SHRI GURU RAM RAI UNIVERSITY

[Estd. by Govt. of Uttarakhand, vide Shri Guru Ram Rai University Act no. 03 of 2017 & recognized by UGC u/s (2f) of UGC Act 1956]

SYLLABUS FOR

Bachelor of Science in Food, Nutrition and Dietetics

School of Humanities and Social Sciences

(W.E.F. 2024-2025)

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The B.Sc. programme in Food, Nutrition and Dietetics intends to create competent professionals with in-depth understanding of various aspects offered under this programme. The programme offers a broad range of courses spanning across areas of community nutrition, food science, dietetics and nutrition counseling. The programme aims at conceptual understanding of the key elements of food, nutrition and dietetics. Students would be trained in areas such as nutritional assessment, diet planning, food product development, health communication, clinical nutrition, nutrition education and behavior modification. The field of Food, Nutrition and Dietetics is vast, dynamic and an evolving area of specialization. This requires students to learn and be abreast with recent advances and evidence- based guidelines in the field of food and nutrition. The skills and attributes acquired during the programme would open doors to job opportunities in areas of food science, nutrition, health promotion, and disease management, also paves way for research and higher education for interested students.

Bachelor of Science in Food, Nutrition and Dietetics

OUTCOME BASED EDUCATION

Programme outcome (POs)
Students will be able to:

PO-1	Disciplinary Knowledge: Understand the role and importance of food and nutrition for the welfare of the community and acquire the skills in planning diet, health and diseases.
PO-2	Communication Skills:Learn and apply evidence-based guidelines in the field of dietetics, nutrition counselling, nutrition research laboratory, community
PO-3	Critical thinking:Understand the structure and functions of the different organs systems in relation to nutrition
PO-4	Interpersonal and Problem Solving: Design solutions and novel food products to meet the specified nutrient needs with appropriate consideration for the public health and safety
PO-5	Critical thinking, Communication and problem solving: Comprehend, communicate effectively, plan, design and implement programs in the field of nutrition and dietetics
PO-6	Decision making, Analytical and Research skills:Understand and demonstrate the knowledge of food science, food science and quality control in societal and environmental contexts
PO-7	Moral and ethical awareness/reasoning and Research skills: Apply ethical principles and commit to professional ethics and responsibilities in the field of nutrition, sports, food industry and health care sectors
PO-8	Interpersonal and Business skills:Understand the applications of nutraceuticals and functional foods in the product development from conceptualization to evaluation of the quality of the food product
PO-9	Analytical and Research skills: Comprehend the knowledge and role of food additives in food industry in relation to its analytical techniques
PO-10	Critical thinking, Analysis and Research skills:Understand and apply the concept of nutrients and nutritional science in the evaluation of health and disease
PO-11	Goal Setting and Problem-solving skills: Enable students to pursue higher education and research

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S.N	Course	Subject	Subject Title	Periods	Evaluation Scheme	Subject

Program Specific Outcome (PSOs)

After completing the programme, the students should be able to:

PSO 1	Apply food science knowledge to describe functional properties of food ingredients. Utilize the knowledge from the physical and biological sciences as a basis for understanding the role of food and nutrients in health and disease processes.
PSO 2	Apply the nutrition and dietetics-based knowledge and skills in the planning and assessment of suitable diets for individuals of every age, patients and the community in a sustainable manner. Evaluate the food product and the application of necessary preservation techniques to increase the shelf life of the product and also be a part in the auditing industry
PSO 3	Apply technical skills, knowledge of health behaviour, clinical judgment, and decision-making skills when assessing and evaluating the nutritional status of individuals and communities and their response to nutrition intervention.
PSO 4	Implement strategies for food access, procurement, preparation, and security for individuals, families, and communities. Apply skills gained in nutrition and dietetics for research, development, and entrepreneurship. Provide nutrition counselling and education to individuals, groups, and communities throughout the lifespan using a variety of communication strategies

Eligibility for admission:

Any candidate who has passed 12th with science or the Higher Secondary Board of Examination with science from any recognized board or equivalent to it having not less than 40 % marks in aggregate is eligible for admission. However, SC/ST, OBC and other eligible candidates shall be given relaxation as per University rules.

Type of Course

Discipline Specific Core Courses (DSCC)

Discipline Specific Elective Courses (DSEC)

General Electives Courses (GEC)

Ability Enhancement Courses (AEC)

Skill Enhancement Elective Courses (SEEC)

IAPC: Internship/Apprenticeship / Project/Community Outreach

VAC: Value Addition Course

Scheme of Teaching and Evaluation of Examination

B.Sc. in Food, Nutrition and Dietetics

Certificate in Food, Nutrition and Dietetics (Duration One Year)

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							Seasonal				
				L	T	P	Credit	1st Internal	2nd Internal	SEE	
Sem	r-I										
1	DSC-I	FNDDC-101	Fundamentals of Food and Nutrition	3	0	0	3	15	15	70	100
2	DSC-I	FNDDL-101 (Lab)	Fundamentals of Food and Nutrition-Lab	0	0	2	1	15	15	70	100
3.	DSC-II	FNDDC-102	Human Physiology – I	3	0	0	3	15	15	70	100
4.	DSC-II	FNDDL-102 (Lab)	Human Physiology– I (Lab)	0	0	2	1	15	15	70	100
5.	DSC-III	FNDDC-103	Food Chemistry	4	0	0	4	15	15	70	100
6.	Gen Elective	FNDGE-101	Choose from a pool	4	0	0	4	15	15	70	100
7.	AEC	AEC – 1 (2)		2	0	0	2	15	15	70	100
8.	SEC-1	FNDSC-101	Fundamentals of Nutrition and Cooking Skills with Healthy Recipe Development	2	0	0	2	15	15	70	100
9.	VAC-I		Choose one from a pool of VAC courses	2	0	0	2	15	15	70	100
							22	Total			900
Semester-II											
1.	DSC-I	FNDDC-201	Principles of Food Science and Preservation	3	0	0	3	15	15	70	100
2.	DSC-I	FNDDL- 201 (Lab)	Principles of Food Science and Preservation-Lab	0	0	2	1	15	15	70	100
3.	DSC-II	FNDDC- 202	Dietetics – I	3	0	0	3	15	15	70	100
4.	DSC-II	FNDDL-202 (Lab)	Dietetics – I (Lab)	0	0	2	1	15	15	70	100
5.	DSC-III	FNDDC-203	Post Harvest Technology	4	0	0	4	15	15	70	100
6.	Gen Elective	FNDGE-201	Choose from a pool	4	0	0	4	15	15	70	100
7.	AEC	AEC – 2 (2)		2	0	0	2	15	15	70	100
8.	SEC	FNDSC201	Food Processing, Preservation and Packaging	2	0	0	2	15	15	70	100
9.	VAC-2		Choose one from a	2	0	0	2	15	15	70	100

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			pool of VAC courses				22	Total			900
Semester-III											
1.	DSC-I	FNDDC-301	Basics of Food Science	3	0	0	3	15	15	70	100
2.	DSC-I	FNDDL- 301 (Lab)	Basic of Food Science-Lab	0	0	2	1	15	15	70	100
3.	DSC-II	FNDDC- 302	Human Physiology-II	3	0	0	3	15	15	70	100
4.	DSC-II	FNDDL-302 (Lab)	Human Physiology-II (Lab)	0	0	2	1	15	15	70	100
5.	DSC-III	FNDDC-303	Nutrition and Health Education	4	0	0	4	15	15	70	100
6.	DSE-1/Gen Elective	FNDDE-301a or FNDDE 301b/FNDGE-301	Bakery Management/ Health and Fitness/Choose from a pool	3	1	0	4	15	15	70	100
7.	AEC	AEC – 3 (2)		2	0	0	2	15	15	70	100
8.	SEC/IAPC	FNDSC-301	Assessment of Nutritional Status/Internship/Apprenticeship/Projects/Community Outreach	2	0	0	2	15	15	70	100
9.	VAC-3		Choose one from a pool of VAC courses	2	0	0	2	15	15	70	100
							22	Total			900
Semester-IV											
1.	DSC-I	FNDDC-401	Advanced Nutrition	3	0	0	3	15	15	70	100
2.	DSC-I	FNDDL- 401 (Lab)	Advanced Nutrition-Lab	0	0	2	1	15	15	70	100
3.	DSC-II	FNDDC- 402	Dietetics-II	3	0	0	3	15	15	70	100
4.	DSC-II	FNDDL-402 (Lab)	Dietetics-II (Lab)	0	0	2	1	15	15	70	100
5.	DSC-III	FNDDC-403	Applied Biochemistry	4	0	0	4	15	15	70	100
6.	DSE/Gen Elective	FNDDE-401a or FNDDE-401b/FNDGE-401	Food product development and Marketing Strategy/ Food standards and quality control/ Choose from a pool	3	1	0	4	15	15	70	100
7.	AEC	AEC– 4 (2)		2	0	0	2	15	15	70	100

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8.	SEC/IAPC	FNDSC-401	Yoga Diet and Nutrition/ Internship/Apprenticeship/Projects/Community Outreach	2	0	0	2	15	15	70	100
9.	VAC-4		Choose one from a pool of VAC courses	2	0	0	2	15	15	70	100
							22	Total			900
Semester-V											
1.	DSC-I	FNDDC-501	Public Health	3	-	-	3	15	15	70	100
2.	DSC-I	FNDDL- 501 (Lab)	Public Health-Lab	-	-	2	1	15	15	70	100
3.	DSC-II	FNDDC- 502	Geriatric Nutrition	3	-	-	3	15	15	70	100
4.	DSC-II	FNDDL-502 (Lab)	Geriatric Nutrition-Lab	0	-	2	1	15	15	70	100
5.	DSC-III	FNDDC-503	Advances in Food Microbiology	4	0	0	4	15	15	70	100
6.	Gen Elective	FNDGE-501	Food Preservation/Choose from a pool/MOOC	4	0	0	4	15	15	70	100
7.	DSE	FNDDE-501a or FNDDE-501b	Mushroom culture/ Food service management /Choose from Pool	3	1	0	4	15	15	70	100
8.	SEC/IAPC	FNDSC-501/IAPC	Nutrition for health and fitness/ Internship/Apprenticeship/Projects/Community Outreach	2	0	0	2	15	15	70	100
							22	Total			800
Semester-VI											
1.	DSC-I	FNDDC-601	Diet Therapy	3	0	0	3	15	15	70	100
2.	DSC-I	FNDDL- 601 (Lab)	Diet Therapy-Lab	0	0	2	1	15	15	70	100
3.	DSC-II	FNDDC- 602	Diet counselling and Patient care	3	0	0	3	15	15	70	100
4.	DSC-II	FNDDL-602 (Lab)	Diet counselling and Patient care-Lab	0	0	2	1	15	15	70	100
5.	DSC-III	FNDDC-603	Nutritional Biochemistry	4	0	0	4	15	15	70	100
6.	Gen Elective	FNDGE-601	Community Nutrition and Nutritional Deficiency/Choose from a pool	4	0	0	4	15	15	70	100

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7.	DSE	FNDDE-601a/FNDDE-601b	Research methodology/Basics of Statistics	3	1	0	4	15	15	70	100
8.	SEC	FNDSC-601	Hospital food service administration/ Internship/Apprenticeship/Projects/Community Outreach	2	0	0	2	15	15	70	100
							22	Total			800

GE PAPERS:

1. Basics of Food and Nutrition
2. Food Safety and Preservation
3. Nutrition for the Family
4. Maternal Nutrition
5. Food Preservation
6. Community Nutrition and nutritional Deficiency

DSE Papers

1. Bakery Management
2. Health and Fitness
3. Food product development and Marketing Strategy
4. Food standards and quality control
5. Mushroom culture
6. Food service management

SEC/IAPC

1. Fundamentals of Nutrition and Cooking Skills with Healthy Recipe Development
2. Food processing, preservation and packaging
3. Assessment of Nutritional Status
4. Yoga Diet and Nutrition
5. Nutrition for health and fitness
6. Hospital food service administration

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Subject Code	Subject Title	Periods per week			Evaluation Scheme				Subject Total
					Seasonal			SEE	
		L	T	P	Credit	1st Internal	2nd Internal		
Semester-I									
FNDDC-101	Fundamentals of Food and Nutrition	3	0	0	3	15	15	70	100
FNDDL-101 (Lab)	Fundamentals of Food and Nutrition- Lab	0	0	2	1	15	15	70	100
FNDDC-102	Human Physiology – I	3	0	0	3	15	15	70	100
FNDDL-102 (Lab)	Human Physiology– I-Lab	0	0	2	1	15	15	70	100
FNDDC-103	Food Chemistry	4	0	0	4	15	15	70	100
FNDGE-101	Choose from a pool	4	0	0	4	15	15	70	100
AEC – 1 (2)		2	0	0	2	15	15	70	100
FNDSC-101	Fundamentals of Nutrition and Cooking Skills with Healthy Recipe Development	2	0	0	2	15	15	70	100
	Choose one from a pool of VAC courses	2	0	0	2	15	15	70	100
					22			**Total**	**900**

Student will opt 3 core (DSC), 1 Generic, 1 AEC, 1 SEC, 1 VAC and therefore will complete 22 credits.

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Course code :FNDDC-101				
Course Name : Fundamentals of Food and Nutrition				
Semester : 1st				
	L	**T**	**P**	**C**
	3	0	0	3

Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To know about functions of food and essential constituents of food.
2. To gain the elementary knowledge of basic food groups.
3. To learn about meal planning for different age groups.

Course Contents:

UNIT 1 - Introduction to food and nutrition:

Definition- Foods, Nutrition, Nutrients.

Classification and function of foods.

Energy-factors affecting total energy requirements of the body

UNIT 2 - Essential constituents of food-their sources, functions, requirements, and deficiency diseases:

Protein

Carbohydrate

Fat

Vitamins

Minerals

Water

UNIT 3 - Elementary knowledge of basic food groups. Importance of basic food groups in the diet.

Nutritive contribution of food stuffs and their importance in Indian diets like cereals and millet, pulses, nuts and oil-seeds, vegetables, fruits, milk and milk products, egg, meat, fish and other flesh, fats and oils, sugar and jaggery, spices and condiments.

UNIT 4 - Nutrition during life cycle:

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Nutrition during childhood

Nutrition for adolescence

Nutrition for adults

Nutrition during old age

Pregnancy and lactation

UNIT 5 -Meal planning

Importance and basic principles of meal planning, factors affecting meal planning, meal planning for special occasions, like festival and birthday party.

Diet planning for different economic levels and different age groups- Early and late childhood adolescence, adulthood and old age.

Books Recommended:

Normal and therapeutic nutrition : Robinson

Essentials of foods and nutrition: Swaminathan

Human nutrition and application in India: Mudambi

Nutritive value of Indian foods: Gopalan C.

Basic Aaharavam Poshan Vigyan: Vimla Sharma

Poshan Vigyan Ke Mool Siddhant : S.P. Sukhiya

Course outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Define food, nutrition and nutrients and also Classify food according to food groups. Learn about essential constituents of food, and meal planning.
CO2	Identify and discuss the factors affecting total energy requirements of the body. Explain the essential constituents of food, and meal planning.
CO3	Enlist and explain the essential constituents of food and the functions of food.
CO4	Analyze the role of meal planning, and essential constituents of food .Discuss and write about Importance of basic food groups in the diet.
CO5	Evaluate the knowledge of basic food groups, essential constituents of food and meal planning.
CO6	Plan diet for different economic levels and different age groups by keeping in mind the essential constituents of food.

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDL-101 (Lab)				
Course Name :Fundamentals of Food and Nutrition-Lab				
Semester :1st				
	L	T	P	C
	0	0	2	1

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

To plan diet for different economic levels and different age groups .

To prepare diet for different economic levels and different age groups .

Course Contents:

Diet planning and preparing diets for different economic levels and different age groups- Early and late childhood, adolescence, adulthood and old age.

Books Recommended:

1.Normal and therapeutic nutrition : Robinson

2.Essentials of foods and nutrition: Swaminathan

3.Human nutrition and application in India: Mudambi

4.Basic Aaharavam Poshan Vigyan: Vimla Sharma

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Recall the theoretical knowledge related to practical work.
CO2	Identify some nutritious recipes.
CO3	Plan diet for different economic levels .
CO4	Plan diet for different age groups .
CO5	Prepare diet for different economic levels.
CO6	Prepare diet for different age groups.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PSO 1	PSO 2	PSO 3	PSO 4
CO1	3	3	2	2	2	3	2	1	2	2	2	3	2	2	3
CO2	3	3	2	2	2	3	2	1	2	2	2	3	2	2	3
CO3	2	2	1	3	2	2	2	1	2	2	2	3	2	2	3
CO4	2	2	1	3	2	2	2	1	2	2	2	3	2	3	3
CO5	3	3	2	3	2	3	2	1	2	2	2	3	2	2	3
CO6	3	3	2	3	2	3	2	1	2	2	2	3	2	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDC-102				
Course Name :Human Physiology – I				
Semester :1st				
	L	**T**	**P**	**C**
	3	0	0	3

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To understand cells and tissues and human life processes.

2. To comprehend the physiological processes and functions of various vital organs.

UNIT-I

Cell - Structure and functions
Tissues - Structure and functions
Blood, RBC, WBC, Platelets and Lymph. Blood coagulation, blood grouping and Rh factor.

UNIT-II

Digestive system - structure & functions, absorption and assimilation of food.
Circulatory system - Heart structure and functions - cardiac cycle.

UNIT-III

Respiratory system –types of respiration, respiratory system, process of respiration, transport and exchange of oxygen and carbon dioxide in the body.
Endocrine glands - Structure and function of pituitary, thyroid, islets of langerhans and adrenal gland.

UNIT-IV

Excretory system - Excretory organs - structure of kidney and functions, formation of urine, composition of urine.

UNIT-V

Muscles - physiology of muscular action. Central nervous system - Physiology of the nerve cell, parts of the central nervous system and function.
Sense organs - Structure and function of eye, ear, nose, tongue and skin.

Books recommended:

Tortora andBryan:AnatomyandPhysiology
Khurana:Anatomyand Physiology

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Course outcomes (COs):Upon successful completion of the course a student will be able to:

CO1	Understand the structure and functions of cells and tissues. Define human life processes like digestive system, circulatory system, respiratory system, excretory systems, endocrine glands, blood, muscles, Central Nervous system and sense organs.
CO2	Comprehend the structure and functions of cells and tissues. Explain human life processes like digestive system, circulatory system, respiratory system, excretory systems, endocrine glands, blood, muscles, Central Nervous system and sense organs.
CO3	Apply the knowledge related to cells, tissues and physiological processes along with functions of vital organs
CO4	Illustrate and analyze digestive system, circulatory system, respiratory system, excretory systems, endocrine glands, blood, muscles, Central Nervous system and sense organs.
CO5	Evaluate and conclude vital functions of various human body systems like digestive system, circulatory system, respiratory system, excretory systems, endocrine glands, blood, muscles, Central Nervous system and sense organs.
CO6	Write about structure and functions of cells and tissues. Define human life processes like digestive system, circulatory system, respiratory system, excretory systems, endocrine glands, blood, muscles, Central Nervous system and sense organs.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDL-102 (Lab)				
Course Name :Human Physiology– I-Lab				
Semester :1st				
	L	T	P	C
	1	0	2	1

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To learn to record blood pressure using various methods.
2. To learn to about blood group identification.
3. To measure pulse rate and measurement of BMI.

Course Contents:

1. Record of blood pressure –Sphygmomanometer, palpatory method, auscultatory method, variation of BP
2. Measuring Pulse Rate
3. Measurement of height, weight and calculation of BMI.
4. Blood Group - Identification

Books Recommended:

1. Guyton AC, Hall JE. Textbook of Medical Physiology, 9th Ed., Prism Books Pvt Ltd.,Bangalore,1996

2. Chatterjee C C. Human Physiology, Calcutta,WB,1988

3. Wilson. Anatomy and Physiology in Health and Illness, Edinburgh ChurchillLivingstone,1989

4. Sembulingam K, Sembulingam P. Essentials of medical physiology, Jaypee Bros. Medical Publ., New Delhi, 2012.

Course outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Recall the theoretical knowledge related to practical work.
CO2	Record blood pressure using various methods.
CO3	Estimate blood grouping and blood pressure.
CO4	Carryout blood grouping and blood pressure.

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CO5	Assess blood grouping and blood pressure.
CO6	Write about the knowledge related to practical work.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDC-103				
Course Name :Food Chemistry				
Semester :1st				
	L	T	P	C
	4	0	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. Comprehensive study on definition, composition of food, water-food relation, macronutrients, vitamins and flavours.

2. Study of various natural food pigments, enzymatic reactions, changes taking place and new product development and browning reactions in food required at industrial level.

UNIT I

Introduction: Composition of food, water in food, structure of water and ice, types of water, absorption and adsorption phenomenon, Water activity and packaging, Water activity and shelf-life

Lipids: Classification of lipids, Physical properties of lipids. Chemical properties of lipids. Effect of frying on fats, Changes in fats and oils on storage and its prevention, Technology of edible fats and oils - Refining, Hydrogenation and Interesterification, Fat Mimetics

UNIT II

Proteins: Protein classification and structure, Nature of food proteins (plant and animal proteins, Physical and chemical properties of proteins, Functional properties of proteins. Carbohydrates: Classification of carbohydrates, Structure of important polysaccharides, Chemical reactions of carbohydrates, Modified celluloses and starches.

Flavours: Definition and basic tastes, Description of food flavours, Flavour enhancers

UNITIII

Minerals: Major and minor minerals, Metal uptake in canned foods, Toxic metals Natural Food Pigments: Introduction and classification, Water soluble and insoluble food pigments (chlorophyll, carotenoids, anthocyanins and flavonoids, beet pigments) Browning Reactionsin Food: Browning, Maillard reaction,Caramelization reaction.

UNITIV

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Enzymes: Introduction, General characteristics, Enzymes in food processing, Industrial Uses of Enzymes, Immobilized enzymes

Changes occurring during food processing treatments: Drying and dehydration, Irradiation, Freezing, Canning

New product development: Definition, importance, need of product development, steps of product development, tools

Books Recommended:

1. Fennema, OR. Food Chemistry, 3rd Ed., Marcell Dekker, New York, 1996
2. Whitehurst and Law, Enzymes in Food Technology, CRC Press, Canada, 2002
3. Wong, DWS. Food Enzymes, Chapman and Hall, New York, 1995
4. Potter, N.N. and Hotchkiss, J.H, Food Science, 5th Ed., Chapman & Hall, 1995
5. DeMan, J.M., Principles of Food Chemistry, AVI, New York, 1980
6. DeMan, J.M., Principles of Food Chemistry, 3rd Ed., Springer 1999
7. Desrosier, NW. and Desrosier, JN., The technology of food preservation, 4th Ed., Westport, Conn., AVI Pub. Co, 1977.
8. Fuller, GW. New Product Development from Concept to Marketplace, CRC Press, 2004.
9. Whitehurst and Law, Enzymes in Food Technology, CRC Press, Canada, 2002
10. Nooralabettu, K.P. Enzyme Technology, Pace Maker of Biotechnology, PHI Learning Private Limited, New Delhi. 2011

Course outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Define and have an overview on food chemistry including composition and theimportanceof water.
CO2	Classify the carbohydrates, lipids, proteins, vitamins and flavour, minerals and natural food pigments used in food products.
CO3	Applythe knowledgeof food chemistry, and browning reactionsinfood products.
CO4	Illustrate the knowledge related to Food Chemistry.
CO5	Assess and discuss about the knowledge related to Food Chemistry.
CO6	Build own product in innovative way by understanding changes that occurs during food development and use of enzyme technology.

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code : FNDGE-101				
Course Name: Basics of Food and Nutrition				
Semester : 1st				
	L	T	P	C
	04	0	0	04

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To know about functions of food and essential constituents of food.
2. To gain the elementary knowledge of basic food groups.
3. To learn about meal planning for different age groups.

Course Contents:

UNIT 1 - Introduction to food and nutrition: Definition- Foods, Nutrition, Nutrients. Classification and function of foods. Energy-factors affecting total energy requirements of the body

UNIT 2 - Essential constituents of food-their sources, functions, requirements, anddeficiency diseases: Protein, Carbohydrate, Fat, Vitamins, Minerals, Water

UNIT 3 - Elementary knowledge of basic food groups. Importance of basic food groups inthe diet. Nutritive contribution of food stuffs and their importance in Indian diets like cereals and millet,pulses, nuts and oil-seeds, vegetables, fruits, milk and milk products, egg, meat, fish and other flesh, fats and oils, sugar and jaggery, spices and condiments.

UNIT 4 - Nutrition during life cycle:

Nutrition during childhood, Nutrition for adolescence, Nutrition for adults, Nutrition during old age Pregnancy and lactation

UNIT 5 -Meal planning

Importance and basic principles of meal planning, factors affecting meal planning, meal planningfor special occasions, like festival and birthday party. Diet planning for different economic levels and different age groups- Early and late childhood adolescence, adulthood and old age.

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Books Recommended:

1. Normal and therapeutic nutrition : Robinson Essentials of foods and nutrition: Swaminathan
2. Human nutrition and application in India: Mudambi
3. Nutritive value of Indian foods: Gopalan C.
4. Basic Aahar avam Poshan Vigyan: Vimla Sharma
5. Poshan Vigyan Ke Mool Siddhant : S.P. Sukhiya

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Define food, nutrition and nutrients and also Classify food according to food groups. Learn about essential constituents of food, and meal planning.
CO2	Identify and discuss the factors affecting total energy requirements of the body. Explain the essential constituents of food, and meal planning.
CO3	Enlist and explain the essential constituents of food and the functions of food.
CO4	Analyze the role of meal planning, and essential constituents of food .Discuss and write about Importance of basic food groups in the diet.
CO5	Evaluate the knowledge of basic food groups, essential constituents of food and meal planning.
CO6	Plan diet for different economic levels and different age groups by keeping in mind the essential constituents of food.

CO-PO, PSO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDSC-101				
Course Name: Fundamentals of Nutrition and Cooking Skills with Healthy Recipe Development				
Semester: 1st				
	L	T	P	C
	2	0	0	2

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To gain the elementary knowledge of food, sanitation and Hygiene
2. To know about Food preservation, Food Adulteration and Consumer Protection.
3. To learn about different methods of cooking and processing of cereals and pulses.

Course Contents:

UNIT I – Food:

Food sanitation and hygiene.

Food preservation – Principles and methods. Home scale methods of food preservation.

Food Adulteration and Consumer Protection.

UNIT II- Methods of cooking and preventing nutrient losses:

Dry, moist, frying and microwave cooking.

Advantages, disadvantages and the effect of various methods of cooking on nutrients.

Minimizing nutrient losses.

Planning various dishes using different methods of cooking:

-Boiling / steaming

-Roasting

-Frying-Deep/shallow

-Pressure cooking

-Hot air cooking/Baking

UNIT III-Processing of fruits and vegetables

Jam, jellies, Marmalades and Murabbas

Fermented Products

Minimally processed vegetables and fruits

UNIT IV- Processing of cereals and pulses

Planning nutrient rich dishes:

-Protein rich dish

-Carbohydrate rich dish

-Fat rich dish

-Vitamins rich dish

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Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to food sanitation and hygiene, preservation, food adulteration and consumer protection. Method of cooking and preventing nutrient losses. Processing of cereals, pulses, fruits and vegetables and planning nutrient rich dishes.
CO2	Understand the concept of Food sanitation and hygiene, adulteration, nutrient rich dishes and methods of cooking. Define food processing of cereals, pulses, fruits and vegetables.
CO3	Discuss about Food preservation, Food Adulteration and Consumer Protection, methods of cooking, Food sanitation and hygiene, nutrient rich dishes.
CO4	Apply the knowledge related to food sanitation and hygiene, nutrient rich dishes to prevent the loss of nutrients while cooking. Use the knowledge to preserve food and processing of food. Find out adulterants in food items. Use the knowledge related to consumer protection in day to day life.
CO5	Evaluate the knowledge related to nutrition and processing of food, nutrient rich dishes, and different methods of cooking and prevention of nutrient losses. Write about food sanitation and hygiene, preservation, adulteration and consumer protection.
CO6	Plan nutrient rich dishes using different methods of cooking. Discuss about food sanitation and hygiene, preservation, adulteration and consumer protection.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Semester-II										
DSC-I	FNDDC-201	Principles of Food Science and Preservation	3	-	-	3	15	15	70	100
DSC-I	FNDDL- 201 (Lab)	Principles of Food Science and Preservation-Lab	-	-	2	1	15	15	70	100
DSC-II	FNDDC- 202	Dietetics – I	3	-	-	3	15	15	70	100
DSC-II	FNDDL-202 (Lab)	Dietetics – I-Lab	-	-	2	1	15	15	70	100
DSC-III	FNDDC-203	Post Harvest Technology	4	-	-	4	15	15	70	100
Gen Elective	FNDGE-201	Choose from a pool	4	-	-	4	15	15	70	100
AEC	AEC – 2 (2)		2	-	-	2	15	15	70	100
SEC	FNDSC201	Food Processing, Preservation and Packaging	2	-	-	2	15	15	70	100
VAC-2		Choose one from a pool of VAC courses	2	-	-	2	15	15	70	100
						22	Total			900

In second Semester, Student will opt 3 core (DSC), 1 Generic, 1 AEC, 1 SEC, 1 VAC and therefore will complete 22 credits.

Course code :FNDDC-201				
Course Name :Principles of Food Science and Preservation				
Semester :2nd				
	L	T	P	C
	3	0	0	3

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To understand the basic knowledge of nutrition in making foods choices.
2. Learn to distinguish and relate the characteristics and properties of foods.
3. To develop an understanding of food safety, standards, and food Preservation

Course Contents

UNIT I

Introduction to Food Science: Properties of food (a) Colloids, sols, gels, foam (b) Emulsion formation (c) Bound and free water (d) pH value, osmosis and osmotic pressure (e) Boiling, melting and freezing points. Sensory evaluation - Subjective and objective. Cereals and millets - Production, importance & composition - cereal products. Wheat, rice maize, ragi and sorghum. Malting and cooking of cereals, non-enzymatic reactions, leavening agents.

Fermented products, milling of wheat, parboiling of rice, pulses- composition, toxic constituents and cooking of pulses, variety and processing

UNIT II

Fruits and vegetables – composition, pigments, flavors and variety- changes during cooking-enzymatic browning, non-enzymatic browning. Milk and milk products- composition, storage- Processing of milk – Effects of heat on milk protein - Milk products available in India. Egg - structure, composition, storage, grade, evaluation, selection, Role of egg in food preparation, factors affecting coagulation of egg proteins.

UNIT III

Sugar, Jaggery and honey - Composition, different forms of sugar, storage- Behaviors of syrups at different temperatures- Crystallization and caramelization. Oil and Fats- Composition, types, storage, plasticity, Hydrogenation and processing.Changes during heating- Fats as shortening agents, smoking point, Rancidity, specific fat (Lard, Butter, Margarine) Meat, Fish poultry-structure, composition, storage, Post mortem changes in meat, Curing of meat, Tenderization, Aging of meat, selection, Meat cookery

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UNIT IV

Concepts of food safety and standards. Food Preservation, food spoilage, method of preservation by low temperature, high temperature, dehydration, food irradiation.

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to food science and preservation.
CO2	Learn to distinguish and relate the characteristics and properties of foods.
CO3	Apply the knowledge gained on characteristics and properties of foods during cooking
CO4	Analyzethe knowledge related to food science and preservation.
CO5	Evaluate the basic knowledge of nutrition in making foods choices and obtaining an adequate diet.
CO6	Develop appropriate food preparation and processing methods to ensure quality standards.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDL-201 (Lab)				
Course Name :Principles of Food Science and Preservation-Lab				
Semester :2nd				
	L	T	P	C
	0	0	2	1

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To Learn about standardization of common food preparation and sensory evaluation.
2. To Learn about starch cookery, leavened products, milk cookery and fermented products.
3. To Learn about egg cookery, fat and oil cookery, syrup formation,.

Course Contents:

1. Weights & measures, standardization of common food preparation.
2. Sensory evaluation
3. Starch cookery - Rice and Wheat preparation, factors influencing dough development, gluten formation.
4. Leavened products, milk cookery-casein formation, curd setting.
5. Fermented products and pulse cookery.
6. Vegetable cookery-Effect on pigments and enzymatic browning in fruits and vegetables
7. Egg cookery and fat and oil cookery.
8. Sugar and Jaggery-Syrup formation, crystallization and caramelization.

References:

1. Manay NS, Shadaksharaswamy M. Foods - Facts and principles, New Age InternationalPubl.,New Delhi, 2010
2. Levies,Foodcommodities,HeinemannLtd.,London,1988
3. HughesandBenniion M.IntroductoryFoods,Macmillanand Co, New York,1980
4. DowellP,BaileyA.TheBookof ingredients,DorlingKindersleyLtd.,London,1980
5. Roseville LJ, Viera ER. Elementary food science, 3rd Ed., Chapman and Hall, New York,1992
6. CharleyH. FoodScience, 2nd Ed.,JohnWileyandSons, 1982
7. PotterNN,HotchkissJH.FoodScience,5thEd,CBSPublisherandDistributors,Delhi,1966

Scanned with OKEN Scanner

8. Frazier WC, Westoff DC. Food Microbiology 4th Ed., Tata Mc Graw Hill Publ. Co. Ltd.,1998

9. PrescottSC,Proctor BE.FoodTechnology,McGrawHill,1937

10. Desroier NV. Thetechnologyoffood preservation,AVIPub.Co, 1963

11. Lal G, Siddappa GS, Tandon GL. Preservation of food and vegetables, ICAR, New Delhi1960

12.Manay NS, Shadaksharaswamy M. Foods Facts and principles, New Age International Publ., New Delhi, 2010

Course outcomes (COs):Upon successful completion of the course a student will be able to

CO1	Recall the theoretical knowledge related to practical work.
CO2	Standardize common food preparation.
CO3	Prepare different types of products from rice and wheat.
CO4	Prepare Leavened products, milk products, syrup from sugar and jaggery
CO5	Evaluate the food by using sensory evaluation method.
CO6	Perform vegetable cookery, and egg cookery.

CO-PO, PSO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDC-202				
Course Name :Dietetics – I				
Semester :2nd				
	L	T	P	C
	3	0	0	3

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To know the principles of diet therapy
2. To understand the modifications of normal diet for therapeutic purposes.
3. To learn the role of a registered dietician
4. To identify the roles of others who collaborate in delivery of food and nutrition services

Course Contents:

UNIT I

Definition of dietetics, clinical dietetics, objectives of dietetics, Growth and scope of dietetics,Characteristics and role of dietician in health care, classification of dietitian, characteristics of a dietitian, objectives of diet therapy. Hospital Dietary services-role and functions.

UNIT II

Concept of diet therapy and meal planning - Basic principles of meal planning: Explanation of terms: concept of health, recommended dietary allowances (RDA), Adequate intake, Food exchange list, food guide pyramid, factors affecting meal planning, reference man and woman. Planning of balanced diet and approaches of assessing nutrient requirements. Food prescription.

UNIT III

Planning diets of different activity levels for various income groups. Definition of nutritional care, interpersonal relationship with patient, Team approach to nutritional care, Diet prescription

UNIT IV

Routine hospital diets: Liquid diet, semi-solid, regular and bland diet. Modification of normal diets. Types of feeding -oral feeding and tube feeding-enteral and parental

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Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to Dietetics.
CO2	Understand the knowledge related to diet therapy, meal planning for various income groups and routine hospital diets.
CO3	Apply the knowledge gained on diet therapy, meal planning for various income groups and routine hospital diets.
CO4	Analyze the knowledge related to diet therapy, meal planning for various income groups and routine hospital diets.
CO5	Evaluate the knowledge related to diet therapy, meal planning for various income groups and routine hospital diets.
CO6	Plan meal for various income groups and routine hospital patients.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDL-202 (Lab)				
Course Name :Dietetics – I (Lab)				
Semester :2nd				
	L	**T**	**P**	**C**
	0	0	2	1

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To plan fluid diets
2. To plan diet for febrile conditions
3. To modify normal diet for therapeutic purposes.

Course Contents:

1. Identification of food sources for various nutrients using food composition tables.
2. Planning and preparation of meals for adults of different activity levels for various income groups.
3. Estimation of BMI
4. Planning, preparing and calculating fluid diets.

REFERENCES

1. Anderson L, Dibble MV, Turkki PR, Mitchall HS, Rynbergin HJ. Nutrition in health anddisease,17thEd., JB Lippincott and Co., Philadelphia, 1982
2. AntiaFP. Clinical dieteticsand nutrition, 2ndEd,Oxford Univ. Press,Delhi, 1973
3. WilliamsSR. Nutritionand diettherapy, 6th Ed, Time,Mirror, MosbyCollegePubl. 1989
4. BegumR., Atextbook offoods, nutritionand dietetics,Sterling Publ.,Delhi, 1989
5. JoshiSA.Nutritionanddietetics, TataMcGraw HillPublications, NewDelhi,1992
6. SrilakshmiB. Dietetics,6thEd.,New Age International Publ.,New Delhi,2011

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Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Recall the theoretical knowledge related to practical work.
CO2	Identify food sources for various nutrients using food composition tables.
CO3	Plan and prepare meals for adults of different activity levels for various income groups.
CO4	Estimate BMI
CO5	Plan fluid diets.
CO6	Prepare fluid diets.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDC-203				
Course Name :Post Harvest Technology				
Semester :2nd				
	L	T	P	C
	4	0	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To comprehend the need for preservation and processing

2. To understand the rationale behind processing leading to a final product with enhanced characteristics and shelf life.

3. To know about their actions and changes taking place during freezing and refrigeration

4. To understand the methodology of drying to preserve the harvest and turn it into multiple use.

Course Contents:

UNIT I

Introduction to food processing: Historical development of food processing, Definition of food processing, aims and objectives of food processing, preparation of raw material for processing, introduction to different processes employed in food processing- milling, cooking, boiling, steaming, braising, stewing, roasting, frying, grilling, baking, fermentation, pickling, refining, canning, definition of shelf life, perishable foods, semi perishable foods, shelf stable foods

UNIT II

Freezing and Refrigeration: Introduction to refrigeration, cool storage and freezing, definition, principle of freezing, freezing curve, changes occurring during freezing, types of freezing , introduction to thawing, changes during thawing and its effect on food.

UNIT III

Sterilization: Principle and applications: commercial sterilization, Pasteurization, ultra high temperature sterilization, aseptic processing and blanching, Hurdle technology, micro wave processing.

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UNIT IV

Drying and Dehydration: Definition, drying as a means of preservation, differences between sun drying and dehydration (i.e., mechanical drying), types of drying, factors affecting rate ofdrying, normal drying curve, names of types of driers used in the food industry. Evaporation: Definition and principle of evaporation, factors affecting evaporation, names of evaporators used in food industry. Irradiation: Introduction, units of radiation, kinds of ionizing radiations used in food irradiation, mechanism of action, uses of radiation processing in food industry. Fermentation: Principles of fermentation, Types of fermentation, curing and pickling, Advantages

REFERENCES

1. Frazier WC, Westoff DC. Food Microbiology 4th Ed., Tata Mc Graw Hill Publ. Co. Ltd.,1998

2. Desroier NV.Thetechnologyoffoodpreservation, AVIPub.Co,1963

3. Lal G, Siddappa GS, Tandon GL. Preservation of food and vegetables, ICAR, New Delhi,1960.

4. Potter NN, Hotchkiss JH. Food Science, 5th Ed., CBS Publisher and Distributors, Delhi,1966

5. PrescottSC,ProctorBE.FoodTechnology,McGrawHill,1937

6. JohnsonR,AndersonMT.FoodPreservation,2012

7. ManayNS,ShadaksharaswamyM.Foods-Factsandprinciples,NewAgeInternationalPubl.,New Delhi, 2010

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to Post Harvest Technology.
CO2	Understand the knowledge related to Food Processing, Freezing and Refrigeration, Sterilization, Drying and Dehydration
CO3	Apply the knowledge gained on Food Processing, Freezing and Refrigeration, Sterilization, Drying and Dehydration
CO4	Analyze the knowledge related to Food Processing, Freezing and Refrigeration, Sterilization, Drying and Dehydration
CO5	Evaluate the knowledge related to Food Processing, Freezing and Refrigeration, Sterilization, Drying and Dehydration
CO6	Write about Food Processing, Freezing and Refrigeration, Sterilization, Drying and Dehydration.

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDGE-201				
Course Name :Food Safety and Preservation				
Semester :2nd				
	L	T	P	C
	4	0	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To enable the students to know about food sanitation and hygiene.

2. To make the students aware about Food Adulteration and Consumer Protection.

3. To familiarize the students with home scale methods of food preservation andfortification of foods with vitamins and minerals.

Course contents:

UNIT 1

Food sanitation and hygiene

Food borne diseases

UNIT 2

Food Adulteration and Consumer Protection, Food laws and standards

UNIT 3

Causes of food spoilage

Food preservation – Principles and methods Home scale methods of food preservation

UNIT -4

Fortification of foods with vitamins and minerals.

Novel and processed supplementary food, Enzymes in food processing.

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References:

1.Fundamentals of Foods and Nutrition, S.R. Mudambi and M.V. Rajagopal, New Age International (P) Ltd. Publishers.

2. A Textbook of Foods, Nutrition and Dietetifes, M.R. Begum, Sterling Publishers Pvt.Ltd.

3. Cherley H (1982). Food Science (2nd edition), John Wiley & Sons, New York4.Gopalan C. (eds.) (1993) Recent Trends in Nutrition, Oxford University Press 5.Handbook of food and nutrition, M. Swaminathan, Bappco.

Course Outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Define food sanitation and hygiene and explain it. Write about home scale methods of food preservation and fortification of foods with vitamins and minerals. Memorize the knowledge related to food borne diseases, 'Food Adulteration and Consumer Protection.'
CO2	Describe food borne diseases, food sanitation and hygiene,'novel and processed supplementary foods, enzymes in food processing', home scale methods of food preservation and fortification of foods with vitamins and minerals.
CO3	Get aware about 'Food Adulteration and Consumer Protection' 'food laws and standards,' causes of food spoilage, home scale methods of food preservation and fortification of foods with vitamins and minerals and explain it.
CO4	Analyze the knowledge related to 'novel and processed supplementary foods, enzymes in food processing,' home scale methods of food preservation and fortification of foods with vitamins and minerals.
CO5	Evaluate the knowledge related to home scale methods of foodpreservation and fortification of foods with vitamins and minerals, food borne diseases, 'Food Adulteration and Consumer Protection.
CO6	Write about food laws and standards, food sanitation and hygiene , foodpreservation and fortification of foods with vitamins and minerals. elaborate on causes of food spoilage.

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CO-PO, PSO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	3
CO2	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	2
CO3	2	2	2	1	3	2	2	2	2	-	2	2	3	3	3	3
CO4	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	2
CO5	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	2
CO6	2	2	2	1	3	2	2	2	2	-	2	2	3	3	3	-3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDSC-201				
Course Name :Food Processing, Preservation and Packaging				
Semester :2nd				
	L	T	P	C
	2	0	0	2

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To enable the students to know about food processing.
2. To make the students aware about Food Laws and Standards.
3. To familiarize the students with food preservation, packaging and labelling of foods.

Course Contents:

UNIT 1: Food Processing

Cereals: Wheat-Structure, Composition and Nutritive Value, Milling of Wheat, Products of wheat
Rice: Composition, Milling, Parboiling, Rice Products
Millets (Maize): Nutritive value, processing and Products
(Ragi): Nutritive value, Milling and malting
Pulses: Composition and Nutritive value, digestibility of pulses, processing, Toxic constituents
Nuts and oil Seeds: Different nuts and oil seeds, Processing of refined oil
Milk: Nutritive value, processing of milk, Some fermented and non-fermented milk products

UNIT 2: Food Preservation

Food Spoilage,
Method of food preservation-by low temperature, high temperature, preservatives and Fermentation

UNIT 3: Packaging and Labelling of Foods

Packaging-Functions, classification, material used for packing, Laws related to packaging,
Nutrition Labelling

UNIT 4: Food Laws and Standards

Food Preservation and Standard Act: Food Safety and Standards Authority of India (FSSAI)
Standardization Mark – India: Bureau of Indian Standards (BIS) and AGMARK
International Standards: Codex Alimentarius and Hazard Analysis Critical Control Point (HACCP)

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Course Outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Remember and define the basic concept of Food preservation, food laws and standards, packaging and labeling of food, and food processing .
CO2	Understand and Explain food preservation and processing, food packaging and labelling, food laws and standard
CO3	Discuss and apply the knowledge related to food laws and standard, food packaging and labeling, food processing and preservation.
CO4	Analyze and conclude the information related to food processing and preservation, packaging and labeling of foods, food laws and standard.
CO5	Evaluate the knowledge with respect to food preservation and processing, food packaging/labelling, food laws and standards
CO6	Express and Write about food laws and standards, food preservation and processing, food packaging/labelling.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	3
CO2	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	2
CO3	2	2	2	1	3	2	2	2	2	-	2	2	3	3	3	3
CO4	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	2
CO5	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	2
CO6	2	2	2	1	3	2	2	2	2	-	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Semester-III											
1.	DSC-I	FNDDC-301	Basics of food science	3	-	-	3	15	15	70	100
2.	DSC-I	FNDDL-301 (Lab)	Basic of food .science-lab	-	-	2	1	15	15	70	100
3.	DSC-II	FNDDC-302	Advanced Physiology	3	-	-	3	15	15	70	100
4.	DSC-II	FNDDL-302 (Lab)	Advanced Physiology-Lab	-	-	2	1	15	15	70	100
5.	DSC-III	FNDDC-303	Nutrition and Health Education	4	-	-	4	15	15	70	100
6.	DSE-1/Gen Elective	FNDDE-301a or FNDDE 301b/FNDGE-301	Bakery Management/ Health and Fitness/Choose from a pool	4	-	-	4	15	15	70	100
7.	AEC	AEC – 3 (2)		2	-	-	2	15	15	70	100
8.	SEC/IAPC	FNDSC-301	Assessment of Nutritional Status	2	-	-	2	15	15	70	100
9.	VAC-3		•Choose one from a pool of VAC courses	2	-	-	2	15	15	70	100
							22	**Total**			**900**

In 3rd Sem Student will opt 3 DSC, 1 DSE/generic, AEC, Skill/IAPC, VAC

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Course code : FNDDC-301				
Course Name : Basics of Food Science				
Semester :3rd				
	L	T	P	C
	3	0	0	3

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To enable the students to know about basics of food and nutrition.
2. To make students aware about carbohydrates, lipids, proteins, Dietary Fibre, vitamins, minerals and water.
3. To familiarize the students with different components of micro and macro nutrients.

Course Contents:

UNIT 1 Basic concept of Food, Nutrition and Nutrients. Classification of Food. Classification of Nutrients.

UNIT 2 Carbohydrates - Definition, Classification, Structure and properties.
Monosaccharides - glucose, fructose, galactose.
Disaccharides - Maltose, lactose, sucrose
Polysaccharides - Dextrin, starch, glycogen, resistant starch.
Carbohydrates - Sources, daily requirements, functions. Effects of too high and too low carbohydrates on health. Digestion and absorption of carbohydrate.

UNIT 3 Lipids -Definition, Classification & Properties. Fatty acids-composition, properties, types. Lipids - sources, daily requirements, functions. Digestion & Absorption of nutrients. Role & nutritional significances of PUFA, MUFA, SFA, W-3 fatty acid.
UNIT4 Proteins- Definition, Classification, Structure & properties. Amino acids Classification, types, functions. Proteins - Sources, daily requirements, functions.
Effect of too high - too low proteins on health. Digestion & absorption.

UNIT 5 Dietary Fibre-Classification, sources, composition, properties & nutritional significance.

UNIT 6 Minerals & Trace Elements, Bio-Chemical and Physiological Role, bio-availability & requirements, sources, deficiency & excess (Calcium, Sodium, Potassium Phosphorus, Iron, Fluoride, Zinc, Selenium, Iodine, Chromium)

UNIT 7 Vitamins - Bio-Chemical and Physiological Role Physiological role, bio-availability and requirements, sources, deficiency & excess.

UNIT 8 Water - Functions, daily requirements, Water balance.

Books Recommended:

1. Normal and therapeutic nutrition : Robinson
2. Essentials of foods and nutrition: Swaminathan
3. Textbook of food science and nutrition: Sunita Roy Chowdhury and Bani Tamber Aeri
4. Human nutrition and application in India: Mudambi

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5. Nutritive value of Indian foods: Gopalan C.

Course Outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Remember and define the basic concept of Food and Nutrients and their classification. Definition, classification, structure, properties, nutritional significance and daily requirement of Carbohydrates, lipids, proteins, dietary fibre, minerals, vitamins and water.
CO2	Understand and Explain the basic concept of Food and Nutrients and their classification. Definition, classification, structure, properties, nutritional significance and daily requirement of Carbohydrates, lipids, proteins, dietary fibre, minerals, vitamins and water.
CO3	Discuss and apply the knowledge related to food and nutrients as well as knowledge related to definition, classification, structure, properties, nutritional significance and daily requirement of Carbohydrates, lipids, proteins, dietary fibre, minerals, vitamins and water.
CO4	Analyze and conclude the information related to Food and Nutrients as well as micro and macro nutrients like Carbohydrates, lipids, proteins, dietary fibre, minerals, vitamins and water.
CO5	Evaluate the knowledge with respect to food and nutrients as well as knowledge related to definition, classification, structure, properties, nutritional significance and daily requirement of Carbohydrates, lipids, proteins, dietary fibre, minerals, vitamins and water.
CO6	Express and Write about concept of Food and Nutrients and their classification. Definition, classification, structure, properties, nutritional significance and daily requirement of Carbohydrates, lipids, proteins, dietary fibre, minerals, vitamins and water.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDL-301 (Lab)				
Course Name :Basics of Food Science-Lab				
Semester :3rd				
	L	T	P	C
	0	0	2	1

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:
To identify mono, di and polysaccharides.
To identify proteins and glycerol .

Course Contents:
1. Identification of Mono, Di and polysaccharides
2. Identification of Proteins
3. Identification of glycerol.

Books Recommended:
1. Normal and therapeutic nutrition : Robinson
2. Essentials of foods and nutrition: Swaminathan
3. Textbook of food science and nutrition: Sunita Roy Chowdhury and Bani Tamber Aeri
4. Human nutrition and application in India: Mudambi
5. Nutritive value of Indian foods: Gopalan C.

Course outcomes (COs):
Upon successful completion of the course a student will be able to

CO1	Recall the theoretical knowledge related to practical work.
CO2	Identify different types of saccharides, proteins and glycerol
CO3	Plan ways to identify types of saccharides, proteins and glycerol
CO4	Analyze types of saccharides, proteins and glycerol
CO5	Test and evaluate types of saccharides, proteins and glycerol
CO6	Express and write information about types of saccharides, proteins and glycerol

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3	PSO 4
CO1	3	3	2	2	2	3	2	1	2	2	2	3	2	2	3
CO2	3	3	2	2	2	3	2	1	2	2	2	3	2	2	3
CO3	2	2	1	3	2	2	2	1	2	2	2	3	2	2	3
CO4	2	2	1	3	2	2	2	1	2	2	2	3	2	3	3
CO5	3	3	2	3	2	3	2	1	2	2	2	3	2	2	3
CO6	3	3	2	3	2	3	2	1	2	2	2	3	2	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDC-302				
Course Name : Human Physiology-II				
Semester :3rd				
	L	T	P	C
	3	0	0	3

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To Understand the homoeostatic status of the human body

2. To Comprehend the physiological processes and functions of various vital organs as applicable to human nutrition

3. To Learn about malfunctioning of vital organs or systems

UNIT I

Introduction: Homoeostasis and bodyfluids. Blood:Red blood cells–Erythropoiesis,stages of differentiation, function, counts, physiological variation. Hemoglobin – structure, function, concentration, physiological variation. White blood cells – production, function, life span, counts, differential counts. Platelets – origin, normal count, morphology, functions. Plasma proteins – production, concentration, types, albumin, globulin, fibrinogen. Clotting factors, mechanism of clotting, disorders of clotting factors. Blood Bank, blood groups. Anticoagulants–examples and uses. Anaemia – classification – morphological and etiological effects of anaemia on body. Blood indices–colour index, MCH, MCV, MCHC. Erythrocytese dimentation rate (ESR). Blood volume – normal value, determination of blood volume and regulation of bloodvolume. Lymph –composition and function.

UNITII

Cardiovascular system: Heart – physiological anatomy, nerve supply, properties of cardiacmuscle, cardiac cycle – systole, diastole, conduction system. Cardiac output. Heart sounds: Normal heart sounds, areas of auscultation. Bloodpressure–Definition, normalvalue, clinical measurement of blood pressure. Physiological variations, regulation of heart rate, cardiacshock,hypotension,hypertension,radialpulse.HeartSounds–
Normalheartsounds,characteristicsandsignification(significance),heartrate.Electrocardiogram(ECG)–significance,coronary, cerebral circulation and capillary circulation

UNITIII

Digestive System: Physiological anatomy of gastro-intestinal tract, functions of digestive system. Salivary glands – structure and functions, deglutition, mastication – stages and regulation of saliva, functions of saliva. Stomach–structure and functions. Gastric secretion–composition, function, regulation of gastric juice secretion. Pancreas – structure, function,

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composition and regulation of pancreatic juice. Liver – functions of liver. Bile secretion - composition, function, regulation of bile secretion, bilirubin metabolism, types of bilirubin, jaundice – types, significance. Gall bladder – functions. Intestine – small intestine and large intestine. Small intestine - functions, digestion, absorption, movements. Large intestine – functions, Defecation

UNITIV

Respiratory System: Function of respiratory system - physiological anatomy of respiratory system, respiratory tract, respiratory muscles, respiratory organs – lungs, alveoli, respiratory membrane, stages of respiration. Mechanism of normal and rigorous respiration, intrapulmonary pleural pressure, surface tension. Transportation of respiratory gases:Transportation of O2: direction, pressure gradient, forms of transportation, oxygenation of haemoglobin, quantity of O2 transported. Lung volumes and capacities. Regulation of respiration, mechanisms of regulation, nervous and chemical regulation, respiratory centre. Hypoxia, cyanosis, asphyxia, dyspnoea, dysbarism, artificial respiration, apnoea

Books Recommended:

1. Guyton AC, Hall JE. Textbook of Medical Physiology, 9th Ed., Prism Books Pvt Ltd.,Bangalore,1996

2. Chatterjee C C. Human Physiology, Calcutta,WB,1988

3. Wilson. Anatomy and Physiology in Health and Illness, Edinburgh ChurchillLivingstone,1989

4. Sembulingam K, Sembulingam P. Essentials of medical physiology, Jaypee Bros. Medical Publ., New Delhi, 2012.

Course outcomes (COs): Upon successful completion of the course a student will be able to:

CO1	Understand the homoeostatic status of the human body
CO2	Comprehend the physiological processes and functions of various vital organs as applicable to human nutrition
CO3	Apply the knowledge of physiological states to therapeutic diets
CO4	Illustrate Cardiovascular system, Digestive System, and Respiratory System
CO5	Assess malfunctioning of vital organs or systems
CO6	Writ about Homoeostasis and body fluids, Cardiovascular system, Digestive System, and Respiratory System

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDL-302 (Lab)				
Course Name : Human Physiology- II (Lab)				
Semester :3rd				
	L	T	P	C
	0	0	2	1

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

- To learn how to record BP by different methods and variation of BP.
- To acquaint about with blood grouping and Haemoglobin estimation.
- To gain knowledge about histology of Cartilage, bone, adipose tissue, skin, muscle

Course Contents:

1. Record of blood pressure – Sphygmomanometer, palpatory method, auscultatory method, variation of BP
2. Determination of Pulse Rate in Resting condition and after exercise.
3. Determination of Bleeding Time (BT) and Clotting Time (CT).
4. Haemoglobin estimation

Books Recommended:

Tortora and Bryan: Anatomy and Physiology
Khurana: Anatomy and Physiology

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Recall the theoretical knowledge related to practical work.
CO2	Identify ways to record blood pressure by Sphygmomanometer, palpatory method, auscultatory method and variation of BP. Predict Haemoglobin estimation. blood grouping, histology of Cartilage, bone, adipose tissue, skin, muscle.
CO3	Apply information related to haemoglobin estimation. blood grouping, histology of Cartilage, bone, adipose tissue, skin, muscle and methods to measure blood pressure,
CO4	Analyse ways to measure blood pressure, estimation of Haemoglobin, blood grouping, histology of Cartilage, bone, adipose tissue, skin and muscle.
CO5	Evaluate methods to measure blood pressure, Haemoglobin estimation. blood grouping, histology of Cartilage, bone, adipose tissue, skin, muscle.
CO6	Write about methods to measure blood pressure, Haemoglobin estimation. blood grouping, histology of Cartilage, bone, adipose tissue, skin, muscle.

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3	PSO 4
CO1	3	3	2	2	2	3	2	1	2	2	2	3	2	2	3
CO2	3	3	2	2	2	3	2	1	2	2	2	3	2	2	3
CO3	2	2	1	3	2	2	2	1	2	2	2	3	2	2	3
CO4	2	2	1	3	2	2	2	1	2	2	2	3	2	3	3
CO5	3	3	2	3	2	3	2	1	2	2	2	3	2	2	3
CO6	3	3	2	3	2	3	2	1	2	2	2	3	2	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDC-303				
Course Name :Nutrition and Health Education				
Semester :3rd				
	L	**T**	**P**	**C**
	4	0	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. Comprehensive study on concept, objectives and importance of nutrition and health education.

2. To learn about principles behind health education, its communication process and steps, methods and evaluation of health and nutrition education programme.

UNIT 1 Concept, objectives and importance of nutrition and health education
UNIT 2 Principles of health education.
UNIT 3 Nutrition and health education communication process.
UNIT 4 Steps in planning health and nutrition education.
UNIT 5 Methods involved in nutrition and health education
UNIT 6 Evaluation of nutrition and health education programmes.

Books Recommended:

1. Nutrition and health education: Gullybaba
2. Health and Nutrition Education: Amit Sen

Course outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Define and have an overview on concept, objectives, principles and importance of Nutrition and health education. Communication process involved in nutrition and health education along with steps involved in planning, method involved and evaluation process for nutrition and health education programmes.
CO2	Discuss concept, objectives and importance of nutrition and health education. Explain principles behind health education, its communication process and steps, methods and evaluation of health and nutrition education programme.
CO3	Apply the knowledge related to nutrition health and education programmes which involve concept, objectives, principles, importance, communication process and planning as well as evaluation of these programme.
CO4	Illustrate the knowledge related to health and nutrition education.
CO5	Assess and discuss about the knowledge health and nutrition education.
CO6	Create innovative programme for health and nutrition education considering concept, objectives, principles and importance of Nutrition and health education.

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDE-301a				
Course Name: Bakery Management				
Semester: 3rd				
	L	T	P	C
	3	1	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: This course will enable the students to:

1. Understand basic concepts of baking.
2. Acquaint with the role of various major and minor ingredients in bakery products.
3. Familiarize with baking process and operation.
4. Learn the quality parameter of bakery products.

Course Content:

UNIT I

Introduction of bakery–definition, principles, types of baked and confectionary products. Major and minor equipment – required to start a small bakery unit. Major and minor ingredient in baking a) Major ingredients – flour, fat, sugar and leavening agent – types, role in bakery
b) Minor ingredients – milk, water, salt – types, role in bakery

UNIT II

BREAD

a) Principles involved in the yeast products preparation, methods – straight dough method, salt delayed method, no dough time method, sponge and dough method, ferment and dough method.
b) Processing – flying fermentation, bulk fermentation, knock back, dividing and rounding, intermediate proofing, molding and panning, final proofing, baking, depanning, cooling, slicing, packaging.
c) Faults and remedies in baked bread, types of bread improvers.

UNIT III

CAKE

a) Principles involved in the preparation of cake, sponge cake – types (fatless sponge, Genoese sponge, plain sponge, gel sponge).
b) Methods – sugar batter method, flour batter method, blending method, boiling method, sugar water method, all-in process method (slow speed, medium speed, fast speed), foaming method.
c) Faults and remedies in baked cakes.

UNIT IV

BISCUITS AND COOKIES

a) Principles involved in cookies preparation, methods for mixing cookies – single or one stage method, creaming or sugar batter method, blending or rub in method, foaming method, flour batter method.
b) Types – sheeted types, piped types, bar types, dropped types, rolled types

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i. Different between biscuits and cookies
ii. Faults and remedies in baked biscuits and cookies

UNIT V

PASTRIES and preparation Methods Pastries – types, short crust pastry – puff pastry – flaky pastry – philo (or) filo pastry – choure pastry – punish pastry – faults and their causes in making pastry.

Books Recommended

1. Textbook of bakery and confectionary by Sivalingam, Yogambai
2. Textbook of bakery and confectionary by Amit Kumar Gupta

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to preparation of bread, biscuits, pastries, cake, cookies and faults and remedies in baked products. Learn about bakery, equipments and ingredients required in bakery management.
CO2	Understand the concept of bakery–definition, principles, types of baked and confectionary products. Major and minor equipment – required to start a small bakery unit. Major and minor ingredient in baking a) Major ingredients – flour, fat, sugar and leavening agent – types, role in bakery b) Minor ingredients – milk, water, salt – types, role in bakery Preparation of bread, biscuits, pastries, cake, cookies and faults and remedies in baked products.
CO3	Discuss about bakery management, Principles involved in the yeast products preparation, methods – straight dough method, salt delayed method, no dough time method, sponge and dough method, ferment and dough method. b) Processing – flying fermentation, bulk fermentation, knock back, dividing and rounding, intermediate proofing, molding and panning, final proofing, baking, depanning, cooling, slicing, packaging. c) Faults and remedies in baked bread, types of bread improvers. Explain preparation of biscuits, pastries, cake, cookies and faults and remedies in baked products.
CO4	Apply the knowledge related to a) Principles involved in cookies preparation, methods for mixing cookies – single or one stage method, creaming or sugar batter method, blending or rub in method, foaming method, flour batter method. b) Types – sheeted types, piped types, bar types, dropped types, rolled types i. Different between biscuits and cookies ii. Faults and remedies in baked biscuits, cookies, bread, cake and pastries. Illustrate bakery management, Preparation of biscuit, cookies, bread, cake and pastries.
CO5	Evaluate the knowledge related to pastry classification and preparation, bakery management and preparation of biscuit, cookies, cake,bread etc.
CO6	Write about preparation of bread, biscuits, pastries, cake, cookies and faults and remedies in baked products. Learn about bakery, equipments and ingredients required in bakery management.

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CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	1	2	1	2	2	-	2	2	2	2	2	2	3	2	2	2
CO-2	2	1	2	2	2	-	2	2	2	2	2	2	2	2	1	2
CO-3	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-4	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2
CO-5	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-6	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDE-301b				
Course Name: Health and Fitness				
Semester: 3rd				
	L	T	P	C
	3	1	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: This course will enable the students to:

1. Understand about health and fitness.
2. Acquaint with the role of yoga, exercise and fitness
3. Familiarize with basic concepts of sports nutrition, special nutritional needs.

Course Content:

UNIT I

HEALTH - Definition of health and wellness – Factors affecting health and wellness. Physiological, psychological and social health.

UNIT II

FITNESS - Definition, parameters of fitness, cardiovascular endurance, muscular strength, muscular endurance, physical fitness tests- for flexibility.

UNIT III

YOGA AND FITNESS - principles of yoga therapy, social skills and living value based education. Yogic concepts in various diseases like diabetes, CVD, digestion and immune system.

UNIT IV

WARM UP EXERCISES & BASIC ASANAS - Simplified physical exercises and body stretching practices. Basic asanas, suryanamaskar, breathing exercise- pranayama

UNIT V

SPECIAL NUTRITION - Basic knowledge on sports nutrition, special nutritional needs for sea voyage, military and space.

Books Recommended

1. Exercise physiology,fitness and sports nutrition by B Srilakshmi, V Suganthi
2. Health and Fitness Education by Dr. Augustine George

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Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to sports nutrition, special nutritional needs for sea voyage, military and space, Warm up exercises and basic asanas, Health, yoga and fitness.
CO2	Understand the concept of special nutrition, sports nutrition, Simplified physical exercises and body stretching practices. Basic asanas, suryanamaskar, breathing exercise- pranayama, yoga fitness and health.
CO3	Discuss about principles of yoga therapy, social skills and living value based education. Yogic concepts in various diseases like diabetes, CVD, digestion and immune system, special nutrition, sports nutrition, warm up exercises and basic asanas, yoga, fitness and health.
CO4	Apply the knowledge related to Definition, parameters of fitness, cardiovascular endurance, muscular strength, muscular endurance, physical fitness tests- for flexibility, health, yoga asanas, warm up exercises, special nutrition.
CO5	Evaluate importance of health, fitness, yoga, its asanas, warm-up exercises, sports nutrition and special nutrition.
CO6	Write about sports nutrition, special nutritional needs for sea voyage, military and space, Warm up exercises and basic asanas, Health, yoga and fitness.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	1	2	1	2	2	-	2	2	2	2	2	2	3	2	2	2
CO-2	2	1	2	2	2	-	2	2	2	2	2	2	2	2	1	2
CO-3	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-4	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2
CO-5	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-6	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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intake. Nutrition modification in Diet.

Books Recommended

1. Nutrition Science by B Srilakshmi
2. Food and Nutrition by Pegasus Encyclopaedia Library

Course outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Memorize the concepts of Nutrition, Micro-nutrients, Macro-nutrients, Balanced Diet, introduction to complete digestive system of Human being, Meal planning for different age group, food guide pyramid.
CO2	Understand the concept related to nutrition, nutrients, their digestion, meal planning for different age group considering age appropriate factors.
CO3	Discuss about digestive system of human beings, balanced diet and nutrition, meal planning for pregnant and lactating, Infants and preschool children, school going children, adolescence, Adults and old age.
CO4	Apply the knowledge related to nutrition, meal planning for different age group and process of digestion among humans.
CO5	Evaluate the knowledge related to nutrition, meal planning for different age group, dietary guidelines, food guide pyramid, digestive system of human beings.
CO6	Write about nutrition, nutrients, dietary management and meal planning among different age group and digestive system of human beings.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	1	2	1	2	2	-	2	2	2	2	2	2	3	2	2	2
CO-2	2	1	2	2	2	-	2	2	2	2	2	2	2	2	1	2
CO-3	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-4	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2
CO-5	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-6	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDSC-301				
Course Name: Assessment of Nutritional Status				
Semester: 3rd				
	L	T	P	C
	2	0	0	2

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To gain the elementary knowledge about nutritional assessment through various methods like dietary assessment, biochemical tests, anthropometric assessment.
2. To know about clinical assessment of diseases.
3. To learn about different nutrition intervention programmes in India

Course content

UNIT -I Dietary assessment as part of nutritional status
UNIT -II Biochemical tests for the assessment of nutritional status
UNIT-III Anthropometric assessment of nutritional status
UNIT -IV Clinical assessment of diseases
UNIT -V Nutrition intervention programmes in India

Books recommended:

1. Nutrition assessment: Pamela Charney
2. Nutrition and health education: Gullybaba
3. Health and Nutrition Education: Amit Sen

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to nutritional status assessment by dietary assessment, Biochemical tests, Anthropometric assessment. Define clinical assessment of diseases and nutrition intervention programmes in India.
CO2	Understand the concept of nutrition status assessment by various methods and explain clinical assessment of diseases and nutrition intervention programmes in India.
CO3	Discuss about dietary assessment, Biochemical tests, Anthropometric assessment, clinical assessment of diseases and nutrition intervention programmes in India.
CO4	Apply the knowledge related to nutritional assessment and analyze nutrition intervention programmes in India.
CO5	Evaluate the knowledge related to nutritional assessment and assess nutrition intervention programmes in India.
CO6	Write about nutritional assessment and assess nutrition intervention programmes in India.

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDGE-301				
Course Name: Nutrition for the Family				
Semester: 3rd				
	L	T	P	C
	4	0	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: This course will enable the students to:

1. Understand the basic concepts of nutrition.
2. Understand the nutritional demands in various stages of life cycle.
3. Acquire skills in planning adequate meals in different stages of life cycle.

Course Content:

UNIT I

Nutrition, Micro-nutrients, Macro-nutrients, Balanced Diet, introduction to complete digestive system of human being, Meal planning, food guide pyramid.

UNIT II

Nutritional needs during Pregnancy– dietary guidelines; general dietary problems, Common Nutritional related problems and complications.
Nutrition during Lactation - Dietary guidelines for lactating women, Composition of Breast Milk.

UNIT III

Nutrition during Infancy and Preschool age - dietary guidelines for infants, advantages of breast feeding, disadvantages of bottle feeding; Weaning foods (definition) and types of supplementary food. Nutritional needs of Pre-school children, factors to be considered while planning meals for pre-school children. Food habits of Pre-School Children.

UNIT IV

Nutrition for School children and Adolescence - dietary guidelines, factors considered in planning packed lunch. School lunch feeding problems. Nutrition during Adolescence – general dietary guidelines; Dietary Problems (Eating Disorders)

UNIT V

Nutritional needs of Adults and Old Age - dietary guidelines for adults. Nutrition during Old age - physiological changes in ageing, psycho-social factors affecting food

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Semester-IV											
1.	DSC-I	FNDDC-401	Advanced Nutrition	3	-	-	3	15	15	70	100
2.	DSC-I	FNDDL-401 (Lab)	Advanced Nutrition-Lab	-	-	2	1	15	15	70	100
3.	DSC-II	FNDDC-402	Dietetics-II	3	-	-	3	15	15	70	100
4.	DSC-II	FNDDL-402 (Lab)	Dietetics- II (Lab)	-	-	2	1	15	15	70	100
5.	DSC-III	FNDDC-403	Applied Biochemistry	4	-	-	4	15	15	70	100
6.	DSE/Gen Elective	FNDDE-401a or FNDDE-401b/FNDGE-401	Food product development and Marketing Strategy/ Food standards and quality control/ Choose from a pool	3	1	-	4	15	15	70	100
7.	AEC	AEC– 4 (2)		2	-	-	2	15	15	70	100
8.	SEC/IAPC	FNDSC-401	Yoga Diet and Nutrition	2	-	-	2	15	15	70	100
9.	VAC-4		Choose one from a pool of VAC courses	2	-	-	2	15	15	70	100
							22	**Total**			**900**

In 4th Sem Student will opt 3 DSC, 1 DSE/generic, AEC, Skill/IAPC, VAC

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Course code :FNDDC-401				
Course Name :Advanced Nutrition				
Semester :4th				
	L	T	P	C
	3	0	0	3

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To gain knowledge about body composition and techniques to determine it.
2. Learn about energy metabolism, specific fuel factor and measurement of energy expenditure.
3. To develop an understanding about proteins and amino acids, their quality and methods of evaluating protein quality along with their therapeutic application.
4. To learn about non-nutritive food components with potential health effects
5. To understand bioavailability, analysis and interaction with other nutrients of minerals and vitamins.

Course Contents

UNIT I

Body Composition:

Concept of body composition, biochemical composition of body.

Techniques of body composition determination

i. Indirect Methods: Nutritional Anthropometry (Height, Weight and Skinfold Thickness)
ii. Calculation of body density: Archimedes's Principle, Calculation of body fat from body density. Relationship between body fat and body water& body water and body density.
iii. Dilution technique & calculation of indices of body composition, concept of body cell mass, lean body weight & fat free body.

UNIT II

Energy Metabolism: Principle of energy metabolism, units of energy measurements, measurement of energy requirement: direct and indirect calorimetry.

Specific fuel factor, Measurement of energy expenditure: BMR, thermic effect of feeding & physical activity, Factors affecting BMR, Oxygen consumption and heat output relationship, Respiratory Quotient, Factors affecting total energy requirements.

UNIT III

Proteins and amino acids: Protein quality and methods of evaluating protein quality. Assessment of Protein quality (BV, PER, NPU). Factors affecting protein bioavailability, Protein and amino acid requirements. Therapeutic application of specific amino acids: branch chain, glutamine, arginine, homo cysteine, cysteine and taurine.

UNIT IV

Non-nutritive food components with potential health effects: polyphenols, tannin, phytates, phytoestrogens, cyanogenic compounds lectins & saponins.

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UNIT V

Minerals and vitamins- bioavailability, analysis and interaction with other nutrients. Minerals: calcium, sodium, chloride, iron. Vitamins - ascorbic acid, biotin, A, D,E,K.

Books Recommended:

1. Advanced Nutrition: Dr. S. Nasreen and Dr. Humera Banu
2. Advanced Nutrition, Health and Fitness: Meenal Phadnis, Amita Baluapuri and Namita Jain

Course outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Memorize the concepts related to concept of body composition, biochemical composition of body, techniques of body composition determination, Energy Metabolism and its Principle, units of energy measurements, measurement of energy requirement, Specific fuel factor, Measurement of energy expenditure, Factors affecting total energy requirements. Proteins and amino acids quality and methods of evaluating protein quality. Factors affecting protein bioavailability, Protein and amino acid requirements. Therapeutic application of amino acids. Non-nutritive food components with potential health effects. Minerals and vitamins- bioavailability, analysis and interaction with other nutrients.
CO2	Learn to distinguish and relate various concepts like body composition, techniques of body composition determination, Energy metabolism, energy requirement, expenditure, protein and amino acid and their therapeutic application, Non-nutritive food components with potential health effects. Minerals and vitamins- bioavailability, analysis and interaction with other nutrients.
CO3	Apply the knowledge gained on body composition, techniques of body composition determination, Energy metabolism, energy requirement, expenditure, protein and amino acid and their therapeutic application, Non-nutritive food components with potential health effects. Minerals and vitamins- bioavailability, analysis and interaction with other nutrients.
CO4	Analyze the knowledge related to body composition, techniques of body composition determination, Energy metabolism, energy requirement, expenditure, protein and amino acid and their therapeutic application, Non-nutritive food components with potential health effects. Minerals and vitamins- bioavailability, analysis and interaction with other nutrients.
CO5	Evaluate the basic knowledge of body composition, techniques of body composition determination, Energy metabolism, energy requirement, expenditure, protein and amino acid and their therapeutic application, Non-nutritive food components with potential health effects. Minerals and vitamins- bioavailability, analysis and interaction with other nutrients.
CO6	Develop understanding about body composition, techniques of body composition determination, Energy metabolism, energy requirement, expenditure, protein and amino acid and their therapeutic application, Non-nutritive food components with potential health effects. Minerals and vitamins- bioavailability, analysis and interaction with other nutrients.

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDL-401 (Lab)				
Course Name :Advanced Nutrition-Lab				
Semester :4th				
	L	**T**	**P**	**C**
	0	0	2	1

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To learn about estimation of protein quality estimation, ASH content, crude fiber content in foods.

2. To Learn about chromatography.

Course Contents:

1. Estimation of Protein Quality using different methods. PER, BV, NPU etc.
2. Estimation of ASH content.
3. Estimation of moisture contents in foods.
4. Estimation of crude fiber contents in foods.
5. Chromatography

Books Recommended:

Advanced Nutrition: Dr. S. Nasreen and Dr. Humera Banu

Advanced Nutrition, Health and Fitness: Meenal Phadnis, Amita Baluapuri and Namita Jain

Course outcomes (COs):Upon successful completion of the course a student will be able to

CO1	Recall the theoretical knowledge related to practical work.
CO2	Predict ways to estimate protein quality, ASH content, moisture content, crude fiber content in foods. Understand about chromatography.
CO3	Apply ways to estimate protein quality, ASH content, moisture content, crude fiber content in foods. Learn use of chromatography.
CO4	Analyze protein quality, ASH content, moisture content and crude fiber content in foods. Learn use of chromatography.
CO5	Evaluate in food protein quality, ASH content, moisture content and crude fiber content in foods. Chromatography use.
CO6	Write about different ways to estimate protein quality, ASH content, moisture content, crude fiber content in foods. Interpret chromatography use.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDC-402				
Course Name : Dietetics-II				
Semester :4th				
	L	T	P	C
	3	0	0	3

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To know about adaptation of normal diet and progressive diet, nutritional support, dietary management in different types of diseases and health conditions.

2. To understand diet, nutrient and drug interaction effect of drugs on ingestion, digestion, absorption and metabolism of nutrients, effect of drug dose on food, nutrients and nutritional status.

Course Contents:

UNIT-I

Adaptation of normal diet, progressive diet - General & Modified Diets.
Nutritional support - special feeding methods.

UNIT-II

Incidence, Aetiology, clinical manifestation, complications, dietary management & counselling of following diseases.
a.) Surgery & burns, trauma.
b.) Gastro - intestinal: peptic ulcer, ulcerative colitis, diarrhoea, dysentery.
c.) Liver & Gall bladder: hepatitis, liver cirrhosis, hepatic coma, stone.
d.) Allergy

UNIT-III

Aetiology, clinical aberrations, complications, prevention and dietary management of:
a. cardiovascular diseases
b. Renal: ARF, CRF, nephritic syndrome, glomerulonephritis, renal stone, ESRD, dialysis, overview of kidney transplant.
c. Metabolic - (a) Diabetes b) Gout
d. Neurological disorders.

UNIT-IV

Disorders including inborn errors of metabolism & their nutritional management
Abnormal haemoglobin, thalassemia, deficiency of Blood clotting factor, Phenyl ketonuria, Albinism, Alkaptonuria, Galactosemia, Lactose intolerance, Tay- Sach's disease intolerance, Cretinism with goitre, Wilson's disease, Menke's disease.

UNIT V

Diet, nutrient and drug interaction: effect of drugs on ingestion, digestion, absorption and metabolism of nutrients, effect of drug dose on food, nutrients and nutritional status.

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Books Recommended:

Manual of Nutrition and Therapeutic Diet: T.K.Indrani
Principles of Therapeutic Nutrition and Dietetics: Avantina Sharma
Clinical Dietetics and Nutrition: F.P Antia

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to normal diet, progressive diet, special feeding methods, Incidence, Aetiology, clinical manifestation, complications, dietary management &counselling of diseases like Surgery & burns, trauma, Gastro - intestinal: peptic ulcer, ulcerative colitis, diarrhoea, dysentery, Liver & Gall bladder: hepatitis, liver cirrhosis, hepatic coma, stone, Allergy, cardiovascular diseases, Renal: ARF, CRF, nephritic syndrome, glomerulonephritis, renal stone, ESRD, dialysis, overview of kidney transplant. Metabolic - (a) Diabetes b) Gout, Neurological disorders. Disorders including inborn errors of metabolism & their nutritional management. Abnormal haemoglobin, thalassemia, deficiency of Blood clotting factor, Phenyl ketonuria, Albinism, Alkaptonuria, Galactosemia, Lactose intolerance, Tay- Sach's disease intolerance, Cretinism with goitre, Wilson's disease, Menke's disease. Diet, nutrient and drug interaction: effect of drugs on ingestion, digestion, absorption and metabolism of nutrients, effect of drug dose on food, nutrients and nutritional status.
CO2	Understand the knowledge related to normal diet, progressive diet and special feeding methods. Learn about incidence, etiology, clinical manifestation, complications, dietary management & counselling of specific diseases and disorders. Explain diet, nutrient and drug interaction: effect of drugs on ingestion, digestion, absorption and metabolism of nutrients, effect of drug dose on food, nutrients and nutritional status.
CO3	Apply the knowledge gained on normal diet, progressive diet, special feeding methods drug interaction with nutrients in digestion. Collect information on incidence, etiology, clinical manifestation, complications, dietary management & counselling of specific diseases and disorders.
CO4	Analyze the knowledge related to general & modified Diets, Nutritional support method, incidence, etiology, clinical manifestation, complications, dietary management & counselling of specific diseases and disorders, effect of drugs on ingestion, digestion, absorption and metabolism of nutrients, diet, nutrient and drug interaction.
CO5	Evaluate and conclude the knowledge related to general & modified Diets, Nutritional support method, incidence, etiology, clinical manifestation, complications, dietary management & counselling of specific diseases and disorders, effect of drugs on ingestion, digestion, absorption and metabolism of nutrients, effect of drug dose on food, nutrients and nutritional status.
CO6	Write about general & modified Diets, Nutritional support method, incidence, etiology, clinical manifestation, complications, dietary management & counselling of specific diseases and disorders, effect of drugs on ingestion, digestion, absorption and metabolism of nutrients, Diet, Nutrient and drug interaction

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDL-402 (Lab)				
Course Name :- Dietetics-II (Lab)				
Semester :4th				
	L	T	P	C
	0	0	2	1

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To plan diet and counsel for different therapeutic diets.
2. Prepare diet counselling aids for common disorders.

Course Contents:

1. Planning, Calculation, Preparation, evaluation & dietary counselling for therapeutic diets covered in theory.
2. Preparation of diet counseling aids for common disorders.

Books Recommended:

1. Manual of Nutrition and Therapeutic Diet: T.K.Indrani
2. Principles of Therapeutic Nutrition and Dietetics: Avantina Sharma
3. Clinical Dietetics and Nutrition: F.P Antia

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Recall the theoretical knowledge related to practical work.
CO2	Identify some therapeutic nutritional recipes.
CO3	Apply theoretical knowledge on planning and preparing teaching aids for counselling of several therapeutic conditions.
CO4	Plan diet for different therapeutic conditions covered in theory.
CO5	Evaluate different therapeutic conditions and plan diet for certain specified therapeutic conditions mentioned in theory
CO6	Prepare diet counselling aids for the different therapeutic patients.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3	PSO 4
CO1	3	3	2	2	2	3	2	1	2	2	2	3	2	2	3
CO2	3	3	2	2	2	3	2	1	2	2	2	3	2	2	3
CO3	2	2	1	3	2	2	2	1	2	2	2	3	2	2	3
CO4	2	2	1	3	2	2	2	1	2	2	2	3	2	3	3
CO5	3	3	2	3	2	3	2	1	2	2	2	3	2	2	3
CO6	3	3	2	3	2	3	2	1	2	2	2	3	2	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDC-403				
Course Name : Applied Biochemistry				
Semester :4th				
	L	**T**	**P**	**C**
	4	0	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To understand the concept of electrolytic dissociation.
2. To know about enzymes and hormones.
3. To learn about carbohydrate metabolism.

Course content

UNIT - I

Electrolytic dissociation - Acids, bases, salts, buffers, Henderson-Hasselbach equation. Theory indicators principles of measurement of pH.

UNIT - II

ENZYME: Enzymes as biological catalyst, IUB System of classification, mechanism of action of enzyme, metal ions, Enzyme's Kinetics Km & V max, equation. Line weaver Burk Plot. Physical factors altering enzyme activity, Enzyme inhibitors. Isoenzymes

UNIT III HORMONES:

Mechanism of action of hormones insulin: glucagon, epinephrine, thyroid and steroid.

UNIT – IV

Carbohydrate Metabolism: Fate of absorbed carbohydrates, Utilisation of Glucose, Regulation of blood glucose level, Transport of glucose into the cell.

Metabolism: glycogenesis and glycogenolysis, Glycolysis, citric acid cycle, Gluconeogenesis, pentose phosphate pathway (HMP Shunt)

Books Recommended:

1. Textbook of applied biochemistry and Nutrition and Dietetics: Harbans Lal
2. Applied biochemistry: Dr. Alok Rawat
3. Applied Bio-chemistry: Dr. Sherlin Varghese

Course outcomes (COs):Upon successful completion of the course a student will be able to:

CO1	Understand about electrolytic dissociation, Hasselbach equation, theory indicators principles of measurement of pH, enzymes, hormones carbohydrate metabolism.
CO2	Comprehend about **electrolytic dissociation of** acids, bases, salts, buffers, Henderson -Hasselbach equation, Theory indicators principles of measurement of pH, Enzymes as biological catalyst, their mechanism and classification, metal ions, Enzyme's Kinetics Km & V max, equation. Line

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	weaver Burk Plot. Physical factors altering enzyme activity, Enzyme inhibitors, Isoenzymes, Mechanism of action of hormones insulin: glucagon, epinephrine, thyroid and steroid, **Carbohydrate Metabolism:** Fate of absorbed carbohydrates, Utilisation of Glucose, Regulation of blood glucose level, Transport of glucose into the cell. Metabolism: glycogenesis and glycogenolysis, Glycolysis, citric acid cycle, Gluconeogenesis, pentose phosphate pathway (HMP Shunt)
CO3	Apply the knowledge related to electrolytic dissociation, Hasselbach equation, theory indicators principles of measurement of ph, enzymes, hormones carbohydrate metabolism.
CO4	Illustrate **electrolytic dissociation of** acids, bases, salts, buffers, Henderson -Hasselbach equation, principles of measurement of pH, enzymes, their classification and mechanism, factors altering enzyme activity, mechanism of hormones, carbohydrate metabolism.
CO5	Assess the information related to carbohydrate metabolism, enzymes and hormones activity/mechanism, electrolyte dissociation, Hasselbach equation, Theory indicators principles of measurement of pH.
CO6	Writ about **electrolytic dissociation of** acids, bases, salts, buffers, Henderson -Hasselbach equation, Theory indicators principles of measurement of pH, Enzymes as biological catalyst, their mechanism and classification, metal ions, Enzyme's Kinetics Km & V max equation. Line weaver Burk Plot. Physical factors altering enzyme activity, Enzyme inhibitors, Isoenzymes, Mechanism of action of hormones insulin: glucagon, epinephrine, thyroid and steroid, **Carbohydrate Metabolism:** Fate of absorbed carbohydrates, Utilisation of Glucose, Regulation of blood glucose level, Transport of glucose into the cell. Metabolism: glycogenesis and glycogenolysis, Glycolysis, citric acid cycle, Gluconeogenesis, pentose phosphate pathway (HMP Shunt)

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDE-401a				
Course Name: Food product development and Marketing Strategy				
Semester: 4th				
	L	**T**	**P**	**C**
	3	1	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: This course will enable the students to:

1. Develop new marketable, nutritionally and economically viable food products.
2. Develop entrepreneurship skills for setting up small scale food industries.
3. Understand packaging of different food products

Course Content:

UNIT I - FOOD CONSUMPTION PATTERN
Trends in food consumption pattern. Economical, Psychological and Sociological Dimensions of Food Consumption patterns. Trends in Social Change as a base for New Product Development

UNIT II - INTRODUCTION TO FOOD PROCESSING AND PRODUCT DEVELOPMENT
Food Components, Types of Food Processing, Status of Food Processing Industry in India and Scope of Growth in Future, Principles and Purpose of New Product Development, Product Design and Specifications.

UNIT III - RECIPE DEVELOPMENT
Traditional Foods, Weaning Foods, Convenience Foods, Extruded foods, IMF Foods, Speciality Products, Health foods, Nutritional Supplements, Functional Foods, Nutraceuticals and Designer Foods, Sports Foods, Foods for Defence Services, Space foods.

UNIT IV - TESTING, EVALUATION AND PACKAGING OF PRODUCTS
Standardization, Portion size, Portion Control, Quantity Cooking, Shelf Life Evaluation- Sensory and Microbial Testing of Processed Foods, Nutrient Analysis. Suitable Packaging Materials for Different Foods, SWOT Analysis

UNIT V - FINANCIAL MANAGEMENT AND MARKETING OF FOOD PRODUCTS
Institutional Support (Training and Finance) for Entrepreneurship Development. Financial Institutions (Central and State Government) banks/Funding Agencies, Market Research, Marketing Strategies, Cost Calculation, Advertising Methods, Product sales, Product License, Legal specifications, Consumer Behaviour and Food Acceptance.

Books Recommended

1. Food Product Operations by Parvinder S. Bali
2. Food Product Development by Avantina Sharma

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Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to food consumption pattern, food processing and product development, recipe development, testing, evaluation and packaging of products, Institutional Support (Training and Finance) for Entrepreneurship Development. Financial Institutions (Central and State Government) banks/Funding Agencies, Market Research, Marketing Strategies, Cost Calculation, Advertising Methods, Product sales, Product License, Legal specifications, Consumer Behaviour and Food Acceptance.
CO2	Understand the concept food consumption pattern, food processing and product development, recipe development, standardization, portion size, portion control, quantity cooking, shelf life, evaluation- sensory and microbial testing of processed foods, nutrient analysis, suitable packaging materials for different foods, swot analysis, financial management and marketing of food products.
CO3	Discuss about food consumption pattern, introduction to food processing and product development, traditional foods, weaning foods, convenience foods, extruded foods, IMF foods, speciality products, health foods, nutritional supplements, functional foods, nutraceuticals and designer foods, sports foods, foods for defence services, space foods, testing, evaluation and packaging of products, financial management and marketing of food products.
CO4	Apply the knowledge related to food consumption pattern, food components, types of food processing, status of food processing industry in India and scope of growth in future, principles and purpose of new product development, product design and specifications, recipe development, testing, evaluation and packaging of products, financial management and marketing of food products.
CO5	Evaluate the knowledge related to trends in food consumption pattern. Economical, Psychological and Sociological Dimensions of Food Consumption patterns. Trends in Social Change as a base for New Product Development, food processing and product development, recipe development, testing, evaluation and packaging of products, financial management and marketing of food products.
CO6	Write about food consumption pattern, food processing and product development, recipe development, testing, evaluation and packaging of products, financial management and marketing of food products.

CO-PO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO-1	1	2	1	2	2	-	2	2	2	2	2	2	3	2	2	2
CO-2	2	1	2	2	2	-	2	2	2	2	2	2	2	2	1	2
CO-3	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-4	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2
CO-5	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-6	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDE-401b				
Course Name: Food standards and quality control				
Semester: 4th				
	L	T	P	C
	3	1	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: This course will enable the students to:

1. To gain knowledge on food safety and food laws.
2. To study about quality control and common food standards.

Course Content:

UNIT-I

Quality Control: Objectives, Importance, functions of quality control, stages of quality control in food industry. Food Quality Assurance: Design of company quality assurance program, Microbiological concerns. Managing quality in supply chain and marketing of food products.

UNIT-II

Government Regulations In Quality Control: FAO/WHO codex Alimentarious commission, PFA, AGMARK, BIS, FPO, fair average quality (FAQ) specification for food grains, ISO 9000 series. HACCP: Background, current status, structured approach, principles, benefits and limitation. Consumer Protection Act (CPA)

UNIT-III

Food Standards: Cereals and products - bread, biscuits, cakes products.
Food Packaging: Food packaging and labelling various methods. Recent trends in Packaging and labelling.
Fruits Products: Jam, juices, squashes, ketchup, sauce.
Oils and Fats: Coconut oil, groundnut oil, palm oil, sunflower oil, vanaspati.
Milk and Products: Skimmed milk powder, partly skimmed milk powder, condensed sweetened milk. Other products - coffee, tea, sugar, honey, toffees.

UNIT-IV

Food Safety: Meaning of food safety
Importance of Food: Quality and safety for developing countries.
Patent: Definition, requirements, patent law in India, administrator, need for patent system, advantages, precautions to be taken by applicants, patent procedures, non-patentable.
Food Hazards: Physical, Chemical, Biological hazards associated with food types. Effect of processing and storage on microbial safety.

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UNIT-V

Food Adulterator: Adulteration of food - common adulterants and tests detect common adulterants.

Books Recommended

1. Food Safety and Quality Control by Pulkit Mathur
2. Objective Food Science and Safety Standards by Prabodh Halde and Sanjeev Kumar Sharma

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related quality control, government regulations in quality control, food standards, food packaging and labelling, recent trends in packaging and labelling. food safety, food adulterator: adulteration of food - common adulterants and tests detect common adulterants.
CO2	Understand the concept of food adulterator: adulteration of food - common adulterants and tests detect common adulterants, quality control, government regulations in quality control, food standards, food packaging and labelling, recent trends in packaging and labelling, food safety.
CO3	Discuss about food standards, food packaging and labelling, recent trends in packaging and labelling, food adulterator: adulteration of food - common adulterants, quality control, government regulations in quality control
CO4	Apply the knowledge related to government regulations in quality control, recent trends in packaging and labelling, quality control, food standards, food packaging and labelling, food safety, food adulterator: adulteration of food - common adulterants and tests detect common adulterants.
CO5	Evaluate the knowledge related to food quality control, packaging and labelling, food safety, adulteration in food, government regulations in quality control, recent trends in packaging and labelling
CO6	Write about quality control, government regulations in quality control, food standards, food packaging and labelling, recent trends in packaging and labelling. food safety, food adulterator: adulteration of food - common adulterants and tests detect common adulterants.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	1	2	1	2	2	-	2	2	2	2	2	2	3	2	2	2
CO-2	2	1	2	2	2	-	2	2	2	2	2	2	2	2	1	2
CO-3	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-4	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2
CO-5	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-6	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDGE-401				
Course Name: Maternal Nutrition				
Semester: 4th				
	L	**T**	**P**	**C**
	4	0	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: This course will enable the students to:

1. Knowledge on healthy diets of Indian Pregnant women and key nutrients during pregnancy.
2. Learn about appropriate weight gain for women during pregnancy.
3. Identify the role of nutrition in preventing and treating nutrition – related issues during pregnancy, such as, gestational diabetes, hypertensive disorders and iron deficiency anaemia.

Course Content:

UNIT-I

Pregnancy trimester and hormonal regulation, Growth of foetus, Psychological and Physiological changes (fluid balance, circulatory, respiratory, digestive, urinary, skeletal, skin and reproductive system changes, weight gain) during pregnancy, Immunization during pregnancy.

UNIT-II

Physiological complications during pregnancy, Ectopic pregnancy
Sign and symptoms: Morning sickness, Backache, Varicose veins, Leg cramps, Palpitation, Shortness of breath, Constipation, Itching in the genital area, Swollen hands and feet, Mood extremes
Gestational diabetes, Pregnancy induced hypertension (PIH), Thyroidism
Toxoplasmosis
Women with alcohol or drug addiction or eating disorders

UNIT-III

Nutritional Anaemia - Iron, Folic acid and Vitamin B12 deficiency anaemia Parasitic Infestation, Sickle cell anaemia and Thalassemia, Consequences of anaemia, Prevention
Maternal nutrition government policies and programmes.

UNIT-IV

Family planning and maternal health: Concept of family planning, Health aspect of family planning• Contraceptive methods (Concept, Advantages and disadvantages): Spacing• methods (Barrier, IUD, Hormonal, Post-conceptional), Terminal method (Male sterilization, Female sterilization)

Books Recommended

1. **The nutrition code for Pregnancy wellness and Breastfeeding by Dr Surabhi Jain**
2. **Textbook on Nutrition and Dietetics I Clement**

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Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to pregnancy trimester and hormonal regulation, Growth of foetus, Psychological and Physiological changes (fluid balance, circulatory, respiratory, digestive, urinary, skeletal, skin and reproductive system changes, weight gain) during pregnancy, Immunization during pregnancy, Physiological complications during pregnancy, Maternal nutrition government policies and programmes, Nutritional Anaemia, Family planning and maternal health.
CO2	Understand the concept of Family planning and maternal health, Nutritional Anaemia, Maternal nutrition government policies and programmes, Physiological complications during pregnancy, Pregnancy trimester and hormonal regulation, Immunization during pregnancy.
CO3	Discuss about Pregnancy trimester and hormonal regulation, Immunization during pregnancy, Family planning and maternal health, Nutritional Anaemia, Maternal nutrition government policies and programmes, Physiological complications during pregnancy.
CO4	Apply the knowledge related to Maternal nutrition government policies and programmes, Family planning, immunization during pregnancy, Pregnancy trimester and hormonal regulation, Nutritional Anaemia, Physiological complications during pregnancy.
CO5	Evaluate the knowledge related to Physiological complications during pregnancy, Pregnancy trimester and hormonal regulation, Immunization during pregnancy, Family planning and maternal health, Nutritional Anaemia, Maternal nutrition government policies and programmes.
CO6	Write about Pregnancy trimester and hormonal regulation, Immunization during pregnancy, Family planning and maternal health, Nutritional Anaemia, Maternal nutrition government policies and programmes, Physiological complications during pregnancy.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	1	2	1	2	2	-	2	2	2	2	2	2	3	2	2	2
CO-2	2	1	2	2	2	-	2	2	2	2	2	2	2	2	1	2
CO-3	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-4	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2
CO-5	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-6	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDSC-401				
Course Name: Yoga Diet and Nutrition				
Semester: 4th				
	L	T	P	C
	2	0	0	2

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are

1. Understand the concept of diet and the medical value of nutrition.
2. Advise the appropriate diet to different age groups.
3. Have an understanding about overeating and malnutrition.
4. Benefits and caloric value of various food groups.

UNIT –1: Yogic concept of diet & Nutrition

General Introduction of Ahara (Diet), Definition and Classification in Yogic diet according to traditional Yoga texts; Concepts of Diet according to Gheranda Samhita, Hatha Pradeepika and Bhagavad geeta; Pathya and Apathya in diet according to Yogic texts; Guna and Ahara; Importance of Yogic Diet in Yog Sadhana; Yogic Diet and its role in healthy living

UNIT –2: Dietetics in yoga

Classification according to triguna- vegetarian vs non-vegetarian, panchabhuta; relationships, rasavirya, Guna, Vipaka of shali, Yava, Godhuma, Mugda, Masha, Chanaka, patola; Surana, Mana, Kakkola, Shukashuka, Karkat, rambha, Balaramba, Mulak, Vartaki, Ridhi; Kalashaka, Vatraka, Himoocika; Navanita, Ghrta, Kshira, Sita, Aikshwam, Gudum, Pakvaramba; Varikellalm, Draksham, Lawali, Dhatri, Ela, Jati, Lavanga, Panasa; Jambu, Haritaki, Khajura, Madhu, Shunthi.

UNIT -3: Bio-molecules

Significance of Carbohydrate, Proteins, Lipids, Vitamins, Minerals and water in the body

UNIT -4: Nutrition-Basics

Nutrients, proximate principles of diet, balanced diet concept; Carbohydrates, proteins, fats sources, nutritive values, importance; Minerals-calcium, iron, phosphorus etc. Vitamins sources, roles, requirements

Text Books

- Ramesh Bijlani: Eating Wisely and Well, Rupa Publication India Pvt. Ltd, 2012
- Stanley David son & others: Human Nutrition & Dietetics, The English Language Book Society & Churchill Livings, Revised Edition
- Dennis Thompson: The Ayurvedic Diet, New age books, New Delhi, 2001
- Randolph Stone: A Purifing Diet, Lilawati Bhargav Charitable Trust, Delhi, Revised Edition

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Reference Books

1. Swami Digamber Ji & Others: Gheranda Samhita, Lonavala Institute, 1978
2. Gharote M L & others: Hatha Pradipika, The Lonavala Yoga Institute, Lonavala, 2006
3. Swami Mangal teertham : Synthetic approach to Diet & Nutrition, Deogarh Nutan Publication, Deogarh, 2005
1. Swami Gambhirananda: Bhagvat gita, Shri Ramkrishna Math, Madras SwamiMaheshananda & Others: Vasishta Samhita.

Course outcomes (CO):

Upon successful completion of the course a student will be able to

CO-1	Define the appropriate diet to different age groups.
CO-2	Understand the concept of diet and the medical value of nutrition.
CO-3	Relate overeating and malnutrition.
CO-4	Illustrate Benefits and caloric value of various food groups.
CO-5	Explain the basics of Nutrition.
CO-6	Developed Yogic concept Diet and Nutrition.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	3	2	1	2	1	1	2	2	2	2	2	2	3	2	2	2
CO-2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	1	2
CO-3	3	2	2	2	2	1	2	2	2	1	2	1	3	3	1	3
CO-4	2	2	2	1	2	2	1	1	2	2	2	2	3	2	1	2
CO-5	3	2	1	2	1	1	2	2	2	2	2	2	3	2	2	2
CO-6	2	1	2	2	2	1	2	2	2	2	2	2	2	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Semester-V										
DSC-I	FNDDC-501	Public Health	3	-	-	3	15	15	70	100
DSC-I	FNDDL-501 (Lab)	Public Health-Lab	-	-	2	1	15	15	70	100
DSC-II	FNDDC-502	Geriatric Nutrition	3	-	-	3	15	15	70	100
DSC-II	FNDDL-502 (Lab)	Geriatric Nutrition-Lab	-	-	2	1	15	15	70	100
DSC-III	FNDDC-503	Advances in Food Microbiology	4	-	-	4	15	15	70	100
Gen Elective	FNDGE-501	Choose from a pool/MOOC	4	-	-	4	15	15	70	100
DSE	FNDDE-501a or FNDDE-501b	Mushroom culture/ Food service management /Choose from Pool	3	1	-	4	15	15	70	100
SEC/IAPC	FNDSC-501/IAPC	Nutrition for health and fitness	2	-	-	2	15	15	70	100
						22	Total			800

Student will opt 3 DSC, 1 DSE, 1 Generic, 1 Skill/IAPC

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Course code :FNDDC-501				
Course Name :Public Health				
Semester :5th				
	L	T	P	C
	3	0	0	3

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To gain the elementary knowledge of health and importance of immunization.
2. To know about epidemiology, community water and waste management.
3. To learn about nature of communicable and infectious diseases.

Course Contents:

UNIT1: Health and Dimension of Health: Positive health Versus Absence of disease. Secondary Sources of Community Health data: Sources of relevant vital statistics of infant, child & maternal mortality rates

UNIT 2: Immunization: Importance and Immunization schedule for children, adults and for foreign travellers.
Concept of Epidemiology: Study of the epidemiologic approach-determinants of disease preventive & social means.

UNIT 3: Community Water and Waste Management: Importance of water to the community, Actiology and effects of toxic agents, water borne infectious agents, sources of water, safe drinking water, potable water, waste and waste disposal, sewage disposal and treatment, solid waste and disposal, liquid waste disposal.

UNIT 4: Nature of communicable and infectious diseases, infection, contamination, disinfections, decontamination, transmission-direct & indirect, vector borne disease infecting organisms and positive agents, environmental agents and epidemiological principles of disease control.

Books recommended:

1. Textbook of community nutrition: Dr. Suryatapa Das
2. A Textbook of public health nutrition: Dr. Archana Prabhat and Ms. Aswini

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Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to Health and dimension of Health, Immunization: Importance and Immunization schedule for children, adults and for foreign travellers, Study of the epidemiologic approach-determinants of disease preventive & social means, Community Water and Waste Management, Nature of communicable and infectious diseases.
CO2	Understand the concept related to infection, contamination, disinfections, decontamination, transmission-direct & indirect, vector borne disease infecting organisms and positive agents, environmental agents and epidemiological principles of disease control, Community Water and Waste Management, Concept of Epidemiology, Immunization, health and its dimension.
CO3	Discuss about Nature of communicable and infectious diseases, Importance of water to the community, Aetiology and effects of toxic agents, water borne infectious agents, sources of water, safe drinking water, potable water, waste and waste disposal, sewage disposal and treatment, solid waste and disposal, liquid waste disposal. Community Water and Waste Management, Concept of Epidemiology, Immunization, health and its dimension.
CO4	Apply the knowledge related to nature of communicable and infectious diseases, Community Water and Waste Management, Importance and Immunization schedule for children, adults and for foreign travellers, study of the epidemiologic approach-determinants of disease preventive & social means, Health and Dimension of Health
CO5	Evaluate the knowledge related to Positive health Versus Absence of disease. Secondary Sources of Community Health data: Sources of relevant vital statistics of infant, child & maternal mortality rates, Concept of Epidemiology, Immunization, Community Water and Waste Management, Immunization: Importance and Immunization schedule for children, adults and for foreign travellers, Concept of Epidemiology
CO6	Write about Health and dimension of Health, Immunization: Importance and Immunization schedule for children, adults and for foreign travellers, Study of the epidemiologic approach-determinants of disease preventive & social means, Community Water and Waste Management, Nature of communicable and infectious diseases.

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDL-501 (Lab)				
Course Name :- Public Health-Lab				
Semester :5th				
	L	T	P	C
	0	0	2	1

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To learn planning and preparation of A/V aids to provide health and nutrition education.
2. To plan recipe as per economic status of target group.

Course content:

1. Preparation of 3 audio visual aids like charts, posters, models related to health and nutrition education.
2. Formulation and preparation of low cost and medium cost nutritious/ supplementary recipe.

Books recommended:

1. Textbook of community nutrition: Dr. Suryatapa Das
2. A Textbook of public health nutrition: Dr. Archana Prabhat and Ms. Aswini

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to theory.
CO2	Understand the concept public health and nutrition, low cost nutritious food and supplementary recipes.
CO3	Discuss about planning of audio-visual aids for health and nutrition education.
CO4	Apply the knowledge related to health and nutrition education.
CO5	Evaluate the knowledge related to planning and preparation of A/V aids to provide health and nutrition education.
CO6	Prepare A/V aids considering economic status.

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDC-502				
Course Name : Geriatric Nutrition				
Semester :5th				
	L	T	P	C
	3	0	0	3

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. Understand the process of aging and the changes occurring there in.
2. Identify the nutritional implications of these changes in terms of nutrient and dietary requirements.
3. Determine different techniques of nutritional assessment of the elderly

Course Contents:

UNIT 1: Definition of ageing, senescence, old age or aged people, gerontology, geriatrics, and Geriatric nutrition. Classification of old population.

UNIT 2: Physiological and biochemical changes during old age.

UNIT 3: Assessment of nutritional status of older adults.

UNIT 4: Nutritional requirements and general dietary guidelines for elderly.

UNIT 5. Major nutritional and health problems during old age.

Books Recommended:

1. Sharma, O.P. (2005). Geriatric Care – A textbook of geriatrics and gerontology. Viva Books Private Limited, New Delhi.
2. Watson, R.R. (2001). Hand book of Nutrition in the Aged. (3rd ed). CRC Press, Washington, D.C.
3. Birren, J.E. (1996). Encylopedia of gerontology : age, aging and the aged. Vol 1 & 2. California, USA: Academic press, INC.
4. Bond, J., Coleman, P., & Peace, S. (Eds). (1993). Ageing in society. (2nd ed). London: SAGE publications Ltd.

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Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to ageing, geriatrics, and Geriatric nutrition, Classification of old population, Physiological and biochemical changes during old age, nutritional status of old age, nutritional requirement and dietary guideline for elderly, major nutritional and health problems during old age.
CO2	Understand the knowledge related to ageing, old age and classification of old population, gerontology, Physiological and biochemical changes during old age, old age nutritional assessment, nutritional requirement and dietary guideline for elderly, major nutritional and health problems during old age.
CO3	Apply the knowledge gained on old age/ageing and its classification, major nutritional and health problems during old age, old age nutritional assessment, nutritional requirement and dietary guideline for elderly, gerontology, Physiological and biochemical changes during old age.
CO4	Analyze the knowledge related to ageing, geriatrics, and Geriatric nutrition, Classification of old population, old age nutritional assessment, nutritional requirement and dietary guideline for elderly, major nutritional and health problems during old age, Physiological and biochemical changes during old age
CO5	Evaluate the knowledge related old age/ageing and its classification, major nutritional and health problems during old age, old age nutritional assessment, nutritional requirement and dietary guideline for elderly, gerontology, Physiological and biochemical changes during old age.
CO6	Write about ageing, geriatrics, and Geriatric nutrition, Classification of old population, Physiological and biochemical changes during old age, nutritional status of old age, nutritional requirement and dietary guideline for elderly, major nutritional and health problems during old age.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDL-502 (Lab)				
Course Name : GERIATRIC NUTRITION (Lab)				
Semester : 5th				
	L	**T**	**P**	**C**
	0	0	2	1

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. Understand the lifestyle of old age homes.
2. Learn to prepare dishes suitable for old person.
3. Determine different techniques of nutritional assessment of the elderly

Course contents:

1. Visit to old- age homes.
2. Preparation of dishes suitable for older person- soft, semisolid and easily digestible balanced diet.

Books Recommended:

1. Sharma, O.P. (2005). Geriatric Care – A textbook of geriatrics and gerontology. Viva Books Private Limited, New Delhi.
2. Watson, R.R. (2001). Hand book of Nutrition in the Aged. (3rd ed). CRC Press, Washington, D.C.
3. Birren, J.E. (1996). Encylopedia of gerontology : age, aging and the aged. Vol 1 & 2. California, USA: Academic press, INC.
4. Bond, J., Coleman, P., & Peace, S. (Eds). (1993). Ageing in society. (2nd ed). London: SAGE publications Ltd.

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to theory.
CO2	Understand the concept related to old age and their nutrition.
CO3	Discuss about old age health condition, life style/living condition and nutritional status along with diet.
CO4	Apply the knowledge related to old age by visiting to old age home and plan dishes of different types for old age people.
CO5	Evaluate old age home and condition of older living there in terms of health, nutrition etc.
CO6	Prepare old age home survey Performa and diets like soft, semi-solid and easily digestible balanced diet.

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDC-503				
Course Name : Advances in Food Microbiology				
Semester : 5th				
	L	T	P	C
	4	0	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To comprehend the importance of microorganism in food along with method of isolation and detection of microorganism in food or their products in food.
2. To understand about spoilage of food.
3. To know about food hazards, role of microbes in fermented and genetically modified foods, pro-biotics.

Course Contents:

UNIT I

Microorganism importance in food - Their classification, morphology, growth & reproduction, industrial importance.

Food as a substrate for microorganism - pH, moisture, oxidation- reduction potential, nutrient content, inhibitory substance & biological structure

UNIT II

Methods of isolation and detection of microorganism or their products in food.

1. Conventional methods
2. Rapid methods (Newer techniques)
3. Immunological Methods
4. Chemical Methods

UNIT III

Spoilage of Food:

a) Sources of contamination- soil, water, air, animal, plant, humans, sewage, equipment and handling.

b) Contamination, Spoilage and preservation of different food groups: cereal and cereal products, milk & milk products, vegetables. & fruits, meat & meat products, egg & poultry, fish & other sea foods, canned food.

UNIT IV

Food Hazards: food borne infections, food intoxication, symptoms and methods of prevention, investigation of food borne disease outbreak.

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UNIT V

Role of microbes in fermented and genetically modified foods.

Probiotics.

Books Recommended:

1. Food Microbiology: An Introduction by Adam M and Dick M.
2. Textbook of food microbiology: Virendra Kumar Pandey
3. Food Microbiology: K.Vijaya Ramesh

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to Microorganism importance in food, their classification, morphology, growth & reproduction, industrial importance. Food as a substrate for microorganism - pH, moisture, oxidation- reduction potential, nutrient content, inhibitory substance & biological structure. Methods of isolation and detection of microorganism or their products in food like Conventional methods, Rapid methods (Newer techniques), Immunological Methods, Chemical Methods, Spoilage of Food, Food Hazards, Role of microbes in fermented and genetically modified foods. Probiotics.
CO2	Understand the knowledge related to Microorganism: importance in food, their classification, morphology, growth & reproduction, industrial importance, Food as a substrate for microorganism, Methods of isolation and detection of microorganism or their products in food. Spoilage of Food, food borne infections, food intoxication, symptoms and methods of prevention, investigation of food borne disease outbreak. Role of microbes in fermented and genetically modified foods, Probiotics.
CO3	Apply the knowledge gained on Microorganism, their classification, morphology, growth & reproduction, industrial importance. Food as a substrate for microorganism, Methods of isolation and detection of microorganism or their products in food. Conventional methods, Rapid methods (Newer techniques), Immunological Methods, Chemical Methods, Spoilage of Food: Sources of contamination, Contamination, Spoilage and preservation of different food group, Food Hazards: food borne infections, food intoxication, symptoms and methods of prevention, investigation of food borne disease outbreak. Role of microbes in fermented and genetically modified foods. Probiotics.
CO4	Analyze the knowledge related to Microorganism importance in food, their classification, morphology, growth & reproduction, industrial importance. Food as a substrate for microorganism - pH, moisture, oxidation- reduction potential, nutrient content, inhibitory substance & biological structure. Methods of isolation and detection of microorganism or their products in food like Conventional methods, Rapid methods (Newer techniques), Immunological Methods, Chemical Methods, Spoilage of Food, Food Hazards, Role of microbes in fermented and genetically modified foods. Probiotics.
CO5	Evaluate the knowledge related to Microorganism, their classification, morphology,

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	growth & reproduction, industrial importance. Food as a substrate for microorganism, Methods of isolation and detection of microorganism or their products in food. Conventional methods, Rapid methods (Newer techniques), Immunological Methods, Chemical Methods, Spoilage of Food: Sources of contamination, Contamination, Spoilage and preservation of different food group, Food Hazards: food borne infections, food intoxication, symptoms and methods of prevention, investigation of food borne disease outbreak. Role of microbes in fermented and genetically modified foods. Pro-biotics.
CO6	Write about Microorganism, their classification, morphology, growth & reproduction, industrial importance. Food as a substrate for microorganism, Methods of isolation and detection of microorganism or their products in food. Conventional methods, Rapid methods (Newer techniques), Immunological Methods, Chemical Methods, Spoilage of Food: Sources of contamination, Contamination, Spoilage and preservation of different food group, Food Hazards: food borne infections, food intoxication, symptoms and methods of prevention, investigation of food borne disease outbreak. Role of microbes in fermented and genetically modified foods. Pro-biotics.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	-	1	-	1	1	-	1	1	2	2	2	2	2	2	3
CO2	2	2	2	-	2	2	-	1	2	2	2	2	2	2	2	3
CO3	3	2	2	1	2	2	-	1	2	2	2	2	2	2	2	3
CO4	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3
CO5	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2	3
CO6	3	3	3	2	2	2	2	2	3	2	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDGE-501				
Course Name: Food Preservation				
Semester: 5th				
	L	**T**	**P**	**C**
	4	0	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives:

To enable the students to:

1. Understand the principles of preservation.
2. Understand the type of spoilages and the various methods of preventing spoilage.
3. Learn about the methods of preservation.

UNIT-I

Principles of food preservation: Importance and principles of food preservation, Need for preservation, types of spoilage, role of micro organism in food spoilage, prevention of food spoilage, shelf life of food products, Factors affecting shelf life.

UNIT-II

Preservation by high osmotic pressure:

High concentration of sugar: Procedure for fruit jelly and jam, fruit preserves, failure to jelly and jam to set.

High concentration of salt: Pickling and Curing of meat.

Fermentation: Types, advantages and factors affecting fermentation.

UNIT-III

Preservation by use of high temperature: Factors affecting heat resistance, canning procedures, spoilage of canned foods, heat sterilization, pasteurization.

Preservation by use of low temperature: Refrigeration – Advantages, factors to be considered, common spoilage, Freezing, Difference between refrigeration and freezing, methods of freezing, steps involved in freezing, common food spoilage. Basic concepts about hurdle technology and membrane technology

UNIT-IV

Preservation by using chemicals: Definition, classification, mode of action, mechanism.

Food irradiation: Properties and safety of irradiation, advantages, mechanism permitted doses.

UNIT-V

Drying and dehydration: Home drying, methods of dehydration, factors in the control of drying, treatment of foods before drying, procedures after drying, intermediate moisture foods, merits and demerits, factors affecting drying.

Books Recommended

1. Srilakshmi. B; Food Science, 6th edition, New Age International (P) Limited Publishers, 2015.

2. Shakunthala Manay. N; ShadaksharaSwamy.M; Foods Facts and Principles, 3rd edition, New Age International (P) Limited Publishers, 2014.

3. Lillian Hoagland Meyer, Food chemistry, CBS Publishers and Distributors, 2004.

4. Subbulakshmi. G and Shobha. A.U; Food processing and preservation, New Age International (P) Limited Publishers, 2014.

5. Norman. N Potter, Joseph H. Hotchkiss, Food Science, 5th edition, CBS Publishers and Distributors, 1996.

6. Sivasankar. B; Food Processing and Preservation, PHI Learning Private Limited, 2011.

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Remember the principles of preservation, types of spoilage, methods to prevent spoilage and different methods of preservation
CO2	Understand the principles of preservation, types of spoilage, methods to prevent spoilage and different methods of preservation
CO3	Discuss the principles of preservation, types of spoilage, methods to prevent spoilage and different methods of preservation
CO4	Analyze the principles of preservation, types of spoilage, methods to prevent spoilage and different methods of preservation
CO5	Evaluate the principles of preservation, types of spoilage, methods to prevent spoilage and different methods of preservation
CO6	Express the principles of preservation, types of spoilage, methods to prevent spoilage and different methods of preservation

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CO-PO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO-1	1	2	1	2	2	-	2	2	2	2	2	2	3	2	2	2
CO-2	2	1	2	2	2	-	2	2	2	2	2	2	2	2	1	2
CO-3	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-4	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2
CO-5	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-6	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code: FNDDE-501a				
Course Name : Mushroom Culture				
Semester : 5th				
	L	T	P	C
	3	1	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course objectives: The objectives of this course are:

1. To enable the students to know about mushroom, its characteristics, classification and life cycle.
2. To make the students aware about nutritional and medicinal value of edible mushroom.
3. To familiarize the students with mushroom cultivation and its storage.

Course Contents:

Unit 1

Definition and characteristics of mushroom. Morphology and life cycle of Mushroom.

Unit 2

Identification and classification of mushroom

Nutritional and medicinal value of edible mushrooms; poisonous mushrooms

Types of edible mushrooms available in India- Volvariella volvacea, Pleurotus citrinopileatus, Agaricus bisporus.

Unit 3

Process of mushroom cultivation- Selection of Mushroom Species, Preparation of Substrate, Inoculation, Incubation, etc.

Unit 4

Storage and nutrition: short term storage (Refrigeration- upto 24 hours), long term storage (canning, pickles, papads), drying, storage in salt solutions.

Books Recommended:

1. Staff E(2007):Hand Book of Mushroom Cultivation, Processing and Packaging Import, Educa Books.
2. Pandey RK and Ghosh SK(1999): A Handbook Of Mushroom Cultivation, Emkay Publications.
3. Patil NN(2010):Mushroom : Cultivation, Processing and Uses, 1st Ed. Universal Prakashan.

Course outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Memorize the concepts related to mushroom, their identification and classification, process of mushroom cultivation, storage and nutrition
CO2	Understand the concept related to mushroom, its nutritive value, storage-short term and long term, identification and classification of edible and poisonous mushroom.
CO3	Discuss about nutritional and medicinal value of mushroom, their life cycle, cultivation process, classification and identification of mushroom, characteristics and morphology of mushroom.

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CO4	Apply the knowledge related to characteristics, morphology and lifecycle of mushroom, Identification and classification of mushroom, Nutritional and medicinal value of edible mushrooms, storage of mushroom
CO5	Evaluate nutritional and medicinal value of mushroom, their life cycle, cultivation process, classification and identification of mushroom, characteristics and morphology of mushroom.
CO6	Write about the concepts related to mushroom, their identification and classification, process of mushroom cultivation, storage and nutrition

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	3	2	1	2	1	1	2	2	2	2	1	2	3	2	2	2
CO-2	2	1	2	2	2	1	2	2	2	2	1	2	2	2	1	2
CO-3	3	2	2	2	2	1	2	2	2	1	1	2	3	3	1	3
CO-4	2	2	2	1	2	2	1	1	2	2	2	1	3	2	1	2
CO-5	3	2	2	2	2	1	2	2	2	1	1	2	3	3	1	3
CO-6	2	2	2	1	2	2	1	1	2	2	2	1	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDE-501b				
Course Name : Food Service Management				
Semester : 5th				
	L	T	P	C
	3	1	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course objectives: The objectives of this course are:

1. To enable the students to know planning a food service Unit and its management.
2. To make the students aware about institutional menu planning, personnel management and food unit sanitation and hygiene.

Course Contents:

UNIT 1

Organization of food service management: Definition, Various types of Food Service institutions, their characteristics and functions.

UNIT 2

Planning a food service unit, layout design, planning of different work areas – preparation, cleaning, storing, serving and dining areas. Lighting and ventilation, working heights in relation to equipment.

UNIT 3

Institutional Menu Planning: Factors influencing menu planning, principles of menu planning, different kinds of menus. Quality food Service – types-Centralized, de-centralized objectives. Styles of service.

UNIT 4

Importance of sanitation and hygiene in food, kitchen hygiene, Hygienic handling of Food, employee's health, hygiene of food service unit. Personnel Management- selection, training and supervision of personnel, criteria for selection of Dietitian and Food Service staff.

Books Recommended:

1. Khan MA (1987):Food Service Operations, Avi Publication Co.
2. Tompkins D(1969):Table Layout and Decoration, Ward Lock Co. Ltd.
3. Kinton R and CaseraniV(1989): The Theory of Catering, 6th Ed. ELBS.
4. Edward K(1997): Food Service Facilities Planning 3rd Ed, John Wiley & Sons.

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Course Outcomes (COs):

Upon successful completion of the course student will be able to:

CO1	Remember and define the basic concept related to Organization of food service management, Planning a food service unit, Institutional Menu Planning, Importance of sanitation and hygiene in food, kitchen hygiene, and personnel management.
CO2	Understand and explain organization of food service management: Definition, Various types of Food Service institutions, their characteristics and functions, Planning a food service unit, Institutional Menu Planning, Importance of sanitation and hygiene in food, kitchen hygiene, and personnel management.
CO3	Discuss and apply the knowledge related to Organization of food service management, Planning a food service unit, layout design, planning of different work areas – preparation, cleaning, storing, serving and dining areas. Lighting and ventilation, working heights in relation to equipment, Institutional Menu Planning, Importance of sanitation and hygiene in food, kitchen hygiene, and personnel management.
CO4	Analyze and conclude the information related to organization of food service management, Planning a food service unit, Institutional Menu Planning: Factors influencing menu planning, principles of menu planning, different kinds of menus. Quality food Service – types-Centralized, de-centralized objectives. Styles of service, Importance of sanitation and hygiene in food, kitchen hygiene, and personnel management.
CO5	Evaluate the knowledge with respect to Organization of food service management, Planning a food service unit, Institutional Menu Planning, Importance of sanitation and hygiene in food, kitchen hygiene, Hygienic handling of Food, employee's health, hygiene of food service unit. Personnel Management- selection, training and supervision of personnel, criteria for selection of Dietitian and Food Service staff.\
CO6	Express and Write about organization of food service management, Planning a food service unit, Institutional Menu Planning, Importance of sanitation and hygiene in food, kitchen hygiene, and personnel management

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	3
CO2	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	2
CO3	2	2	2	1	3	2	2	2	2	-	2	2	3	3	3	3
CO4	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	2
CO5	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	2
CO6	2	2	2	1	3	2	2	2	2	-	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDSC-501				
Course Name : Nutrition for Health and Fitness				
Semester : 5th				
	L	**T**	**P**	**C**
	2	**0**	**0**	**2**

L - Lecture T – Tutorial P – Practical C – Credit

Course objectives: The objectives of this course are:

1. To enable the students to know about fitness and health along with alternative systems like yoga and meditation.
2. To make the students aware about Nutrition in sports.
3. To familiarize the students with energy systems for endurance and power activity along with mobilization of fat stores during exercise.

Course Contents:

UNIT I

Definition, components of specific fitness and health status. Energy input & output, diet & Exercise. Nutrition, exercise, physical fitness & health inter-relationship.

UNIT II

Review of different energy systems for endurance and power activity shifts in carbohydrate and fat metabolism. Mobilization of fat stores during exercise.

UNIT III

Nutrition in sports: sports specific requirements. Diet manipulation, pre-game & Post game meal. Life style and dietary management of stress.

UNIT IV

Significance of Physical fitness, nutrition and prevention of weight control, obesity, CV disorder and diabetes.

UNIT V

Alternative systems for health and fitness like Yoga, meditation.

Books Recommended:

1. Nutrition for Health, Fitness and sports by Melvin H. Williams, Eric Rawson, and David Branch
2. Sports Nutrition: A Practice Manual for professionals by Marie Dunford.
3. Nutrition for sport and exercise by Marie Spano, Laura Kruskall and D. Travis Thomas
4. The complete Guide to Sports Nutrition by Anita Bean.

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Course Outcomes (COs):

Upon successful completion of the course student will be able to:

CO1	Remember and define the basic concept related to components of fitness and health status, Energy input & output, diet & Exercise, Nutrition, exercise, physical fitness & health inter-relationship, Review of different energy systems for endurance and power activity shifts in carbohydrate and fat metabolism. Mobilization of fat stores during exercise, Nutrition in sports. Diet manipulation, pre-game & Post game meal. Life style and dietary management of stress. Significance of Physical fitness, nutrition and prevention of weight control, obesity, CV disorder and diabetes, Alternative systems for health and fitness like Yoga, meditation.
CO2	Understand and Explain definition, components of specific fitness and health status. Energy input & output, diet & Exercise. Nutrition, exercise, physical fitness & health inter-relationship. Review of different energy systems for endurance and power activity shifts in carbohydrate and fat metabolism. Mobilization of fat stores during exercise. Nutrition in sports: sports specific requirements. Diet manipulation, pre-game & Post game meal. Life style and dietary management of stress. Significance of Physical fitness, nutrition and prevention of weight control, obesity, CV disorder and diabetes. Alternative systems for health and fitness like Yoga, meditation.
CO3	Discuss and apply the knowledge related to fitness and health,
CO4	Analyze and conclude the information related to food processing and preservation, packaging and labeling of foods, food laws and standard.
CO5	Evaluate the knowledge with respect to food preservation and processing, food packaging/labelling, food laws and standards
CO6	Express and Write about food laws and standards, food preservation and processing, food packaging/labelling.

CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	3
CO2	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	2
CO3	2	2	2	1	3	2	2	2	2	-	2	2	3	3	3	3
CO4	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	2
CO5	2	2	2	1	-	2	2	2	2	-	2	2	2	2	2	2
CO6	2	2	2	1	3	2	2	2	2	-	2	2	3	3	3	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Semester-VI											
1.	DSC-I	FNDDC-601	Diet Therapy	3	-	-	3	15	15	70	100
2.	DSC-I	FNDDL-601 (Lab)	Diet Therapy-Lab	-	-	2	1	15	15	70	100
3.	DSC-II	FNDDC-602	Diet counselling and Patient care	3	-	-	3	15	15	70	100
4.	DSC-II	FNDDL-602 (Lab)	Diet counselling and Patient care-Lab	-	-	2	1	15	15	70	100
5.	DSC-III	FNDDC-603	Nutritional Biochemistry	4	-	-	4	15	15	70	100
6.	Gen Elective	FNDGE-601	Choose from a pool	4	-	-	4	15	15	70	100
7.	DSE	FNDDE-601a/FNDDE-601b	Research methodology/Basics of Statistics	3	1	-	4	15	15	70	100
8.	SEC	FNDSC-601	Hospital food service administration	2	-	-	2	15	15	70	100
							22	**Total**			**800**

Student will opt 3 DSC, 1 DSE, 1 Generic, 1 Skill/IAPC

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Course code :FNDDC-601				
Course Name : Diet Therapy				
Semester :6th				
.	L	T	P	C
	3	0	0	3

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To know about energy modifications and nutritional care for weight management.

2. To gain the elementary knowledge of hypertension, anaemia, intestinal, pancreas, renal and liver diseases.

3. To learn dietary management of diseases.

Course Contents:

UNIT 1: Energy modifications and nutritional care for weight management: Assessment, aetiology, complications, prevention and treatment of obesity and underweight.
Etiological factors, symptoms, and management of common diseases of stomach-Gastritis and Peptic ulcer.

UNIT 2: Aetiology, symptoms, and management of intestinal diseases: Diarrhoea, steatorrhea, inflammatory bowel disease, Ulcerative Colitis, Flatulence, Constipation, irritable Bowel Syndrome.

UNIT 3: Diseases of the liver and Biliary System: Liver function tests. Actiology, symptoms, dietary care and general management of Viral Hepatitis and Cirrhosis of liver. Dietary care and management of Gall Bladder diseases –Cholecystitis and Cholelithiasis.
Anaemia: General concept, aetiology, classification, and dietary management of Nutritional anaemia.

UNIT 4: Diet in disease of the endocrine pancreas: Diabetes Mellitus: Classification, symptoms, diagnosis, management -insulin therapy, oral hypoglycaemic agents, glucose monitoring at home, dietary care and nutrition therapy, meal plan (with and without insulin), special diabetic foods and artificial sweeteners.

UNIT 5: Classification, aetiology, symptoms and dietary management of Hypertension, infarct, ischemia, angina pectoris, myocardial infarction, heart attack and stroke.
Renal Diseases: Aetiology, symptoms and dietary management of acute and chronic Glomerulonephritis. Nephrotic syndrome - dietary management. Uraemia-dietary Nephrolithiasis - dietary management. Use of sodium and potassium exchange list.

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Books Recommended:
Applied Nutrition and Dietetics: Ashisbala Mohapatra and Santoshini Jena
Advances in diet therapy: V Vimala
Manual of Nutrition and Therapeutic Diet: T. K. Indrani

Course outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Define energy modifications and nutritional care for weight management: Assessment, aetiology, complications, prevention and treatment of obesity and underweight, diseases of Stomach, intestine, liver, gall bladder, anemia, endocrine pancreas, hypertension and renal diseases.
CO2	Identify and discuss energy modifications and nutritional care for weight management: Assessment, aetiology, complications, prevention and treatment of obesity and underweight. Etiological factors, symptoms, and management of common diseases of stomach-Gastritis and Peptic ulcer, Diarrhoea, steatorrhea, inflammatory bowel disease, Ulcerative Colitis, Flatulence, Constipation, irritable Bowel Syndrome. Liver function tests, viral Hepatitis and Cirrhosis of liver. Dietary care and management of Gall Bladder diseases –Cholecystitis and Cholelithiasis, Anaemia, Diabetes Mellitus, Hypertension, heart attack/stroke and Renal Diseases
CO3	Enlist and explain modifications and nutritional care for weight management: Assessment, aetiology, complications, prevention and treatment of obesity and underweight, diseases of Stomach, intestine, liver, gall bladder, anemia, endocrine pancreas, hypertension and renal diseases.
CO4	Analyze aetiology, complications, prevention and treatment of obesity and underweight. Common diseases like Gastritis and Peptic ulcer, Diarrhoea, steatorrhea, inflammatory bowel disease, Ulcerative Colitis, Flatulence, Constipation, irritable Bowel Syndrome, Diseases of the liver and Biliary System, Gall Bladder diseases, Anaemia, Diabetes Mellitus, Hypertension and Renal Diseases.
CO5	Evaluate aetiology, complications, prevention and treatment of obesity and underweight. Common diseases like Gastritis and Peptic ulcer, Diarrhoea, steatorrhea, inflammatory bowel disease, Ulcerative Colitis, Flatulence, Constipation, irritable Bowel Syndrome, Diseases of the liver and Biliary System, Gall Bladder diseases, Anaemia, Diabetes Mellitus, Hypertension and Renal Diseases.
CO6	Write about energy modifications and nutritional care for weight management: Assessment, aetiology, complications, prevention and treatment of obesity and underweight, diseases of Stomach, intestine, liver, gall bladder, anemia, endocrine pancreas, hypertension and renal diseases.

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CO-PO, PSO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4
CO-1	2	2	2	1	2	2	1	1	2	2	1	2	3	2	1	2
CO-2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	1	2
CO-3	3	2	2	2	2	1	2	2	2	1	2	2	3	3	1	3
CO-4	2	2	2	1	2	2	1	1	2	2	1	2	3	2	1	2
CO-5	2	1	2	2	2	1	2	2	2	2	2	2	2	2	1	2
CO-6	3	2	2	2	2	1	2	2	2	1	2	2	3	3	1	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDL-601 (Lab)				
Course Name : Diet Therapy –Lab				
Semester :1st				
	L	T	P	C
	0	0	2	1

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

To plan diet for different economic levels and different age groups .

To prepare diet for different economic levels and different age groups .

Course Contents:

Planning and preparation of Diets for the following diseases:

i) Obesity and Underweight

ii) Diabetes mellitus

iii) Hypertension and Atherosclerosis

iv) Acute and chronic glomerulonephritis

Books Recommended:

1. Applied Nutrition and Dietetics: Ashisbala Mohapatra and Santoshini Jena
2. Advances in diet therapy: V Vimala
3. Manual of Nutrition and Therapeutic Diet: T. K. Indrani

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Recall the theoretical knowledge related to practical work.
CO2	Identify some nutritious recipes.
CO3	Plan diet for different diseases like obesity, underweight, diabetes mellitus etc.
CO4	Analyze different recipes for disease like renal diseases, hypertension, diabetes, obesity and underweight.
CO5	Evaluate diet for different diseases.
CO6	Write and prepare diet for different diseases.

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CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	2	2	2	1	2	2	1	1	2	2	1	2	3	2	1	2
CO-2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	1	2
CO-3	3	2	2	2	2	1	2	2	2	1	2	2	3	3	1	3
CO-4	2	2	2	1	2	2	1	1	2	2	1	2	3	2	1	2
CO-5	2	1	2	2	2	1	2	2	2	2	2	2	2	2	1	2
CO-6	3	2	2	2	2	1	2	2	2	1	2	2	3	3	1	3

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDC-602				
Course Name : Diet counselling and Patient care				
Semester : 6th				
	L	T	P	C
	3	0	0	3

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To understand concept of dietician, his role in hospital and community.
2. To comprehend about nutrition care process, nutrition assessment and nutrition diagnosis.
3. To learn about nutrition monitoring and evaluation.

Course content

UNIT1. Introduction to term Dietician: Definition of Dietician, Difference between registered dietician &Nutritionist
Role of dietician in hospital: work area of hospital dietician, role of dietician in hospital, Role of dietician in community- work area of community dietician, role of community dietician

UNIT 2: Introduction to Nutrition Care Process: Definition of Nutrition Care Process. Steps of Nutrition Care Process
UNIT 3: Nutrition Assessment - Definition, Nutrition assessment component, Critical thinking
Nutrition Diagnosis: nutrition diagnosis domain- intake, clinical, behavioural – environmental

UNIT 4: Nutrition diagnosis component- nutrition vs. medical diagnosis
Nutrition Interventions: Definition and objectives
Nutrition Monitoring & Evaluation: Definition, Nutrition monitoring & evaluation components, nutrition goals & objectives. Evaluation of nutrition care

Books Recommended:

1. Clinical Nutrition Handbook: Anita Jatana
2. Applied Nutrition and Dietetics: Ashisbala Mohapatra and Santoshini Jena
3. Essentials of nutrition and diet therapy: Sue Rodwell Williams and Eleanor D. Schlenker

Course outcomes (COs):Upon successful completion of the course a student will be able to:

CO1	Understand the concept related to dietician, difference between registered dietician &Nutritionist, role of dietician in community and hospital,

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	nutrition care process, Nutrition Assessment, Nutrition Diagnosis, Nutrition Interventions, Nutrition Monitoring & Evaluation, nutrition goals & objectives. Evaluation of nutrition care
CO2	Comprehend the concept related to dietician, difference between registered dietician &Nutritionist, role of dietician in community and hospital, nutrition care process, Nutrition Assessment, Nutrition Diagnosis, Nutrition Interventions, Nutrition Monitoring & Evaluation, nutrition goals & objectives. Evaluation of nutrition care.
CO3	Apply the knowledge related to concept related to nutrition Assessment, Nutrition Diagnosis, Nutrition Interventions, Nutrition Monitoring & Evaluation, nutrition goals & objectives. Evaluation of nutrition care dietician, difference between registered dietician &Nutritionist, role of dietician in community and hospital, nutrition care process.
CO4	Illustrate about definition of Dietician, Difference between registered dietician & Nutritionist, work area of hospital dietician, role of dietician in hospital, work area of community dietician, role of community dietician, Definition of Nutrition Care Process and its Steps, Nutrition assessment component, Critical thinking, nutrition diagnosis domain- intake, clinical, behavioural – environmental, nutrition vs. medical diagnosis, Nutrition Interventions, Nutrition Monitoring & Evaluation components, nutrition goals & objectives. Evaluation of nutrition care.
CO5	Assess the concept related to dietician, difference between registered dietician &Nutritionist, role of dietician in community and hospital, nutrition care process, Nutrition Assessment, Nutrition Diagnosis, Nutrition Interventions, Nutrition Monitoring & Evaluation, nutrition goals & objectives. Evaluation of nutrition care.
CO6	Writ about Dietician, Difference between registered dietician & Nutritionist, work area of hospital dietician, role of dietician in hospital, work area of community dietician, role of community dietician, Definition of Nutrition Care Process and its Steps, Nutrition assessment component, Critical thinking, nutrition diagnosis domain- intake, clinical, behavioural – environmental, nutrition vs. medical diagnosis, Nutrition Interventions, Nutrition Monitoring & Evaluation components, nutrition goals & objectives. Evaluation of nutrition care.

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CO-PO-PSO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	2	2	2	1	2	-	1	1	2	1	1	1	3	2	1	2
CO-2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	1	2
CO-3	3	2	2	2	2	1	2	2	2	1	2	2	3	3	1	3
CO-4	2	2	2	1	2	-	1	1	2	2	1	1	3	2	1	2
CO-5	2	2	2	1	2	-	1	1	2	2	1	1	3	2	1	2
CO-6	2	2	2	1	2	-	1	1	2	2	1	1	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code : FNDDL-602 (Lab)				
Course Name : Diet Counseling and Patient Care-Lab				
Semester :6th				
	L	T	P	C
	0	0	2	1

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. To do detailed case study of a patient.
2. To learn how to do counselling and intervention.
3. To report writing and presentation.

Course Contents:

1. Detailed study of a patient case (medical records, prescription, anthropometry, diet, etc.)
2. Evaluation of the patient's condition
3. Counseling and intervention
4. Result analysis
5. File submission and Presentation

OR

1. Project planning for any one disease.
2. Preparations of teaching aids in the field of nutrition.

Books recommended:

1. Clinical Nutrition Handbook: Anita Jatana
2. Applied Nutrition and Dietetics: Ashisbala Mohapatra and Santoshini Jena
3. Essentials of nutrition and diet therapy: Sue Rodwell Williams and Eleanor D. Schlenker

Course outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Recall the theoretical knowledge related to practical work.
CO2	Record medical records, prescription, anthropometry and diet etc of patient.
CO3	Estimate patient condition.
CO4	Carryout detailed study of patient along with evaluation of their condition.
CO5	Assess patient condition
CO6	Write result analysis and file report along with presentation.

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CO-P, PSO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	3	2	1	2	2	-	2	2	2	2	2	2	3	2	2	2
CO-2	2	1	2	2	2	-	2	2	2	2	2	2	2	2	1	2
CO-3	3	2	2	2	2	2	2	2	2	1	2	1	3	3	1	3
CO-4	2	2	2	1	2	-	1	1	2	2	2	2	3	2	1	2
CO-5	3	2	2	2	2	2	2	2	2	1	2	1	3	3	1	3
CO-6	2	2	2	1	2	-	1	1	2	2	2	2	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDC-603				
Course Name :Nutritional Biochemistry				
Semester :6th				
	L	T	P	C
	4	0	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. Comprehensive study on protein metabolism and lipid metabolism.
2. Study biological oxidation, vitamins and Minerals.

Course content:

UNIT 1: Protein metabolism- General reactions of amino acid Metabolism. Transamination, decarboxylation, oxidative & non- oxidative deamination of amino acids. Urea cycle and its regulation.
Purine and pyrimidines: synthesis and break down.
Nucleic acid: DNA replication and transcription, DNA repairs systems DNA recombinant Genetic mutation, regulation of gene expression and protein bio-synthesis.

UNIT 2: Lipids metabolism- Introduction, Role of liver and adipose tissues in lipid metabolism, Oxidation of fat: alpha, beta and omega oxidation. Energetics of fatty acids, Fatty acid biosynthesis. Lipid biosynthesis and synthesis of triglycerides. Essential Fatty Acids. Formation and Metabolism of ketone bodies. Metabolism of cholesterol and its regulation

UNIT 3: Biological Oxidation: Enzymes and Co-enzymes involved in Oxidation and Reduction. Respiratory chain: Organisation, Substrate Oxidation.

UNIT 4: Vitamins: Chemistry and biochemical role of fat-soluble vitamins. A. D. E. and K. Water soluble vitamins – B1, B2, B6 niacin and C.
Minerals: Biochemical role of inorganic elements

Books Recommended:

1. Basic and applied biochemistry, nutrition and dietetics by Sheila John and Jasmine Devaselvam
2. Applied Nutrition, dietetics and biochemistry by Clement
3. Applied nutrition including dietetics and applied biochemistry by Sreemathy Venkatraman and Sucheta P. Dendekar

Textbook of Nutrition and Biochemistry by Harbans Lal

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Course outcomes (COs):Upon successful completion of the course a student will be able to:

CO1	Define and have an overview of Protein metabolism, Lipids metabolism, Biological Oxidation, Vitamins and Minerals.
CO2	Develop understanding of general reactions of amino acid, Metabolism. Transamination, decarboxylation, oxidative & non- oxidative deamination of amino acids. Urea cycle and its regulation. Summarize synthesis and break down of purine and purimidines, DNA replication and transcription, DNA repairs systems DNA recombinant Genetic mutation, regulation of gene expression and protein bio-synthesis. Explain Lipids metabolism, Enzymes and Co-enzymes involved in Oxidation and Reduction. Respiratory chain: Organisation, Substrate Oxidation. Chemistry and biochemical role of fat-soluble vitamins. A. D. E. and K. Water soluble vitamins – B1, B2, B6 niacin and C. Minerals: Biochemical role of inorganic elements
CO3	Apply knowledge related to Protein metabolism, Purine and pyrimidines, Nucleic acid, Lipids metabolism, Biological Oxidation: Enzymes and Co-enzymes involved in Oxidation and Reduction. Respiratory chain: Organisation, Substrate Oxidation. Vitamins: Chemistry and biochemical role of fat-soluble vitamins. A. D. E. and K. Water soluble vitamins – B1, B2, B6 niacin and C. Minerals: Biochemical role of inorganic elements
CO4	Analyze general reactions of amino acid, Metabolism. Transamination, decarboxylation, oxidative & non- oxidative deamination of amino acids. Urea cycle and its regulation. Summarize synthesis and break down of purine and purimidines, DNA replication and transcription, DNA repairs systems DNA recombinant Genetic mutation, regulation of gene expression and protein bio-synthesis. Lipids metabolism, Enzymes and Co-enzymes involved in Oxidation and Reduction. Respiratory chain: Organisation, Substrate Oxidation. Chemistry and biochemical role of fat-soluble vitamins. A. D. E. and K. Water soluble vitamins – B1, B2, B6 niacin and C. Minerals: Biochemical role of inorganic elements
CO5	Evaluate and conclude about Protein metabolism, Lipids metabolism, Biological Oxidation, Vitamins Chemistry and biochemical role of fat-soluble vitamins. A. D. E. and K. Water soluble vitamins – B1, B2, B6 niacin and C. Minerals: Biochemical role of inorganic elements
CO6	Express and write your learning about Protein metabolism, Purine and pyrimidines, Nucleic acid, Lipids metabolism, Biological Oxidation: Enzymes and Co-enzymes involved in Oxidation and Reduction. Respiratory chain: Organisation, Substrate Oxidation. Vitamins: Chemistry and biochemical role of fat-soluble vitamins. A. D. E. and K. Water soluble vitamins – B1, B2, B6 niacin and C. Minerals: Biochemical role of inorganic elements

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CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	2	2	2	1	-	-	1	1	2	2	1	1	3	2	1	2
CO-2	2	1	2	2	1	1	2	2	2	2	2	2	2	2	1	2
CO-3	3	2	2	2	1	-	2	2	2	1	2	2	3	3	1	3
CO-4	2	2	2	1	1	1	1	1	2	2	1	1	3	2	1	2
CO-5	3	2	2	2	1	-	2	2	2	1	2	2	3	3	1	3
CO-6	2	2	2	1	1	1	1	1	2	2	1	1	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDGE-601				
Course Name: Community Nutrition and nutritional Deficiency				
Semester: 6th				
	L	**T**	**P**	**C**
	4	0	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: This course will enable the students to:

1. Understand the relationship between health, nutrition, community and society.
2. Understand the role of immunization in prevention of diseases.
3. learn signs and symptoms of various diseases and their dietary management

Course Content:

UNIT – I a. Relationship between health, nutrition, community and society. Role of public nutritionists in health care delivery.
b Programme Planning - Diagnosis of the situation, setting of objectives, suitability & implementation & evaluation. Policy analysis & operational Research.

UNIT-II A) Communicable diseases : surveillance & treatment, Control of communicable diseases in emergencies-role of immunization & sanitation.
B) PEM - Indications of malnutrition, clinical signs for screening acutemalnutrition. Indicators & cut-offs indicating seriously abnormal nutritionsituations: weight and height based indices and social indicators.

UNIT – III
Prevalence, causes, signs, symptom and dietary management:
A).Vitamin A deficiency
B).Vitamin B1deficiency
C) Vitamin D and calcium deficiency
D) Vitamin C deficiency

UNIT - IV
Prevalence, causes, signs, symptom and dietary management
a. Vitamin B12, iron, folic acid deficiency
b. Iodine deficiency
c. Flourosis

UNIT – V
A) Nutrition relief & rehabilitation.

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B) Food distribution strategy-identification & reaching the vulnerable group-targeting food aid.

Books Recommended

1. Nutrition and Health Education IGNOU and All Indian University
2. Text book of Food Science and Nutrition by Sunita Roy Chowdhury Bani Tamber Aeri

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Memorize the concepts related to health, nutrition, community and society, Communicable diseases and Nutrition relief & rehabilitation.
CO2	Understand the concept of health, nutrition, community and society, Communicable diseases and Nutrition relief & rehabilitation.
CO3	Discuss about health, nutrition, community and society, Communicable diseases and Nutrition relief & rehabilitation.
CO4	Apply the knowledge related to health, nutrition, community and society, Communicable diseases and Nutrition relief & rehabilitation.
CO5	Evaluate the knowledge related to health, nutrition, community and society, Communicable diseases and Nutrition relief & rehabilitation.
CO6	Write about health, nutrition, community and society, Communicable diseases and Nutrition relief & rehabilitation.

CO-PO Mapping

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	PSO 4
CO-1	1	2	1	2	2	-	2	2	2	2	2	2	3	2	2	2
CO-2	2	1	2	2	2	-	2	2	2	2	2	2	2	2	1	2
CO-3	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-4	-	2	2	1	2	-	1	1	2	2	1	2	3	2	1	2
CO-5	2	2	2	2	2	-	2	2	2	1	2	2	3	3	1	3
CO-6	-	2	2	1	2	-	1	1	2	2	-	2	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDE-601a				
Course Name: Research methodology				
Semester: 6th				
	L	T	P	C
	3	1	0	4

L - Lecture T – Tutorial P – Practical C - Credit

Course Objectives: The objectives of this course are:

1. Research and Research Design.
2. Methods of acquiring knowledge.
3. Sources of Data and data collection.

Course Content:

UNIT I

Methods of acquiring knowledge Research: Definition, nature, need and steps

UNIT II

Definition and identification of research problem, selection of a problem Nature, types and functions of hypothesis

UNIT III

Types of researches – Historical, survey and experimental Research Design – Definition, types, basic principles

UNIT IV

Population and sample Probability sampling Non-probability sampling
Sources of Data Data gathering instruments and techniques – interview, questionnaire, observation, case study, sociometry and projective techniques

UNIT V

Reliability and Validity, Report writing

Books Recommended:

1. Gupta, S.P., Statistical Methods, Sultan Chand and Sons, New Delhi,1994
2. Jain, Gopal Lal, Research Methodology, Methods, Tools and Techniques, Mangaldeep Publications, Jaipur,1998
3. Kothari, C.R.: An Introduction to Operational Research, Vikas Publishing House Pvt. Ltd, New Delhi,1994
4. Wright, Susan E., Social Science Statistics Allyn and Bacon Inc., London,1986

5. Wisniewski, Mik, Quantitative Methods for Decision Makers, Mcmillan India Ltd., New Delhi ,1986

Course Outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Define Research, research problem and its identification, methods of acquiring knowledge, selection of problem and describe need, and steps of research, types of researches, research design, sampling method, data collection instrument and techniques, validity and reliability of test; nature, types and functions of hypothesis and report writing.
CO2	Develop understanding about research, research problem and its types, research design, hypothesis, population and sampling and types of research, validity and reliability of test, sources of data and techniques for data gathering, report writing and method of acquiring knowledge.
CO3	Apply various concepts of research methodology for better understanding along with procedure of report writing .
CO4	Analyze different methods of acquiring knowledge and write about types of researches, sampling, sources of data and report writing.
CO5	Gain knowledge and conclude various steps involved in research method along with report writing and evaluate it
CO6	Write about different steps taken to conduct research as well as method of acquiring knowledge and procedure of report writing.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	3	2	1	2	1	1	2	2	2	2	1	2	3	2	2	2
CO-2	2	1	2	2	1	1	2	2	2	2	1	2	2	2	1	2
CO-3	3	2	2	2	1	2	2	2	2	1	2	2	3	3	1	3
CO-4	2	2	2	1	1	2	1	1	2	2	2	1	3	2	1	2
CO-5	3	2	1	2	1	1	2	2	2	2	1	2	3	2	2	2
CO-6	2	1	2	2	1	1	2	2	2	2	1	2	2	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDDE-601b				
Course Name: Basics of Statistics				
Semester: 6				
	L	**T**	**P**	**C**
	3	1	0	4

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives

The objectives of this course are:

1. To understand the significance of Statistics in research.
2. To learn about diagrammatic representation of data.
3. To learn about analysis of data and writing a research report.

Course Contents

UNIT I

Meaning and uses of statistics, classification and tabulation of data, Construction of frequency distribution table

UNIT II

Diagrammatic representation of data – single dimensional diagrams (line and bar), twodimensional diagram (pie) Graphical representation of data – graphs of frequency distribution (histogram, frequency polygon, frequency curve)

UNIT III

Measures of central tendency – mean, median, mode
Measures of dispersion – standard deviation
Calculation of chi square, t-test and correlation.

UNIT IV

Analysis of data, Writing a research report

Books Recommended

1. Gupta, S.P., Statistical Methods, Sultan Chand and Sons, New Delhi,1994
2. Jain, Gopal Lal, Research Methodology, Methods, Tools and Techniques, Mangaldeep Publications, Jaipur,1998
3. Kothari, C.R.: An Introduction to Operational Research, Vikas Publishing House Pvt. Ltd, New Delhi,1994
4. Wright, Susan E., Social Science Statistics Allyn and Bacon Inc., London,1986
5. Wisniewski, Mik, Quantitative Methods for Decision Makers, Mcmillan India Ltd., New Delhi,1986

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Course Outcomes (COs):

Upon successful completion of the course a student will be able to:

CO1	Define and explain statistics and it's uses, data classification and tabulation, diagrammatic and graphical representation of data, measures of central tendency and Standard deviation, calculation of chi square, t-test and correlation, analysis of data and report writing
CO2	Classify data and construct frequency distribution table, diagram and graphs based on data, describe statistics meaning and uses, measures of central tendency and SD, data analysis tests and research report writing
CO3	Use measures of central tendency and SD, graphs and diagrams, data analysis, classification and tabulation of data, data analysis in their research work along with writing a research report. Illustrate meaning and uses of statistics.
CO4	Learn about tabulation, analysis and diagrammatic of data as well as writing a research report. Analyze use of statistics, measures of central tendency and SD.
CO5	Conclude use of statistics in data presentation in tabular and diagrammatic form, data analysis, measures of central tendency and research report writing
CO6	Develop the understanding of 'significance of Statistics in research' and write about statistics, diagrammatic representation of data, measures of central tendency.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	3	2	1	2	1	1	2	2	2	2	1	2	3	2	2	2
CO-2	2	1	2	2	1	1	2	2	2	2	1	2	2	2	1	2
CO-3	3	2	2	2	1	2	2	2	2	1	2	2	3	3	1	3
CO-4	2	2	2	1	1	2	1	1	2	2	2	1	3	2	1	2
CO-5	3	2	1	2	1	1	2	2	2	2	1	2	3	2	2	2
CO-6	2	1	2	2	1	1	2	2	2	2	1	2	2	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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Course code :FNDSC-601				
Course Name: Hospital Food Service Administration				
Semester: 6				
	L	T	P	C
	2	0	0	2

L - Lecture T – Tutorial P – Practical C – Credit

Course Objectives: The objectives of this course are:

1. Gain knowledge in hospital functions and administration
2. Acquire skills in maintaining medical records
3. Understand the management of resources in hospitals

Course Content:

UNIT I

Hospital based health care and its changing scenario, Effects of globalization on health care, concepts of corporate hospitals in developing countries, infrastructure and layout of an ideal corporate hospital, functioning of modern, hospital and changing needs of patients, hospitality in hospital care

UNIT II

Patient Care Services Patient Admission / discharge, cafeteria and dietary services, front office services, housekeeping services, blood bank, diagnostic services, lab, physiotherapy, pharmacy operation theatre, outpatient and inpatient ward –admission

UNIT III

Principles of Hospital management Managerial activities for effective hospital functioning duties and responsibilities of hospital managers, qualities of office managers, effective inter and intra departmental co-ordination, understanding functioning of corporate multi specialty hospital

UNIT IV

Marketing and Material management, Human resource management, managerial accounting and financial management, importance of material management, principles of material management, inventory management. Types of computer systems used for reservation systems, point of sale systems (POS) and property management systems

UNIT V

Hospitality in hospital care Management of dietary department, diet planning for

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hospital diets, purchasing, storage and quantity food production, patient compliance, food production, serving to patient- tray and trolley service, plate waste management, washing and garbage disposal.

Books Recommended:

1. Hospital Administration and Management: A comprehensive Guide by Jaydeep Das Gupta
2. Food Service Management by Amitabh Ramachandran

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	Understand the Evolution and Impact of Hospital-Based Health Care. Comprehend the changing scenarios in hospital-based healthcare and the effects of globalization on healthcare systems, the role and growth of corporate hospitals in developing countries, infrastructure and layout requirements for an ideal corporate hospital, hospital and changing needs of patients, Principles of hospital management, functioning of Hospital managers, marketing and material management, human resource management, computer management. Hospitality in hospital care management of dietary department.
CO2	Understand the functioning of modern hospitals and the changing needs of patients, importance of hospitality in hospital care and its impact on patient satisfaction, diet planning for hospital diets, purchasing, storage and quantity food production, patient compliance, food production, serving to patient- tray and trolley service, plate waste management, washing and garbage disposal, Hospital-Based Health Care. Comprehend the changing scenarios in hospital-based healthcare and the effects of globalization on healthcare systems, the role and growth of corporate hospitals in developing countries, infrastructure and layout requirements for an ideal corporate hospital, functioning of Hospital managers, marketing and material management, human resource management, computer management.
CO3	Manage and apply the processes involved in hospitality in hospital care Management of dietary department, Marketing and Material management, Human resource management, managerial accounting and financial management, importance of material management, principles of material management, inventory management. Types of computer systems used for reservation systems, point of sale systems (POS) and property management systems, Principles of Hospital management Managerial activities for effective hospital Functioning, Patient Care Services, Hospital based health care and its changing scenario.

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CO4	Analyze managerial activities necessary for effective hospital functioning. Define the duties and responsibilities of hospital managers and the qualities required for successful office management, marketing and material management. Recognize the importance of effective inter and intra-departmental coordination. Analyze the functioning of corporate multi-specialty hospitals. Hospitality in hospital care Management of dietary department, Patient Care Services, Hospital based health care and its changing scenario.
CO5	Evaluate Patient Admission / discharge, cafeteria and dietary services, front office services, housekeeping services, blood bank, diagnostic services, lab, physiotherapy, pharmacy operation theatre, outpatient and inpatient ward –admission, Hospital based health care and its changing scenario, Principles of Hospital management, Marketing and Material management, Hospitality in hospital care Management of dietary department.
CO6	Write about Hospital based health care and its changing scenario, Effects of globalization on health care, concepts of corporate hospitals in developing countries, infrastructure and layout of an ideal corporate hospital, functioning of modern, hospital and changing needs of patients, hospitality in hospital care, Patient Care Services, Principles of Hospital management, Marketing and Material management, Hospitality in hospital care Management of dietary department.

CO-PO-PSO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1	2	2	2	1	2	1	1	1	2	1	1	1	3	2	1	2
CO-2	2	1	2	2	2	-	2	2	2	2	2	2	2	2	1	2
CO-3	3	2	2	2	2	1	2	2	2	1	1	1	3	3	1	3
CO-4	2	2	2	1	2	-	1	1	2	2	2	2	3	2	1	2
CO-5	3	2	2	2	2	1	2	2	2	1	1	1	3	3	1	3
CO-6	2	2	2	1	2	-	1	1	2	2	2	2	3	2	1	2

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

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