

Recommended Readings:
APA manual for dissertation
Evaluation: Viva jointly by one internal and one external examiner.

Bakery Theory II

(For Students Admitted from 2022-23)

Semester: II **Hours/week: 6**
Subject Code: IDBC21 **Credit: 6**

Course Objectives:

1. To enable students about the functions and principles of ingredients, tool and equipment used.
2. To develop interpersonal skills in various baking procedures.

Unit I **(15hours)**

Introduction to fundamental ingredients: Classification-perishables, Market survey of equipment & Equipment; Non-perishables, Semi-perishable; Selection, storage (hygiene); wheat grain structure, functionality of wheat flour components and bakery ingredients; quality testing of wheat flour and bakery products; rheology and chemistry of dough; bread industry and processes; soft wheat products and processes

Unit II **(15hours)**

Breads: Classification of baking and pastrybreads, Bread Rolls; Basic Procedures; Variations of Bread.
Biscuits: Classification baking various types of biscuits; Basic procedure in production.
Types ofbiscuits: Salted, Ice-Box, Piping, Rolling, Macrons, Tarts,

Unit III **(15hours)**

Cakes: Classification baking cakes; Basic procedure Faults in baking cakes - identification and rectification. Decorative, Non-decorative cakes.
Chocolates: Fundamentals of the science of chocolate. Established industry standards in - Tempering, Moulding, modeling, enrobing, filling, show pieces, stencils, chocolate couverture.

Unit IV **(15hours)**

Icing and Pastries: Classification Preparing and applying various types of icing; basic procedure; tools and equipment. Flaky and Puff Preparing various mixtures, types of pastes and mixtures. Biscuits, Cheese straws; Cream Rolls

Unit V **(15hours)**

Accounting Procedures: Purchasing and sales Maintaining accounts procedure in a unit, Maintenance of accounts; Calculation of -selling & cost price, calculating selling price, gross profit, net profit. Taxes, Preparing invoices statement ofaccount.

Course outcomes:

After successful completion of this course, student will be able to

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CO1: Highlight the processing methods used in baking and confectionery industries
CO2: Know about the various types of food products made using baking technology
CO3: Have a basic idea about baking and confectionery manufacture and qualitycontrol
CO4: Know about the importance of each ingredient in the bakery and how it affects the overallproduct and its sensory and quality parameters.
CO5: Able to start a small scale bakery and confectionery unit.

Text Books:

1. Ashokkumar, Y., *Textbook of Bakery and Confectionery*, PHI Learning Pvt. Ltd, 2018.
2. Mathuravalli, S. M. D., *Handbook of Bakery and Confectionery*. CRC Press.2021.
3. Bali, P. S., *Theory of Bakery*, Oxford University Press,2018.

Reference Books:

1. Edwards, W. P., *The Science of Bakery Products*. United Kingdom: Royal Society of Chemistry, 2015.
2. Paul, V., *Textbook of Bakery and Confectionery*. Germany: Lap Lambert Academic Publishing, 2016.
3. Jagarlamudi, L., *Bakery and Confectionery Products: Processing, Quality Assessment Packaging and Storage Techniques*, New India Publishing Agency ,2019.

E- Resources:

1. https://www.researchgate.net/publication/341660500_Perishable_and_non-perishable_food_products_roles_in_environment-_A_review
2. https://snscourseware.org/snsrcas/files/CW_5d25a0d5bc884/Unit%20IV.docx
3. https://www.craftybaking.com/learn/baked-goods/pastry/problems-and-solutions
4. http://gbpssi.in/admin/coursepack/MBR517Lect01.pdf
5. https://stclaircollege.ca/courses/bpa200-baking-pastry-cakes-decorating-theory- ii

Confectionery Theory II

(For Students Admitted from 2022-23)

Semester: II **Hours/week: 6**
Subject Code: IDBC22 **Credit: 6**

Course Objectives:

1. To understand the fundamentals in problem-solving techniques in a professional and profitable business environment in Bakery and Confectionery
2. Develop skillto analyze food quality parameters used in bakeryand confectionary

Unit I **(18hours)**

Introduction to bakery and confectionery: Fundamentals of Food Production; Fundamentals of Food & Beverage Service; Fundamentals of Bakery; Fundamentals of Confectionery; Hygiene and Sanitation; Commodities and Costing.

Unit II **(18hours)**

Pastry Art Management: Introduction to Culinary Science; Baking Sweetbreads; Professional Baking Sweetbreads; Bakery Operations Management; Baking Microbiology; Baked Foods-Product Development; Baking Technology; Professional Baking Tarts & Pastries; Baked Foods Functional Ingredients & Allergens.

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Unit III **(18hours)**

Culinary science: Culinary Fundamentals – organization, terminologies & cooking methods; Nutrition, Hygiene and Safety; Culinary Management - Menu Planning, Engineering & Costing; Introduction to Culinary & Hospitality Business; Indian Cuisines & Food Culture; Product Knowledge; Balanced Diet & Allergens; Culinary Management - Purchasing & Cost Control; Beverage and Wine Knowledge.

Unit IV **(18hours)**

Advanced confectioneries: Baking Arts; Biscuits, Tortes and Cakes; Frozen Desserts; Plated Desserts; Chocolate showpieces and Sugar Arts; Truffles; Advanced Breads; Modern Cake Designs; SensoryDevelopment; Nutrition, Labeling; Food Safetyand Sanitation.

Unit V **(18hours)**

Sensory science: 5 senses in human beings; taste system; olfaction; sensory process; sensory evaluation: uses; plan; requirement; sensory analysis booths; sensory methods- discriminative descriptive; hedonic preference; selection of panel members; sensory methods- triangle test; duo –trio test; paired comparison test.

Course Outcomes:

After successful completion ofthis course, student will be able to:

CO1: Understand the importance and role ofvarious ingredients used in bakery and confectionary

CO2: Explainthe importance offood costing and costing techniques.

CO3: Understand the different types ofbiscuits, cookies and their methods ofmanufacturing

CO4: Develop standard recipes and adjust the quantities using adjustment factor

CO5: Understandthe different types ofsugar confectionaryproducts and their process products.

Text Books:

1. Ashokkumar, Y., *Textbook of Bakery And Confectionery*, PHI Learning Pvt. Ltd, 2018.
2. Mathuravalli, S. M. D., *Handbook of Bakery and Confectionery*. CRC Press, 2021.
3. Hofberger, R., Hartel, R. W., von elbe, J. H., *Confectionery Science and Technology*. Springer International Publishing, 2017.

Reference Books:

1. Hartel, R. W., Elbe, J. H., &Hofberger, R. *Confectionery Science and Technology*, 2018.
2. Culinary Institute ofAmerica, *Baking and pastry: Mastering the art and craft*, 2016.
3. Paul, V., *Textbook of Bakery and Confectionery*. Germany: Lap Lambert Academic Publishing, 2016.
4. Talbot, G., *Science and technology of enrobed and filled chocolate, confectionery and bakery products*. Oxford, Woodhead Publishing, 2019.

E- Resources:

1. https://www.uou.ac.in/sites/default/files/slm/HM-301.pdf
2. http://www.chifss.in/pdf/FSMS-Guidance-Documents-Biscuits-Breads-Cakes-Draft-V6-for-website.pdf
3. https://www.intracen.org/uploadedFiles/intracenorg/Content/Exporters/Exporting_Better/Quality_Management/AssetPDF/FINAL%20Food%20safety%20and%20GHP%20-%20Gambia(2).pdf
4. https://study.com/academy/lesson/food-safety-definition- guidelines.html
5. https://www.academia.edu/15638010/DIPLOMA_IN_BAKERY_and_CONFECTIONERY

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Baking Practicals II

(For Students Admitted from 2022-23)

Semester: II **Hours/week: 6**

Subject Code: IDBC23P **Credit: 3**

Course Objectives:

1. To equip the professional standards of baking principles
2. To gain knowledge about the quality assessment of bakery products on storage and the different finishing techniques in bakeryproducts.

List of Experiments:

1. Group discussion on selection, storage and use of; Perishable Non-perishable Semi-perishable ingredients.
2. Demonstration and practice of the following: Rubbing in method, creaming method, Whisking method
3. Preparationof Bread Loafs- Currant Loaf, Masala Bread, Raisin Bread.
4. Preparationof Simple yeast fermented products- Bread Sticks, hand and Soft Rolls
5. Preparation of Butter sponge, Caramelcake, Madeira cake, Victoria cake.
6. Preparation of International Bread French Bread, Chelsea Buns.
7. Preparationof Flavored Breads – Hot cross buns & Garlic rolls.
8. Preparation of Rich Yeast Fermented Breads -Brioche & Savarin
9. Preparation of Laminated Yeast breads- Danish Pastry& Croissants
10. Preparation of Burger Buns &Pizza Base.

Course Outcomes:

After successful completion ofthis course, student will be able to

CO1: Explorethe concepts and processes required to produce a selection ofspecialty breads to include yeast/gluten breads and enriched dough

CO2: Demonstratethe ingredients of different 3 cakes and baking procedure

CO3: Design preparation methods to finishing techniques

CO4: Acquire skills in the preparation offood

CO5: Demonstrate masteryof all basic baking formulas necessaryto manage a pastry operation or department.

Text Books:

1. Jagarlamudi, L., *Bakery and Confectionery Products: Processing, Quality Assessment Packaging and Storage Techniques:* India: New India Publishing Agency,2 019.
2. Chlebana, R. A., The Advanced Art ofBaking and Pastry. United Kingdom: Wiley, 2017.

Reference Books:

1. Patil, H. *Standardization of sugar-based bakery and confectionery products*. , Lap lambert academic Publisher, 2019.
2. Paul, V. *Textbook of Bakery and Confectionery*. Germany: Lap Lambert Academic Publishing, 2016.

E- Resources:

1. https://whatsarahbakes.com/baking-secrets/mixing- methods/the-rubbing- in-method/
2. https://www.britannica.com/topic/Chelsea-bun

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3. https://bakerpedia.com/processes/puff-pastry/
4. https://www.pearsonhighered.com/assets/preface/0/1/3/5/013524014X.pdf
5. https://www.nios.ac.in/media/documents/swayam/Home_Science_Hospitality_training_Schedule_voc/training_schedule_bakery_and_confectionery256.pdf

Confectionery Practicals II

(For Students Admitted from 2022-23)

Semester: II **Hours/week: 3**
Subject Code: IDBC24P **Credit: 6**

Course Objectives:

1. To learnevolving technologies equip for effective and patisserie operations.
2. To obtainthe knowledge in various strategies in sensoryanalysis ofproducts.

List of Experiments:

1. Preparation of Madeira Cake, Rock Cake and Fruit Cake.
2. Preparation ofFatless Sponge.
3. Preparation of piping biscuits and cherryknobs.
4. Preparation of Macaroons and cream fingers.
5. Preparation of Choux Pastry.
6. Preparation of Puff Pastry& flaky pastry.
7. Preparation of veg patties and chicken patties.
8. Preparation of Marzipan.
9. Preparation of Bavarois.
10. Study on role of hygiene in products.

Course Outcomes:

After successful completion of this course, student will be able to:
CO1: Explore with innovation the concepts ofcomposition, taste, design, texture and current trends for pastry through practical skills and related theory.
CO2: Develop techniques to adapt classical dishes and confectionery products to a contemporarystyle.
CO3: Evaluate and apply the techniques necessary to create a comprehensive range of chocolate work.
CO4: Creative modern plated desserts, and individual pastry products.
CO5: Abilityto work with chocolate and sugar to create design, plates and showpieces

Text Books:

1. Davidson.I., *Biscuit, Cookie and Cracker Production: Process, Production and Packaging Equipment*, Elsevier Science, 2018.
2. Chlebana, R. A, *TheAdvanced Art of Bakingand Pastry*, Wiley, 2017.

Reference Books:

1. Hartel, R. W., Vonelbe, J. H., Hofberger, R, *Confectionery Science and Technology*, Springer International Publishing, 2017.
2. Amit Kumar Gupta, *Textbook of Bakeryand Confectionery*, Generic Publisher,2021

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E- Resources:

1. https://bharatskills.gov.in/pdf/E_Books/BakeryConfectionary2sem_TP.pdf
2. https://www.wikihow.com/Make-Marzipan
3. https://bromabakery.com/foolproof- macaron-recipe-step-by-step/
4. https://www.allrecipes.com/recipe/258264/vanilla- madeira-cake/
5. https://www.education.vic.gov.au/Documents/school/principals/management/exconfectionery.pdf

Major Project

(For Students Admitted from 2022-23)

Semester: II **Hours/week: 12**
Subject Code: IDBC25PW **Credit: 12**

Course Objectives:

To mentor the students with contemporary guidelines to design and conduct original and ethical research. They should be able to write a dissertation in the APA format. The research done can either be empirical/data based [quantitative/qualitative/mixed methods] or it can be in the form ofa critical review ofresearch and theory.

Recommended Readings:

APA manual for dissertation

Evaluation: Viva jointlyby one internal and one external examiner.

Certificate course in Food Preservation Technology

S.No	Subject Code	Subject title	Duration	Contact Hours	Credits	ESE Marks
1.	GCFP1	Food Preservation Technology	12weeks	40	4	100
		Total				**100**

Paper-I Food Preservation Technology

SubjectCode:GCFP1 **Hours: 40**
Credits: 4

Course Objectives:

1. To equip the novel technologies used in food preservation
2. To develop the skill and analyze the quality parameters of preserved food

Course layout:

Week – 1

1. Basic Principle of Food Preservation
2. Principle and Traditional Methods of Food Protection in Preservation
3. Bio-Preservation and Chemical Preservatives

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Week – 2

4. ModernTechnologies in Food Preservation
5. Microorganisms in Food
6. Characteristics of Microorganisms in Food
7. Food Spoilage byMicroorganisms

Week – 3

8. Control of Microorganisms in Foods
9. Food Borne Disease
10. Proteins and Enzymes
11. Preservation by Salt and Sugar|

Week - 4

12. Fruits – Classification and Composition
13. Fruits and Vegetable Products
14. Dehydrationof Fruits and Vegetables
15. Squashes and Cordials

Week – 5

16. Pectin
17. Jams, Jellies and Marmalades
18. Fruit Juice Concentration
19. Tomato Product

Week – 6

20. Enzymes in Fruit Processing/Liquefaction
21. Value Addition to Fruits and Vegetables through Processing
22. Bottling Food Products
23. Freezing of Products

Week–7

24. Introduction to Refrigeration and Freezing (Part-1)
25. Refrigeration and Freezing–Pressure Enthalpy and freezing methods (Part-2)
26. SteamEvaporation and Dehydration
27. Meat and Poultry Industry in India

Week-8

28. PreservationofMeat: Chilling and Freezing
29. Preservation ofMeat: Irradiation
30. PreservationofMeat: Thermal Processing
31. Canning offish

Week– 9

32. Fish Curing and Smoking
33. Microbial Spoilage ofFish, Meat, Poultry and Egg
34. Chillingand Freezing ofFish

Week-10

35. Design ofActivated Sludge Process
36. Laminar Air Flow (LAF) Cabinet

Week-11

37. Post-Harvest Losses ofFruits, Vegetables and Preservation
38. Sterilizing Equipment

Week- 12

39. Identification of Hazards
40. Hygiene and sanitation

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Course Outcomes:

1. After successful completionof this course, student will be able to:
2. Define food preservation and understand the basic knowledge of microbial application in food preservation
3. Applythe knowledge in preserving foods bylaboratory and house hold measures
4. Demonstrateondifferent methods offood preservation techniques
5. Evaluate the microbial quality of foods

Text Books:

1. Tzia,C, *Handbook of Food Processing: Food Preservation*, CRC Press, 2015
2. Amin,T., Naik,H., *Food Processing and Preservation*, Taylor&Francis, 2021

Reference Books:

1. Gaspar,P.D.,& Silva,P.D., *Novel Technologies and Systems for Food Preservation* .IGI Global, 2019.
2. Warris, D. S., *Food Processing and Preservation*, Volume - 2. India: CBS Publishers & Distributors, 2020.
3. Chemat, F., & Vorobiev, E. *Green Food Processing Techniques: Preservation, Transformation and Extraction*. Academic Press, 2019.

Journals:

1. Journal of Food &Microbiology.
2. Journal of Food Processing &Technology.
3. Journal of FoodProcessing &Preservation.

E-Resources:

1. www.newfoodmagazine.com
2. www.nzifst.org.nz
3. www.itrhd.com
4. https://www.tarladalal.com/tomato-ketchup-tomato-sauce-homemade-tomato-ketchup-40725r
5. http://ecoursesonline.iasri.res.in/mod/page/view.php?id=5168

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