Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)
Approved by Government of Tamil Nadu & Accredited by NAAC with A++ Grade (3rd Cycle-3.64 CGPA)
Dr. N.G.P.-Kalapatti Road, Coimbatore-641 048, Tamil Nadu, India
Website: www.drngpasc.ac.in | Email: info@drngpasc.ac.in | Phone: +91-422-2369100

REGULATIONS 2025-26 for Post Graduate Programme

(Outcome Based Education model with Choice Based Credit System)

M.Sc. FOOD AND NUTRITION

(For the students admitted during the academic year 2025-26 and onwards)

Eligibility:

A pass in any one of the following Degree Courses of B.Sc. Nutrition and Dietetics, Nutrition, Food Service Management and Dietetics, Food Science and Quality Control, B.VOC-Food Processing Technology, Food Science and Nutrition, Botany, Zoology, Biochemistry, Biotechnology, Chemistry, Microbiology, Home science or Family and Community Science or an Examination accepted as equivalent thereto by the Academic Council, subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the M.Sc. Food and Nutrition Examination of this College after a course study of two academic years.

Programme Educational Objectives:

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. To provide advanced knowledge on food science and nutrition to enhance the quality of life through the improvement of human health and nutritional status
2. To enable the students to implement the basic food science in operation
3. To develop skills and techniques in food preparation with conservation of nutrients and palatability using cooking methods generally employed
4. To help the students to contribute proper utilization of foods and prevent wastes
5. To understand the prevalence of malnutrition in our Country and gain knowledge on effective methods to combat malnutrition.

PROGRAMME OUTCOMES:

On the successful completion of the program, the following are theexpected outcomes.

PO Number	PO Statement
PO1	To develop the knowledge of the students in the area of human nutrition, food science, food product development, food safety and quality management.
PO2	Apply recently advanced novel foods in medical nutrition therapy and recommend the physical activity to manage the common diseases and metabolic disorder to achieve the fitness and wellbeing.
PO3	Familiarize with the problems and plan, implement, monitor and evaluate interventional programs related to food and nutrition and security to the community.
PO4	To build entrepreneurial values, attitudes, quality and desire in developing innovative food products by fulfilling quality parameters, used to meet the consumer needs nutritionally and commercially viable.
PO5	To develop skills and techniques for the students to become professionals in service industries.

Total Credit Distribution

Course	Credits	Total		Credits	Cumulative Total
Core	4	13 x 100	1300	52	92
Core Practical	3	1 x 100	100	03	
	2	4 x 100	400	08	
EDC	2	1 x 100	100	02	
Mini Project Work	1	1 x 100	100	01	
Core Project Work	12	1 x 200	200	12	
Internship	2	1 x 100	100	02	
Electives	4	1 x 100	100	04	
Electives	3	1 x 100	100	03	
Elective Practical	2	1 x 100	100	02	
Elective Practical	3	1 x 100	100	03	
			2700	**92**	**92**

PG
CURRICULUM

M.Sc. Food and Nutrition
AY 25 - 26

Course Code	Course Category	Course Name	L	T	P	Duration		Exam (h)	Max Marks			Credit
						Week	Total		CIA	ESE	Total	
First Semester												
25FNP1CA	Core – I	Advanced Food Science	4	-	-	4	48	3	25	75	100	4
25FNP1CB	Core – II	Nutrition Through Life Cycle	4	-	-	4	48	3	25	75	100	4
25FNP1CC	Core – III	Nutritional Biochemistry	4	-	-	4	48	3	25	75	100	4
25FNP1CD	Core – IV	Food Chemistry	4	-	-	4	48	3	25	75	100	4
25FNP1CP	Core Practical – I	Food Science and Food Chemistry	-	-	4	4	48	3	40	60	100	2
25FNP1CQ	Core Practical – II	Food Analysis	-	-	6	6	72	3	40	60	100	3
25FNP1DA	DSE - I	Food Product Development	4	-	-	4	48	3	25	75	100	4
25FNP1DB		Functional Foods										
25FNP1DC		Harvest Technology of Agricultural Produce										
		Total	**20**	**-**	**10**	**30**	**360**				**700**	**25**

BoS Chairman/HoD
Department of Food Science & Nutrition
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

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Course Code	Course Category	Course Name	L	T	P	Duration		Exam h	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
Second Semester												
25FNP2CA	Core – V	Macronutrients	4	-	-	4	48	3	25	75	100	4
25FNP2CB	Core - VI	Applied Physiology	4	-	-	4	48	3	25	75	100	4
25FNP2CC	Core - VII	Therapeutic Nutrition – Lifestyle Disorders	4	-	-	4	48	3	25	75	100	4
25FNP2CD	Core - VIII	Research Methodology and Statistics	4	-	-	4	48	3	25	75	100	4
25CAP2EA	EDC - I	Computer Application in Nutrition	2	-	-	2	24	3	25	75	100	2
25FNP2CP	Core Practical – III	Food Analytical Techniques	-	-	4	4	48	3	40	60	100	2
25FNP2CQ	Core Practical – IV	Therapeutic Nutrition – Lifestyle Disorders	-	-	4	4	48	3	40	60	100	2
25FNP2DP	DSE - II	Food Product Development	-	-	4	4	48	3	40	60	100	2
25FNP2DQ		Functional Foods										
25FNP2DR		Harvest Technology of Agricultural Produce										
25FNP2CT	IT	Internship	-	-	-	-	-	3	40	60	100	2
Total			18	-	12	30	360				900	26

Course Code	Course Category	Course Name	L	T	P	Duration		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
Third Semester												
25FNP3CA	Core – IX	Micronutrients	4	-	-	4	48	3	25	75	100	4
25FNP3CB	Core – X	Therapeutic Nutrition – Systemic Disorders	4	-	-	4	48	3	25	75	100	4
25FNP3CC	Core – XI	Food Processing	4	-	-	4	48	3	25	75	100	4
25FNP3CD	Core – XII	Food Safety and Quality Management	4	-	-	4	48	3	25	75	100	4
25FNP3CE	Core – XIII	Public Health Nutrition	4	-	-	4	48	3	25	75	100	4
25FNP3CV	Core – XIV	Mini Project	-	-	3	3	36	3	40	60	100	1
25FNP3CQ	Core Practical - V	Therapeutic Nutrition – Systemic Disorders	-	-	4	4	48	3	40	60	100	2
25FNP3DA	DSE - III	Food Microbiology	3	-	-	3	36	3	25	75	100	3
25FNP3DB		Diet Counseling Strategies										
25FNP3DC		Instrumentation in Food Industry										
		Total	**23**	**-**	**07**	**30**	**360**				**800**	**26**

Course Code	Course Category	Course Name	L	T	P	Duration		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
Fourth Semester												
25FNP4CV	Core – XV	Project Work and Viva Voce	-	-	24	24	288	3	80	120	200	12
25FNP4DP	DSE - IV	Food Fermentation and Quality Control Practical	-	-	6	6	72	3	40	60	100	3
25FNP4DQ		Clinical Diet Counseling										
25FNP4DR		Unit Operations in Food Industry										
Total			**-**	**-**	**30**	**30**	**360**				**300**	**15**
***Grand Total**											**2700**	**92**

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DISCIPLINE SPECIFIC ELECTIVE

Semester I (Elective I)

(Student shall select any one of the following courses as Elective in first semester)

List of Elective Courses

S. No.	Course Code	Name of the Course
1.	25FNP1DA	Functional Foods
2.	25FNP1DB	Food Product Development
3.	25FNP1DC	Harvest Technology of Agricultural Produce

Semester II (Elective II)

(Student shall select any one of the following courses as Elective in second semester)

List of Elective Courses

S. No.	Course Code	Name of the Course
1.	25FNP2DP	Functional Foods
2.	25FNP2DQ	Food Product Development
3.	25FNP2DR	Harvest Technology of Agricultural Produce

Semester III (Elective III)

(Student shall select any one of the following course as Elective in Third semester)

List of Elective Courses

S. No.	Course Code	Name of the Course
1.	25FNP3DA	Food Microbiology
2.	25FNP3DB	Diet Counseling Strategies
3.	25FNP3DC	Instrumentation in Food Industry

Semester IV (Elective IV)

(Student shall select any one of the following courses as Elective in fourthsemester)

List of Elective Courses

S. No.	Course Code	Name of the Course
1.	25FNP4DP	Food Fermentation and Quality Control Practical
2.	25FNP4DQ	Clinical Diet Counseling
3.	25FNP4DR	Unit Operations in Food Industry

Self-study paper offered by the Department of Food Science and Nutrition

S. No.	Semester	Course Code	Course Name
1	III	25FNPSSA	Composite Home science
2	III	25FNPSSB	Diet Counseling

Semester – I CORE - I: ADVANCED FOOD SCIENCE							
Semester	**Course Code**	**Course Name**	**Category**	**L**	**T**	**P**	**Credits**
I	25FNP1CA	ADVANCED FOOD SCIENCE	CORE	48	-	-	4

Preamble	This course has been designed for students to learn and understand • the structure, classification and nutrient composition of foods • identify what foods are good sources for what nutrients • appropriate sensory evaluation tests to answer specific questions regarding food attributes or consumer preferences
Prerequisite	Knowledge on advanced food science concepts

Course Outcomes (COs)

CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Analyze the structure of foods and compare the nutrient composition of foods	K2
CO2	Classify foods based on food processing and explain the methods of processing different foods	K3
CO3	Interpret the factors which affects the nutritive value of foods, classify the methods of cooking	K3
CO4	Examine the postmortem changes in meat, criticize the food quality, analyze the medicinal value of foods	K3
CO5	Choose foods based on quality, decide storage condition, subjective and objective evaluation of foods	K3

Mapping with Program Outcomes:

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓		
CO2		✓	✓		
CO3	✓		✓	✓	✓
CO4		✓		✓	
CO5	✓		✓		✓

25FNP1CA	CORE - I: ADVANCED FOOD SCIENCE

Syllabus

Unit	Content	Hours	E-Contents / Resources
I	Cereals Rice - Structure, Composition and nutritive value Wheat - Structure, composition and nutritive value. Wheat flour – types, functionality of components, baking qualities, manufacture of bread, pastries and cakes Millets- Jowar, Bajra, Maize and Ragi, Composition and nutritive value and Products	08	Text Book
II	Pulses, Fats & Oils Pulses - Composition and nutritive value, methods of processing – dry and wet processing, vegetable protein mixes, Anti nutritional factors and eliminations Nuts and Oilseeds- Composition and nutritive value, nutritious food mixes from oil seeds, toxins Fats and Oil - Nutritional importance of oil and fats, Functions of oil and fats in foods, Sources, nutritional composition, rancidity – types and prevention, role of fat / oil in food preparations	10	Text book
III	Fruits & Vegetables Classification, Composition and nutritive value, selection, storage, pigments, browning reactions (Enzymatic and Non-Enzymatic), pectic substances, ripening of fruits, changes on cooking Beverages – Classification, fruit-based beverages, carbonated nonalcoholic beverages Spices and condiments – Type, uses and adulteration, role in cookery and medicinal uses Evaluation of foods - Subjective and objective evaluation of foods. Study of proximate constituents	10	Text Book
IV	Milk and milk products & egg	10	Reference book

	Composition, physical and chemical properties - effects of heat, acid and enzymes, processing of milk – pasteurization, homogenization, types of milk. Milk products – Butter, curd, yogurt, butter milk, cheese, milk powder, khoa, ice cream Egg - Structure, composition, grading and selection, effects of heat on egg protein, egg foam (factors affecting foam formation) and role in cookery		
V	Meat, poultry & fish Meat - Structure, composition, postmortem changes, Rigor mortis, Aging and Tenderization of meat, color of meat, changes of meat in cookery and methods of cooking, meat analogues Poultry - Classification, composition, market forms, selection factors and methods of cooking Fish - Classification, composition, kinds of fish, characteristics of fresh fish, fish products and methods of cooking	10	Text Book
	Total	**48**	

Text Books	**1.**	Srilakshmi, B 2015, "Food Science," 8th Edition, New Age International Private Ltd., New Delhi.
	2.	Manay & Shadaksharaswamy, S.N & M, 2008, "Food facts and Principles", New Age International Private Ltd. New Delhi.
Reference Books	**1.**	Potter. N. N and Hotchkiss, 1996, "Food Science", CBS Publication, New Delhi.
	2.	Sunetra Roday, I. N. 2015, — "Food Science and Nutrition" Oxford Publishers New Delhi

Journal and Magazines	https://link.springer.com/journal/13197
E-Resources and Website	https://ifst.onlinelibrary.wiley.com/journal/13652621

Learning Method	Chalk and Talk/Assignment/ Seminar/ Interactive session

Focus of the Course	Skill Development / Employability / Innovation and Entrepreneurship

Semester – I CORE - II: NUTRITION THROUGH LIFE CYCLE							
Semester	**Course Code**	**Course Name**	**Category**	**L**	**T**	**P**	**Credits**
I	**25FNP1CB**	**NUTRITION THROUGH LIFE CYCLE**	**CORE**	**48**	**-**	**-**	**4**

Preamble	This course has been designed for students to learn and understand • The role of adequate nutrition in stages of life cycle • The role of nutrition in the growth & development of human body • The importance of proper dietary pattern and its health effects
Prerequisite	Knowledge about nutritional requirements for various stages of life

Course Outcomes (COs)

CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Plan diet for the stages of the life span. Learning nutritional requirements of preconception & pregnancy.	K2
CO2	Analyze specific dietary practices during lactation complementary and weaning foods for infants.	K3
CO3	Illustrate the nutrition for toddlers, school children - physiological & cognitive development.	K3
CO4	Evaluate physical growth, eating disorders, physiological changes among adolescence, adulthood and old age.	K4
CO5	Examine the nutritional requirements for sports, exercise and special condition.	K4

Mapping with Program Outcomes:

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2		✓	✓		
CO3	✓		✓	✓	✓
CO4		✓		✓	
CO5	✓		✓		✓

25FNP1CB	CORE – II: NUTRITION THROUGH LIFE CYCLE

Syllabus

Unit	Content	Hours	E-Contents / Resources
I	Nutrition in Preconception and Pregnancy Nutrition in Preconception-Introduction, premenstrual syndrome, obesity and fertility, eating disorder and fertility, polycystic ovary syndrome, nutrient intake for pre-conceptual women, factors contributing infertility in female. Nutrition in pregnancy - Stages of gestation, maternal physiological adjustments, weight gain during pregnancy and nutritional requirements for pregnancy, miscarriage, preterm delivery and complications of pregnancy.	10	Text Book
II	Nutrition in Lactation and Infancy Nutrition in Lactation - Physiological adjustments during lactation, Physiology of milk Production - hormonal controls and reflex action, lactation in relation to growth and health of infants, Breast feeding and problems of breast feeding, nutritional composition of colostrum and mature milk, special foods during lactation, nutritional requirements during lactation. Expressing and storing breast milk, Breast feeding promotion network of India. Nutrition in Infancy - Rate of growth, weight as the indicator, premature infant, feeding premature infants, low birth weight, breast vs. bottle feeding, nutritional allowances, complementary feeding, and weaning foods.	10	Reference Book
III	Nutrition for Toddlers and School age Nutrition in Toddlers-Physiological and Cognitive development, feeding skill and behavior, common nutrition problems. Nutrition in Preschool Children - Growth and development of preschool children, food habits, nutritional requirements, supplementary foods. Nutrition in School Age – Early and middle childhood, physiological development, nutritional requirements and feeding, packed lunches, post school snacks, physical activity and nutrition.	10	Text Book
IV	Nutrition During Adolescence, Adulthood and Old age Nutrition During Adolescence - Physical growth, physiological and psychological changes associated with puberty (menarche and menstruation in girls), nutritional	10	Text Book

	needs, eating disorders - anorexia nervosa, bulimia nervosa, physiological and nutritional problems in adolescent pregnancy and its requirements and complications, physical activity and nutrition. Nutrition during Adulthood — Physiological changes of adulthood Nutrition and work efficiency for maintenance of health, RDA Nutrition for Old Age – senescence and sarcopenia - theories of ageing, physiological changes, Socio economic and psychological factors — geriatric foods and nutritional requirements, factors affecting food intake, institutionalized changes in old age.		
V	Nutrition for Sports and Special Condition Sports and Exercise Fitness - Physical fitness assessment — cardio respiratory fitness, assessment of body composition. Role of carbohydrate, fat and protein as a fuel for exercise, fluid and electrolyte balance during prolonged exercise, nutritional requirements in sports, dietary intake before, during and after exercise. Concept of aerobic and anaerobic exercises, Nutrition for higher altitudes, Nutrition for expeditions and space voyage, Nutrition for armed forces, Nutrition for special children-ADHD and ASD.	08	Text Book
	Total	48	

Text Books	**1.**	Srilakshmi.B, 2010 "Dietetics", 7thedition., New Age International Pvt. Ltd, New Delhi
	2.	Ravinder Chandha, Pulkit Mathur, "Nutrition-A lifecycle approach" Orient Blackswan
Reference Books	**1.**	Brown, J.E, 2011, "Nutrition Through The Lifecycle",4th edition Wadsworth Cengage Learning, USA
	2.	Mahan and Escott ,K & S, 2004, "Food Nutrition and Diet Therapy", 11th Edn., W.S. Saunder's Company, USA

Journal and Magazines	https://www.cambridge.org/core/journals/journal-of-nutritional-science
E-Resources and Website	https://www.nutritionsociety.org/journal-nutritional-science

Learning Method	Chalk and Talk / Assignment / Interactive session

Focus of the Course	Skill Development/ Employability

Semester – I CORE - III: NUTRITIONAL BIOCHEMISTRY							
Semester	**Course Code**	**Course Name**	**Category**	**L**	**T**	**P**	**Credits**
I	25FNP1CC	NUTRITIONAL BIOCHEMISTRY	CORE	48	-	-	4

Preamble	This course has been designed for students to learn and understand • The application of biochemistry in the field of Food and Nutrition • The on-assay techniques and instrumentation • The role of nutrients in the body
Prerequisite	Knowledge on metabolic process in human body

Course Outcomes (COs)

CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Infer on carbohydrate metabolism	K2
CO2	Illustrate the cholesterol metabolism and the inborn errors of fat metabolism	K3
CO3	Explain the biosynthesis and importance of protein metabolism in biochemical analysis	K3
CO4	Interpret the significance of nucleic acids in the field of biochemistry	K3
CO5	Editorialize the principle and techniques involved in the field of biochemistry	K3

Mapping with Program Outcomes:

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓		
CO2		✓	✓		
CO3	✓		✓	✓	✓
CO4		✓		✓	
CO5	✓		✓		✓

25FNP1CC	CORE - III: NUTRITIONAL BIOCHEMISTRY

Syllabus

Unit	Content	Hours	E-Contents / Resources
I	Carbohydrates Carbohydrates – classification, functions. Glycolysis, TCA Cycle, HMP Shunt and Energy Production, Glycogenesis, Gluconeogenesis. Renal threshold for Glucose. Inborn Error of Carbohydrate Metabolism – Lactose Intolerance, fructosuria, Galactosemia.	10	Text Book
II	Fatty Acids Fatty Acids - Classification, Functions and Oxidation of Saturated and Unsaturated Fatty Acids, Biosynthesis of Cholesterol, Structure and Functions of Lecithin, Cephalin. Inborn errors of Fat Metabolism – Niemann-Pick Disease, Gouchers Disease	10	Text Book
III	Protein Protein- Classification, Function & Metabolism of Protein, Denaturation, Transamination, Deamination, Decarboxylation, Urea Formation and Protein Synthesis. Amino acids – Classification, Function & Metabolism of Amino acids, phenylalanine, leucine, methionine and tryptophane. Inborn errors of Amino acids – maple syrup urine disease, phenyl ketonuria.	08	Reference Book
IV	Nucleic acids Nucleic acids – structure, function and properties of DNA and RNA. Biosynthesis and breakdown of purine and pyrimidine nucleotides. Assay Techniques: Bioassay techniques, molecular cloning, microbiological assay of vitamins. ELISA.	10	Text Book
V	Techniques in nutritional biochemistry in nutritional biochemistry- Separation of sugars and amino acids by chromatography.	10	Text Book

	Electrophoresis separation of proteins. Colorimetry and spectrophotometer - principle and procedures. pH meter – working and application. Principle and procedure of operation of GC, HPLC and HPTLC. Elemental analysis by atomic absorption spectroscopy and flame photometry		
	Total	**48**	

Note: Structure not needed

Text Books	**1.**	Lehininger A.L, 2000, "Biochemistry". 7Edition, Worth Publishers Inc., New York.
	2.	Deb A.C, 2004, "Fundamentals of Biochemistry", 8 Edition New Central Book Agency Pvt Ltd., Kolkata –India.
Reference Books	**1.**	Shanmugam. A, 2004, "Fundamentals of Biochemistry for Medical Students", 7th Edition Karthik Printers, India.
	2.	Sathyanarayana. U and Chakrapani. U, 2004, "Biochemistry". 3rd Edition Books and Allied Publication, Kolkata, India.
	3.	Tom Brody, 2007, "Nutritional Biochemistry", 2nd Edition Academic press, U.K.
	4.	Sharma. D and Devanshi Sharma. C ,2015, "Nutritional Biochemistry",2nd Edition CBS publishing pvt. Ltd., New Delhi.

Journal and Magazines	https://www.sciencedirect.com/journal/the-journal-of-nutritional-biochemistry
E-Resources and Website	https://www.sabapub.com/index.php/jcnb

Learning Method	Chalk and Talk /Assignment/ Seminar/ Interactive session

Focus of the Course	Skill Development/ Employability

Semester – I CORE - IV: FOOD CHEMISTRY							
Semester	**Course Code**	**Course Name**	**Category**	**L**	**T**	**P**	**Credits**
I	**25FNP1CD**	**FOOD CHEMISTRY**	**CORE**	**48**	**-**	**-**	**4**

Preamble	This course has been designed for students to learn and understand • The gain insight into the chemistry of foods • The chemistry underlying the properties of various food components • The properties of bioactive compounds in spices, condiments, fruits and vegetables
Prerequisite	

Course Outcomes (COs)

CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Understand the structure and properties of water and ice, Learn the structure, permanence and Emulsions	K2
CO2	Gain knowledge on the chemistry of mono and oligosaccharides, Use of Polysaccharides in gelatinization, retrogradation.	K3
CO3	Understand the structure, physicochemical properties, functional properties of amino acids.	K3
CO4	Comprehend the types, sources, and properties of fats and oils	K4
CO5	Illuminate the chemistry of Individual aroma compounds-vegetable, fruit and spice and condiment.	K3

Mapping with Program Outcomes:

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓		
CO2		✓	✓		
CO3	✓		✓	✓	✓
CO4		✓		✓	
CO5	✓		✓		✓

25FNP1CD	CORE - IV: FOOD CHEMISTRY

Syllabus

Unit	Content	Hours	E-Contents / Resources
I	Chemistry of water, ice and colloidal system Structure and properties of water and ice, types of water, concept of water activity and Food spoilage, Sorption phenomena. Gels: Structure, formation, strength, types and permanence Emulsions: formation, stability, surfactants and emulsifiers, Foams: Structure, formation and stabilization.	08	Text Book
II	Chemistry of Starch and Non- starch polysaccharides Starch: structure, properties of amylose and amylopectin, Characteristics of food starches and polysaccharide hydrolysis. Modified Food Starches - various processing techniques and its industrial applications Non-starch polysaccharides: properties and applications of cellulose, hemicellulose, pectins, gums (gum arabic, guar gum, xanthan gum), agar, alginates, carrageenan, β-Glucans and Glucomannan	10	Text Book
III	Chemistry of Protein Classification, structure, physicochemical properties, functional properties, chemical and enzymatic modifications - denaturation and other chemical changes, processing induced physical, chemical and nutritional changes, texturized proteins, protein isolates, concentrates, protein hydrolysate and complementary protein.	10	Reference Book
IV	Chemistry of Fats and Oils Classification, distribution, composition, physical and chemical properties. Effect of processing on chemical structure and physical properties; functional properties of fat, inter-esterification of fats. Lipids exposed to frying conditions and hydrogenated fat. Lipid-protein complexes. Fat deterioration and antioxidants and fat substitutes.	10	You Tube Videos
V	Chemistry of Active Compounds Fruits and vegetables - chemical and functional properties of quercetin, anthocyanin, flavonoids, tannin and gallic	10	Text Book

	acid. Spices – chemical and functional properties of curcumin, capsaicin, eugenol, piperine, cinnamaldehyde and allyl sulphide (spices). Condiments - chemical and functional properties of anethole, aldehyde cumino, allicin, gingerol and myristicin.		
	Total	**48**	

Text Books	**1.**	Shakuntala Manay, Shadaksharaswamy M, 2000, "Foods, Facts and Principle", 2th Edition, New Age International Pvt Ltd Publishers, Delhi.
	2.	Srinivasan Damodaran and Kirk Parkin, 2017, Fennamma's Food Chemistry, 5th Edition, CRC press, Taylor & Francis Group, Florida.
Reference Books	**1.**	Swaminathan, M. 2005, "Food Science, Chemistry and Experimental Foods", Bappco Publishers, Bangalore.
	2.	Meyer,L.H, 2004,"Food Chemistry and Distributors", 4th Edition, CBS Publishers, New Delhi.
	3.	Paul, and Palmer, P.C, 2000, "Food Theory and Applications", John Wiley and Sons, New York.
	4.	Chandrasekhar, U., 2002, "Food Science and applications in Indian Cookery", 10th Edition, Phoenix Publishing House, New Delhi.

Journal and Magazines	http://foodb.ca/
E-Resources and Website	https://pubs.acs.org/journal/jafcau

Learning Method	Chalk and Talk/Assignment / Interactive session

Focus of the Course	Skill Development/ Employability

Semester – I CORE PRACTICAL - I: FOOD SCIENCE AND FOOD CHEMISTRY							
Semester	Corse Code	Course Name	Category	L	T	P	Credits
I	25FNP1CP	FOOD SCIENCE AND FOOD CHEMISTRY	CORE	-	-	48	2

Preamble	This course has been designed for students to learn and understand • The starch modification, protein coagulation, enzymatic reactions, and sensory evaluation. • Enhances students' comprehension of food science principles • Scientific reasons in various cooking principles and food processing changes.
Prerequisite	Basic knowledge of food science and its various principles involved during processing

Course Outcomes (Cos)		
CO Number	**Course Outcomes (COs) Statement**	**Bloom's Taxonomy Knowledge Level**
CO1	Demonstrate the effects of heat, moisture on starch and examine structures microscopically	K3
CO2	Analyse the gluten formation and impact of processing on pulses and cereals.	K4
CO3	Demonstrate the enzymatic browning in fruits and vegetables and fat absorption in cooking	K3
CO4	Evaluate the egg protein coagulation and cooking methods	K3
CO5	Examine the stages of sugar cookery and learn the **sensory evaluation of food products**	K3

Mapping with Program Outcomes:					
Cos / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	✓			✓	✓
CO2	✓			✓	✓
CO3	✓			✓	✓
CO4	✓			✓	✓
CO5	✓			✓	✓

25FNP1CP	CORE PRACTICAL – I: FOOD SCIENCE AND FOOD CHEMISTRY

Syllabus

S.No.	Contents
1	Dextrinization, Gelatinization of Starch, Retrogradation and Syneresis, Malting of cereals.
2	Microscopic examination of uncooked and gelatinized starch
3	Determination of Gluten in wheat flour.
4	Effect of Soaking, germination and fermentation of Cereals and Pulses
5	Enzymatic Browning and Methods of Prevention
6	Effect of acids, alkali and heat on water soluble and fat-soluble pigments
7	Scum formation, boiling over and scorching of milk Coagulation and precipitation of milk proteins
8	Testing freshness of egg- Coagulation of egg white and egg yolk, Boiled Egg, Poached Egg, Omelettes, Custards, Cake and Mayonnaise
9	Effect of cooking meat, fish and poultry, testing the tenderness of meat
10	Smoking Temperature of different fats, Factors affecting absorption of fats
11	Stages of Sugar Cookery, Preparation of Fondant, Fudge, Caramel and Toffee
12	Sensory Evaluation of Food

Manuals	1.	Mohini Sethi, Eram. S. Rao, 2021, "Food Science - Experiments and Applications," CBS Publishers, India.

Learning Method	Demonstration/ Hands on Practical Sessions/Observation and Recording/Collaborative Learning

Focus of the Course	Skill Development/ Employability

Semester – I CORE PRACTICAL - II: FOOD ANALYSIS							
Semester	Corse Code	Course Name	Category	L	T	P	Credits
I	25FNP1CQ	FOOD ANALYSIS	CORE	-	-	72	3

Preamble	This course has been designed for students to learn and understand • the basic principles for analysing nutrients in food. • the quality control and assurance techniques in food analysis. • the application of classical and modern analytical methods in food composition and safety evaluation. •
Prerequisite	Basic knowledge of food chemistry and nutrition.

Course Outcomes (Cos)		
CO Number	**Course Outcomes (COs) Statement**	**Bloom's Taxonomy Knowledge Level**
CO1	Identify appropriate analytical methods for estimating nutrients in foods.	K3
CO2	Demonstrate techniques in the estimation of phytochemical Constituents.	K3
CO3	Interpret experimental results and assess food quality parameters.	K4
CO4	Apply standard protocols and maintain accuracy in laboratory settings.	K3
CO5	Analyse data from food tests to determine nutritional composition.	K4

Mapping with Program Outcomes:					
Cos / POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓		✓	
CO2	✓	✓	✓		✓
CO3	✓	✓	✓	✓	✓
CO4	✓		✓	✓	✓
CO5	✓	✓	✓	✓	✓

25FNP1CQ	CORE PRACTICAL – II: FOOD ANALYSIS

Syllabus

S.No	Contents
1	Determination of Moisture content and Ash content
2	Estimation of Carbohydrates by Anthrone Method
3	Estimation of Cellulose in plant material
4	Determination of Crude Fibre Content
5	Estimation of protein by Lowry's Method
6	Estimation of Protein by Kjeldahl Method
7	Estimation of Fat by Soxhlet Extraction
8	Estimation of lipid in egg yolk
9	Estimation of Ascorbic Acid
10	Estimation of Iron
11	Estimation of Phosphorus
12	Estimation of Calcium
13	Quantitative Analysis of Phytochemical Constituents

Manuals	1.	Raghuramulu, N., Madhavan Nair, K., & Kalyanasundaram, S. (2003). *A Manual of Laboratory Techniques*. National Institute of Nutrition, ICMR.
	2.	Sadasivam, S. & Manickam, A. (2019). *Biochemical Methods*. New Age International Publishers.

Learning Method	Demonstration/ Hands on Experiments/ Group Trials

Focus of the Course	Skill Development/ Employability/ Entrepreneurial Development/ Innovations

Semester – I DSE - I: FOOD PRODUCT DEVELOPMENT							
Semester	Corse Code	Course Name	Category	L	T	P	Credits
I	25FNP1DA	FOOD PRODUCT DEVELOPMENT	DSE	48	-	-	4

Preamble	This course has been designed for students to learn and understand • The various aspects of food product develop food science and technology, packaging, nutrition values and marketing • Modern aspects of nutritional science and novel food usage • Recognize the potential for entrepreneurship through marketing
Prerequisite	To learn the different stages of product development

Course Outcomes (Cos)		
CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Choose raw materials, standardizations for products. use of the technology and marketing on health concerns.	K3
CO2	Categorize the products for the development to the community.	K4
CO3	Examine sensory and objective evaluation test, score card designing and Instruments used for texture evaluation.	K4
CO4	Select the types of food packing materials	K5
CO5	Build the marketing structure and integration Improve the marketing efficiency	K6

Mapping with Program Outcomes:					
Cos / POs	PO1	PO2	PO3	PO4	PO5
CO1		✓	✓	✓	
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

25FNP1DA	DSE - I: FOOD PRODUCT DEVELOPMENT

Syllabus

Unit	Content	Hrs	Resources
I	**New product development** Definition and classification, characterization and factors shaping new product development. Food product development and technologies, Marketplace influence. Measures of Food Product Success-Production, Market, Customer, New product development – patent, patent laws, international code for Intellectual property rights (IPR)	11	Text Book
II	**Phases of product development** Food product development- stages in product development, Standardisation of product, Level of Innovation-New product categories. FSSAI Regulations	8	Text Book
III	**Sensory Evaluation** Establishing sensory panels – Designing testing facilities – Analytical Test – Conduct a sensory Evaluation Test – Designing score card, objective evaluation, Instruments used for texture evaluation.	9	Text Book
IV	**Formulation of new product development** Formulation of product for infants, preschool, elderly, sports person - Selection of raw materials, portion size, calculation of nutritive values, cost- Suggested Retail Price (SRP), shelf life.	9	Text Book
V	**Packaging and Marketing** Packaging – Types of packing materials, Labelling. Concept of market and marketing – Approaches to study marketing functions, market structure, market efficiency and market integration. Role of government in promoting agricultural marketing. GST for food products.	11	Text Book
	Total	**48**	

	Case Study 1: Launch of Aavin's Fortified Milk), Case Study 2: Nestlé's Maggi Masala-ae-Magic, Case Study 1: Ragi-Based Health Drink for Elderly

Text book	1.	Sharma A.2018, "Food Product Development" CBS Publishers and Distributors Private Ltd., New Delhi.
	2.	Fuller. G. W 2008, "New Food Product Development from Concept to Marketplace", New Age International Private Ltd, New Delhi.
Reference Books	1.	Earle, R., and Anderson, A, 2001, "Food product development: Maximizing success", CRC press,England..

	2.	Sivarama Prasad ,A., 1985, "Agricultural marketing in India", Mittal Publication, New Delhi.
	3.	Aaron, Brody, Joha Lord,L and B., 2005, "New Food Product for a changing Market place", 2nd Edition. i.
	4.	Baker, R.C 1988, " Fundamentals of New Food Product Development", 8th Edition, New Age International Private Ltd. New Delhi.

Journal and Magazines	https://www.researchgate.net/publication/259054153_New_Food_Product_Development
E-Resources and Website	https://www.cbspd.co.in/food-product-development-pb-2018

Learning Method	Chalk and Talk/Assignment/Seminar/ Group Discussion/Case Study

Focus of the Course	Skill Development/ Employability/ Entrepreneurial Development/ Innovations

Semester – I DSE – I: FUNCTIONAL FOODS							
Semester	**Corse Code**	**Course Name**	**Category**	**L**	**T**	**P**	**Credits**
I	25FNP1DB	FUNCTIONAL FOODS	DSE	48	-	-	4

Preamble	This course has been designed for students to learn and understand • the basic concept of functional foods and its health benefits • the role of prebiotics, probiotics and synbiotics in disease prevention • the classification and health benefits of phytochemicals and antioxidants.
Prerequisite	Knowledge on Functional Foods

Course Outcomes (Cos)		
CO Number	**Course Outcomes (COs) Statement**	**Bloom's Taxonomy Knowledge Level**
CO1	Identify the different types and groupings of functional foods based on their health benefits.	K2
CO2	Interpret the functional role of prebiotics by examining their sources, health benefits, and applications.	K3
CO3	Describe the between endogenous and exogenous antioxidants based on their sources and functions.	K3
CO4	Examine the classification, functional properties and health benefits of phytochemicals.	K4
CO5	Evaluate the presence and significance of functional compounds in various food sources.	K5

Mapping with Program Outcomes:					
Cos / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	✓		✓		✓
CO2	✓	✓		✓	✓
CO3		✓	✓	✓	
CO4		✓			✓
CO5	✓		✓		

25FNP1DB	DSE - I: FUNCTIONAL FOODS

Syllabus

Unit	Content	Hrs	Resources
I	**Introduction to Functional Foods** Definition, History, Benefits of functional foods,Classification and types of functional foods, Grouping of Functional Foods, Market Survey and Regulatory Issues.	10	Text Book
II	**Probiotics, Prebiotics, and Synbiotics** **Probiotics** – definition, concept, types and role of probiotics in gastrointestinal health, cancer, and other diseases. Challenges and regulatory issues related to probiotics. **Prebiotics** – definition, concept, health benefits of prebiotics and recent advances in prebiotics – sources, and applications of galacto oligosaccharides (GOS), functional disaccharides, (lactulose, lactitol and lactose) and Resistant starch (RS). **Synbiotics** – definition, concept, sources and health benefits.	10	Text Book
III	**Free radicals and Antioxidants** Free Radicals – Concept and definition of free radicals, reactive oxygen species (ROS) and oxidative Stress. Antioxidant - Definition and classification of antioxidants: Role of endogenous antioxidants - Super Oxide Dismutase (SOD), Catalases, Glutathione, Reductase, Peroxidases-Glutathione Peroxidase. Role of Exogenous antioxidants-Retinol, β –carotene, Ascorbic acid and Tocopherol.	10	Text Book
IV	**Phytochemicals** Distribution and health benefits of Terpenoids, Carotenoids - Carotene, Leutein, zeaxanthin, and Lycopene. Poly Phenols - Non-Flavonoid polyphenols, Flavonoids - Flavanols, Flavanol, (Catechin) Flavan-3-ol, Flavones, Flavanones, Anthocyanidins, Phytoestrogens (isoflavonones), Other Poly Phenols: Curcumin, Tannins, Lignan and Resveratrol.	9	Text Book
V	**Food Sources of functional ingredients** Cereals and grains, fruits and vegetables, milk and milk products, nuts and oilseeds, sea foods, herbs and spices – functional compounds and its role in disease prevention.	9	Text Book
	Total	**48**	

Text book	1.	Mahtab S, Bamji, Kamala Krishnasamy, Brahmam, G.N.V. 2019, "Text Book of Human Nutrition", Fourth Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.
	2.	Mudgil, D., & Barak, S. 2017. "Functional Foods: Sources and Health Benefits" 1st Ed, Scientific Publishers, India.
Reference	1.	Goyal, M. R., Malik, J. A., & Kumari, A. 2024, "The Functional Foods:

Books		Nutrient and Health Benefits", 1st Ed., Apple Academic Press.
	2.	Goyal, M. R., Malik, J. A., & Kumari, A. 2024, "The Functional Foods: Nutrient and Health Benefits" 1st Ed., Apple Academic Press.
	3.	Geoffrey P.Webb. 2011, "Dietary Supplements & Functional Foods" 2nd Ed., Wiley Blackwell.
	4.	Webb, G.P. 2006, "Dietary Supplements and Functional Foods", Black well Publishing Ltd., NewYork..

Journal and Magazines	https://www.sciencedirect.com/journal/journal-of-functional-foods)
E-Resources and Website	https://onlinecourses.swayam2.ac.in/ugc19_hs33/preview

Learning Method	Chalk and Talk/ Group Discussion

Focus of the Course	Skill Development/Innovations

Semester – I DSE - I: HARVEST TECHNOLOGY OF AGRICULTURAL PRODUCE							
Semester	**Course Code**	**Course Name**	**Category**	**L**	**T**	**P**	**Credits**
I	**25FNP1DC**	**HARVEST TECHNOLOGY OF AGRICULTURAL PRODUCE**	**DSE**	**48**	**-**	**-**	**4**

Preamble	This course has been designed for students to learn and understand • The safety control measures in handling foods from harvest to consumption agencies of control. • Good agricultural and horticultural practices for food safety management. • Importance of pre-harvest physiology for the long-term storage of horticultural crops.
Prerequisite	To learn the concepts of post-harvest handling of foods.

Course Outcomes (COs)

CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Identify the role of Post Harvest Technology in combating malnutrition in India.	K1
CO2	Categorize the agents causes food spoilage.	K2
CO3	Examine the physical and chemical methods to control insects and rodents.	K3
CO4	Prioritize the Importance of storage structures for food grains. Explain the agencies that control food losses.	K4
CO5	Improve the product-process efficiency of food grain.	K5

Mapping with Program Outcomes:

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓	✓	
CO2		✓			✓
CO3				✓	
CO4	✓			✓	
CO5	✓	✓			

25FNP1DC	DSE - I: HARVEST TECHNOLOGY OF AGRICULTURAL PRODUCE

Syllabus

Unit	Content	Hours	E-Contents / Resources
I	Post harvest Technology Introduction to Post Harvest Technology - Definition, importance. Post harvest handling of perishables. Governmental measures to augment food production-need for food conservation. Food loss in the post-harvest period, extent of losses, loss in the field, threshing yard, storage, marketing loss Role of Post Harvest Technology in combating malnutrition in India	9	Textbook
II	Agent causing food loss Agents Causing Food Losses - Physical agents (moisture, temperature), Chemical losses, biological losses- insects-insects attacking food grains - types and life cycle,damage caused to food grains and detection of insect infestation, rats and rodents, birds, animals- Nature of damage, identification	10	Textbook
III	Spoiling Agents Control of Spoilage Agents - Importance and methods of sanitary handling, physical, chemical, biological and other means of control of insects, rats and rodents and birds Insect control methods- Physical methods and chemical methods including fumigation techniques Handling and Transport of Food Commodities - Traditional and improved methods, Nutrient losses in spoiled grains and National program to save grains	10	Textbook
IV	Storage and grains Storage of Grains - Importance of storage structures-requirements, traditional and modern and underground and above ground storage and their improvements, PDS.	11	Textbook
V	Food Processing Food Processing of Selected Food Items – wheat, rice, breakfast cereals, pulses,oilseeds. Agencies Controlling Food Losses - Role of SGC, FCI, CWC, EPA SWC, IGSI in controlling food losses	8	Textbook

	Total	**48**	

Text Books	**1.**	Potter ,N.W 1973, Food Science". 8th Edn. The A VI Publishing Co. the Westport.
	2.	Chakravarthy ,A 1981, Post Harvest Technology of Cereals, Pulses and Oilseeds"., 1st Edn., Oxford and IBH. NewDelhi.
Reference Books	**1.**	Boumans,G 2012, Grain Handling and Storage ". 4th Edn. Elsevier Science Publishing

Journal and Magazines	https://www.frontiersin.org/journals/sustainable-food-systems http://jpht.in/ https://www.inderscience.com/jhome.php?jcode=ijpti
E-Resources and Website	https://fmipa.umri.ac.id/wp-content/uploads/2016/03/Amalendu_Chakraverty_Arun_S._Mujumdar_HosahalliBookFi.org_.pdf

Learning Method	Chalk and Talk/Assignment/ Seminar

Focus of the Course	Skill Development/ Employability/ Entrepreneurial Development

BoS Chairman/HoD
Department of Food Science & Nutrition
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr.N.G.P. Arts and Science College
APPROVED

BoS- 19th 28.06.25	AC -	GB -