Vidyasagar University

Curriculum for B.Sc. (Honours) in Nutrition [Choice Based Credit System]

Semester-VI

Course	Course Code	Name of the Subjects	Course Type/ Nature	Teaching Scheme in hour per week			Credit	Marks
				L	T	P		
CC- 13		**C13T:** Dietetics and Counselling	Core Course-13	4	0	0	6	75
		- Lab		0	0	4		
CC- 14		**C14T:** Entrepreneurship development, Enterprise management and Entrepreneurship for small catering units	Core Course-14	4	0	0	6	75
		- Lab		0	0	4		
DSE-3		TBD	Discipline Specific Elective - 3	4	0	0	6	75
				0	0	4		
DSE-4		TBD	Discipline Specific Elective - 4	4	0	0	6	75
				0	0	4		
Semester Total							**24**	**300**

L= Lecture, **T=** Tutorial, **P =** Practical, **CC** - Core Course, **TBD** - To be decided, **DSE:** Discipline Specific Elective.

Semester-VI

List of Core Course (CC)

CC-13: Dietetics and Counselling

CC-14: Entrepreneurship development, Enterprise management and Entrepreneurship for small catering units

Discipline Specific Electives (DSE)

DSE-3: Geriatric Nutrition
Or
DSE-3: Nutrition Communication for Health Promotion
Or
DSE-3: Personnel Management and Food Service Management

DSE-4: Methods for Epidemiological Data Analysis
Or
DSE-4: Food packaging
Or
DSE-4: Bakery Technology and Mushroom Culture
Or
DSE-4: Sea food and Dairy Technology

Semester-VI

Core Course (CC)

CC-13: Dietetics and Counselling **Credits 06**

CT13: Dietetics and Counselling **Credits 04**

Course Contents:

Unit-I: Introduction to Psychology and counselling

Introduction to psychology – Definition , Nature and Scope. Attention and perception – Types of attention and factors influencing attention , principles of perceptual organization and abnormalities in perception. Learning and memory- Types of learning, Types of memory, Forgetting and its causes. Motivation and emotion- Types of motives, types of emotions, emotional expression. Personality- nature and definition , factors influencing personality, Psycho analytic theory of personality. Nature and goals of counselling. Principles of counselling. Characteristics of a good counsellor. Ethical principles of counselling. Special areas of counselling: Educational, family, health, community and counselling of alcoholic, and drug addicts.

Unit-II: Counselling Skills

Approaches to counselling – i. Psycho analytic approach, ii. Behaviouristic, iii. Humanistic approach.

Pre – Helping phase: i. Rapport building skills, ii. Attending and listening skills,

Stage I skills: Empathy, respect, Genuineness and concreteness,

Stage II skills: Advanced empathy, self disclosure, Immediacy and Confrontation.

Stage III skills: Goal setting, Action plan Programme and Brainstorming.

Unit-III: Basics of Diet Counceling

Diet Counselling - meaning, significance, process, types. Goals of counselling, individuals, group and family counselling. Basic sequence in counselling. Materials needed for counselling – models, charts, posters, AV aids, Hand outs etc. Communication process in counselling and linguistics in clinical dietary practices, problems in communication. Role of Counsellor & Counselee. Techniques of obtaining relevant information- 24 Hour Dietary recall, List of food likes and dislikes, Lifestyle. Dietician as a part of medical team and research team. Impact of counselling on health and disease of individuals – discussion of hospital case studies.

Processes involved in dietary counseling

Managing resources of the communicator/counselor. Designing of counseling plans – goals & objectives, evaluation instruments. Implementation: facilitating self-management of disease condition. Evaluation: evaluating adherence to dietary changes. Counseling approaches after evaluation**.**

Unit-IV: Practical consideration in giving dietary advice and counselling

a) Factors affecting and individual food choice. b) Communication of dietary advice c) Consideration of behaviour modification d) Motivation.

Unit-V: Counselling and educating patient

a) Introduction to nutrition counselling, b) Determining the role of nutrition counsellor, c) Responsibilities of the nutrition counselor , d) Practitioner v/s client managed care, e) Conceptualizing entrepreneur skills and behavior , f) Communication and negotiation skills.

Unit-VI: Teaching aids used by dietitians

Charts, leaflets, posters etc., preparation of teaching material for patients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis and cirrhosis.

Unit-VII: Diet Counselling at Hospital and Community level

Role of counselling in hospital. Role of counselling in community. Organizing health camps and patient feedback – at hospital level. Organizing health camps and patient feedback – at community level.
Dietary counseling through the life span - Diet counselling plans for obese people, Diabetics, CVD, dyslipidemia, cancer risk prevention, renal diseases, liver disorders mother and child care, Prenatal and pregnant women, Lactating women Childhood nutrition problems like, SAM, weight management, vitamin and mineral deficiencies, School children, adolescents, young adults, fitness, weight management, eating disorders. Geriatric counselling. Patient follow up / home visits,

Unit-VIII: Computer application

a) Execution of software packages.

b) Straight line, frequency table, bar diagram, pie chart, Preparation of dietary charts for patients.

c) Statistical computation- mean, median, standard deviation, conclusion and regression test.

Unit-IX: Computer application in dietetic management

a) Use of computers by dietician, b) Dietary computations, c) Dietetic management ,d) Education/ training , e) Information storage, f) Administrations , g) Research

Unit -X: Nutritional/medicinal role of traditional foods:

Traditional food beliefs, role of Ayurveda, Naturopathy, Yoga and other traditional medicines in disease management.

C13P: Dietetics and Counselling (Practical) **Credits 02**

Practical

1. Computer application for collection of data of different diseases. Submitting computed data.

2. Preparations of teaching aids in the field of nutrition.

3. Preparation of case history of a patient and feeding of information in the hard disc.

4. Understanding the use of conventional and non-conventional methods of counseling

i. Face to face counseling. **ii.** Use of software for counseling e.g Dietcal. **iii.** Use of any one Diet App for counseling and assessing food intake.

5. Planning Nutrition counseling sessions and identifying ways to adhere to dietary changes for the following conditions:

Lactation counseling, SAM. Eating disorders. Overweight / Obesity in School children, adolescent and adults. Metabolic syndrome. Diabetes- Gestational Diabetes. Renal disease, Liver disorders.

6. Organizing health camps and patient feedback – both at hospital level and community level.

7. Project planning for any one disease.

CC- 14: Entrepreneurship development, Enterprise management and Entrepreneurship for small catering units Credits 06

C14T: Entrepreneurship development, Enterprise management and Entrepreneurship for small catering units Credits 04

Course Contents:

Unit-I: Entrepreneurship development

Entrepreneurship - concept, definition, need and significance of entrepreneurship development in India, entrepreneurship growth process, barriers, entrepreneurship education model.

Entrepreneur- their characteristics, types, gender issues, role demands and challenges. Entrepreneurial motivation. Challenges faced by Women Entrepreneurs

Unit- II: Enterprise Planning and Launching

Types of enterprises classification based on capital, product, location, ownership pattern and process. Sensing business opportunities and assessing market potential; market research. Appraising of project and feasibility

Unit-III: Enterprise Management and Networking

a. Organization and Management - Principles of management. Functions of management/ manager.

b. Managing Production: Organizing Production; input- output cycle. Ensuring Quality

c. Managing marketing: Understanding markets and marketing. Functions of marketing. 4Ps of marketing (same as marketing mix).

d. Financial Management: Meaning of Finance. Types and sources of Finance. Estimation of project cost. Profit Assessment. Networking of Enterprises. Importance of Financial Management. Budgets and Budgeting process. Cost concepts

Unit - IV: Personnel management

Functions of a personnel manager, Factors to consider while planning the kind and number of personnel: Menu, type of operations, Type of service, Job description and job specification

Unit-V: Food service units, Menu planning, Food production process, Space and equipment

1. **Food service units:** Origin of Food Service units. Kinds of food service units.
2. **Menu Planning:** Importance of menu. Factors affecting menu planning, Types of menu.
3. **Food Production Process:** Food purchase and receiving, Storage. Quantity food production: Standardization of recipes, Recipe adjustments and portion control, Quantity food production techniques. Food service. Food hygiene and sanitation.
4. **Space and Equipment:** Types of kitchen areas, Flow of work and work area relationship. Equipment a) Factors affecting selection of equipment, b) Equipment needs for different situations

Unit VI: Planning of a small food service unit

a. **Preliminary Planning:** Survey of types of units, identifying clientele, menu, operations and delivery.
b. **Planning the set up:** a) Identifying resources, b) Developing Project plan, c) Determining investments

Unit-VII: Development of a business plan

CC14P: Entrepreneurship development, Enterprise management and Entrepreneurship for small catering units (Practical) **Credits 02**

Practical

1. SWOT analysis with respect to entrepreneurial competencies through case profiling of successful entrepreneurs and enterprises.
2. Achievement Motivation lab-development of entrepreneurial competencies.
3. Survey of an institution facilitating entrepreneurship development in India.
4. Preparation of business plan.
5. Market survey for food items both raw and processed. Survey of food service units.
6. Standardization of a recipe.
7. Preparing Quick Foods for scaling up for quantity production.
8. Planning menus for the following:
    a. Packed meals for office employees.
    b. Nutritious Tiffin for school children.
    c. School/college canteens.
9. Demonstration of a specialized cuisine.
10. Develop a checklist for good hygiene practices.

Discipline Specific Electives (DSE)

DSE-3: Geriatric Nutrition **Credits 06**

DSE3T: Geriatric Nutrition **Credits 04**

Course Contents:

Unit-I: Introduction to ageing

Definition of ageing, senescence, old age or aged people, gerontology, geriatrics, and Geriatric nutrition. Classification of old population.
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.
Implication of ageing population for rehabilitation: Demography, mortality and morbidity.

Unit-II: Issues and challenges of ageing

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. Geriatric guidance and counselling. Depression in old age. Exercise- yoga, meditation .

Behavior therapy: rational- emotive behavior therapy (REBT), horticultural therapy. Music therapy, Art therapy, Bibliotherapy

Unit-III: Clinical Geriatric

Physiological and biochemical changes during old age. Nutritional requirements and general dietary guidelines for elderly. Major nutritional and health problems during 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. Coronary heart disease.

Assessment of nutritional status of older adults.

Unit – IV: Social Geriatric

Types of family – Joint family System, Role of Elders and Younger generation. Isolation, Loneliness and Dependency – Dependency Ratio – Generational equality. Financial aspects – Sources of income, Old age pension. 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.

DSE-3: Geriatric Nutrition (practical) **Credits 02**

1. Visit to old- age homes- assessment of nutritional status of old people, diet counselling.
2. Preparation of dishes suitable for older person- soft, semisolid, easily digestible, nutritious and calorie dense balanced diet.

Or

DSE-3: Nutrition communication for Health promotion Credits 06

DSE3T: Nutrition communication for Health promotion **Credits 04**

Course Contents:

Unit-I: Dietary guidelines for nutrition and health related concerns

National and international guidelines and their role in nutrition promotion. Critical appraisal of the current guidelines.

Unit-II: Nutrition and behaviour inter-relationship

Food and health behaviour, models/ theories of health behaviour, food choices, strategies for intervention at the ecological and individual level.

Unit-III: Social and Behaviour Change Communication for nutrition and health promotion

a. Concept and objectives of communication for behaviour change
b. Planning of communication strategies for social and behaviour change programme,
c. Communication needs analysis, stakeholders in nutrition promotion, developing nutrition education plan, identifying communication strategies/ approaches for nutrition and health promotion (e.g. social marketing), designing nutrition and health messages, selecting communication channels, developing and field testing of communication materials, designing training strategies for trainers and their capacity building.
d. Implementing social and behaviour change communication intervention: an overview
e. Evaluation of social and behaviour change communication programmes

Unit-IV: Nutrition Advocacy

a. Meaning, types, tools and techniques and advocacy planning.
b. Role of advocacy in nutrition policy formulation, preparation of policy briefs.

Unit V Ethics in nutrition and health communication

a. Significance of ethics in nutrition and health communication.
b. Ethical Principles and concerns

DSE3P: Nutrition communication for Health promotion (Practical) Credits 02

1. Planning of communication strategies for public health nutrition problems among vulnerable groups in the community -field testing of messages, materials and methods.

2. Review of communication strategies being used in any one public health nutrition programme in the community.

Or

DSE-3: Personnel management and Food service management Credits 06

DSE3T: Personnel management and Food service management Credits 04

Course Contents:

Personnel Management

Unit-I: Organization and management: a) Definition and types of organization. b) Definition-functions and tools of management. c) Technique of effective management and its application to food preparation and science.

Unit-II: Food material management: a) Meaning, definition, and importance. b) Food selection, purchasing, receiving and storeroom management. c) Control in relation to the above operations (material planning, budgeting, material identification, modification and standardization, inventory control, store keeping, definition, objectives, functions, factors underlying successful storekeeping, duties and responsibilities of a storekeeper, purchasing, organization, principle, procedure, systems and quality control).

Unit-III: Personnel Management: Recruitment, selection and training of personalities, work standards, productivity, supervision, and performance appraisal and motivation incentives for effective performances.

Unit-IV: Labour policies and legislation: (Personnel policies related to salaries, other emoluments, allowances, leave, uniform and other prize benefit, laws and organization)- Laws affecting food service institution to study the following: (hospital, flight kitchen, hotel, Restaurant, canteen, Industrial) - a. Organization, b. Physical plan and layout. c. Food and silver equipment, d. Sanitation and hygiene.

Food Service Management

Unit-V: Foundations: The Foodservice Industry, The Systems Approach, The Fundamentals, Food Safety, Cleaning, Sanitation, and Environmental Safety, The Menu.

Unit-VI: Operational Functions: Purchasing, Receiving, Storage, and Inventory, Production, Beverage Provision, Food and Beverage Service, Events Conferencing & Banqueting, Apprising Performance, Strategic Decisions.

Unit-VII: Facilities: Facilities Planning and Design, Equipment and Furnishings, Environmental Management.

Unit-VIII: Management Functions: Organizational Design, Leadership, Human Resource Management, Performance Improvement, Financial Management, Marketing.

DSE3P: Personnel management and Food service management (Practical) Credits 02

Visit and appraisal of any two medical organizations.

1. Work simplification: food preparation, Calculating work unit, time norms etc.
2. Costing, accounting, budgeting, purchase.
3. Storekeeping: Listing and management of food items in the store.
4. Personnel recruitment: Preparations of a project and report making.

5. Maintenance of the clothing for persons and staff involved in kitchen area.
6. Prepare an inventory for evaluating staffs personal hygiene.

Food service Management:

1. Layout of Food Service Outlets & Organisations
2. Food Service Operations
3. Conferencing & Banqueting
4. Equipment and Furnishings, Environmental Management in Food Service Operations
5. Visit to a professional Food Service Outlet

Note: An Event may be planned to supplement learning of students and practical may be conducted in view of theory syllabus to provide practical inputs to learners.

DSE- 4: Methods for Epidemiological Data Analysis Credits 06

DSE4T: Methods for Epidemiological Data Analysis Credits 04

Course Contents:

Unit I: Understanding Epidemiological Data
Components of epidemiology: disease frequency, distribution of disease and determinants of disease. Epidemiological approach and measurements- vital statistics (rates, ratios and proportions), measurements of health indicators (morbidity, mortality and fertility rates).

Unit II: Epidemiologic Methods and Survey
Data collection: observational (descriptive and analytical) and experimental studies. Epidemiology study designs - case control and cohort studies (prospective and retrospective), techniques of sampling and matching, sources of bias.

Unit III: Data Organization and Presentation
Basic principles of 'R' software for tabulation and graphical representations (bar diagrams, histograms, pie charts, box plot, etc.), measures of central tendency (mean, mode, median and partition values), dispersion (range, standard deviation, coefficient of variance and covariance) and skewness.

Unit IV: Statistical Modeling and Analysis using 'R' on NCRP data and survey conducted by the students

Correlation analysis (scatter diagrams and Karl Pearsons coefficient of determination, standard and probable errors) and regression analysis. Inferential statistics: sampling distributions and standard error null and alternate hypothesis, basic concept and illustrations of type I and type II

errors, concept of confidence interval estimation, large sample tests for single mean and difference of means, single proportion and difference of proportions, students t-distribution (test for single mean, difference of means and paired t-test), chi-square distribution, F-distribution, one-way and two-way ANOVA, non parametric analysis (sign and rank tests), p-value.

DSE4P: Methods for epidemiological data analysis (Practical) Credits 02

List of Practical

1. Analysis of data from National Cancer Registry Program (NCRP). Understanding incidence, mortality (rates, ratios and proportions).
2. Designing a questionnaire for survey of prevalence diabetes/ hypertension/ allergy/ respiratory disorders/etc. Determining the target and control populations
3. Surveying the population for the diseases mentioned above.
4. Introduction to 'R' software. Analysis of data from NCRP data and survey conducted by the students.
5. Correlation studies. Regression studies. Probabilistic distribution studies. Comparison of groups and ascertaining statistical significance of differences.

Or

DSE-4: Food packaging Credits 06

DSE4T: Food packaging Credits 04

Course Contents:

Unit 1: Introduction to Food Packaging -Packaging Functions and Requirements,, Printing of packages .Barcodes & other marking, Labeling Laws

Unit 2: Food Packaging Materials -Paper and paper-based materials, corrugated fiber board (CFB). Plastics, formation- Injection molding, Blow molding, Types of plastics, Lamination, Biodegradable plastics, Edible packaging and Bio-composites. Environmental Concerns recycling and disposal of plastic waste Metal packaging- Metals: Tinplate, tinning process, components of tinplate, tin free can (TFC) types of can, metallic films, lacquers Glass: Composition, Properties, Methods of bottle making, Types of closures.

Unit 3: Package Designing for Foods - Package design for fresh horticultural produce and animal foods, dry and moisture sensitive foods, frozen foods, fats and oils, thermally processed foods and beverages.

Unit 4: Testing and Regulatory Aspects of Food Packaging- Testing Procedures for Packaging Materials- thickness, tensile strength, puncture resistance, bursting strength, seal strength, water

vapor permeability, CO_2 permeability, oxygen permeability, grease resistance, Testing Procedures for Packaged Foods - Compatibility and shelf life studies, evaluation of transport worthiness of filled packages. Food Packaging Laws and Regulations.

Unit 5: Packaging Machinery and Systems - Bottling machines, Cartoning systems, Seal and Shrink packaging machine; Form, Fill and Sealing machine (FFS). Vacuum, Controlled and Modified atmosphere packaging systems; Aseptic packaging systems; Retort packaging, Active and Intelligent packaging systems

DSE4P: Food Packaging (Practical) **Credits 02**

List of Practical:

1. Testing of physical/mechanical properties of food packaging material.

2. Testing of thermal shock resistance of glass.

3. Gas/Vacuum packaging of foods and shelf life studies.

5. Edible packaging of Food Samples.

6. Packaged food cut-out analysis.

Demonstration:

1. Study of Sorption Isotherm for Food Package Design **(Demonstration)**.

2. Determination of Water Vapor Transmission rate of Packaging Material **(Demonstration)**.

3. Study the operation of FFS machine **(Demonstration**).

Or

DSE-3: Bakery Technology and Mushroom Culture **Credits 06**

DSE3T: Bakery Technology and Mushroom Culture **Credits 04**

Course Contents:

Unit- I: Bakery industry: Current status, growth rate, and economic importance of Bakery Industry in India. Product types, nutritional quality and safety of products, pertinent standards & regulations.

Unit- II: Bread, Buns and Pizza base - Ingredients & processes for breads, buns, pizza base, Equipments used, product quality characteristics, faults and corrective measures

Unit- III: Cakes - Ingredients & processes for cakes, Equipments used, product quality characteristics, faults and corrective measures. Different types of icings.

Unit- IV: Biscuits, Cookies & Crackers - Ingredients & processes, Equipments used, product quality characteristics, faults and corrective measures.

Unit- V: Modified Bakery Products - Modification of bakery products for people with special nutritional requirements e.g. high fibre, low sugar, low fat, and gluten free bakery products.

Unit- VI: Breakfast Cereals, Macaroni Products and Malt - Production and quality of breakfast cereals, macaroni products and malt.

Unit- VI:

Mushroom Culture: 1. Definition and characteristics of mushroom. **2.** Morphology and life cycle of Mushroom**. 3.** Identification and classification of mushroom **4** Nutritional and medicinal value of edible mushrooms; poisonous mushrooms. **5.** Types of edible mushrooms available in India- Volvariella volvacea, Pleurotus citrinopileatus, Agaricus bisporus. **6.** Process of mushroom cultivation. **7.** Storage and nutrition: short term storage (Refrigeration- upto 24 hours), long term storage (canning, pickles, papads), drying, storage in salt solutions.

DSEP: Bakery Technology and Mushroom Culture (Practical) Credits 02

List of Practical:

1. Preparation of pizza base and assessment of its quality

2. Preparation of bread and assessment of its quality

3. Preparation of buns and assessment of quality

4. Preparation of butter cake and assessment of its quality.

5. Preparation of sponge cake with icing and assessment of its quality.

6. Preparation of cookies and assessment of quality.

7. Preparation of biscuits and assessment of quality.

8. Visit to Mushroom Culture Centres/ Farms for:

    Process involved in mushroom cultivation Types and varieties of mushroom. Visual Identification of edible and poisonous mushroom Marketing.

9. Different Food preparation from mushroom.

Or

DSE-4: Sea food and Dairy Technology — Credits 06

DSE4T: Sea food and Dairy Technology — Credits 04

Course Contents:

Technology of Sea food:

Unit-I: Introduction. Status of fishery industry in India.

Unit-II: Chilling and Freezing of fish. Relationship between chilling and storage life, MAP, general aspects of freezing, freezing systems (air blast freezing, plate or contact freezing spray or immersion freezing, freezing on board, onshore processing, changes in quality in chilled and frozen storage, thawing.

Unit-III: Fish Curing and Smoking - Drying and salting of fish, water activity and shelf-life , salting process, salting methods (brining, pickling, kench curing, gaspe curing), types of salts, dried and salted fish products- pindang, fishwood, dried shrimp. Preservation by smoking, smoke production , smoke components, quality, safety and nutritive value of smoked fish, processing and equipment, pre-smoking processes, smoking process control. Traditional chimney kiln, modern mechanical fish smoking kiln, examples of smoked and dried products.

Unit-IV: Canning of fish: Principles of canning, classification based on pH groupings, effect of heat processing on fish, storage of canned fish, pre-process operations, post process operations, cannery operations for specific canned products.(Tuna,Mackerel,Sardine).

Unit-V: Fishery by-products - Surimi- Introduction, fish muscle proteins, the surimi process, traditional and modern surimi production lines, quality of surimi products, comparision of surimi and fish mince products. Fish protein concentrates (FPC), fish protein extracts (FPE), fish protein hydrolysis (FPH)

Unit-VI: Fermented fish- Flowchart of Indigenous products- Fish sauce and Paste

Unit-VII: Concept of other Sea foods - Crabs, lobsters, prawns, shrimps, shell- fish.

Technology of milk and milk products

Unit-VIII: Physical properties of milk : Color, taste, pH and buffering capacity, refractive index, viscosity, surface tension, freezing, boiling point, specific heat, OR, electrical conductivity.

Unit-IX: Lactose - Lactose (alpha and beta forms and their differences) Significances of lactose in dairy industry.

Unit-X: Milk fat: Composition and structure, factors affecting melting point, boiling point, solubility and Refractive Index, fat constants (saponification value, iodine value, RM value, Polenske value, peroxide value). Chemical reactions of fat (hydrolysis, auto-oxidation), condition favouring autooxidation, prevention, measurement of auto-oxidation.

Unit-XI: Protein and Enzymes - General structure, amphoteric nature, difference between casein and serum protein, different types of casein (acid and rennet), uses of casein, fractionation of protein. Enzymes- catalase, alkaline phosphatase, lipases and proteases.

Unit-XII: Market milk industry and milk products: Systems of collection of milk Reception, Platform testing- Various stages of processing, Filtration, Clarification • Homogenization • Pasteurization • Description and working of clarifier, cream separator, homogenizer and plate heat exchanger. Flow diagram of following milk products - Butter, ghee, flavored milk, yoghurt, dahi, shrikhand, ice-cream, condensed milk, milk powder, channa, paneer, cheese (cheddar).

DSE4P: Sea food and Dairy Technology (Practical) Credits 02

List of Practical:

1. Perform platform tests in milk.(Acidity, COB, MBRT, specific gravity, SNF)
2. Estimate milk protein by Folin method.
3. Estimate milk fat by Gerber method.
4. Preparation of flavoured milk. Pasteurization of milk.
5. Prepare casein and calculate its yield.
6. Quality evaluation of fish/prawn.
7. Subjective evaluation of Fresh Fish.
8. Cut out examination of canned fish.(Sardine, Mackerel, Tuna)
9. Fish product formulation/canning.

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