



MUSLIM ARTS COLLEGE

(Accredited by NAAC with B+ grade & Affiliated to Manonmaniam Sundaranar University,
Tirunelveli; Recognized US 2(f) 12 (B) of UGC Act.)

Thiruvithancode, Kanyakumari District, Tamil Nadu - 629174.

DEPARTMENT OF NUTRITION AND DIETETICS

CBCS SYLLABUS

Learning Outcome-based Curriculum Framework for

NUTRITION AND DIETETICS (M.Sc.)

*Applicable for students admitted from June 2026 as per the Resolutions of the Academic Council Meeting held
on 01.06.2026*

Vision

To achieve excellence in Nutrition and Dietetics with Hospitality Management through quality education, research, innovation, and community engagement, promoting healthy lifestyles and sustainable food systems.

Mission

- To provide quality education in nutrition, dietetics, food science and hospitality management.
- To promote research and innovation in nutrition and healthcare.
- To develop professional competence and ethical values.
- To create awareness on food safety, nutrition and public health.
- To prepare competent nutritionists, dietitians and hospitality professionals for global opportunities.

Academic and Professional Attributes of the Graduates

- 1. Advanced Disciplinary Knowledge**
Demonstrate comprehensive knowledge in nutrition, dietetics, food science, clinical nutrition, public health nutrition, food service management, and hospitality management.
- 2. Critical Thinking and Problem-Solving Skills**
Analyze nutritional, clinical, and food service challenges using scientific reasoning and evidence-based approaches to develop appropriate solutions.
- 3. Research and Innovation**
Apply research methodologies, statistical tools, and scientific inquiry to conduct independent research, interpret findings, and contribute to innovations in nutrition, dietetics, and hospitality.
- 4. Professional and Clinical Competence**
Perform nutritional assessment, diet planning, food quality evaluation, therapeutic nutrition care, and food service management with competence and professionalism.
- 5. Communication and Interpersonal Skills**
Communicate effectively with patients, healthcare professionals, food service personnel, and the community through oral, written, and digital media.
- 6. Ethical, Legal, and Social Responsibility**
Uphold professional ethics, food safety standards, legal regulations, environmental sustainability, and social responsibility while promoting health and well-being.
- 7. Leadership and Teamwork**
Demonstrate leadership qualities and collaborate effectively in multidisciplinary healthcare, hospitality, research, and community settings.
- 8. Entrepreneurship and Professional Readiness**
Develop entrepreneurial skills and managerial competencies to establish and manage nutrition clinics, food industries, catering services, wellness centres, and hospitality enterprises.
- 9. Global and Sustainable Perspective**
Understand national and international nutrition policies, food regulations, sustainable food systems, and emerging trends in healthcare and hospitality management.
- 10. Lifelong Learning and Professional Development**
Engage in continuous learning, professional development, and skill enhancement to

adapt to advancements in nutrition, dietetics, food technology, and hospitality management throughout their careers.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Upon completion of the M.Sc. Nutrition and Dietetics Degree Programme, graduates are expected to	Mapping with Mission
PEO1	Demonstrate advanced knowledge and professional competence in nutrition, dietetics, food science, clinical nutrition, food service systems, and hospitality management to address healthcare and industry needs.	M1, M2
PEO2	Apply critical thinking, research skills, innovation, and evidence-based practices to solve problems in nutrition, public health, food service, and hospitality management.	M2, M3
PEO3	Exhibit ethical values, leadership, effective communication, and managerial competencies while working collaboratively in multidisciplinary healthcare, hospitality, academic, and community settings.	M3, M4
PEO4	Pursue lifelong learning, entrepreneurship, and professional development to contribute to sustainable food systems, public health, and global opportunities in nutrition and hospitality sectors.	M4, M5

Programme Outcomes (POs)

POs	Upon completion of the M.Sc. Nutrition and Dietetics Degree Programme, students will be able to	Mapping with PEOs
PO1: Advanced Disciplinary Knowledge	Apply advanced knowledge of nutrition, dietetics, food science, clinical nutrition, public health nutrition, food service systems, and hospitality management to address professional and societal needs.	PEO1
PO2: Critical Thinking and Problem Solving	Analyze nutritional, clinical, food service, and hospitality-related issues using scientific reasoning, evidence-based practices, and innovative problem-solving approaches.	PEO1, PEO2
PO3: Research and Innovation	Design, conduct, interpret, and communicate research using appropriate methodologies, statistical tools, and modern technologies to contribute to advancements in nutrition, dietetics, and hospitality management.	PEO2
PO4: Professional Competence	Demonstrate competency in nutritional assessment, therapeutic diet planning, food quality assurance, hospital dietetics, food safety, and hospitality operations while adhering to professional standards.	PEO1, PEO3
PO5: Communication and Leadership	Communicate effectively with patients, healthcare professionals, food service personnel, industry stakeholders, and the community while demonstrating	PEO3

	leadership and teamwork in multidisciplinary environments.	
PO6: Ethics and Social Responsibility	Uphold professional ethics, legal regulations, food safety standards, environmental sustainability, and social responsibility in healthcare, food industries, and hospitality services.	PEO3
PO7: Digital and Technological Competence	Utilize digital technologies, nutrition software, healthcare information systems, laboratory techniques, and emerging technologies to enhance professional practice, research, and decision-making.	PEO2, PEO4
PO8: Entrepreneurship and Management	Apply managerial, financial, and entrepreneurial skills to establish and manage nutrition clinics, food service institutions, catering units, wellness centres, and hospitality enterprises.	PEO3, PEO4
PO9: Global Perspective and Sustainability	Integrate national and international nutrition policies, food regulations, sustainable food systems, and global best practices in professional decision-making and community development.	PEO4
PO10: Lifelong Learning	Engage in continuous learning, professional development, and self-improvement to adapt to emerging trends, innovations, and challenges in nutrition, dietetics, food technology, and hospitality management.	PEO4

Programme Specific Outcomes (PSOs)

PSOs	Upon completion of the M.Sc. Nutrition and Dietetics Degree Programme, students will be able to	Mapping with POs
PSO1	Clinical Nutrition and Dietetics: Apply advanced knowledge and practical skills in nutritional assessment, therapeutic diet planning, medical nutrition therapy, and patient counseling to promote health, prevent diseases, and support clinical care.	PO1, PO2, PO4, PO5
PSO2	Food Science, Food Service and Hospitality Management : Demonstrate competence in food science, food quality assurance, food safety, menu planning, institutional food service, hospitality operations, and resource management while ensuring quality and customer satisfaction.	PO1, PO4, PO5, PO6, PO8
PSO3	Research, Innovation and Technology: Design and conduct research using scientific methods, biostatistics, laboratory techniques, nutrition software, and digital technologies to develop innovative solutions for nutrition, food, and hospitality-related challenges.	PO2, PO3, PO7, PO10
PSO4	Entrepreneurship and Professional Practice: Establish and manage nutrition clinics, wellness centres, food industries, catering services, consultancy firms, and hospitality enterprises by applying leadership, managerial, financial, and entrepreneurial skills.	PO5, PO6, PO8, PO10
PSO5	Public Health and Sustainable Development: Plan, implement, and evaluate community nutrition programmes, public health interventions, food safety initiatives, and sustainable food systems while demonstrating ethical, environmental, and social responsibility.	PO2, PO6, PO9, PO10

Mapping of Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)

(POs) / (PSOs)	PSO1	PSO2	PSO3	PSO4	PSO5
PO1: Advanced Disciplinary Knowledge	3	3	2	2	2
PO2: Critical Thinking and Problem Solving	3	2	3	2	3
PO3: Research and Innovation	2	2	3	2	2
PO4: Professional Competence	3	3	2	3	2
PO5: Communication and Leadership	3	3	2	3	2
PO6: Ethics and Social Responsibility	2	3	2	2	3
PO7: Digital and Technological Competence	2	2	3	2	2
PO8: Entrepreneurship and Management	2	3	2	3	2
PO9: Global Perspective and Sustainability	2	2	2	2	3
PO10: Lifelong Learning	2	2	3	3	3

●3 – High Correlation

●2 – Moderate Correlation

●1 – Low Correlation

COURSES OFFERED

SEMESTER I

Part	Course Code	Title of the Course	Credits	Hours / Week
Core-I	NMND11	Advanced Food science	5	6
Core –II	NMND12	Advanced Human Physiology	5	6
Core-III	NMND13	Hospital Administration	4	6
Core- I Practical	NMNDP1	Advanced Food Science practical	2	4
Elective - I	NEND11	Food Microbiology and Sanitation	2	4
Elective - II	NEND12	Food Microbiology and Sanitation - Practical	2	4
Total			20	30

FIRST YEAR - SEMESTER I

CORE COURSE I: ADVANCED FOOD SCIENCE

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
NMND11	Core	Y	Y	-	-	5	6	25	75	100

Pre-requisite

Students should possess foundational knowledge of food science, food chemistry, human nutrition, and basic concepts of food processing acquired at the undergraduate level.

Learning Objectives

The course aims to:

1. Develop an advanced understanding of the physical, chemical, and functional properties of food components.
2. Explain the effects of processing, cooking, storage, and preservation on the quality and nutritive value of foods.
3. Apply principles of food science in food product development, quality assurance, and food service operations.
4. Evaluate the role of food additives, sweeteners, colours, and flavouring agents in ensuring food quality and safety.
5. Analyze the scientific basis of food preparation and processing for improving nutritional quality and consumer acceptability.

Course Outcomes (COs)

Upon successful completion of the course, students will be able to:

CO No.	Course Outcomes	BT Level
CO1	Explain the structure, composition, physicochemical properties, and functional characteristics of major food components including carbohydrates, proteins, lipids, milk, and eggs.	K2
CO2	Analyze the effects of processing, cooking, storage, and preservation on the nutritional quality and functional properties of foods.	K4
CO3	Apply food science principles in food preparation, quality evaluation, product development, and food service management.	K3
CO4	Evaluate the role of food additives, sweeteners, colours, enzymes, and flavouring agents in ensuring food quality, safety, and regulatory compliance.	K5
CO5	Design scientifically sound strategies for selecting, processing, and preserving foods to improve nutritional value, shelf life, and consumer acceptability.	K6

Bloom's Taxonomy Levels

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create

Course Content

Units	Contents	No. of Hours
I	Properties of food- Food nutrients, solids, solutions and colloids, Solutions-Physical properties of solutions, classification of foods based on viscosity characteristics. Solutes- chemical properties, Food dispersion: Colloids-Types of colloid and properties of colloids and rheology of food dispersions; Structure, formation and stability of gels, sols, emulsion and foams. Starch - Sources, Structure and composition of starch; Properties and characteristics of foodstarches; Modified food starches-Structure and composition, Effect of heat on food starch properties, gluten formation in wheat flour, influencing factors[gluten], gelatinization, gelation and retrogradation, dextrinization and factors affecting gelatinization.	18
II	Proteins-Structure and composition, Classification and properties of proteins; Effect of heat on physio- chemical properties of proteins; Role of proteins in food products; Texturized vegetable protein, protein concentrates. 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.	18
III	Fats and oil -Structure, composition and properties of fats and oil; storage of fat, characteristics [shortening, plasticity, flavor, retention of moisture, melting point, optical activity, color, specific gravity], Hydrogenation, winterization, flavor reversion, smoking point, Rancidity- Types, Mechanism and prevention; Role of fat/oil in food products; Fat substitutes. Sugar and sugar products- Types of sugar, Types of granulated sugar, Physical and chemical properties, Sugar products -Types of honey, Jaggery, corn syrup, various forms of sugar used in cookery and Crystallization of sugar.	18
IV	Milk components- water, carbohydrate, milk fat, milk protein, minerals and other components in milk, Physiochemical properties of milk, Effect of physical and chemical factors on milk components [Effect of heat, protein, factors affecting coagulation, casein coagulation, minerals, Non-enzymatic browning], [Effects of acid], Effects of enzymes-renin, fermented and non-fermented milk products. Egg-proteins in Egg, microscopic structure of egg, characteristics [color, size], Nutritional qualities, quality check, functional properties- foaming, factors affecting foam formation.	18
V	Food additives- Definition, different food additives and Need for food additives. Flavour compounds in vegetables, fruits and spices; Effect of processing on food flavours; Role of colours and flavours in food products. Sweetners- Properties, Artificial and Natural sweeteners and role of sweeteners in food industry.	18
	Total	90

S. No.	Text Books
1	Srilakshmi B. (2015). Food Science.New Age International (P) Ltd. Publishers.
2	S.M. Reddy (2015). Basic Food science and technology. New Age International publishers.AvantinaSharma (2017).
3	Text book of food science and Technology. CBS Publisheres and distributes ltd. 3rd Edition.
4	Swaminathan A.(2018) . Handbook of Food and Nutrition, Bangalore press.
5	Serpil Sahin and ServetGulumSumnu.(2006).Physical properties of Foods. Springer publications.

S. No.	Reference Books
1	Gerard L. Hasenhuettl , Richard W. Hartel. (2019).Food Emulsifiers and Their Applications.Springer publications. 3 rd edition.
2	Vickie.A. Vaciavik. (2021). Essentials of Food science. Springer publications. 5th edition.
3	Dr.M.Swaminathan.(2015). Advanced text book of Food and Nutrition. volume-2.Bapco publications.
4	Eskein.(2012). Biochemistry of Food. Elsievier publications.
5	Lyn O brienNabors.(2001).Alternative Sweetners. Taylor and Francis publications.
6	Janet D. Ward and Larry Ward.(2006). Principles of Food Science. Stem Publishers. 4th Edition.
S. No.	Web Sources (URL)
1	www.fao.org www.wfp.org
2	www.foodrisk.org .
3	http://www.fsis.usda.gov/
4	https://www.fda.gov/food

Mapping with Programme Outcomes

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	3	1	2	2	1	1	2
CO2	3	3	2	3	2	2	2	1	2	2
CO3	3	3	2	3	2	2	3	2	2	2
CO4	3	3	2	3	2	3	2	2	3	2
CO5	3	3	3	3	2	3	3	3	3	3

3 – Strong, 2 – Medium , 1 - Low

Mapping with Programme Specific Outcomes

CO / PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	2
CO2	3	3	3	2	2
CO3	3	3	2	2	2
CO4	3	3	3	2	3
CO5	3	3	3	3	3
Weightage	15	15	13	10	12
Weighted percentage of Course Contribution to POs	3.0	3.0	2.6	2.0	2.4

FIRST YEAR - SEMESTER I

CORE COURSE II – ADVANCED HUMAN PHYSIOLOGY

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
NMND12	Core	-	-	Y	Y	5	6	25	75	100

Learning Objectives

The course aims to:

1. Develop an advanced understanding of the structure and functions of human organ systems.
2. Explain the physiological mechanisms regulating normal body functions and homeostasis.
3. Analyze the integration of organ systems and their responses under normal and pathological conditions.
4. Apply physiological principles to understand clinical conditions relevant to nutrition, dietetics, and healthcare.
5. Interpret physiological processes using scientific reasoning for effective clinical and nutritional practice.

Course Outcomes

Upon successful completion of the course, students will be able to:

CO No.	Course Outcomes	BT Level
CO1	Explain the structural and functional organization of human cells, tissues, and the physiological interactions among body systems.	K2
CO2	Analyze the structure and functions of blood, cardiovascular system, and mechanisms regulating circulation and cardiac activity.	K4
CO3	Analyze the physiological functions of the respiratory, endocrine, immune, gastrointestinal, and urinary systems in maintaining homeostasis.	K4
CO4	Explain the physiology of the digestive and reproductive systems and their significance in growth, development, and health.	K2
CO5	Evaluate the physiological functions of the nervous system, skin, and excretory system and their role in maintaining internal body balance.	K5

Bloom's Taxonomy Levels

K1 – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyse, **K5** – Evaluate, **K6** – Create

Unit	Contents	No. of Hours
I	Cell Structure and Function, Transportation across cell membrane, Cell theory and Cycle. Difference between Meiotic and Mitotic cell, Stem cells- types and functions. Tissue Structure and Function.	18

II	Blood Composition & Functions, Blood Group – ABO System & Rh factor, Blood Coagulation. Heart Structure & Function of Heart and Blood Vessels, Systemic & Pulmonary circulation, Cardiac cycle and Conduction, Heart rate and Cardiac output. ECG, Blood pressure & their regulations.	18
III	Respiratory System Structure and function: Gas Laws pertaining to Gas Exchange (Meaning only)- Henry's Law of Partial Pressure, Boyle - Mariotte's Law of Volume and Pressure, Dalton's Law of Partial Pressure, Charles's Law of Ideal Gas Equation and Fick's Law of Diffusion. Mechanism of respiration: Circulation and Exchange of respiratory gases. Internal and External Respiration. Chloride shift. Definitions of Lung volumes and Lung capacities, Ventilation and Artificial Respiration. Immunity Definition and types Innate and Acquire immunity. Endocrine System Hormones and its type, Syndromes resulting from hypo and hyperactivity of Pituitary, Thyroid, Adrenals and Pancreas.	18
IV	Gastrointestinal System Structure and function of GI tract and its accessory organs, Digestion and absorption of Carbohydrates, Proteins and Fats. Reproductive System Roll of hormones in reproduction and Lactation, Menstrual Cycle and Menopause, In vitro (IV) fertilization, Spermatogenesis.	18
V	NERVOUS SYSTEM Structure and Function of Neuron. Afferent and Efferent Nerves, Conduction of Nerve Impulse- Synapses, Neurotransmitters, Summation and Action Potential, Sympathetic and Parasympathetic nervous System, Cerebrospinal fluid (CSF) – composition and function, Blood-brain barrier (BBB), Electroencephalogram (EEG) EXCRETORY SYSTEMS Renal system Organs in the Urinary System, Structure and functions of Nephron, Juxtaglomerular Cell, Mechanism of formation of urine, Role of the kidney to regulate Blood pressure, Water, Electrolytes and Acid Base Balance. Skin Structure and function, Regulation of temperature of the body.	18
	Total	90

S. No.	Text Books
1	K. Sembulingam&PremaSembulingam (2019), Essentials of Medical Physiology. Jaypee publications. Eighth edition.
2	Waugh A, Ross and Wilson (2018). Anatomy and Physiology in Health and Illness. Elsevier publications. 13ed.
3	CC Chatterjee (2020). Human Physiology. CBS publishers. 13 ed.
4	Indu Khurana (2020). Medical Physiology for Undergraduate Students. Elsevier Publication. 2 Edition.
5	GK Pal (2019). Textbook of human physiology, Elsevier publications. 3edition.

S. No.	Reference Books
1	Guyton, A.G. and Hall, J.B. (2005): Text Book of Medical Physiology.W.B.Sanders Company, Prism Books (Pvt.) Ltd., Bangalore. 9th Edition.
2	Wilson, K.J.W and Waugh, A. (2003): Ross and Wilson Anatomy and Physiology in Heathand Illness. Churchill Livingstone. 8th Edition.
3	Jain, A.K.: Textbook of Physiology. Avichal Publishing Co., New Delhi. Vol.I and II.
4	McArdle, W.D., Katch, F.I. and Katch V.L(2001): Exercise Physiology. 1 6 16 Page Energy, Nutritionand Human Performance. Williams and Wilkins, Baltimore. 4th Edition.
5	Ganong, W.F. (1985): Review of Medical Physiology. lange Medical Publication. , 12th Edition.
6	Moran Campell E.J., Dickinson, C.J., Slater, J.D., Edwards. C.R.W. and Sikora, K. (1984): Clinical Physiology. ELBS, Blackwell ScientificPublications. , 5th Edition.
7	McArdle, W.D., Katch, F.1. and Katch, V.L. (1996): Exercise Physiology. Energy, Nutrition and Human Performance, Williams and Wilkins, Baltimore. 4th Edition.
8	Jain, A.K.: Textbook of Physiology. Avichal Publishing Co., New Delhi. Vol. I and II.
9	Winword. Sear's Anatomy and Physiology for Nurses. London, Edward Arnell.
10	Chatterjee ChandiCharan: Text Book of Medical Physiology, London W.B.
S. No.	Web Sources (URL)
1	https://youtu.be/MZDy0RvA52Y -Osmosis
2	https://youtu.be/TgcyiVQnVBs - Respiratory system
3	https://youtu.be/44B0ms3XPKU - nervous system

Mapping with Programme Outcomes

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	3	2	2	3	1	1	2
CO2	3	3	2	3	2	2	3	1	1	2
CO3	3	3	3	3	2	2	3	2	2	2
CO4	3	3	2	3	3	2	2	2	2	2
CO5	3	3	3	3	3	3	3	2	2	3

3 – Strong, 2 – Medium , 1 - Low

Mapping with Programme Specific Outcomes

CO / PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	1	2
CO2	3	2	3	1	2
CO3	3	2	3	2	2
CO4	3	2	2	2	3
CO5	3	3	3	2	3
Weightage	15	11	13	8	12
Weighted percentage of Course Contribution to POs	3.0	2.2	2.6	1.6	2.4

3 – Strong, 2 – Medium , 1 - Low

FIRST YEAR - SEMESTER I

CORE COURSE III – HOSPITAL ADMINISTRATION

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
NMND13	Core	Y		Y		4	6	25	75	100

Learning Objectives

The course aims to:

1. Understand the principles, organization, and administration of various types of hospitals and healthcare institutions.
2. Explain hospital organizational structure, departmental functions, and the roles and responsibilities of healthcare professionals.
3. Develop knowledge of hospital ethics, legal regulations, patient rights, quality assurance, and healthcare safety standards.
4. Apply the principles of hospital financial management, budgeting, and healthcare resource management in hospital settings.
5. Evaluate national health policies, healthcare planning, community health programmes, and hospital management practices to improve healthcare delivery.

Course Outcomes

Upon successful completion of the course, students will be able to:

CO No.	Course Outcomes	BT Level
CO1	Distinguish the different types of hospitals, their departments, organizational structure, and administrative functions.	K1, K2
CO2	Explain the code of ethics followed in hospitals and describe the roles and responsibilities of healthcare professionals.	K1, K2
CO3	Apply legal principles to identify medical malpractice and evaluate quality assurance and patient safety measures in hospitals.	K3, K5
CO4	Analyze budgeting, financial management, fund flow, and budgetary control in hospital administration.	K4
CO5	Evaluate the National Health Policy, primary healthcare system, and community-based health programmes for rural and public health development.	K3, K5

Bloom's Taxonomy Levels

K1 – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyse, **K5** – Evaluate, **K6** – Create

Course Content

Unit	Contents	No. of Hours
I	Introduction to Hospital Administration: Concept of Hospitals, Different types of Hospitals, Problems and constraints in different types of Hospitals, History of Hospital Development, Departmentation and organization structure of different types of hospitals.	18
II	Code of Ethics, Duties of Healthcare professionals - Doctors, Nurses, Nutritionists, and Dietitians (in brief) to their patients, profession at large, profession in consultation, and to the community - Breach of ethics and code of conduct	18
III	Legal framework in Hospitals, Patient's rights & provider's responsibility :Medical Malpractices, Disciplinary Action, Management of Hazard and Safety in a Hospital Setup, Bio-Medical Waste Management - Benefits of Health Insurance and Managing Health Care, Medical audit to meet legal requirements of Hospitals	18
IV	Accounting and financial Management in Hospitals: Principles, analysis and interpretation of financial reports, Preparation and use of budgets, Capital budgeting, Fund flow management, and budgetary control	18
V	Health Planning & Management: National Health Policy, Provision of medical care, Primary healthcare, Health for All, Encouragement of indigenous systems of medicine, Process of health planning in India.	18
	Total	90

S. No.	Reference Books
1	Davidson S.R.andPassmore J.F., 1975, HumanNutritionandDieteics.Vol.I,IIEdition.
2	Francis,C.MandD'Souza,M.C.,2000,HospitalAdministration.JayBrothers.
3	GillespieS.McNeiG.,1992,HospitalManagementMacmillanandCo.,NewYork.
4	Mitchelletal.,1987,NutritioninHealth&disease,PitmanM.Edu.PublishingCo.
5	Robinsonet.al.,1986,NormalandTherapeuticNutrition.MacmillanCo.,NewYork.
S. No.	Web Sources (URL)
1	www.ingenta.connect.com-FoodandFoodways .
2	www.fda.gov/search.html
3	www.wodswrth.com/nutrition
4	www.elsevier.com- IndianJournalofNutritionandfoodmicrobiology .

Mapping with Programme Outcomes

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	2	2	2	2	2	1	2
CO2	3	2	2	3	3	3	2	2	2	2
CO3	3	3	2	3	2	3	2	2	3	2
CO4	2	3	2	3	2	2	2	3	2	2
CO5	3	3	2	3	3	3	2	2	3	3

3 – Strong, 2 – Medium, 1 - Low

Mapping with Programme Specific Outcomes

CO / PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	1	2	2
CO2	3	3	2	2	2
CO3	3	3	2	2	3
CO4	2	3	2	3	2
CO5	2	3	2	3	3
Weightage	12	15	9	12	12
Weighted percentage of Course Contribution to POs	2.4	3.0	1.8	2.4	2.4

3 – Strong, 2 – Medium, 1 - Low

FIRST YEAR - SEMESTER I

CORE/MAJOR PRACTICAL I – ADVANCED FOOD SCIENCE PRACTICAL

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
NMNDP1	Core Practical	-	-	Y	Y	2	4	50	50	100

Learning Objectives

The course aims to:

1. Develop practical skills in evaluating the physicochemical and functional properties of food components.
2. Apply scientific principles to food preparation, processing, and quality evaluation using standard laboratory techniques.
3. Analyze the factors influencing cooking quality, sensory attributes, and functional characteristics of foods.
4. Perform laboratory experiments to assess food quality, adulteration, and processing characteristics using appropriate methods.
5. Demonstrate competency in food quality assurance and adopt standard laboratory practices to meet food industry requirements.

Course Outcomes

Upon successful completion of the course, students will be able to:

CO No.	Course Outcomes	BT Level
CO1	Demonstrate the principles and techniques of sensory evaluation and cereal cookery experiments.	K2
CO2	Analyze the physicochemical and functional properties of cereals, pulses, milk, fats, sugars, fruits, and vegetables through laboratory experiments.	K4
CO3	Apply food science principles to evaluate cooking quality, processing characteristics, and functional properties of different foods.	K3
CO4	Analyze the physical characteristics and quality parameters of food materials using standard laboratory methods.	K4
CO5	Demonstrate appropriate food preparation, quality evaluation, adulteration detection, and processing techniques to ensure food quality and industry standards.	K5

Bloom's Taxonomy Levels

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create

Course Content

Contents	
	SENSORY METHOD
1.	Analysis of taste sensitivity
2.	Threshold test
3.	Duo-Trio test

4.	Multiple sample difference
	STARCH
5.	Microscopic structure and gelatinization
6.	Factors affecting gelatinization
7.	Sag test
8.	Gluten formation
	PULSES
9.	Factors affecting cooking quality
	FRUIT
10.	Enzymatic browning
11.	Pectin test
12.	Firmness of gel
	VEGETABLE
13.	Various methods of cooking
14.	Fat-soluble and water-soluble pigments
	MILK
15.	Detecting the presence of starch, soda, urea in milk sample
16.	pH of milk sample
17.	Effect of acid on milk
18.	Maillard reaction
	SUGAR
19.	Relative sweetness of sugars: sucrose, maltose, lactose, fructose, dextrose, glucose, artificial sweeteners
20.	Stages of sugar cookery
21.	Effect of dextrose, jaggery, honey, and cream of tartar on sucrose
	FATS AND OILS
22.	Smoking point of various oils: Groundnut oil, coconut oil, Gingelly oil, Olive oil, Vanaspati, Ghee, Refined Sunflower oil, Rice bran oil
23.	Cooking temperature and fat absorption: Groundnut oil, coconut oil, Gingelly oil, Refined Sunflower oil, Rice bran oil
	PHYSICAL PROPERTIES
24.	Thousand-grain weight
25.	Thousand-grain volume
26.	Hydration capacity
27.	Hydration index
28.	Swelling capacity
29.	Specific gravity
30.	Seed displacement test
31.	Viscosity: Line spread test, Viscometer
32.	Food Adulteration

S. No.	Text Book
1	Srilakshmi B. (2015). Food Science, New Age International (P) Ltd. Publishers.
2	Potter N. and Hotchkiss J.H. (1996). Food Science, Fifth ed., CBS Publishers and

	Distributors, New Delhi
3	Avantina sharma (2017). Textbook of Food Science and Technology. CBS Publishers and Distributors Ltd. 3rd Edition.
4	Reddy S M. (2015). Basic Food science and technology. New Age International publishers. 2 ND edition.

S. No.	Reference Books
1	Swaminathan A (1979) . Food Science And Experimental Foods, Ganesh And Company Madras. 3rd edition.
2.	Bennion, Marion and O. Hughes (2001). Introductory Foods. Edi: Macmillian N. Y. 1st edition.
3.	Eskein . (2012). Biochemistry of Food. Elsevier publications
4	Desrosier, N.W. and James N. (2007). Technology of food preservation. AVI Publishers.
5.	Manay, S. and Shadaksharamasamy, (2004) .Food: Facts and Principles, New Age International Publishers, New Delhi. 1st edition.
S. No.	Web Sources (URL)
1	http://www.fao.org/3/V5030E/V5030E00.htm
2.	https://fmtmagazine.in/fruits-vegetables-processing-technologies/
3.	www.fao.org
4.	www.wfp.org
5.	Learn Microbiology with Online Courses and Classes edX

Mapping with Programme Outcomes

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	3	2	2	2	1	1	2
CO2	3	3	3	3	2	2	3	2	2	2
CO3	3	3	2	3	2	2	3	2	2	2
CO4	3	3	3	3	2	2	3	2	2	2
CO5	3	3	3	3	3	3	3	2	3	3

3 – Strong, 2 – Medium, 1 – Low

Mapping with Programme Specific Outcomes

CO / PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	2
CO2	3	3	3	2	2
CO3	3	3	3	2	2
CO4	3	3	3	2	3
CO5	3	3	3	3	3
Weightage	15	15	14	10	12
Weighted percentage of Course Contribution to PSOs	3.0	3.0	2.8	2.0	2.4

3 – Strong, 2 – Medium, 1 – Low

FIRST YEAR - SEMESTER I

Elective-I –FOOD MICROBIOLOGY AND SANITATION

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
NEND11	Elective-I	Y	Y	-	-	2	4	25	75	100

Learning Objectives

The course aims to:

1. Develop an understanding of microorganisms associated with food spoilage, food fermentation, and food-borne diseases.
2. Explain the principles of food microbiology, sterilization, sanitation, and food preservation techniques.
3. Analyze microbial contamination in different foods and methods for its prevention and control.
4. Apply food safety regulations, hygiene practices, and sanitation measures in food production and food service establishments.
5. Evaluate food quality and safety using microbiological principles and national and international food safety standards.

Course Outcomes

Upon successful completion of the course, students will be able to:

CO No.	Course Outcomes	BT Level
CO1	Explain the morphology, classification, characteristics, and significance of microorganisms associated with food spoilage, fermentation, and food-borne diseases.	K2
CO2	Analyze the principles of sterilization, disinfection, water purification, and microbial control methods used in food industries.	K4
CO3	Apply microbiological principles to identify, prevent, and control contamination in fruits, vegetables, cereals, milk, meat, fish, and poultry products.	K3
CO4	Evaluate food sanitation practices, personal hygiene, food safety systems, and food laws for maintaining food quality and public health.	K5
CO5	Design appropriate food safety and sanitation strategies to minimize food-borne hazards and ensure compliance with national and international food safety standards.	K6

Bloom's Taxonomy Levels

K1 – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyse, **K5** – Evaluate, **K6** – Create

Course Content

Unit	Contents	No. of Hours
I	Fundamentals of Microbiology Introduction ,Objectives, Fundamentals of Microbiology, Development of Microbiology, Morphology and Cultural Characteristics of Bacteria, Yeast, Mold and Viruses.	12
II	Sterilization a. Physical agents – Lights, Desiccation, Electricity and Heat. b. Chemical agents- removal of microorganisms and filtration c. Water-Sources of bacteriology of water supplies, Purification	12
III	Microbiology of Fruits ,Vegetables , Cereal and Cereal Products Microbiology of Fruits and Vegetables -External contamination, preservation and spoilage of fruits, contamination and control of microorganism in vegetables. Microbiology of Cereal and Cereal Products- Classification and control of molds in bread.	12
IV	Microbiology of Milk and Fleshy Foods Microbiology of Milk and Milk Products - fermented milk, butter and cheese, Control of Microorganism in Milk. Microbiology of Poultry, fish and meat products.	12
V	Food Sanitation Food Sanitation and Safety, Personal Hygiene, Food laws and Standards, Bureau of Indian Standards, Consumer Protection Act -1986, International Standards.	12
	Total	60

S. No.	Reference Books
1	Frazier, W.C. and Westhof, D.C., Food Microbiology, Tata MC Graw Hill Publishing Company Limited, 1993.
2	Johns, N Managing Food Hygiene, Mc Millan press Ltd., 1995
3	Longree, K., Quantity Food sanitation, Inter Science Publishers, New York, 1955.
4	Joshua, A., Microbiology, Popular book depot publishers, New York, 1995.
5	Adams, M.R., Moss, M.O., Food Microbiology, New Age International (P) Limited Publishers, 1996.
6	Rodey, S., Hygiene and Sanitation in food Industry, Tata McGraw Hill Publishing Company Limited, New Delhi, 1999.
7	Kumar, H.D, Kumar, S., Modern concepts of Microbiology, Vikas publishing House Pvt. Limited, 1999.

Mapping with Programme Outcomes

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	3	1	2	2	1	2	2
CO2	3	3	3	3	2	2	3	1	2	2
CO3	3	3	2	3	2	3	2	2	2	2
CO4	3	3	2	3	2	3	2	2	3	2
CO5	3	3	3	3	3	3	3	2	3	3

3 – Strong, 2 – Medium, 1 – Low

Mapping with Programme Specific Outcomes

CO / PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	1	2
CO2	2	3	3	1	2
CO3	3	3	3	2	3
CO4	3	3	2	2	3
CO5	3	3	3	2	3
Weightage	13	15	13	8	13
Weighted percentage of Course Contribution to POs	2.6	3.0	2.6	1.6	2.6

3 – Strong Correlation, 2 – Moderate Correlation, 1 – Low Correlation

FIRST YEAR – SEMESTER I

ELECTIVE-II - FOOD MICROBIOLOGY AND SANITATION

PRACTICAL

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	CIA	External	Total
NEND12	Elective-II	-	-	Y	Y	2	4	50	50	100

Learning Objectives

The course aims to:

1. Develop practical skills in microbiological techniques used for the examination of food and water samples.
2. Identify the sources of microbial contamination in foods and evaluate methods for their prevention and control.
3. Apply microbiological principles to assess food quality, preservation, and sanitation practices.
4. Demonstrate laboratory safety procedures and aseptic techniques while handling food samples and microorganisms.
5. Evaluate microbiological quality and recommend appropriate food safety and sanitation measures in food industries and food service establishments.

Course Outcomes

Upon successful completion of the course, students will be able to:

CO No.	Course Outcomes	BT Level
CO1	Demonstrate aseptic techniques and basic microbiological laboratory procedures for the examination of food and water samples.	K2
CO2	Perform microbiological analysis to determine the quality of milk, water, fruits, cereals, meat, and other food samples using standard laboratory methods.	K3
CO3	Analyze sources of microbial contamination and evaluate appropriate methods of food preservation and sanitation.	K4
CO4	Apply food hygiene, laboratory safety, and microbiological quality control practices in food processing and food service operations.	K3
CO5	Evaluate microbiological test results and recommend suitable food safety and sanitation measures to ensure quality assurance and public health.	K5

Bloom's Taxonomy Levels

K1 – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyse, **K5** – Evaluate, **K6** – Create

Course Content

	Contents
1.	Visit to water plant to observe methods of purification.
2.	Microbial examination of fruits – surface washing
3.	Determination of quality of milk
4.	Identify types of microorganisms in cereal and cereal products.
5.	Microbial examination of fleshy foods surface washing.
6.	Bacteriological examination of water.
7.	Visit to water plant to observe methods of sewage treatment

S. No.	Reference Books
1	Frazier, W.C. and Westhof, D.C., Food Microbiology, Tata MC Graw Hill Publishing Company Limited, 1993.
2	Johns, N Managing Food Hygiene, Mc Millan press Ltd., 1995.
3	Longree, K., Quantity Food sanitation, Inter Science Publishers, New York, 1955.
4	Joshua, A., Microbiology, Popular book depot publishers, New York, 1995
5	Adams, M.R., Moss, M.O., Food Microbiology, New Age International (P) Limited Publishers, 1996.

Mapping with Programme Outcomes

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	3	2	2	3	1	2	2
CO2	3	3	3	3	2	2	3	2	2	2
CO3	3	3	3	3	2	3	3	2	3	2
CO4	3	3	2	3	3	3	2	2	3	2
CO5	3	3	3	3	3	3	3	2	3	3

3 – Strong, 2 – Medium, 1 – Low

Mapping with Programme Specific Outcomes

CO / PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	1	2
CO2	2	3	3	2	2
CO3	3	3	3	2	3
CO4	3	3	3	2	3
CO5	3	3	3	2	3
Weightage	13	15	14	9	13
Weighted percentage of Course Contribution to POs	2.6	3.0	2.8	1.8	2.6

3 – Strong, 2 – Medium, 1 – Low