Programme Structure

Sharda School of Allied Health Sciences

Bachelors of Science
(Nutrition and Dietetics)

Programme Code: SAH0105

Batch: 2023-27

Sharda School of Allied Health Sciences
B.Sc. (Nutrition and Dietetics)
Batch: 2023-27
TERM: I

S. No.	Subject Code	Subjects	Teaching Load			Credits	Type of Course[1]: 1. CC 2. AECC 3. SEC 4. DSE
			L	T	P		
Theory							
1	BND132	Fundamental of Food and Nutrition	3	0	-	3	DSE
2	BND126	Human Anatomy and Physiology	4	0	-	4	CC
3	BND133	Environmental Science	3	0	-	3	OE
	BND134	Green Chemistry					
5	VAC103	Environmental Management	2	1	-	3	VAC
6	ARP 101	Communicative English-I	1	0	2	2	AEC
Practical							
1.	VOA101	Family Finance and Meal Management	3	0	-	3	SEC
2.	BND 164	Human Anatomy and Physiology (LAB)	-	-	2	1	CC
3.	BND 165	Cooking Skills and Healthy Recipes	-`	-	2	1	DSE
TOTAL CREDITS 20							

[1] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Programme Structure
Sharda School of Allied Health Sciences
B.Sc. (Nutrition and Dietetics)
Batch: 2023-27
TERM: II

S. No.	Subject Code	Subjects	Teaching Load			Credits	Type of Course[2]: 1. CC 2. AECC 3. SEC 4. DSE
			L	T	P		
Theory							
1	BND 127	Nutrition through life cycle	4	0	-	4	CC
3	BND135	Applied Chemistry	3	0	-	3	CC
4	BND136/137	Processing Technology of Cereals, Pulses Legumes and Oilseed/Food Science and Technology	3	0	-	3	OE
5	VOA 102	Nutrition and Health Education	1	1	2	3	SEC
6	VAC	VAC	2	1	0	3	VAC
7	ARP 102	Communicative English-II	1	0	2	2	AEC
Practical							
1	BND 166	Nutrition through life cycle Lab	-	-	2	1	CC
2	BND 167	Food Science and Technology Lab	-	-	2	1	CC
	Total Credits					20	

[2] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Programme Structure
Sharda School of Allied Health Sciences
B.Sc. (Nutrition and Dietetics)
Batch 2023-27
Term -III

S. No.	Subject Code	Subjects	Teaching Load			Credits	Type of Course[3]: 1. CC 2. AE CC 3. SEC 4. DSE
			L	T	P		
Theory							
1	BND 225	Basic Dietetics and Counselling	3	1	-	4	CC
3	BND 233	Nutritional Biochemistry -I	3	0	-	3	CC
4	BND234	Psychology	3	0	-	3	DSE
5	BND 235/235	Food Safety & Security / Food Sanitation & Hygiene	3	0	-	3	OE
6	VOA 103	Clinical case studies	-	1	4	3	SEC
7	ARP207	Logical Skills Building and Soft Skills	1	-	2	2	AEC
Practical							
1	BND272	Basic Dietetics and Counselling(LAB)	-	-	2	1	CC
2	BND273	Nutritional Biochemistry-I(LAB)	-	-	2	1	CC
3	RBL001	Research Based Learning (RBL)-1	-	-	-	0 (Audit)	DSE
4	BND274	Psychology (Lab)	-	-	2	1	CC
TOTAL CREDITS						21	

[3] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Programme Structure
Sharda School of Allied Health Sciences
B.Sc. (Nutrition and Dietetics)
Batch: 2023-27
TERM: IV

S. No.	Subject Code	Subjects	Teaching Load			Credits	Type of Course: 1.CC 2.AECC 3.SEC 4.DSE
			L	T	P		
Theory							
1	BND 237	Nutritional Biochemistry-II	3	-	-	3	CC
2	BND 231	Community nutrition	3	1	-	4	DSE
3	BND 232	Food Microbiology	3	1	-	4	CC
4	ARP305	Campus to Corporate	1	-	2	2	AEC
5	BND238/239	Bioethics and Health Management system/Nutrition Programme planning	3	0	-	3	OE
Practical							
1	BND274	Community nutrition (LAB)	-	-	2	1	DSE
2	BND275	Nutritional Biochemistry-II (LAB)	-	-	2	1	CC
3	RBL002	Research Based Learning (RBL)- 2	-	-	-	0(Audit)	Project
4	BND276	Food Microbiology Lab	-	-	2	1	CC
TOTAL CREDITS						19	

Programme Structure
Sharda School of Allied Health Sciences
B.Sc. (Nutrition and Dietetics)
Batch: 2023-27
TERM: V

S. No.	Subject Code	Subjects	Teaching Load			Credits	Type of Course[4]: 1.CC 2.AECC 3.SEC 4.DSE
			L	T	P		
Theory							
1	BND327	Food Service Management	2	1	-	3	CC
2	BND328	Therapeutic Nutrition-I	3	-	-	3	DSE
3	BND329	Nutrition for fitness	2	1	-	3	CC
4	BND330	Preventive Nutrition	2	1	-	3	CC
Practical							
5	BND368	Therapeutic Nutrition (LAB)	-	-	4	2	CC
6	RBL002	Research Based Learning (RBL)- 3	-	-	2	1	DSE
7.	BND369	FSIC (LAB)	-	-	4	2	CC
8	BND369	Food Service Management (LAB)	-	-	4	2	CC
9	BND370	Food Adulteration (LAB)	-	-	2	1	CC
TOTAL CREDITS						20	

[4] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Programme Structure
Sharda School of Allied Health Sciences
B.Sc. (Nutrition and Dietetics)
Batch: 2023-27
TERM: VI

S. No.	Subject Code	Subjects	Teaching Load			Credits	Type of Course[5]: 1.CC 2.AECC 3.SEC 4.DSE
			L	T	P		
Theory							
1	BND331	Therapeutic Nutrition-II	3	0	-	3	CC
2	BND332	Principles of Food Preservation	3	0	-	3	CC
3	BND333	Food Product Development & Sensory analysis	2	1	-	3	CC
4	BND334	Food Toxicity	2	1	-	3	OE
5	BND335	Food Analysis					
Practical							
5	BND371	Therapeutic Nutrition-II(LAB)	-	-	4	2	CC
6	BND372	Community Connect	-	-	4	2	Project
	BND373	Food Product Development & Sensory analysis			2	1	CC
	BND374	Food Preservation and Bakery (LAB)			4	2	CC
7.	RBL004	Research Based Learning (RBL)- 4	-	-	2	1	DSE
TOTAL CREDITS						20	

[5] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Programme Structure
Sharda School of Allied Health Sciences
B.Sc. (Nutrition and Dietetics Honours)
Batch: 2023-27
TERM: VII

S. No.	Subject Code	Subjects	Teaching Load			Credits	Type of Course[6]: 1.CC 2.AECC 3.SEC 4.DSE
			L	T	P		
Theory							
1	BND 411	Applied Physiology	3	1	-	4	DSE
2	BND 412	Advanced Nutritional Biochemistry and Instrumentation	3	0	-	3	DSE
3	BND 413	Nutrition Science	3	0	-	3	CC
4	BND 414	Food Chemistry	3	0	-	3	CC
5	BND 415	Human Development	3	1	-	4	OE
	BND 416	Early childhood education					
Practical							
6	BND 454	Advance Nutritional Biochemistry and Instrumentation - I(Lab)	-	-	2	1	DSE
7	BND455	Food Chemistry (LAB)	-	-	4	2	Cc
TOTAL CREDITS						20	

[6] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Programme Structure
Sharda School of Allied Health Sciences
B.Sc. (Nutrition and Dietetics Honours)
Batch: 2023-27
TERM: VIII

S. No.	Subject Code	Subjects	Teaching Load			Credits	Type of Course[7]: 1.CC 2.AEC 3.SEC 4.DSE
			L	T	P		
Theory							
1	BND405	Research Methodology and Biostats	3	0	-	3	CC
2	BND 406	Advance Food Microbiology and safety	3	0	-	3	CC
3	BND 407	Clinical Nutrition	3	0	-	3	CC
4	BND 408/409	Nutrition in Emergency and Disaster Management/ Nutrition for Maternal and Child Health	3	1	-	4	OE
5	BND 410	Public Health Nutrition	3	0	-	3	CC
Practical							
6	BND 456	Clinical Nutrition (Lab)	-	-	3	1.5	cc
7	BND 457	Advance Food Microbiology and Safety (Lab)	-	-	3	1.5	cc
8	BND 459	Nutritional Assessment	-	-	2	1	CC
TOTAL CREDITS						20	

[7] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Programme Structure
Sharda School of Allied Health Sciences
B.Sc. (Nutrition and Dietetics with Research)
Batch: 2023-27
TERM: VII

S. No.	Subject Code	Subjects	Teaching Load			Credits	Type of Course[8]: 1.CC 2.AECC 3.SEC 4.DSE
			L	T	P		
Theory							
1	BND 411	Applied Physiology	3	1	-	4	DSE
2	BND 412	Advanced Nutritional Biochemistry and Instrumentation	3	0	-	3	DSE
3	BND 413	Nutrition Science	3	0	-	3	CC
4	BND 414	Food Chemistry	3	0	-	3	CC
5	BND 415	Human Development	3	1	-	4	OE
	BND 416	Early childhood education					
Practical							
6	BND 454	Advance Nutritional Biochemistry and Instrumentation - I(Lab)	-	-	2	1	DSE
7	BND455	Food Chemistry (LAB)	-	-	4	2	Cc
8	BND456	Minor Project	-	-	6	3	
TOTAL CREDITS						23	

[8] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Programme Structure
Sharda School of Allied Health Sciences
B.Sc. (Nutrition and Dietetics with Research)
Batch: 2023-27
TERM: VIII

S. No.	Subject Code	Subjects	Teaching Load			Credits	Type of Course[10]: 1.CC 2.AECC 3.SEC 4.DSE
			L	T	P		
Theory							
1	BND 407	Clinical Nutrition	3	0	-	3	CC
2	BND 408/409	Nutrition in Emergency and Disaster Management/ Nutrition for Maternal and Child Health	3	1	-	4	OE
Practical							
1	BND 456	Clinical Nutrition (Lab)	-	-	2	1	CC
2		Project	-	-	18	9	
TOTAL CREDITS						23	

Course Modules

of

B.Sc. (Nutrition and Dietetics)

First Semester

Theory Subjects

School: SSAHS		**Batch :** 2023-27	
Programme: BND		**Current Academic Year: 2023-2024**	
Branch:		**Semester:** 1st Semester	
1	Course Code	BND 126	
2	Course Title	Human Anatomy and Physiology-I	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Major	
5	Course Objective	To understand the normal structure and functioning of various organ systems of the body and their interactions and to be able to comprehend the pathophysiology of commonly occurring diseases	
6	Course Outcomes	CO1: To identify the current state of knowledge about the functional organization of the human body. CO2: Summarise insight of normal functioning of all the organ systems of the body and their interactions. CO3: To discover the pathophysiology of commonly occurring diseases. CO4: Illustrate physiology with various disorders and their pathogenesis. CO5: Value of defence mechanism of human body. CO6: Develop knowledge gained to understand the disease development	
7	Course Description	The course in Physiology and Anatomy cover the first year is designed to give the students a depth knowledge of fundamental functions of different systems of human body. The major topics to be covered include the following: the cell, muscle& nervous tissue; blood; lymphoid tissues; respiratory system; blood vessels; circulation; heart; gastro intestinal tract; endocrine & Reproductive system, excretory system, central nervous system and special senses.	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Component of cell**	
	A	Components of cell, functions of cell organelles, transport across cell membrane, intercellular communication and body fluids , homeostasis & membrane potential. Cell structure, Tissues – structure and functions of various types of tissues.	CO1
	B	Structure , functions &classification of nerve tissues, physiological properties of nerve and nerve impulse & neuroglia	CO1
	C	Neuromuscular junction, Difference between skeletal muscle, smooth muscle & cardiac muscle.	CO1
	Unit 2	**Composition and functions of blood**	
	A	Composition & functions of blood, plasma proteins, blood volume & haemoglobin.	CO2

	B	Erythrocytes, jaundice, leucocytes & platelets. Blood coagulation, blood groups, blood transfusion, Rh factor, Haematocrit value, ESR, Lymph , RE system & immunity	CO1, CO3
	C	Blood coagulation, blood groups, blood transfusion, Rh factor, Haematocrit value, ESR, Lymph , RE system & immunity Bones and muscles anatomy	CO2,CO6
	Unit 3	**Circulatory System**	
	A	Cardiac Muscle , physiological anatomy of the heart & blood vessels, cardiac cycle.	CO3
	B	Conducting system of heart, Heart sounds & ECG Heart Rate, Cardiac Output, Blood Pressure & Pulse.	CO3
	C	Heart- structure and blood vessels	CO3,CO6
	Unit 4	**Respiratory System**	
	A	Physiological anatomy & functions of respiratory system , airways, dead space, graph of lung volume & capacities	CO4
	B	Transport of Gases	CO4
	C	Regulation of respiration & Hypoxia. Basic anatomy of respiratory system.	CO4
	Unit 5	**Digestive system**	
	A	Physiological anatomy and functions of GIT, Saliva , Mouth & Oesophagus.	CO5,CO6
	B	Stomach, Pancreas, Liver & Gall Bladder. digestive juices and their functions	CO5
	C	Small Intestine , Large Intestine , Digestion and Absorption in GIT.	CO5, CO6
	Mode of examination	Theory	

	Weightage Distribution	**CA**	**MTE**	**ETE**		
		15%	10%	75%		
	Text book/s*	• Text book of physiology- A.K. Jain • Essentials of medical physiology- K.Sembulingam				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	2	1	2	-	-
CO2	3	2	1	2	2	2	1	2	-	-

CO3	3	2	1	1	2	2	1	3	-	-
CO4	3	3	1	1	1	1	2	2	-	-
CO5	3	2	1	1	2	1	1	1	-	-
CO6	3	3	3	3	3	3	2	3	-	-

Theory Subjects

School: SSAHS		**Batch :** 2023-27	
Programme: BND		**Current Academic Year: 2023-2024**	
Branch:		**Semester:** 1st Semester	
1	Course Code	BND 132	
2	Course Title	Fundamental of Food & Nutrition	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Major	
5	Course Objective	To understand the basic knowledge of food chemistry, nutritive value of different foods , and role of macronutrient for energy contribution in body.	
6	Course Outcomes	CO1:Describe the basic concept of nutrients CO2: classify the food groups & summarise food pyramid CO3: Use of basic nutrients and their functions. CO4: Analyse the role of micronutrients in human body CO5: evaluate the role of protein in human body CO6: Design the skills to connect food utilization and health outcomes.	
7	Course Description	The course "Fundamentals of Food and Nutrition" aims at developing basic understanding about nutrition, its effect on human health and newer advances in food technology. This course encompasses physiological, biochemical and social aspects of food and discusses relationship between metabolites and human health. Moreover, the course is focused on the advances in the most emerging area of applied science of Nutraceuticals (where food is the medicine).	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Introduction to Nutrition**	
	A	Introduction to nutrition -Food as source of nutrients, functions of food, definition of nutrition, nutrients & energy, adequate, optimum & good nutrition, malnutrition.	CO 1
	B	Basic definition, function, classification and dietary sources of foods, nutrition and dietetics	CO1
	C	Concept of malnutrition, health, immunity by food and functions of food	CO1, CO6
	Unit 2	**Carbohydrates**	
	A	Carbohydrates: classification, food sources, storage in body.	CO2
	B	Carbohydrate: digestion and absorption	CO2
	C	Carbohydrate: Health Effects Regulation of the blood glucose level	CO2, CO6
	Unit 3	**Lipids and Proteins**	

	A	Lipids : Classification, health benefits of lipids Proteins : Classification and its role in body Proteins in Food				CO3
	B	Lipids and Proteins: Digestion, Absorption and transport				CO3
	C	Lipids: Role in body Protein Quality Evaluation				CO3, CO6
	Unit 4	**Role of Vitamins and mineral in body**				
	A	Functions, Sources, Bioavailability				CO4
	B	Deficiency Disease				CO4
	C	Deficiency Disease- Treatment and Prevention				CO3, CO6
	Unit 5	**Electrolyte balance**				
	A	Water - as a nutrient, function, sources				CO3,CO6
	B	Electrolyte Balance				CO4,CO6
	C	Acid base balance				CO3
	Mode of examination	Theory				
	Weightage Distribution	**CA**	**MTE**	**ETE**		
		15%	10%	75%		
	Text Book	Nutrition Science- B.Srilakshmi				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO2	PSO3
CO1	3	2	1	1	2	2	1	2	1	1
CO2	3	2	1	2	2	2	1	1	2	1
CO3	3	2	1	1	2	2	1	1	2	2
CO4	3	3	1	1	1	1	2	3	3	2
CO5	3	2	1	1	2	1	1	3	3	3
CO6	3	3	3	3	3	3	2	2	2	3

Theory Subjects

School: SSAHS		**Batch :** 2023-27	
Programme: BND		**Current Academic Year: 2023-2024**	
Branch:		**Semester:** 1st Semester	
1	Course Code	BND 133	
2	Course Title	Environmental Science	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1	
	Course Type	Minor	
5	Course Objective	To understand the basic knowledge of environment and chemistry, its implications, and energy resource conservation.	
6	Course Outcomes	CO1: Knowledge of environmental science and chemistry. CO2: Understand about atmosphere and its importance. CO3: Application of energy and resource conservation CO4: Analyse how environmental pollution effect the health CO5: Plan different instrumental techniques. CO6: Apply the knowledge gained in various environmental problems.	
7	Course Description	The goal of the **Environmental Science course** is to provide you with the **scientific** principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyse **environmental** problems both natural and human-made.	
8	**Outline syllabus**		CO Mapping
	Unit 1		
	A	Environmental Sciences – Relevance, Significance, Public awareness, Forest resources, Water resources, Mineral resources, Food resources. Ecosystem – concept, structure and function Biodiversity – Definition, genetic, species and ecosystem diversity, Values and uses of biodiversity	CO 1
	B	Definition of Environmental Chemistry-Concept and Scope of Environmental Chemistry, Definition and description of various terms -Contaminant, Pollutant, Sink, Aerosols, RSPM, Particulate matter, DO, COD, BOD, Toxicology, Toxins, Hazardous chemicals, Carcinogens, Sewage, Affluent, Effluents, Potability etc.	CO1, CO6

	C	Bio-geo chemical cycles in the environment: Carbon cycles, Oxygen cycle, Nitrogen cycles , Phosphorus cycles and Sulphur cycles. Chemistry of ozone layer, Ozone depletion - Causes and effects, Greenhouse effect, Major greenhouse gases- Causes and effects, Global warming; Acid rain- Causes and effects.	CO1
	Unit 2		
	A	Chemical composition of atmosphere- atmospheric water and CO2; ions and radicals in atmosphere, formation of particulate matter	CO2
	B	Photo-chemical and chemical reactions in the atmosphere, thermal inversion, particles in atmosphere,	CO2
	C	photochemical smog, acid rain, chemistry of ozone layer depletion; greenhouse gases and global warming.	CO2, CO6
	Unit 3		
	A	Renewable and non-renewable energy resources, growing energy need, sun as source of energy, solar radiation and its spectral characteristics, fossil fuels classification, composition. Physico-chemical characteristics and energy content of coal, petroleum and natural gas	CO3
	B	Principle of generation and conservation of conventional and non-conventional energy	CO3
	C	Energy from biomass and biogas, anaerobic digestion, energy use pattern and future need projection in different parts of the world, energy conservation policies.	CO3, CO6
	Unit 4		
	A	Environmental Pollution, Types and major sources of air pollutants, effects of air pollutants on physico-chemical and biological properties surrounding atmosphere, air borne diseases and their effects on health.	CO4
	B	Types and major sources of water pollutants, effects of water pollutants on physico-chemical and biological properties of water bodies, water borne diseases with special	CO4

		reference to water pollution.			
	C	Major sources of noise pollution, effects of noise pollution on health, noise level standard in industrial, commercial, residential and silence zones. Radioactive and thermal pollution sources and their effects on surrounding environment. Solid waste disposal and its effects on surrounding environment.			CO3, CO6
	Unit 5				
	A	Basic principle of Instrumentation and application			CO5, CO6
	B	Spectrophotometer – photometric laws			CO5, CO6
	C	Application of pH, conductivity meter and turbidity meter.			CO5, CO6
	Mode of Examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		15%	10%	75%	
	Text Book	• Agarwal, K.C.2001 Environmental Biology, Nidi Publ. Ltd. Bikaner. • Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd. , Ahmedabad — 380 013, India, Email: mapin@icenet.net • Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill lnc.480p 4. Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)			

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	3	2	2	2	2	2	-	-
CO2	1	1	3	2	1	2	2	2	-	-
CO3	2	2	3	1	2	2	2	1	-	-
CO4	1	2	3	2	2	2	2	3	-	-
CO5	3	2	3	1	3	1	1	1	-	-
CO6	3	2	2	1	2	3	1	2	-	-

Theory Subjects

School: SSAHS		**Batch :** 2023-27	
Programme: BND		**Current Academic Year: 2023-2024**	
Branch:		**Semester:** 1st Semester	
1	Course Code	BND 134	
2	Course Title	Green chemistry	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1	
	Course Type	Minor	
5	Course Objective	To understand the basic knowledge of environment and chemistry, its implications, and energy resource conservation.	
6	Course Outcomes	CO1: Knowledge of environmental science and chemistry. CO2: Understand about atmosphere and its importance. CO3: Application of energy and resource conservation CO4: Analyse how environmental pollution effect the health CO5: Plan different instrumental techniques. CO6: Apply the knowledge gained in various environmental problems.	
7	Course Description	The goal of the **Environmental Science course** is to provide you with the **scientific** principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyse **environmental** problems both natural and human-made.	
8	**Outline syllabus**		CO Mapping
	Unit 1		
	A	Environmental Sciences – Relevance, Significance, Public awareness, Forest resources, Water resources, Mineral resources, Food resources. Ecosystem – concept, structure and function Biodiversity – Definition, genetic, species and ecosystem diversity, Values and uses of biodiversity	CO 1
	B	Definition of Environmental Chemistry-Concept and Scope of Environmental Chemistry, Definition and description of various terms -Contaminant, Pollutant, Sink, Aerosols, RSPM, Particulate matter, DO, COD, BOD, Toxicology, Toxins, Hazardous chemicals, Carcinogens, Sewage, Affluent, Effluents, Potability etc.	CO1, CO6

	C	Bio-geo chemical cycles in the environment: Carbon cycles, Oxygen cycle, Nitrogen cycles , Phosphorus cycles and Sulphur cycles. Chemistry of ozone layer, Ozone depletion - Causes and effects, Greenhouse effect, Major greenhouse gases- Causes and effects, Global warming; Acid rain- Causes and effects.	CO1
	Unit 2		
	A	Chemical composition of atmosphere- atmospheric water and CO2; ions and radicals in atmosphere, formation of particulate matter	CO2
	B	Photo-chemical and chemical reactions in the atmosphere, thermal inversion, particles in atmosphere,	CO2
	C	photochemical smog, acid rain, chemistry of ozone layer depletion; greenhouse gases and global warming.	CO2, CO6
	Unit 3		
	A	Renewable and non-renewable energy resources, growing energy need, sun as source of energy, solar radiation and its spectral characteristics, fossil fuels classification, composition. Physico-chemical characteristics and energy content of coal, petroleum and natural gas	CO3
	B	Principle of generation and conservation of conventional and non-conventional energy	CO3
	C	Energy from biomass and biogas, anaerobic digestion, energy use pattern and future need projection in different parts of the world, energy conservation policies.	CO3, CO6
	Unit 4		
	A	Environmental Pollution, Types and major sources of air pollutants, effects of air pollutants on physico-chemical and biological properties surrounding atmosphere, air borne diseases and their effects on health.	CO4
	B	Types and major sources of water pollutants, effects of water pollutants on physico-	CO4

		chemical and biological properties of water bodies, water borne diseases with special reference to water pollution.				
	C	Major sources of noise pollution, effects of noise pollution on health, noise level standard in industrial, commercial, residential and silence zones. Radioactive and thermal pollution sources and their effects on surrounding environment. Solid waste disposal and its effects on surrounding environment.				CO3, CO6
	Unit 5					
	A	Basic principle of Instrumentation and application				CO5, CO6
	B	Spectrophotometer – photometric laws				CO5, CO6
	C	Application of pH, conductivity meter and turbidity meter.				CO5, CO6
	Mode of Examination	Theory				
	Weightage Distribution	CA	MTE	ETE		
		15%	10%	75%		
	Text Book	• Agarwal, K.C.2001 Environmental Biology, Nidi Publ. Ltd. Bikaner. • Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd. , Ahmedabad — 380 013, India, Email: mapin@icenet.net • Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill lnc.480p 4. Clark R.S., Marine Pollution, Clanderson Press Oxford (TB) •				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	3	2	2	2	2	2	-	-
CO2	1	1	3	2	1	2	2	2	-	-
CO3	2	2	3	1	2	2	2	1	-	-
CO4	1	2	3	2	2	2	2	3	-	-
CO5	3	2	3	1	3	1	1	1	-	-

CO6	3	2	2	1	2	3	1	2	-	-

Schools :SSAHS		Batch : 2023-2027 Academic Year: 2023-2024 Semester: I	
1	Course Code	ARP101	
2	Course Title	Communicative English-1	
3	Credits	2	
4	Contact Hours(L-T-P)	1-0-2	
5	Course Objective	To minimize the linguistic barriers that emerges invaried socio-linguistic environments through the use of English. Help students to understand different accents and standardise their existing English. Guide the students to hone the basic communication skills - listening, speaking, reading and writing while also uplifting their perception of themselves, giving them self-confidence and building positive attitude.	
6	Course Outcomes	CO1 Develop a better understanding of advanced grammar rules and write grammatically correct sentences CO2 Acquire wide vocabulary and punctuation rules and learn strategies for error-free communication. CO3 Interpret texts, pictures and improve both reading and writing skills which would help them in their academic as well as professional career CO4 Comprehend language and improve speaking skills in academic and social contexts CO5 Develop, share and maximise new ideas with the concept of brainstorming and the documentation of key critical thoughts articulated towards preparing for a career based on their potentials and availability of opportunities. CO6 Function effectively in multi-disciplinary teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality	
7	Course Description	The course is designed to equip students, who are at a very basic level of language comprehension, to communicate and work with ease in varied workplace environment. The course begins with basic grammar structure and pronunciation patterns, leading up to apprehension of oneself through written and verbal expression as a first step towards greater employability.	
8	Outline syllabus – ARP 101		
	Unit A	**Sentence Structure**	**CO Mapping**
	Topic 1	Subject Verb Agreement	CO1
	Topic2	Parts of speech	
	Topic3	Writing well-formed sentences	
	Unit B	**Vocabulary Building & Punctuation**	
	Topic 1	Homonyms/ homophones, Synonyms/Antonyms	CO1,

			CO2
	Topic2	Punctuation/ Spellings (Prefixes-suffixes/Unjumbled Words)	CO1, CO2
	Topic3	Conjunctions/Compound Sentences	CO1, CO2
	Unit C	**Writing Skills**	
	Topic 1	Picture Description – Student Group Activity	CO3
	Topic2	Positive Thinking - Dead Poets Society-Full-length feature film -Paragraph Writing inculcating the positive attitude of a learner through the movie | SWOT Analysis – Know yourself	CO3, CO2, CO3
	Topic3	Story Completion Exercise –Building positive attitude - The Man from Earth (Watching a Full length Feature Film)	CO2, CO3
	Topic 4	Digital Literacy | Effective Use of Social Media	CO3
	Unit D	**Speaking Skill**	
	Topic 1	Self-introduction/Greeting/Meeting people – Self branding	CO4
	Topic2	Describing people and situations - To Sir With Love (Watching a Full length Feature Film)	CO4
	Topic3	Dialogues/conversations (Situation based Role Plays)	CO4
	Unit E	**Professional Skills | Career Skills**	
	Topic 1	Exploring Career Opportunities	CO4, CO5
	Topic2	Brainstorming Techniques & Models	CO4, CO5
	Topic3	Social and Cultural Etiquettes	CO4, CO5
	Topic4	Internal Communication	CO4, CO5
	Unit F	**Leadership and Management Skills**	
9	Evaluations	*Class Assignments/Free Speech Exercises / JAM Group Presentations/Problem Solving Scenarios/GD/Simulations (60% CA and 40% ETE*	*N/A*
10	Texts & References | Library Links	• Blum, M. Rosen. *How to Build Better Vocabulary*. London: Bloomsbury Publication • Comfort, Jeremy (et.al). *Speaking Effectively*. Cambridge University Press	

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
ARP101.1	-	-	-	-	-	-	-	-	1	3		2	-	-	-
ARP101.2	-	-	-	-	-	-	-	-	1	3		2	-	-	-
ARP101.3	-	-	-	-	-	-	-	-	1	3		2	-	-	-
ARP101.4	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP101.5	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP101.6	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-

Practical Subjects

School: SSAHS		**Batch :** 2023-27	
Programme: BND		**Current Academic Year: 2023-2024**	
Branch:		**Semester:** 1st Semester	
1	Course Code	VOA 101	
2	Course Title	Family Finance and Meal Management	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Type	Vocational	
5	Course Objective	To understand family values, income and imparting knowledge and skills needed to effectively manage recourses.	
6	Course Outcomes	CO1: Describe concept of family income and expenditure CO2: understand concept of first aid CO3: Apply the Knowledge of basic principles of meal planning CO4: Illustrate different principles of resource management CO5: Evaluate the concept of consumer aid. CO6: Develop knowledge gained from planning and first aids.	
7	Course Description	Develop a philosophy of why *meal* preparation and consumption at the *family* table is an important component in development and stability of *families*.	
8	**Outline syllabus**		**CO Mapping**
	Unit 1	**Concept of family and family income**	
	A	Concept of family income, meaning of household records. Money management: Types of income - management process applicable to money - planning, controlling and evaluating	CO 1
	B	Meaning of saving need of saving, benefits of saving hearing of investment, methods of investment	CO1. CO6
	C	Meaning of saving need of saving, benefits of saving hearing of investment, methods of investment	CO1, CO6
	Unit 2	**Family Values**	
	A	Family values - Components, structure and responsibilities of family - Neutralization of anger	CO2
	B	Threats of family life - Status of women in family and society	CO2, CO6
	C	Caring for needy and elderly - Time allotment for sharing ideas and concerns.	CO2
	Unit 3	**Meal Planning**	
	A	Meal Planning, Importance of meal planning	CO3,CO6
	B	Planning meal for family	CO3, CO6

	C	Meal modification for special conditions.	CO3, CO6
	Unit 4	**Recourse Management**	
	A	PRINCIPLES OF RESOURCE MANAGEMENT Definition, Management Process - planning, controlling evaluating goals, values and standards.	CO4
	B	Decision making: concepts, types of decisions, steps in decision making, methods of resolving conflicts. Resource Management - Classification, characteristics, factors affecting the use of resources.	CO4
	C	Time management - Time norms, plans and time management. Energy management - Fatigue - types and causes of fatigue - principles and techniques Mundel's class of changes - work simplification	CO3, CO6
	Unit 5	**Consumer Education**	
	A	**Consumer Education –** Definition of consumer, problem faced by consumer, importance of consumer of education, rights & responsibility of consumer.	CO5
	B	**Consumer Aids-** Different types of consumer aid	CO5
	C	Consumer Rights	CO5, CO6
	Mode of examination	Theory	
	Weightage Distribution	CA: 25% / CE: 25% / ETE: 50%	
	Text Book	Text Book of Home Science- Asha Das, Puja Gupta Text Book of Dietetics- B. Srilakshmi	

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	3	2	2	2	2	3	-	-
CO2	1	1	3	2	1	2	2	3	-	-
CO3	2	2	3	1	2	2	2	1	-	-
CO4	1	2	3	2	2	2	2	2	-	-

CO5	3	2	3	1	3	1	1	2	-	-
CO6	3	2	3	1	3	1	1	2	-	-

Practical Subject

School: SSAHS		**Batch :** 2023-27
Programme: BND		**Current Academic Year: 2023-2024**
Branch:		**Semester:1st semester**
1	Course Code	BND 164
2	Course Title	Human Anatomy and Physiology-I
3	Credits	2
4	Contact Hours (L-T-P)	0-0-4
	Course Status	Major Practical

5	Course Objective	To understand the normal structure and functioning of various organ systems of the body and their interactions and to be able to comprehend the pathophysiology of commonly occurring diseases			
6	Course Outcomes	CO1: knowledge of the use of compound microscope CO2: understand the estimation of haemoglobin concentration CO3: application of the estimation method of RBC count CO4: Illustrate the estimation method of leucocyte count CO5: Evaluation of different test for blood estimation CO6:Development of the knowledge gained in diagnosing physical conditions.			
7	Course Description	The course in Physiology and Anatomy cover the first year is designed to give the students a depth knowledge of fundamental functions of different systems of human body. The major topics to be covered include the following: the cell, muscle& nervous tissue; blood; lymphoid tissues; respiratory system; blood vessels; circulation; heart; gastro intestinal tract; endocrine & Reproductive system, excretory system, central nervous system and special senses.			
8	Outline syllabus				CO Mapping
	Unit 1	**Study of Compound Microscope**			**CO1**
	A	Briefing about different parts of compound microscope			
	B	Demonstration of different parts of compound microscope			
	C	To perform the practical of compound microscope work function.			
	Unit 2	**Estimation of Haemoglobin Concentration**			**CO2**
	A	To study about the haemoglobin			
	B	To understand the working principle of haemoglobin			
	C	To estimate the haemoglobin concentration			
	Unit 3	**Total Red Blood Cell Count**			**CO3, CO6**
	A	To study the total red blood cells count			
	B	To understand the preparation of blood smear			
	C	To estimate the total red blood cell counts			
	Unit 4	**Total Leucocyte Count**.			**CO4, CO6**
	A	Briefing about the types of the blood			
	B	To demonstrate the counting of total leucocyte			
	C	Estimation of the total leucocyte count			
	Unit 5	**BT,CT , Blood Group Estimation and Demonstration of ESR & PCV.**			CO5, CO6
	A	To estimate the BT & CT			
	B	Estimation of different the Blood Groups			
	C	Demonstration of ESR & PCV			
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE	ETE	
		25%	25%	50%	

Pos COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3

CO1	3	2	1	1	2	1	2	3	-	-
CO2	3	2	2	2	1	1	2	2	-	-
CO3	2	1	2	3	3	2	1	2	-	-
CO4	3	2	1	2	1	2	1	2	-	-
CO5	3	2	1	1	1	1	2	2	-	-
CO6	3	2	1	3	3	3	2	3	-	-

Practical Subject

School: SSAHS		**Batch :** 2023-27
Programme: BND		**Current Academic Year: 2023-2024**
Branch:		**Semester:1st semester**
1	Course Code	BND 165
2	Course Title	Cooking Skills & Healthy Recipes
3	Credits	1
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Major Practical
5	Course Objective	To understand the basic knowledge of food chemistry, nutritive value of different foods , and role of macronutrient for energy contribution in body.
6	Course Outcomes	CO1:To describe the use and care of kitchen equipment CO2: Understand the methods of food preparation for LIG CO3: Interpret the methods of food preparation for MIG CO4: Analyze the methods of food preparation for HIG

		CO5: Assess the use of nutritional educational pamphlets . CO6: Create the skills for preparation of healthy meals.			
7	Course Description	The course "Fundamentals of Food and Nutrition" aims at developing basic understanding about nutrition, its effect on human health and newer advances in food technology. This course encompasses physiological, biochemical and social aspects of food and discusses relationship between metabolites and human health. Moreover, the course is focused on the advances in the most emerging area of applied science of Nutraceuticals (where food is the medicine). The knowledge of nutrition under extreme climate conditions, space nutrition, and sports nutrition empowers students' knowledge and skills to utilize food as a powerful tool for physical, mental, and social wellbeing.			
8	Outline syllabus				CO Mapping
	Unit 1	**Use and care of kitchen equipment**			
	A	Demonstration and uses of kitchen equipment			CO1
	B	To study about food Pyramids			CO1
	C	To understand the concept of Weight and Measures			CO1
	Unit 2	**Food preparation (LIG)**			
	A	Preparation of Snacks for LIG			CO2, CO6
	B	Preparation of Main Course meal for LIG			CO2, CO6
	C	Preparation of Beverages for LIG			CO2,CO6
	Unit 3	**Food preparation (MIG)**			
	A	To prepare snacks for MIG			CO3
	B	To prepare main Course meal for MIG			CO3
	C	To prepare beverages for MIG			CO3
	Unit 4	**Food preparation (HIG)**			
	A	To prepare Snacks for HIG			CO4, CO6
	B	To prepare the Main Course meal for HIG			**CO4, CO6**
	C	To prepare Beverages for HIG			CO4,CO6
	Unit 5	**Nutrition Education**			
	A	To draw the Pamphlets for the giving nutritional conditions			CO5
	B	To understand the concept of PEM			CO5, CO6
	C	To study about Anaemia			CO5
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE	ETE	
		25%	25%	50%	

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	2	1	3	2	3	3	2
CO2	3	2	1	2	2	3	2	3	3	2
CO3	2	3	2	1	3	2	2	3	2	2
CO4	3	2	1	2	1	2	2	2	3	3

CO5	3	2	1	3	3	3	2	3	2	3
CO 6	3	2	3	2	3	3	3	1	2	1

BND Second Semester

Theory Subject

School: SSAHS		**Batch :** 2023-27
Programme: BND		**Current Academic Year: 2023-2024**
Branch:		**Semester: 2nd** Semester
1	Course Code	BND 127
2	Course Title	Nutrition in Life Cycle
3	Credits	4
4	Contact Hours (L-T-P)	3-1-0
	Course Type	Major
5	Course Objective	• To apply knowledge of the science of nutrition to human health across the lifespan. • To formulate a dietary intervention plan to address nutritional deficiencies or excesses according to the health needs of individuals relative to age, developmental and disease status.
	Course Outcomes	CO1:Examine the nutritional requirements of pregnancy and formulate a dietary intervention plan for pregnancy CO2: Explain the nutritional requirements of lactation and formulate a dietary intervention plan for lactation CO3: Interpret the nutritional requirements of infancy and formulate a dietary intervention plan for infancy CO4: Analyze the nutritional requirements of childhood and formulate a dietary intervention plan for childhood CO5: Evaluate the nutritional requirements of adulthood and old age and formulate a dietary intervention plan for adulthood and old age. CO6: Integrate the knowledge of vitamins and minerals requirement and its effect on different functions and deficiency.

7	Course Description	This course investigates how nutrition requirements and challenges change throughout the human lifecycle and how alteration in nutritional requirements impact on human health. The course will begin by investigating the influence of nutrition prior to and during conception. Students will then be taught about the importance of good maternal nutrition during pregnancy and lactation and the impact of poor nutritional balance on feotal and infant development and maternal health. The course will cover the assessment of normal growth and body development during childhood and adolescence and will conclude with a full review of current literature and research on nutrient needs and factors affecting the nutritional status of adults and the elderly	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Nutrition in pregnancy**	
	A	Introduction of Nutrition , Functions of food, Classification of nutrients, Phytochemicals, Health.	CO1
	B	Physiological changes, Relationship between maternal and foetal nutrition,	CO1
	C	Impact of nutritional deficiency on the outcome of pregnancy, Nutritional and food requirements, Dietary guidelines, Dietary problems, Complications of pregnancy, GDM	CO1, CO6
	Unit 2	**Nutrition during Lactation**	
	A	Structure of Breast, Physiology of lactation, Hormonal control of lactation, Nutritional and food requirements.	CO2, CO6
	B	Factors affecting volume & Composition of breast milk, Breast feeding and its advantages, Pre-term milk (PTM), Expressed Breast Milk (EBM), Drip Breast Milk (DBM)	CO2, CO6
	C	Common problems during breast feeding, Contraindications to breast feeding	CO2
	Unit 3	**Nutrition during Infancy**	
	A	Growth & development, LBW, Small for Gestational Age and Pre term baby, Nutritional requirements	CO3, CO6
	B	IMS Act, Artificial feeding, Hazards of Bottle feeding, Feeding of the Preterm and LBW babies	CO3
	C	Weaning, Feeding problems in weaning, Family Pot Feeding, Low cost supplementary foods, ARF	CO3
	Unit 4	**Nutrition during early childhood**	

	A	Growth and nutrient needs, Food requirements, Dietary guidelines				CO4
	B	Feeding problems, Nutrition related problems, Growth monitoring, Importance of growth charts, GOBIFFF.				CO4, CO6
	C	Nutrition of school children: Nutritional and food requirements, Dietary guidelines, Importance of breakfast, Feeding problems, Packed lunch, School lunch Programme				CO4
	Unit 5	**Nutrition during other life span**				
	A	Nutrition during adolescence: Growth and nutrient needs, Food requirements, Food habits and dietary guidelines, Nutritional problems, Nutritional Programme for adolescence.				CO5, CO6
	B	Nutrition during adulthood – Reference man, Reference woman, Nutritional requirements, feeding pattern.				CO5
	C	Geriatric nutrition: Process of ageing, Factors affecting food intake and nutrient use, Change in organ function with ageing, Nutrient needs, Nutrition related problems.				CO5
	Mode of examination	Theory				
	Weightage Distribution	**CA**	**MTE**	**ETE**		
		15%	10%	75%		
	Text book/s*	• Text book of Nutrition and Dietetics- Kumud Khanna Text of Human Nutrition-Anjana Agarwal, Shobha Agarwal				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	1	1	3	2	3
CO2	3	2	1	2	2	1	1	3	2	2
CO3	2	1	2	1	1	1	2	3	2	2
CO4	3	1	1	2	2	2	2	2	2	3
CO5	3	2	1	1	1	2	1	3	3	2
CO 6	3	2	2	3	2	2	3	3	3	2

Theory Subject

School: SSAHS		**Batch :** 2023-27
Programme: BND		**Current Academic Year: 2023-2024**
Branch:		**Semester: 2nd** Semester
1	Course Code	BND 135
2	Course Title	Applied Chemistry

3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Minor	
5	Course Objective	The **Course** of **Applied Chemistry** covers a variety of **chemical** fields, working on various materials including metal compounds, inorganic and organic compounds, polymers, proteins etc, doing basic researches and their applications	
6	Course Outcomes	CO1: Describe the knowledge of atomic structure and chemical bonding CO2: Understand about chemical kinetics and thermodynamics CO3:Interpret the concept of Periodic Table and periodic properties CO4: Analyse the Metallurgy, Acids and Bases, Concentration of solution and volumetric analysis CO5: Assess the concept of organic and polymer chemistry CO6: To create the knowledge gained in various applications	
7	Course Description	The degree course covers the study of topics and subjects like process design, health and safety, biological chemistry, biomaterials, inorganic materials and polymer synthesis. It also provides an insight into the fundamentals of inorganic, organic and physical chemistry, and their current applications.	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Atomic Structure and Chemical Bonding**	
	A	**Atomic structure:** Rutherford atomic model – Bohr theory of hydrogen atom – Sommerfeld theory - Particle and wave character of electrons – de Broglie's equation, Heisenberg's uncertainty principle, Schrödinger wave equation, quantum numbers – Pauli's exclusion principle – Orbits and Orbitals. Electronic configurations	CO 1
	B	**Chemical Bonding:** Types of bonds – ionic, covalent, coordinate, metallic and hydrogen bonds - conditions for the bond formation - concept of hybridization – hybridization involving s and p orbitals – properties of ionic, covalent and coordinate compounds – valence bond theory – VSEPR theory. Molecular orbital theory – molecular orbital configurations of simple homo nuclear diatomic molecules, Comparison between	CO1

		Valence bond theory and Molecular orbital theory Effluents, Potability etc.	
	C	**Chemical Bonding:** Types of bonds – ionic, covalent, coordinate, metallic and hydrogen bonds - conditions for the bond formation - concept of hybridization – hybridization involving s and p orbitals – properties of ionic, covalent and coordinate compounds – valence bond theory – VSEPR theory. Molecular orbital theory – molecular orbital configurations of simple homo nuclear diatomic molecules, Comparison between Valence bond theory and Molecular orbital theory.	CO1
	Unit 2	**Chemical Kinetics and Thermodynamics**	
	A	**Chemical Kinetics** :Order and Molecularity of a reaction, Derivation of First order rate equation, half-life period of first order reaction, determination of rate constant of hydrolysis of ester, Energy of activation, Catalysis, Industrial application of catalysts.	CO2
	B	**Thermodynamics:** Definitions of thermodynamic terms : System, surroundings etc. Types of systems, intensive and extensive properties, State functions, Thermodynamic processes, concept of heat and work. Laws of thermodynamics and concepts of entropy, free energy, heat content and chemical potential.	CO2
	C	First Law of Thermodynamics : Statement, definition of internal energy and enthalpy, Heat capacity, heat capacities at constant volume and pressure and their relationship, Joule's law – Joule-Thomson coefficient and inversion temperature.	CO2
	Unit 3	**Periodic Table and periodic properties**	
	A	**Periodic Table** – Classification of elements and General characteristics of s, p, d and f block elements	CO3
	B	**Periodic properties: Ionic radii,** Ionization potential, Electron affinity, Electronegativity.	CO3

		Variation of periodic properties in periodic table.	
	C	**Periodic properties: Ionic radii,** Ionization potential, Electron affinity, Electronegativity. Variation of periodic properties in periodic table.	CO3
	Unit 4	**Metallurgy, Acids and Bases, Concentration of solution and volumetric analysis**	
	A	**Metallurgy:** Minerals and Ores, Ore Dressing - Types of ore Dressing- Froth Floatation process and Magnetic separation. Extraction of Aluminium and Iron metals from their ores.	CO4
	B	**Acids & Bases:** Arrhenius, Bronsted-Lowry, the Lux-Flood, solvent system and Lewis concept of acids and bases.	CO4
	C	Molarity - normality - molality and mole fraction - their calculations – in solutions for primary and secondary standards. Calculation of equivalent weight of acid, base, oxidizing agent, reducing agent and salt. Principle of Volumetric Analysis	CO3
	Unit 5	**Basic concepts in organic and polymer chemistry**	
	A	**Concepts in organic chemistry**: Classification of organic compounds - Nomenclature of organic compounds - Functional groups - Homologous series - IUPAC recommendations for naming simple aliphatic and aromatic compounds. Electron displacement effects - inductive - inductomeric - electrometric – mesomeric effect - resonance - hyperconjugation and steric effects.	CO5
	B	**Polymers** Polymerization - Types of polymerization - Distinction between addition and condensation polymerization - free radical -	CO5

		cationic and anionic polymerizations - mechanism of preparation of polymers - addition polymers and condensation polymers with examples - Thermoplastic and thermosetting polymers			
	C	**Polymers** Polymerization - Types of polymerization - Distinction between addition and condensation polymerization - free radical - cationic and anionic polymerizations - mechanism of preparation of polymers - addition polymers and condensation polymers with examples - Thermoplastic and thermosetting polymers			CO5
	Mode of Examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		15%	10%	75%	
	Text Book	• Agarwal, K.C.2001 Environmental Biology, Nidi Publ. Ltd. Bikaner. • Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd. , Ahmedabad — 380 013, India, Email: mapin@icenet.net			

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	3	2	2	2	2	2		
CO2	1	1	3	2	1	2	2	2		
CO3	2	2	3	1	2	2	2	2		
CO4	1	2	3	2	2	2	2	1		
CO5	3	2	3	1	3	1	1	2		
CO6	3	2	2	1	2	3	1	2		

Theory Subjects

School: SSAHS		**Batch :** 2023-27	
Programme: BND		**Current Academic Year: 2023-2024**	
Branch:		**Semester: 2nd**	
1	Course Code	BND 136	
2	Course Title	**Food Science and Technology**	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Type	Minor	
5	Course Objective	1. To understand the raw and processed food commodities used in daily life. 2. To discuss the qualities of available commodities and their suitability for different purposes	
6	Course Outcomes	CO1: To Define the objectives and methods of cooking. CO2:To understand the nutritive value, and various processing methods for cereals CO3:To interpret the nutritive value, composition of nuts and oils and pulses. CO4:To appraise the composition, and various properties of fats and oils CO5:To evaluate the composition, nutritional value, chemical reactions in fruits and vegetables. CO6: To integrate the knowledge in healthy recipe formulation.	
7	Course Description	**Food Sciences** is the study of the nature of **foods** and the changes that occur in them naturally and as a result of handling and processing	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction to Food Science**	
	A	Definition, functions of food, food groups	CO1,
	B	Food relation with health, cooking methods,	CO1
	C	Preliminary preparations for cooking, Advantages, Disadvantages, Moist heat methods, advantages, disadvantages	CO1, CO6
	Unit 2	**Introduction to Cereals**	
	A	Structure of cereals, nutritive value, composition,	CO2
	B	processing of wheat, rice, barley, rye, oats, millets and its products , convenient cereal products Effect of cooking on Nutritional value.	CO2
	C	Cereal cookery: Gluten formation, Gelatinization and dextrinization.	CO2, CO6
	Unit 3	**Introduction to Nuts and oils, Pulses.**	
	A	Composition and Nutritive value, Specific nuts and oilseeds, Toxic constituents of nuts	CO3
	B	Role of Nuts and oilseeds in cookery	CO3
	C	Composition and nutritive value, Digestibility of pulses, Processing, Toxic constituents, Pulse cookery	CO3, CO6
	Unit 4	**Introduction to fats and oils**	
	A	Composition and nutritional Value,	CO4
	B	Refining and processing of fats, storage, Emulsions, Rancidity,	CO4
	C	Smoking point and Flash point, Unconventional Oils	CO4, CO6
	Unit 5	**Introduction to fruits and vegetables**	
	A	Composition and Nutritive value of vegetables, Pigments, Selection and Storage, Vegetable cookery	CO5

	B	Composition and nutritive value, selection, post- harvest changes and storage,			CO5
	C	Ripening of fruits, Enzymatic and non-enzymatic browning.			CO5, CO6
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		15%	10%	75%	
	Text book/s*	Text Book of Food Science by B Srilakshmi			

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	1	3	3	3	3	3	3
CO2	2	2	2	1	3	3	3	3	3	3
CO3	2	2	2	1	3	3	3	2	3	3
CO4	2	2	2	1	3	3	3	3	3	3
CO5	2	2	2	1	3	3	3	3	3	3
CO6	2	2	3	3	2	1	1	2	3	2

Practical Subjects

School: SSAHS		**Batch :** 2023-27	
Programme: BND		**Current Academic Year: 2023-2024**	
Branch:		**Semester: 2nd** Semester	
1	Course Code	VOA102	
2	Course Title	Nutrition and Health Education	
3	Credits	3	
4	Contact Hours (L-T-P)	0-1-4	
	Course Type	Vocational	
5	Course Objective	This course will help in planning of nutrition education in community and helping them to achieve good nutritional status	
6	Course Outcomes	CO1:Understand and select themes and issues appropriate for the community. make modifications in order to improve the effectiveness of the teaching process. CO2:Understand the formulation of different messages for health education CO3:Understanding the concept of giving messages to health education CO4:Knowledge of nutrition and health education CO5:Understand different methods of communications. CO6: Develop the knowledge of different methods of communication	
7	Course Description	Thus course uses a question and answer format to Pregnancy and Lactation raise issues of concern in relation to nutrition and diet therapy .As part of Infancy and Preschool Age the answer you will also sometimes find hints and guidelines for yourself	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Themes in Nutrition Education**	
	A	Nutrition in pregnancy and lactation	CO 1
	B	Themes in nutrition during infancy and childhood	CO1
	Unit 2	**Themes in Health Education**	
	A	Preventing and Treating Common Sicknesses and Problems	CO2,CO6
	B	Infectious and Non infectious diseases	CO2
	Unit 3	**Messages in Nutrition and Health Education**	
	A	Messages in Nutrition Education	CO3
	B	Messages in Health Education	CO3
	C	How to Improve effectiveness of a Message	CO3
	Unit 4	**Nutrition and health status of the community**	
	A	earning and Working with the Community	CO4,CO6
	B	Community Nutrition and Health	CO4
	C	Factors Influencing Community Health and Nutrition	CO3
	Unit 5	**Communication Method**	
	A	Group Communication Methods Mass Communication Media	CO3
	B	Presentation of Selected Communication Media	CO4,CO6

		Non-Machine Media—Planning and Preparation				
	C	Machine Operated Devices—Planning and Preparation				CO3
	Mode of examination	Theory				
	Weightage Distribution	**CA**	**MTE**	**ETE**		
		25%	25%	50%		
	Text Book	Nutrition Science- B.Srilakshmi Text of Human Nutrition-Anjana Agarwal, Shobha Agarwal				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO 1	3	2	1	1	2	2	1	3	3	3
CO 2	3	2	1	2	2	2	1	3	3	3
CO 3	3	2	1	1	2	2	1	2	3	3
CO 4	3	3	1	1	1	1	2	3	3	3
CO 5	3	2	1	1	2	1	1	3	3	3
CO6	3	2	1	1	2	1	2	2	3	2

Theory Subject

School: SSAHS		**Batch :** 2023-27	
Programme: BND		**Current Academic Year: 2023-2024**	
Branch:		**Semester: 2nd**	
1	Course Code	BND 137	
2	Course Title	**Processing technology of cereals, pulses, legumes & oil seeds**	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Open elective	
5	Course Objective	1. To understand the raw and processed food commodities used in daily life. 2. To discuss the qualities of available commodities and their suitability for different purposes	
6	Course Outcomes	CO1: To Define the objectives and methods of cooking. CO2:To understand the nutritive value, and various processing methods for cereals CO3:To interpret the nutritive value, composition of nuts and oils and pulses. CO4:To appraise the composition, and various properties of fats and oils CO5:To evaluate the composition, nutritional value, chemical reactions in fruits and vegetables. CO6: To integrate the knowledge in healthy recipe formulation.	
7	Course Description	**Food Sciences** is the study of the nature of **foods** and the changes that occur in them naturally and as a result of handling and processing	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction to Food Science**	
	A	Definition, functions of food, food groups	CO1,
	B	Food relation with health, cooking methods,	CO1
	C	Preliminary preparations for cooking, Advantages, Disadvantages, Moist heat methods, advantages, disadvantages	CO1, CO6
	Unit 2	**Introduction to Cereals**	
	A	Structure of cereals, nutritive value, composition,	CO2
	B	processing of wheat, rice, barley, rye, oats, millets and its products , convenient cereal products Effect of cooking on Nutritional value.	CO2
	C	Cereal cookery: Gluten formation, Gelatinization and dextrinization.	CO2, CO6
	Unit 3	**Introduction to Nuts and oils, Pulses.**	
	A	Composition and Nutritive value, Specific nuts and oilseeds, Toxic constituents of nuts	CO3
	B	Role of Nuts and oilseeds in cookery	CO3
	C	Composition and nutritive value, Digestibility of pulses, Processing, Toxic constituents, Pulse cookery	CO3, CO6
	Unit 4	**Introduction to fats and oils**	
	A	Composition and nutritional Value,	CO4
	B	Refining and processing of fats, storage, Emulsions, Rancidity,	CO4
	C	Smoking point and Flash point, Unconventional Oils	CO4, CO6
	Unit 5	**Introduction to fruits and vegetables**	
	A	Composition and Nutritive value of vegetables, Pigments, Selection and Storage, Vegetable cookery	CO5
	B	Composition and nutritive value, selection, post- harvest changes and storage,	CO5
	C	Ripening of fruits, Enzymatic and non-enzymatic browning.	CO5, CO6
	Mode of examination	Theory/Jury/Practical/Viva	

	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	
	Text book/s*	Text Book of Food Science by B Srilakshmi			

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	1	3	3	3	3	3	3
CO2	2	2	2	1	3	3	3	3	3	3
CO3	2	2	2	1	3	3	3	2	3	3
CO4	2	2	2	1	3	3	3	3	3	3
CO5	2	2	2	1	3	3	3	3	3	3
CO6	2	2	3	3	2	1	1	2	3	1

Practical Subject

School: SSAHS		**Batch :** 2023-27			
Programme: BND 156		**Current Academic Year: 2023-2024**			
Branch:		**Semester:2nd semester**			
1	Course Code	BND 166			
2	Course Title	Nutrition in life cycle			
3	Credits	2			
4	Contact Hours (L-T-P)	0-0-4			
	Course Status	Major			
5	Course Objective	• To apply knowledge of the science of nutrition to human health across the lifespan. • To formulate a dietary intervention plan to address nutritional deficiencies or excesses according to the health needs of individuals relative to age, developmental and disease status.			
6	Course Outcomes	CO1: describe the methods of food preparation for adults CO2: Understand the methods of food preparation for lactating and pregnant women CO3: To interpret the methods of food preparation for children CO4: Analyze the methods of food preparation for adolescent CO5: Evaluate the use of nutritional educational old age CO6: create skill of planning diet for different age groups.			
7	Course Description	This course investigates how nutrition requirements and challenges change throughout the human lifecycle and how alteration in nutritional requirements impact on human health. The course will begin by investigating the influence of nutrition prior to and during conception. Students will then be taught about the importance of good maternal nutrition during pregnancy and lactation and the impact of poor nutritional balance on feotal and infant development and maternal health.			
8	Outline syllabus				CO Mapping
	Unit 1	**Preparation of diets for adults**			
	A	To prepare the diet plan for adults			CO1
	B	To calculate the nutritive values regarding the diets			CO1
	C	Diet preparation for adults			CO1, CO6
	Unit 2	**Preparation of diet for pregnant and lactating mothers**			
	A	To understand and prepare Diet plan			CO2
	B	To Calculate the nutritive value for given diet			CO2
	C	Diet preparation for pregnant and lactating mothers			CO2, CO6
	Unit 3	**Preparation of diets for children**			
	A	To prepare the Diet plan			CO3, CO6
	B	Calculate the nutritive value for diet for children			CO3
	C	Diet preparation for children			CO3, CO6
	Unit 4	**Preparation of diets for adolescents**			
	A	To understand and prepare Diet plan			CO4
	B	Calculate the nutritive value for the given diet			**CO4**
	C	Diet preparation for adolescents			CO4, CO6
	Unit 5	**Preparation of diets for old age**			
	A	To prepare the Diet plan			CO5
	B	Calculate the nutritive value for the given diet			CO5
	C	Diet preparation for old age			CO5, CO6
	Mode of examination	Practical/Viva			
	Weightage	CA	CE	ETE	

	Distribution	25%	25%	50%	

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	2	1	3	2	3
CO2	3	2	1	2	2	1	1	3	2	2
CO3	2	1	2	1	1	1	2	3	2	2
CO4	3	1	1	2	2	2	2	2	2	3
CO5	3	2	1	1	1	2	1	3	3	2
CO 6	3	2	2	3	2	2	3	3	3	2

Practical Subject

School: SSAHS		**Batch :** 2023-27			
Programme: BND		**Current Academic Year: 2023-2024**			
Branch:		**Semester: 2nd**			
1	Course Code	BND 167			
2	Course Title	Food Science and technology			
3	Credits	2			
4	Contact Hours (L-T-P)	0-0-2			
	Course Status	Major			
5	Course Objective	1. To understand the raw and processed food commodities used in daily life. 2. To discuss the qualities of available commodities and their suitability for different purposes			
6	Course Outcomes	CO1: To describe the various cooking methods. CO2: To explain the gluten content in cereal products. CO3: To interpret the determination of acidity. CO4: To analyze the evaluation of egg quality. CO5: To evaluate the methods of vegetable product preservation. CO6: To create the knowledge of food science technology applications in industry.			
7	Course Description	**Food Sciences** is the study of the nature of **foods** and the changes that occur in them naturally and as a result of handling and processing			
8	Outline syllabus				CO Mapping
	Unit 1				
	A	Introduction of Food Science Practical			CO1
	B	Preliminary preparation of cooking			CO1
	C	Different cooking methods			CO1, CO6
	Unit 2	**Determination of gluten content**			
	A	Demonstration of the gluten content in the flour			CO2
	B	To estimate the gluten content in the sample			CO2
	C	Result Analysis of the gluten content			CO2, CO6
	Unit 3	**Determination of acidity in given samples**			
	A	To study about the acidity and its factors			CO3
	B	To determine the acidity in the given sample			CO3
	C	Result Analysis of the acidity			CO3, CO6
	Unit 4	**Study the effect of various additives on stability of egg white foam**			
	A	Demonstration about the various food additives			CO4
	B	To identify the effect of additives on egg white foam			CO4
	C	Analysis of the effect of food additives			CO4, CO6
	Unit 5	**Jam and Jelly preparation**			
	A	To study about preparation of jam and jellies			CO5
	B	To prepare the jam and jellies			CO5
	C	Analysis of the prepared jam and jellies			CO5, CO6
	Mode of examination	Practical			
	Weightage	CA	CE	ETE	

	Distribution	25%	25%	50%	

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	1	3	3	3	3	3	3
CO2	2	2	2	1	3	3	3	3	3	3
CO3	3	2	3	3	3	3	3	2	3	3
CO4	2	2	2	1	3	3	3	3	3	3
CO5	2	2	2	1	3	3	3	3	3	3
CO6	2	2	3	3	2	1	1	2	3	2

Schools: SSAHS		Batch : 2023-2027 Current Academic Year: 2023-2024 Semester:II	
1	Course Code	ARP102	
2	Course Title	Communicative English -2	
3	Credits	2	
4	Contact Hours(L-T-P)	1-0-2	
5	Course Objective	To Develop LSRW skills through audio-visual language acquirement, creative writing, advanced speech et al and MTI Reduction with the aid of certain tools like texts, movies, long and short essays.	
6	Course Outcomes	After completion of this course, students will be able to: CO1 Acquire Vision, Goals and Strategies through Audio-visual Language Texts CO2 Synthesize complex concepts and present them in creative writing CO3 Develop MTI Reduction/Neutral Accent through Classroom Sessions & Practice CO4 Determine their role in achieving team success through defining strategies for effective communication with different people CO5 Realize their potentials as human beings and conduct themselves properly in the ways of world. CO6 Acquire satisfactory competency in use of Quantitative aptitude and Logical Reasoning	
7	Course Description	The course takes the learnings from the previous semester to an advanced level of language learning and self-comprehension through the introduction of audio-visual aids as language enablers. It also leads learners to an advanced level of writing, reading, listening and speaking abilities, while also reducing the usage of L1 to minimal in order to increase the employability chances.	
8	Outline syllabus – ARP 102		
	Unit A	**Acquiring Vision, Goals and Strategies through Audio-visual Language Texts**	**CO Mapping**
	Topic 1	Pursuit of Happiness / Goal Setting & Value Proposition in life	CO1
	Topic2	12 Angry Men / Ethics & Principles	
	Topic3	The King's Speech / Mission statement in life | strategies & Action Plans in Life	

	Unit B	**Creative Writing**	
	Topic 1	Story Reconstruction - Positive Thinking	CO2
	Topic2	Theme based Story Writing - Positive attitude	
	Topic3	Learning Diary Learning Log – Self-introspection	
	Unit C	**Writing Skills 1**	
	Topic 1	Precis	CO2
	Topic2	Paraphrasing	
	Topic3	Essays (Simple essays)	
	Unit D	**MTI Reduction/Neutral Accent through Classroom Sessions & Practice**	
	Topic 1	Vowel, Consonant, sound correction, speech sounds, Monothongs, Dipthongs and Tripthongs	CO3
	Topic2	Vowel Sound drills , Consonant Sound drills, Affricates and Fricative Sounds	
	Topic3	Speech Sounds | Speech Music| Tone | Volume| Diction |Syntax |Intonation | Syllable Stress |	
	Unit E	**Gauging MTI Reduction Effectiveness through Free Speech**	
	Topic 1	Jam sessions	CO3
	Topic2	Extempore	
	Topic3	Situation-based Role Play	
	Unit F	**Leadership andManagement Skills**	
	Topic 1	Innovative Leadership and DesignThinking	CO4
	Topic2	Ethics and Integrity	CO4
	Unit F	**Universal HumanValues**	
	Topic 1	Love & Compassion, Non-Violence & Truth	CO5
	Topic2	Righteousness, Peace	CO5
	Topic3	Service, Renunciation (Sacrifice)	CO5
	Unit G	**Introduction to Quantitative aptitude & Logical Reasoning**	
	Topic1	Analytical Reasoning & Puzzle Solving	CO6
	Topic2	Number Systems and its Application in Solving Problems	CO6
9	Evaluations	*Class Assignments/Free Speech Exercises / JAM Group Presentations/Problem Solving Scenarios/GD/Simulations (60% CA and 40% ETE*	*N/A*
10	Texts & References | Library Links	• Wren, P.C.&Martin H. *High English Grammar and Composition*, S.Chand& Company Ltd, New Delhi. • Blum, M. Rosen. *How to Build Better Vocabulary*. London: Bloomsbury Publication • Comfort, Jeremy(et.al). *Speaking Effectively*. Cambridge University Press. The Luncheon by W.Somerset Maugham - http://mistera.co.nf/files/sm_luncheon.pdf	

BND Third Semester

Theory Subject

School: SSAHS		**Batch : 2023-27**	
Programme: BND		**Current Academic Year: 2024-2025**	
Branch:		**Semester: 3rd**	
1	Course Code	BND 225	
2	Course Title	Basic Dietetics and Counselling I	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Major I	
5	Course Objective	1 Critically evaluates and derives requirements for specific macronutrients. 2. Understand critical periods in growth and development and impact of malnutrition.	
6	Course Outcomes	CO1: To define the principles and role of dietician. CO2: To understand the various types of diets used in hospital set ups. CO3: To Apply the principles and objectives of diet therapy in obesity. CO4: To Analyze the principles and objectives of diet therapy in leanness. CO5: To assess the food allergy and food intolerance and diet modifications. CO6: Integrate the diet for different life style diseases by using diet objectives.	
7	Course Description	To understand how Dietary Reference Intakes are derived for the population. To appreciate the role of nutrition in cellular and physical growth and assess nutritional status	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction Diet therapy and patient counselling**	
	A	Dietician and diet counselling: Role of Dietician, specializations of dietician, Nutrition and diet clinic,	CO1,
	B	Patient check-up and Nutrition counselling- directive and non-directive, Strategies and goals of counselling and follow up.	CO1
	C	Computer application: use of computers by Dietician, Dietary computations, Dietetic management, education/training	CO1, CO6
	Unit 2	**Concept of diet therapy and diet in fever**	
	A	Routine hospital diets - regular diets, clear fluid diet, full fluid diet, soft diet,	CO2
	B	Modified diets, Enteral and parenteral nutrition, Refeeding syndrome.	CO2
	C	Diet in Infections and Fevers: Types, Aetiology, Metabolic changes, Dietary considerations in Typhoid,	CO2, CO6

		Influenza, Malaria, Tuberculosis, AIDS.			
	Unit 3	**Diet in obesity**			
	A	Aetiology, Assessment, Types, Childhood and Adolescent Obesity			CO3
	B	Complications, Management, and preventive strategies of Obesity.			CO3
	C	**Food exchange list** – Definition, types, and significance.			CO3, CO6
	Unit 4	**Diet in Leanness**			
	A	Aetiology, Nutritional requirement and Dietary management			CO4
	B	Diet during eating disorders- anorexia, bulimia,			CO4
	C	Binge eating.			CO4CO6
	Unit 5	**Diet in Food Allergy and food intolerance (hypersensitivity)**			
	A	Definition, etiology, food allergens, symptoms and diagnosis of food allergies,			CO5
	B	nutritional management, restricted diets, elimination diets and hypo-sensitization,			CO5
	C	Prevention of adverse food reaction. Skin disturbances: Types, symptoms, Diagnosis and Treatment. Drug-Nutrient interactions (in brief)			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		15%	10%	75%	
	Text book/s*	Text book of Dietetics By B Srilakshmi, Text book of Nutrition and Dietetics by Kumud Khanna			

Pos COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	2	2	2	2	3	2	1
CO2	3	3	2	3	1	1	2	2	1	3
CO3	2	2	2	3	3	2	1	2	1	3
CO4	3	3	1	2	1	2	1	2	1	2
CO5	3	1	1	3	1	2	2	2	2	2
CO6	3	3	1	3	3	3	2	3	1	1

Theory Subject

School: SSAHS		**Batch : 2023-27**
Programme: BND		**Current Academic Year: 2024-2025**
Branch:		**Semester: 3rd**
1	Course Code	BND 233

2	Course Title	Nutritional Biochemistry I			
3	Credits	3			
4	Contact Hours (L-T-P)	3-0-0			
	Course Type	Major I			
5	Course Objective	The course is an introduction to nutritional biochemistry. The students will learn how nutrients effect biochemical processes and signal transduction pathways and how this can lead to development of nutrition related diseases.			
6	Course Outcomes	CO1: Define the chemistry of lipids metabolism. CO2: understand the chemistry of proteins. CO3: To interpret the chemistry and synthesis of Nucleic acids. CO4: Analyse the biochemical mechanism of vitamins and minerals. CO5: Evaluate the biochemistry of haemoglobin, free radicals and porphyrias. CO6: Integrate the gained knowledge in different applications.			
7	Course Description	Nutritional Biochemistry provides students with knowledge and understanding of the delivery and function of cellular nutrients and metabolism in the human body. It involves integrated learning between the areas of Biochemistry and Nutrition.			
8	Outline syllabus				CO Mapping
	Unit 1	**Lipids Chemistry**			
	A	Chemistry of lipids			CO1,
	B	Digestion and absorption of Lipids			CO1
	C	Metabolism of Lipids			CO1, CO6
	Unit 2	**Amino-acid Chemistry**			
	A	Chemistry of amino acids and Proteins			CO2
	B	Digestion and absorption of proteins			CO2
	C	Metabolism of Proteins			CO2, CO6
	Unit 3	**Nucleic acid Chemistry**			
	A	Chemistry of Nucleic acids			CO3
	B	Metabolism of Nucleic acids			CO3
	C	De Novo synthesis of Nucleic acids			CO3, CO6
	Unit 4	**Vitamins and Mineral Chemistry**			
	A	Vitamins and Their Classification			CO4
	B	Metabolism of fats and water soluble vitamins			CO4
	C	Minerals and their classification and metabolism			CO4, CO6
	Unit 5	**Free Radicals, Haemoglobin and Porphyria**			
	A	Free Radical chemistry			CO5
	B	Haemoglobin and molybdenum			CO5
	C	Porphyria and its types			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		15%	10%	75%	
	Text book/s*	• Textbook of Biochemistry By D.M. Vasudevan • Biochemistry by U. Satyanarayan • Textbook of Biochemistry by Chatterjee &Shinnde			

Pos COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3

CO1	2	2	1	1	2	2	2	1	-	-
CO2	3	3	2	1	1	1	2	2	-	-
CO3	2	2	2	2	3	2	1	1	-	-
CO4	1	3	1	2	1	2	1	2	-	-
CO5	3	1	1	3	1	2	2	2	-	-
CO6	3	3	1	3	3	3	2	1	-	-

Theory Subject

School: SSAHS		**Batch : 2023-27**
Programme: BND		**Current Academic Year: 2024-2025**
Branch:		**Semester: 3rd** Semester
1	Course Code	BND 234
2	Course Title	Psychology
3	Credits	3
4	Contact Hours (L-T-P)	3-0-0

	Course Type	Discipline Specific (Major)	
5	Course Objective	To help students understand the process of emotion and relating them to diverse contexts.	
6	Course Outcomes	CO1: Describe the basic concept and definitions of Psychology CO2: To understand the concept of life span and its development CO3: Application of Knowledge of sensation, attention and perception CO4: Appraise the theories of motivation CO5: Evaluate the theories of frustration and conflict. CO6: Integrate the approaches for decision making and well being.	
7	Course Description	This **course** provides a comprehensive **overview** of cognitive **psychology**, the scientific study of mental processes: how people acquire, store, transform, use, and communicate information. Topics may include perception, attention, language, memory, reasoning, problem solving, decision-making, and creativity.	
8	**Outline syllabus**		**CO Mapping**
	Unit 1	**Introduction to psychology**	
	A	Schools: Structuralism, functionalism, behaviourism, Psychoanalysis.	CO 1
	B	Methods: Introspection, observation, inventory and experimental Branches: Pure Psychology and Applied Psychology	CO1
	C	Psychology of patients and their counselling	CO1
	Unit 2	**Developmental stages**	
	A	Life span: Different developmental stages	CO2
	B	Heredity and environment	CO2
	C	Role of nature and its controversy	CO2, CO6
	Unit 3	**Sensation, attention and perception**	
	A	Sensation: Vision, Hearing, Olfactory, Gustatory and coetaneous sensation, movement and visceral sense	CO3
	B	Attention: types of attention, determinants of attention	CO3, CO6
	C	Perception: Gestalt principles of organization of perception, factors influencing perception Illusion and Hallucination: types	CO3
	Unit 4	**Motivation**	
	A	Motivation cycle	CO4
	B	Classification of Motives	CO4
	C	Abraham Maslow's theory of need hierarchy	CO3, CO6
	Unit 5	**Frustration and conflict**	
	A	**Frustration:** Sources of frustration	CO5
	B	**Conflict:** Types of conflict	CO5, CO6

	C	Management of frustration and conflict				CO5
	Mode of Examination	Theory				
	Weightage distribution	CA	MTE	ETE		
		15%	10%	75%		

Pos COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	1	1	2	2	2	1	-	-
CO2	3	3	2	1	1	1	2	2	-	-
CO3	2	2	2	2	3	2	1	1	-	-
CO4	1	3	1	2	1	2	1	2	-	-
CO5	3	1	1	3	1	2	2	2	-	-
CO6	3	3	1	3	3	3	2	1	-	-

Theory Subject

School: SSAHS		**Batch : 2023-27**
Programme: BND		**Current Academic Year: 2024-2025**
Branch:		**Semester: 3rd**
1	Course Code	BND 235
2	Course Title	Food safety and Security
3	Credits	3
4	Contact Hours (L-T-P)	3-0-0
	Course Type	Minor elective
5	Course Objective	To enable the students to acquire knowledge on: Food safety, hygiene and food hazards, Food regulations (national as well as international),Design and implementation of food safety management systems such as ISO series, HACCP and its prerequisites such as GMP, GHP etc.
6	Course	CO1: ToDescribe the importance food safety and food storage.

	Outcomes	CO2: To understand various food borne illness by various contamination. CO3.Apply various accreditations and measures for food safety management. CO4:.Analyze various laws and standards used for food safety and quality control. CO5: Assess the various methods of waste disposal from food industry. CO6: Integrate the knowledge in industrial applications.	
7	Course Description	The course explains the importance of food safety by being able to define the terms food safety, contamination, food poisoning, HACCP, hazard and safe food. Candidates will be able to outline the ways in which the multiplication of food poisoning bacteria in food can be prevented during the preparation, storage and service of food and state the ways in which food poisoning bacteria in food can be destroyed.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction to Food Safety**	
	A	Definition, Types of hazards and their impact on health, biological, chemical, physical hazards, and their control measures, Factors affecting Food Safety, Hygienic Food Handling, Purchasing and Receiving Safe Food—Important points to be observed for receiving various foods	CO1,
	B	Sanitary procedures while preparing, cooking and holding food, Safety of left over foods	CO1
	C	Food Storage- Guidelines for storage of foods at various temperatures, Storage of Specific Foods.	CO1, CO6
	Unit 2	**Food Borne Diseases**	
	A	Food Borne Illness and Food Hazards	CO2
	B	Food borne illnesses caused by Bacteria, Virus and Parasites, Natural toxicants in foods,	CO2
	C	Chemicals, Antibiotics, Hormones and Metal contamination.	CO2, CO6
	Unit 3	**Food Safety**	
	A	Food Safety Management: Basic concept, Prerequisites - GHPs, GMPs and SSOPs , HACCP, ISO series, TQM - concept and need for quality, components of TQM,	CO3
	B	Kaizen. Risk Analysis, Accreditation and Auditing (in brief)	CO3
	C	Safety concerns in food packaging: Principles in the development of safe and protective packaging , Product labelling, Nutritional labelling and safety assessment of food packaging materials	CO3, CO6
	Unit 4	**Food Laws**	
	A	Food laws and Standards**:** Indian Food Regulatory Regime, Global Scenario, Other laws and standards related to food, FPO, PFA, FSSAI, AGMARK, BIS.	CO4

	B	GRAS and permissible limits for chemical preservatives and legal aspects for γ- irradiations			CO4
	C	Recent concerns in food safety: New and Emerging Pathogens. Genetically modified foods / Transgenics / Organic foods. Newer approaches to food safety.			CO4, CO6
	Unit 5	**Waste Product Handling**			
	A	Waste product handling			CO5
	B	Planning for waste disposal			CO5
	C	Solid wastes and liquid wastes			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		15%	10%	75%	
	Text book/s*	The Food safety hazard Guidebook by R.Lawley, L. Curtis Food Safety and Toxicity, by De Vries, CRC, New York			

Pos COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	1	3	2	2	1	1	1
CO2	3	3	2	1	2	1	2	2	1	3
CO3	2	2	2	2	3	2	1	1	1	3
CO4	1	3	1	2	1	2	1	2	1	2
CO5	3	1	1	3	3	2	2	2	2	2
CO6	3	3	1	3	3	3	2	1	1	1

Theory Subject

School: SSAHS		**Batch : 2023-27**	
Programme: BND		**Current Academic Year: 2024-2025**	
Branch:		**Semester: 3rd semester**	
	Course Code	BND 236	
2	Course Title	Food Sanitation & Hygiene	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Minor Elective	
5	Course Objective	To understand the basic knowledge consumer protection and ensure that all foods during production, handling, storage, processing and distribution are safe, wholesome and fit for human consumption.	
6	Course Outcomes	CO1:Understand the food borne illness & its management. CO2:Understand the ideal storage conditions for food products. CO3:Understand the methods & standards of maintenance of hygiene in food service system. CO4:Understand the common cleaning techniques used to clean kitchen equipments CO5: Understand the strategies to ensure food safety in food service system.	
7	Course Description	Safe food is food which is free of contaminants and will not cause illness or harm. Our food is devitalized, colored, filled with chemicals, drugs and synthetic ingredients, polluted by agricultural and environmental chemicals and are grown on impoverished land puffed up by chemical fertilizers. Moreover, the chemicals used are known to cause adverse effects in humans and animals. Therefore all individuals involved in food handling should be trained in handling food safety. It is necessary to create and maintain hygienic and sanitary conditions to safeguard the food.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction to food sanitation & hygiene**	
	A	Terms related to food hygiene: Sanitation, hygiene, food safety, food sanitation, contamination, food spoilage, danger zone.	CO1
	B	Significance of sanitation in food catering units, hospital kitchens,	CO1

		food handlers.			
	C	Food borne illnesses: prevention & treatment, Personal hygiene - importance, sanitary habits, and practices.			CO1
	Unit 2	**Purchase and Hygiene**			
	A	Purchasing and Storage: Choosing a supplier, Inspection Procedures, Receiving and Inspecting Specific Food,			CO2
	B	Food storage: General Storage Guidelines, Types of Storage, storing specific food, storage techniques - dry food storage, refrigerated storage, freezer storage.			CO2
	Unit 3	**Hygiene in food service system**			
	A	FSSAI, HACCP			CO2
	B	Hygiene procedures in food preparation, holding & display of food for service, protective display of food, safe use of left over foods.			
	C	Classification of waste, methods of disposal.			
	Unit 4	**Cleaning & sanitation**			
	A	Cleaning equipments of kitchen: Sanitation Standards for Equipment, installing and maintaining kitchen equipment.			CO4
	B	Cleaning and Sanitizing: Cleaning vs. Sanitizing, machine dishwashing, manual dishwashing, sanitizing food contact surfaces, cleaning the Premises, storing utensils.			**CO4**
	Unit 5	**Methods to ensure food safety**			
	A	Pest control methods and its importance.			CO5
	B	Cleaning agents used in the kitchen			CO5
	C	Developing a cleaning Programme			CO5
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE	ETE	
		15%	10%	75%	

Pos COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	2	2	2	2	3	2	1
CO2	3	3	2	3	1	1	2	2	1	3
CO3	2	2	2	3	3	2	1	2	1	3
CO4	3	3	1	2	1	2	1	2	1	2
CO5	3	1	1	3	1	2	2	2	2	2
CO6	3	3	1	3	3	3	2	3	1	1

Practical Subject

Programme: BND		**Batch : 2023-27**
Branch: SSAHS		**Current Academic Year: 2024-2025**
1	Course Code	VOA 103
2	Course Title	Clinical case studies
3	Credits	3
4	Contact Hours (L-T-P)	00-01-4
	Course Type	Vocational Course
5	Course Objective	1. The objective of assigning the project related to hospital work is to expose our students to different health issues coming in the hospitals. 2. This type of project work will help the students to develop better understanding of working in a hospital environment and dealing with IPD and OPD patients.
6	Course Outcomes	CO1: To define the hospital posting project will enable our students to acquire knowledge and skills which will help them take up jobs in hospitals. CO2: To understand the practical exposure to our students working in a hospital. CO3: Apply value to students, faculty members, school and university. CO4: Appraise the role of diet for OPD patients CO5: Evaluate the kitchen working and food preparation in hospital diet CO6:Create the activities will help the students to develop exposure about patient handling.
7	Theme	Major sub-themes for research: • Woking in a hospital kitchen • Case studies of IPD patients • Counselling of OPD patients
8	**Guidelines for faculty members**	It will be a individual assignment. Every student has to do case study of 50 IPD patients in a tenure of 6 months. The dietitian in the hospital will guide the students and approve the case studies and help the student in preparing final report. The faculty will guide the student to prepare the PPT. The report should contain a proper format of case studies and result of each nutritional assessment of IPD patients The student should **submit the report** to Programme-Coordinator signed by the Dietitian of Sharda Hospital.

		The students have to send the hard copy of the **report and PPT**, and then only they will be allowed for ETE.	
	Role of Coordinator	The Coordinator will supervise the whole process and assign students to the dietitian of the hospital.	
	Layout of the Report	Report must contain case studies done in hospital in a format given by the dietitian. Note: Research report should base on primary data.	
	Format	**The report should be in a hard cover /file** The Design of the Cover page to report will be given by the Coordinator	
	ETE	**The students will be evaluated by panel of faculty members on the basis of their presentation.**	

Pos COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	1	3	2	2	1	1	1
CO2	3	3	2	1	2	1	2	2	1	3
CO3	2	2	3	3	3	2	1	1	1	3
CO4	2	3	2	2	1	2	1	2	1	2
CO5	3	1	1	3	3	2	2	2	2	2
CO6	3	3	1	3	3	3	2	3	1	3

School: SSAHS		**Batch :** 2023-2027	
Programme:		**Academic Year:** 2024-2025	
Branch: BND		**Semester:** III	
1	Course Code	**ARP207**	Course Name : **Logical Skills Building and Soft Skills**
2	Course Title	**Logical Skills Building and Soft Skills**	
3	Credits	2	
4	Contact Hours (L-T-P)	1-0-2	
	Course Status	Active	
5	Course Objective	To enhance holistic development of students and improve their employability skills. To provide a 360 degree exposure to learning elements of Business English readiness Programme, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To step up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a student will have entered the threshold of his/her 1st phase of employability enhancement and skill building activity exercise.	
7	Course Description	This Level 1 blended training approach equips the students for Industry employment readiness and combines elements of soft skills and numerical abilities to achieve this purpose.	
8	Outline syllabus – ARP 207		
	Unit 1	**BELLS (Building Essential Language and Life Skills)**	**CO Mapping**
	A	*Know Yourself*: Core Competence. A very unique and interactive approach through an engaging questionnaire to ascertain a student's current skill level to design, architect and expose a student to the right syllabus as also to identify the correct TNI/TNA levels of the student.	CO1
	B	Techniques of Self Awareness | Self Esteem & Effectiveness| Building Positive Attitude | Building Emotional Competence	CO1, CO2
	C	Positive Thinking & Attitude Building | Goal Setting and SMART Goals – Milestone Mapping | Enhancing L S R W G and P (Listening Speaking Reading Writing Grammar and Pronunciation) |	CO1, CO2,CO3
	Unit 2	**Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical**	

	A	Syllogism | Letter Series | Coding, Decoding , Ranking & Their Comparison Level-1	CO4
	B	Number Puzzles	CO5
	C	Selection Based On Given Conditions	CO5
	Unit 3	**Quantitative Aptitude**	
	A	Number Systems Level 1 | Vedic Maths Level-1	CO6
	B	Percentage ,Ratio & Proportion | Mensuration - Area & Volume |Algebra	CO6
	Unit 4	**Verbal Abilities – 1**	
	A	Reading Comprehension	CO1
	B	Spotting the Errors	CO2
	Unit 5	**Time & Priority Management**	
	A	Steven Covey Time Management Matrix	CO3
	B	Creating Self Time Management Tracker	CO3
	Weightage Distribution	*Class Assignment/Free Speech Exercises / JAM – 60% | Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%*	
	Text book/s*	*Wiley's Quantitative Aptitude-P Anand* | ***Quantum CAT - Arihant Publications | Quicker Maths- M. Tyra*** | *Power of Positive Action (English, Paperback, Napoleon Hill)* | *Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness - Nathaniel Brandon* | *Goal Setting (English, Paperback, Wilson Dobson*	

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
ARP203.1	-	-	-	-	1	-	-	-	1	3	-	2	-	-	-
ARP203.2	-	-	-	-	1	-	-	-	1	3	-	2	-	-	-
ARP203.3	-	-	-	-	1	-	-	-	1	3	-	2	-	-	-
ARP203.4	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP203.5	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP203.6	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-

Practical Subject

School: SSAHS		**Batch : 2023-27**	
Programme: BND		**Current Academic Year 2024-25**	
Branch:		**Semester: 3rd**	
1	Course Code	BND 272	
2	Course Title	Basic Dietetics and Counselling	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective		
6	Course Outcomes	CO1: To examine weights and measurement of various food stuffs. CO2: To explain various routine diets used in hospital setups. CO3: To prepare various diets for obesity. CO4: To analyse and understand diet in leanness. CO5: To evaluate and understand diets for food intolerance and food allergy. CO6: to integrate the dietary principles while planning diet.	
7	Course Description	The course includes the study of objective and principles behind the treatment of various diseases via diet therapy and identification of diseases via signs and symptoms.	
8	Outline syllabus		CO Mapping
	Unit 1	**Weights and Measurement**	
	A	To prepare the Exchange list	CO1
	B	To study and understand the concept of Raw foods	CO1
	C	To analyse Cooked foods weight	CO1
	Unit 2	**Preparation of Routine hospital diets**	
	A	Preparation and calculation of clear liquid diets	CO2
	B	Preparation and calculation of Full liquid diet	CO2
	C	Preparation and calculation of Soft and normal diet	CO2
	Unit 3	**Diet in Obesity**	
	A	Diet planning for obesity	CO3,CO6
	B	Calculation of the nutritive value for the obese	CO3
	C	Preparation of the diets for obese person	CO3
	Unit 4	**Diet in Leanness**	
	A	Diet planning for lean people	CO4,CO6
	B	Calculation of nutritive value for the diets	CO4
	C	Preparation of the meals and diets for lean people	CO4
	Unit 5	**Diet in Food allergy and intolerance**	
	A	Diet planning for allergies	CO5,CO6
	B	Calculation in diets for the needed requirements	CO5
	C	Preparation of diets according to allergy and intolerance	CO5

	Mode of examination	Practical			
	Weightage Distribution	CA	CE	ETE	
		25%	25%	50%	
	Text book/s*	Dietician's pocket book by NancieH.Herbold Therapeutic Nutrition, 17th edition, Mac Milan Publishers			

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	3	1	3	2	2	2	3	2
CO2	3	3	3	2	2	2	1	2	3	2
CO3	1	1	2	1	2	3	3	1	2	3
CO4	1	3	2	1	1	3	3	3	1	3
CO5	1	2	3	1	1	2	2	3	2	1
CO6	1	2	3	2	1	2	3	2	3	1

Practical Subject

School: SSAHS	**Batch :2023-27**

Programme: BND		**Current Academic Year: 2024-2025**			
Branch:		**Semester: 3rd**			
1	Course Code	BND 273			
2	Course Title	Nutritional Biochemistry I			
3	Credits	1			
4	Contact Hours (L-T-P)	0-0-2			
	Course Status	Compulsory			
5	Course Objective	The course is an introduction to nutritional biochemistry. The students will learn how nutrients effect biochemical processes and signal transduction pathways and how this can lead to development of nutrition related diseases			
6	Course Outcomes	CO1: To define the preparation of various reagents CO2: To Understand the qualitative analysis of carbohydrates I. CO3: To prepare the qualitative analysis of carbohydrates II CO4: To appraise the working of colorimeter. CO5: To assess the quantitative analysis of glucose CO6: To integrate the principles of qualitative analysis of carbohydrates.			
7	Course Description	Nutritional Biochemistry provides students with knowledge and understanding of the delivery and function of cellular nutrients and metabolism in the human body. It involves integrated learning between the areas of Biochemistry and Nutrition.			
8	Outline syllabus				CO Mapping
	Unit 1	**pH, Buffer and various types of solutions**			
	A	Preparation of Reagents			CO1
	B	Preparation of buffer			CO1
	C	Checking of Ph			CO1
	Unit 2	**Qualitative analysis of Carbohydrates-1**			
	A	Molisch Test			CO2,CO6
	B	Iodine Test			CO2,CO6
	C	Benedict Test			CO2,CO6
	Unit 3	**Qualitative analysis of Carbohydrates-2**			
	A	Barford's Test			CO3,CO6
	B	Seliwanoff's Test			CO3,CO6
	C	Hydrolysis of sucrose			CO3
	Unit 4	**Colorimetry and its importance**			
	A	Colorimetry			CO4
	B	Lambart-Beer test			CO4
	C	Standard , Black and test solution			CO4
	Unit 5	**Quantitative analysis of Glucose**			
	A	Quantitative analysis of Glucose in normal sample			CO5
	B	Quantitative analysis of abnormal sample			CO5
	C	Quantitative analysis of unknown sample			CO5
	Mode of examination	Practical			
	Weightage	CA	Viva	ETE	

	Distribution	25%	25%	50%	
	Text book/s*	Textbook of Biochemistry By D.M. Vasudevan Biochemistry by U. Satyanarayan Textbook of Biochemistry by Chatterjee &Shinnde			

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	1	1	2	2	2	1	-	-
CO2	3	3	2	1	1	1	2	2	-	-
CO3	2	2	2	2	3	2	1	1	-	-
CO4	1	3	1	2	1	2	1	2	-	-
CO5	3	1	1	3	1	2	2	2	-	-
CO6	3	3	1	3	3	3	2	1	-	-

BND Fourth Semester

Theory Subject

School: SSAHS		**Batch : 2023-27**	
Programme: BND		**Current Academic Year: 2024-2025**	
Branch:		**Semester: 4th**	
1	Course Code	BND 231	
2	Course Title	Community Nutrition	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Major	
5	Course Objective	To understand the importance of nutrition in national progress and the significance of the assessment of nutritional status and find solutions to overcome problems of malnutrition in the community.	
6	Course Outcomes	CO1: To describe various aspect of community nutrition. CO2: To explain various methods used for assessment of nutritional status in community. CO3. To interpret various modes of contamination and water & waste disposal. CO4: To analyse the importance of public hygiene and public safety. CO5: To evaluate common infectious diseases. CO6: To integrate the various ways to assess nutritional status .	
7	Course Description	This course will provide an introduction to the practice of public health nutrition, discussion of significant public health nutrition problems. and an overview of food and nutrition Programmes available to the community. Students will engage in skill-building and participatory activities, as well be introduced	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction to Community**	
	A	**Definition of Community –** meaning of optimum nutrition, malnutrition – under nutrition and overnutrition	CO1,
	B	**Characteristics of community –** Demography, vital statistics - IMR, MMR, NMR, Morbidity rate, Crude birth rate, Crude death rate, General fertility rate, Age specific fertility rate, Life expectancy	CO1
	C	**Factors contributing to malnutrition in the community**- Food habits, customs and practices, availability of food, socio- economic factors and housing and hygienic conditions. Inter -relationship between malnutrition, infection and poverty	CO1
	Unit 2	**Assessment of Nutritional Status**	
	A	Methods of assessment of nutritional status: Direct assessment and indirect assessment	CO2, CO6
	B	Significance of nutritional assessment of community, improvement of nutrition of community	CO2,CO6
	C	National Nutrition Policy	CO2
	Unit 3	**Agents of contamination**	
	A	Agents of contamination, Sources and Reservoirs of infection, Modes of transmission of infection, Modes of entry into a susceptible host, prevention and control of infection and diseases	CO3
	B	Water supply: Sources of water, Urban drinking water supply system	CO3
	C	Waste disposal: Urban waste disposal methods, steps in waste disposal	CO3
	Unit 4	**Personal Hygiene**	
	A	Personal Hygiene: Introduction, Personal cleanliness, Rest and sleep, Exercise, fatigue, and posture, Habits,	CO4
	B	Public and Home safety: Safety at homes, Areas at home which have	CO4

		high potential for accidents, Activities, potential for accidents, Household goods, potential for accidents			
	C	Public safety: Road accidents, Railway and airplane accidents, Prevention measures.			CO4
	Unit 5	**Common infectious diseases**			
	A	Common infectious diseases, Definition, types, and modes of infection			CO5
	B	Measles, Diptheria, malaria			CO5
	C	Tuberculosis			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		15%	10%	75%	

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	3	3	3	2	1	1	2	1
CO2	3	3	2	3	2	2	1	3	1	2
CO3	1	2	3	3	2	1	3	1	1	1
CO4	1	2	3	3	2	1	3	2	1	1
CO5	3	3	3	2	3	1	2	3	3	2
CO6	3	2	3	1	1	1	1	2	2	1

Theory Subject

School: SSAHS		**Batch : 2023-27**	
Programme: BND		**Current Academic Year: 2024-2025**	
Branch:		**Semester: 4th**	
1	Course Code	BND 237	
2	Course Title	Nutritional Biochemistry II	
3	Credits	4	
4	Contact Hours (L-T-P)	2-1-0	
	Course Type	Compulsory	
5	Course Objective	The course is an introduction to nutritional biochemistry. The students will learn how nutrients effect biochemical processes and signal transduction pathways and how this can lead to development of nutrition related diseases.	
6	Course Outcomes	CO1: To understand the chemistry of lipids metabolism. CO2: To understand the chemistry of proteins. CO3: To understand the chemistry and synthesis of Nucleic acids. CO4: To understand the biochemical mechanism of vitamins and minerals. CO5: To understand the biochemistry of haemoglobin, free radicals and porphyrias.	
7	Course Description	Nutritional Biochemistry provides students with knowledge and understanding of the delivery and function of cellular nutrients and metabolism in the human body. It involves integrated learning between the areas of Biochemistry and Nutrition.	
8	Outline syllabus		CO Mapping
	Unit 1	**Lipids Chemistry**	
	A	Chemistry of lipids	CO1,
	B	Digestion and absorption of Lipids	CO1
	C	Metabolism of Lipids	CO1
	Unit 2	**Amino-acid Chemistry**	
	A	Chemistry of amino acids and Proteins	CO2
	B	Digestion and absorption of proteins	CO2
	C	Metabolism of Proteins	CO2
	Unit 3	**Nucleic acid Chemistry**	
	A	Chemistry of Nucleic acids	CO3
	B	Metabolism of Nucleic acids	CO3
	C	De Novo synthesis of Nucleic acids	CO3
	Unit 4	**Vitamins and Mineral Chemistry**	
	A	Vitamins and Their Classification	CO4
	B	Metabolism of fats and water soluble vitamins	CO4

	C	Minerals and their classification and metabolism			CO4
	Unit 5	**Free Radicals, Haemoglobin and Porphyria**			
	A	Free Radical chemistry			CO5
	B	Haemoglobin and molybdenum			CO5
	C	Porphyria and its types			CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		15%	10%	75%	
	Text book/s*	• Textbook of Biochemistry By D.M. Vasudevan • Biochemistry by U. Satyanarayan • Textbook of Biochemistry by Chatterjee &Shinnde			

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO214.1	3	2	1	1	2	3	1
CO214.2	3	2	1	1	3	2	1
CO214.3	3	2	1	1	3	2	1
CO214.4	3	2	1	1	2	2	1
CO214.5	3	1	1	1	1	2	1

School: SSAHS		**Batch : 2023-27**	
Programme: BND		**Current Academic Year 2024-25**	
Branch:		**Semester: 4th**	
1	Course Code	BND 232	
2	Course Title	Food Microbiology	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Major	
5	Course Objective	The course aims to provide theoretical and practical knowledge about the micro-organisms involved in the food spoilage, infections and intoxications. The course also enables to understand the concept of preservation and microbiological safety in various food operations.	
6	Course Outcomes	CO1: To describe the concept of food microbiology. CO2: To understand the various microorganism involved in food industry. CO3: To interpret the microbial contamination and its effects on food products CO4: To Analyse the microbial contamination and its effects on food products CO5: To Evaluate various aspects of environmental microbiology CO6: To Integrate the morphology of various microorganism in food	
7	Course Description	This course provides students with general information on microbiology, such as the classification of various microorganisms, including bacteria, viruses and fungi. Students interested in food science use this course to gain information on potentially dangerous microorganisms that can be introduced during food processing and preservation. Methods in microbe detection and control are highlighted.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Introduction to Microbiology: Definitions of microbiology and microbes, Beneficial effects of microorganisms.	CO1,
	B	Microbial growth curve, Effect of intrinsic and extrinsic factors on growth curve	CO1
	C	PH, Moisture, Temperature, Oxygen availability, Nutrients and others.	CO1
	Unit 2		
	A	Microorganisms: General morphology, Characteristics, Reproduction, and Economic importance of: A) Bacteria, B) Fungus	CO2, CO6
	B	Microorganisms: General morphology, Characteristics,	CO2, CO6

		Reproduction, and Economic importance of: B) Virus C) Algae	
	C	Microorganisms: General morphology, Characteristics, Reproduction, and Economic importance of: B) Protozoa	CO2, CO6
	Unit 3		
	A	**Microbiology of Deficient Food**: Spoilage, contamination sources, types, Bioethics Effect on the following: Cereal and cereal products	CO3
	B	**Microbiology of Deficient Food**: Spoilage, contamination sources, types, effect on the following: Sugar and sugar products	CO3
	C	**Microbiology of Deficient Food**: Spoilage, contamination sources, types, effect on the following: Vegetables and fruits	CO3
	Unit 4		
	A	**Microbiology of Deficient Food**: Spoilage, contamination sources, types, effect on the following: Meat and meat products	CO4
	B	**Microbiology of Deficient Food**: Spoilage, contamination sources, types, effect on the following: Fish, egg and poultry, Milk and milk products	CO4
	C	**Microbiology of Deficient Food**: Spoilage, contamination sources, types, effect on the following: Canned Foods	CO4
	Unit 5		
	A	**Environmental Microbiology:** Water and water borne diseases	CO5
	B	**Environmental Microbiology:** Air and air borne diseases	CO5
	C	**Environmental Microbiology:** Soil and soil borne diseases, Sewage and diseases	CO5
	Mode of examination	Theory	
	Weightage Distribution	CA / MTE / ETE	
		15% / 10% / 75%	
	Text book/s*	Textbook of food Microbiology By Willium C Fraizier	

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	3	3	3	2	1	1		

CO2	2	3	1	3	2	2	1	3		
CO3	1	2	3	3	3	1	2	1		
CO4	1	3	3	3	2	1	3	2		
CO5	3	3	3	1	3	1	2	2		
CO6	3	2	3	1	1	1	1	2		

School: SSAHS		Batch : 2023-2027	
Programme:		Current Academic Year: 2024-2025	
Branch: BND		Semester: VI	
1	Course Code	ARP 305	Course Name : Campus to Corporate
2	Course Title	Campus to Corporate	
3	Credits	2	
4	Contact Hours (L-T-P)	1-0-2	
	Course Status	Active	
5	Course Objective	To enhance holistic development of students and improve their employability skills. Provide a 360 degree exposure to learning elements of Business English readiness Programme, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a will have entered the threshold of his/her 4th phase of employability enhancement and skill building activity exercise.	
6	Course Outcomes	After completion of this course, students will be able to: CO1: Develop a creative resumes, cover letters, interpret job descriptions and interpret KRA and KPI statements and art of conflict management. CO2: Build negotiation skills to get maximum benefits from deals in practical life scenarios. CO3: Develop skills of personal branding to create a brand image and self-branding CO4: Acquire higher level competency in use of logical and analytical reasoning such as direction sense, strong and weak arguments CO5: Develop higher level strategic thinking and diverse mathematical concepts through building analogies, odd one out CO6: Demonstrate higher level quantitative aptitude such as average, ratio & proportions, mixtures & allegation for making business decisions.	
7	Course Description	This penultimate stage introduces the student to the basics of Human Resources. Allows the student to understand and interpret KRA | KPI and understand Job descriptions. A student also	

		understands how to manage conflicts, brand himself/herself, understand relations and empathise others with level-4 of quant, aptitude and logical reasoning	
8	Outline syllabus – ARP 306		
	Unit 1	**Ace the Interview**	**CO MAPPING**
	A	HR Sensitization (Role Clarity | KRA | KPI | Understanding JD) | Conflict Management	CO1
	B	Negotiation Skills | Personal Branding	CO3, CO4
	C	Uploading & Curating Resumes in Job Portals, getting Your Resumes Noticed | Writing Cover Letters | Relationship Management	CO1, CO3
	Unit 2	**Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical**	
	A	Sitting Arrangement & Venn Diagrams | Puzzles | Distribution | Selection	CO4
	B	Direction Sense | Statement & Conclusion | Strong & Weak Arguments	CO4
	C	Analogies, Odd One out | Cause & Effect	CO5
	Unit 3	**Quantitative Aptitude**	
	A	Average , Ratio & Proportions, Mixtures & Allegation	CO6
	B	Geometry-Lines, Angles & Triangles	CO6
	C	Problem of Ages | Data Sufficiency - L2	CO6
	Unit 4	**Verbal Abilities-4**	
	A	Antonyms and Synonyms	CO1
	B	Idioms and Phrases	CO2
	Unit 5	**Problem Solving and Case Studies**	
	A	Real time Case Study Solving Exercises	CO4
	B	Intra student Mock Situation Handling Exercises	CO4
	Evaluation Weightage	*(CA)Class Assignment/Free Speech Exercises / JAM – 60% | (ETE) Group Presentations/Mock Interviews(MIP's)/GD/ Reasoning, Quant & Aptitude- 40%*	
	Text book/s*	*Wiley's Quantitative Aptitude-P Anand* | ***Quantum CAT – Arihant Publications*** | ***Quicker Maths- M. Tyra*** | *Power of Positive Action (English, Paperback, Napoleon Hill) | Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon | Goal Setting (English, Paperback, Wilson Dobson*	

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
ARP302.1	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP302.2	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP302.3	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP302.4	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP302.5	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP302.6	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-

School: SSAHS		**Batch :** 2023-27	
Programme: BND		**Current Academic Year: 2024-25**	
Branch:		**Semester: 4th** Semester	
1	Course Code	BND 238	
2	Course Title	Bioethics and health management system	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Type	Compulsory	
5	Course Objective	Acquire theoretical knowledge and develop practical skills to apply scientific approach to management of people, materials, finance, communication and for organising work and managing resources Learn modern management techniques like inventory canal, control, economic order quantity(EOQ) , operational research organisational development, management information system etc.	
6	Course Outcomes	CO1: Discuss ethical issues that relate to healthcare and nursing professionals. CO2: Use logical reasoning and healthcare principles to assist in resolving ethical dilemmas CO3: Identify methods to strategically solve ethical issues CO4: Plan in advance how to face the problems of hospital management , learn methods of problems solving and decision making. CO5: Assess the clinical and non-clinical needs of patient care, understanding the administrative and technical requirements of physicians and paramedical personnel.	
7	Course Description	This course provides students with the foundations for critically analysing ethical dilemmas in nursing practice. Ethical theories including moral developmental theories will be discussed. The course will help students to clarify values and promote moral reflection in the context of contemporary health-care challenges. Emerging issues as involving emerging technologies and political, legal, socio-economic, and fiscal factors will be examined.	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Overview of Hospital System**	
	A	Evolution and Classification of Hospital	CO1
	B	Hospital Organization and role of hospital	CO1
	C	Role of Hospital Administration	CO1
	Unit 2	**Challenges in Hospital Management**	
	A	Present Hospital Scenario: Management Orientation	CO2
	B	Public Relations and Image of Hospital	CO1, CO3
	C	Fundamental of Quality Management and research in hospital Administration	CO2

	Unit 3	**Health System in India**				
	A	Overview of Health Care Delivery System Holistic Approach to Health				CO3
	B	Health and Population, Policy and Strategies				CO3
	C	Introduction to research methodology in clinical practice				CO3
	Unit 4	**Bioethics**				
	A	Ethics and bioethics				CO4
	B	The birth of Bioethics				CO4
	C	Principles of Bioethics				CO4
	Unit 5	**Nutrition Programme Planning**				
	A	Concepts of dignity in the history of ideas				CO5
	B	The diverse understandings of human dignity in different cultural and moral traditions				CO5
	C	Autonomy and individual responsibility				CO5
	Mode of examination	Theory				
	Weightage Distribution	**CA**	**MTE**	**ETE**		
		15%	10%	75%		

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	3	3	3	2	1	1		
CO2	2	3	1	3	2	2	1	3		
CO3	1	2	3	3	3	1	2	1		
CO4	1	3	3	3	2	1	3	2		
CO5	3	3	3	1	3	1	2	2		
CO6	3	2	3	1	1	1	1	2		

Practical Subject

School: SSAHS		**Batch :** 2023-2027	
Programme: BND		**Current Academic Year: 2024-2025**	
Branch:		**Semester: 4th Semester**	
1	Course Code	BND274	
2	Course Title	Community Nutrition (Lab)	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Type	Compulsory	
5	Course Objective	This course will help in planning of nutrition education in community and helping them to achieve good nutritional status	
6	Course Outcomes	CO1: Understand and select themes and issues appropriate for the community. make modifications in order to improve the effectiveness of the teaching process. CO2: Understand the formulation of different messages for health education CO3: Understanding the concept of giving messages to health education CO4: Knowledge of nutrition and health education CO5: Understand different methods of communications. CO6: Develop the knowledge of different methods of communication	
7	Course Description	Thus course uses a question and answer format to Pregnancy and Lactation raise issues of concern in relation to nutrition and diet therapy .As part of Infancy and Preschool Age the answer you will also sometimes find hints and guidelines for yourself	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Themes in Nutrition Education**	
	A	Nutrition in pregnancy and lactation	CO 1
	B	Themes in nutrition during infancy and childhood	CO1
	Unit 2	**Themes in Health Education**	
	A	Preventing and Treating Common Sicknesses and Problems	CO2,CO6
	B	Infectious and Non infectious diseases	CO2
	Unit 3	**Messages in Nutrition and Health Education**	
	A	Messages in Nutrition Education	CO3
	B	Messages in Health Education	CO3
	C	How to Improve effectiveness of a Message	CO3
	Unit 4	**Nutrition and health status of the community**	
	A	Learning and Working with the Community	CO4,CO6
	B	Community Nutrition and Health	CO4

	C	Factors Influencing Community Health and Nutrition				CO3
	Unit 5	**Communication Method**				
	A	Group Communication Methods Mass Communication Media				CO3
	B	Presentation of Selected Communication Media Non-Machine Media—Planning and Preparation				CO4,CO6
	C	Machine Operated Devices—Planning and Preparation				CO3
	Mode of examination	Theory				
	Weightage Distribution	**CA**	**CE**	**ETE**		
		25%	25%	50%		
	Text Book	Nutrition Science- B.Srilakshmi Text of Human Nutrition-Anjana Agarwal, Shobha Agarwal				

Pos COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	1	1	2	2	2	1	1	1
CO2	3	3	2	1	1	1	2	2	1	3
CO3	2	2	2	2	3	2	1	1	1	3
CO4	1	3	1	2	1	2	1	2	1	2
CO5	3	1	1	3	1	2	2	2	2	2
CO6	3	3	1	3	3	3	2	1	1	1

Practical Subject

School: SSAHS		**Batch :2023-27**	
Programme: BND		**Current Academic Year: 2024-2025**	
Branch:		**Semester: 4th**	
1	Course Code	BND 275	
2	Course Title	Nutritional Biochemistry II	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Major	
5	Course Objective	The course is an introduction to nutritional biochemistry. The students will learn how nutrients effect biochemical processes and signal transduction pathways and how this can lead to development of nutrition related diseases	
6	Course Outcomes	CO1: To define the preparation of various reagents CO2: To Understand the qualitative analysis of carbohydrates I. CO3: To prepare the qualitative analysis of carbohydrates II CO4: To appraise the working of colorimeter. CO5: To assess the quantitative analysis of glucose CO6: To integrate the principles of qualitative analysis of carbohydrates.	
7	Course Description	Nutritional Biochemistry provides students with knowledge and understanding of the delivery and function of cellular nutrients and metabolism in the human body. It involves integrated learning between the areas of Biochemistry and Nutrition.	
8	Outline syllabus		CO Mapping
	Unit 1	**pH, Buffer and various types of solutions**	
	A	Preparation of Reagents	CO1
	B	Preparation of buffer	CO1
	C	Checking of pH	CO1
	Unit 2	**Qualitative analysis of Carbohydrates-1**	
	A	Molisch Test	CO2,CO6
	B	Iodine Test	CO2,CO6
	C	Benedict Test	CO2,CO6
	Unit 3	**Qualitative analysis of Carbohydrates-2**	
	A	Barford's Test	CO3,CO6
	B	Seliwanoff's Test	CO3,CO6
	C	Hydrolysis of sucrose	CO3
	Unit 4	**Colorimetry and its importance**	
	A	Colorimetry	CO4
	B	Lambart-Beer test	CO4
	C	Standard , Black and test solution	CO4
	Unit 5	**Quantitative analysis of Glucose**	
	A	Quantitative analysis of Glucose in normal sample	CO5
	B	Quantitative analysis of abnormal sample	CO5

	C	Quantitative analysis of unknown sample			CO5
	Mode of examination	Practical			
	Weightage Distribution	CA	CE	ETE	
		25%	25%	50%	
	Text book/s*	Textbook of Biochemistry By D.M. Vasudevan Biochemistry by U. Satyanarayan Textbook of Biochemistry by Chatterjee &Shinnde			

Pos COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	1	1	2	2	2	1	1	1
CO2	3	3	2	1	1	1	2	2	1	3
CO3	2	2	2	2	3	2	1	1	1	3
CO4	1	3	1	2	1	2	1	2	1	2
CO5	3	1	1	3	1	2	2	2	2	2
CO6	3	3	1	3	3	3	2	1	1	1

BND Fifth Semester

Theory Subjects

School: SSAHS		**Batch:**2023-27	
Programme: BND		**Current Academic Year:** 2025-26	
Branch: SSAHS		**Semester: 5th Semester**	
1	Course Code	BND 327	
2	Course Title	Food Service Management	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Type	Major	
5	Course Objective	• To prepare students to meet the challenges associated with the Food and Beverage Industry. • Students will gain a basic understanding of the Food and Beverage industry by analysing the industry's various processes	
6	Course Outcomes	CO1: To provide knowledge of development of food service unit CO2: To understand principles of entrepreneurship in food services CO3: To apply principles of menu planning in diet management CO4: To analyse principles of food management system with reference to diet management in industry. CO5: To evaluate the process of storage in food service management. CO6: To create the knowledge of Food service management for different organisation	
7	Course Description	A **food service management** Programme provides you with theoretical and practical knowledge, and you usually spend extensive time applying your coursework in real-world restaurant environments. The **courses** you take include **food service** sanitation, nutrition, culinary arts, dining room **management** and business practices.	
8	**Outline Syllabus**		CO Mapping
	Unit 1	**History and development of food service system**	
	A	Food service establishments-history and development, factors affecting development	CO 1
	B	Approaches to food service management, principles of management, functions of management	CO1
	C	The management process, types of plan, preparing a planning guide or prospectus	CO1,CO2
	Unit 2	**Entrepreneurship and food service management**	
	A	Entrepreneurship- characteristic of entrepreneur, creativity, innovation and entrepreneurship	CO2
	B	Business requirement for food products	CO2,CO1
	C	Entrepreneurship development and training	CO2

	Unit 3	**Menu Planning**				
	A	Definition and functions of menu, need for menu planning, knowledge and skills required for planning menu				CO3,CO4
	B	Types of menu and its application				CO3
	C	Steps in menu planning and its evaluation				CO3,CO6
	Unit 4	**Food Management: Purchase and Storage**				
	A	Purchasing: A food Management activity				CO4,CO3
	B	Mode of Purchasing				CO4,
	C	Methods of purchasing				CO4CO6
	Unit 5	**Storage**				
	A	Storage Space				CO5
	B	Store Room Management				CO5,CO4
	C	Production Control: Use of standardized recipes, quality control in food preparation and cooking				CO5, CO6
	Mode of Examination	Theory				
	Weightage distribution	CA	MTE	ETE		
		15%	10%	75%		
	Text Book	• West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised By Hargar FV, Shuggart SG, & Palgne Palacio June, Macmillian Publishing Company New York. • Sethi Mohini (2005) Institution Food Management New Age International Publishers • Tripati P C & Reddy PW (2008) Principles of Management 3rd edition Tata Mc Graw Hill Book Company				

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	3	2	1	-	3
CO2	2	2	2	2	1	3	2	1	3	-
CO3	3	1	1	1	1	3	2	1	-	2
CO4	2	1	2	2	2	1	2	-	2	1
CO.5	2	2	1	1	2	2	2	2	3	-
CO6	-	1	1	1	1	3	2	1	-	2

Theory Subject

School: SSAHS		**Batch :** 2021-24	
Programme: BND		**Current Academic Year: 2021-2022**	
Branch: SSAHS		**Semester: 5th** Semester	
1	Course Code	BND 330	
2	Course Title	Preventive Nutrition	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Type	Compulsory	
5	Course Objective	• To familiarize students with recent advances in nutraceuticals. • To impart knowledge on the health benefits of nutraceuticals and functional foods.	
6	Course Outcomes	CO1: Understand the diseases of GI tract and principles of diet modifications for its different therapeutic conditions CO2: Understand principles of diet modifications for Diabetes mellitus CO3:Understand principles of diet modifications for Cardiovascular diseases CO4: Understand principles of diet modifications for Gout CO5: Understand importance of diet for inborn error	
7	Course Description	Understand the functional foods and their uses. Comprehend the rationale of prevention of various diseases/disorders using nutraceuticals.	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Functional foods**	
	A	Definition, Relation of functional foods & Nutraceutical (FFN) to foods & drugs	CO 1
	B	Applications of herbs to functional foods. free radicals, antioxidants, phytochemicals, prebiotics, probiotics and symbiotic	CO1
	C	Fibre – classification, role, physiological and metabolic effect, Role of fibre in prevention of diseases	CO1
	Unit 2	**Introduction to Nutraceuticals as Science**	
	A	Historical perspective, classification, scope &future prospects	CO2
	B	Applied aspects of the Nutraceutical Science. Sources of Nutraceuticals	CO2
	C	Relation of Nutraceutical Science with other Sciences: Medicine, Human physiology, genetics, food	CO2

		technology, chemistry and nutrition				
	Unit 3	**Properties, structure and functions of various Nutraceuticals**				
	A	Glucosamine, Octacosanol, Lycopene, Carnitine, Melatonin and Ornithine alpha ketoglutarate				CO3
	B	Glucosamine, Octacosanol, Lycopene, Carnitine, Melatonin and Ornithine alpha ketoglutarate				CO3
	C	Use of pro-anthocyanidins, grape products, flaxseed oil as Nutraceuticals.				CO3
	Unit 4	**Nutrigenomics**				
	A	Production technology for recombinant therapeutic products using E.coli with examples like human insulin, growth hormones, interferons, erythropoietin.				CO4
	B	Immunization – Significance, immunization schedule for children				CO4
	C	Immunization – Significance, immunization schedule for children				CO3
	Unit 5	**Perspectives in preventive nutrition**				
	A	Fortification, enrichment, restoration, health supplements and proprietary foods				CO5
	B	Nutrigenomics				CO5
	C	Biomolecules as antibiotics, vitamins, pigments				CO5
	Mode of Examination	Theory				
	Weightage distribution	CA	MTE	ETE		
		15%	10%	75%		

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO330.1	3	1	3	3	3	2	2
CO330.2	3	2	3	2	3	3	2
CO330.3	3	3	1	3	1	3	3
CO330.4	1	3	2	3	2	2	3
CO330.5	1	2	3	3	3	3	3

Theory Subject

School: SSAHS		**Batch:** 2023-27	
Programme: BND		**Current Academic Year:** 2025-26	
Branch:		**Semester: 5th Semester**	
1	Course Code	BND 329	
2	Course Title	Nutrition for Fitness	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Type	Major	
5	Course Objective	This course will impart knowledge on changes in the human physiology and understand the role of exercise in fitness. The course will enable the students to understand the benefits of exercise in therapeutic conditions	
6	Course Outcomes	CO1: To introduce concept of nutrition and its application for physical fitness. CO2: To impart knowledge regarding importance of nutrition and exercise for physical, psychological, social and spiritual fitness of an individual. CO3: To understand the importance of different systems of body in the overall fitness of an individual CO4: To impart physical skills among the students in the planning and execution of exercise. CO5: To impart and develop intellectual for the execution of exercise and nutritional principles for fitness management. CO6: To develop understanding and application of holistic health and wellness	
7	Course Description	Physical fitness course will introduce the basics of exercise physiology and help to understand how the body responds and adapts to physical exercise.	
8	**Outline syllabus**		CO Mapping
	Unit 1	Body Composition	
	A	An overview of human body composition Factors influencing body composition and association with special emphasis on different sport	CO1
	B	Methods of Assessing body Composition	CO1
	C	Structure, Composition, Types and Functioning of muscles -Types of muscle exercises-endurance, resistance and flexibility and their effect on the composition and strength of muscle	CO1
	Unit 2	Cardiovascular Response to Exercise	

	A	-Physiology of Cardiovascular System-Effect of exercise				CO2
	B	-Markers of cardiovascular fitness -Effect of Exercise training on Cardiovascular fitness -Role of exercise in the diseases of CV system				
	Unit 3	Pulmonary response & skeletal fitness to exercise				
	A	Physiology of respiration, Effect of Exercise training on pulmonary function Markers of pulmonary fitness				CO3
	B	Bone Physiology-Structure of bone, Bone formation & remodelling -Types of joints				CO3,CO4
	C	Bone injuries during exercise training -Exercise & bone health				CO3,CO4
	Unit 4	Body Systems And Effect Of Exercise				
	A	Fluid & Electrolyte Balance, Acid Base Balance-Effect of Exercise				CO4,CO5
	B	Endocrinal And Neuronal Factors Influencing Exercise Performance				CO4, CO5
	Unit 5	Signs & Benefits Of Physical Fitness And Wellness				
	A	Relationship of Health and Disease with Personality				CO5, CO6
	B	Coronary type personality - Cancer prone personality				CO5, CO6
	C	Health effects of depression - Suicide – Warning signs / prevention Behavioural changes and wellness				CO5, CO6
	Mode of examination	Theory				
	Weightage Distribution	**CA**	**MTE**	**ETE**		
		15%	10%	75%		
	Text book/s*	1.Rhodes,R & Pflouzer, R (2003) Human Physiology, Thomson Brooks & cole, 4th Ed. 2. Waugh,A and Grant, A (2006) Anatomy and Physiology in Health and illness, Churchill Livingstone, 10th ed. 3. Davier, A, Blakeley, GH and Kidd,C (2001) Human Physiology, Harcourt Pub., 1st ed 4. Tortora,GJ and Grabowski, RS (1993) Principles of anatomy and Physiology, Harper Collins College Publishers, 7th ed. life style Wadsworth/Thomas Learning), USA				

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	3	2	1	1	1	-	3
CO2	3	2	2	3	2	1	2	1	3	-
CO3	2	1	2	3	1	2	1	1	-	2

CO4	3	1	1	3	2	2	1	-	2	1
CO5	3	2	1	3	1	1	1	2	3	-
CO6	3	2	1	3	1	2	1	1	-	2

Theory Subject

School: SSAHS		**Batch:** 2023-27	
Programme: BND		**Current Academic Year:** 2025-26	
Branch:		**Semester: 5th Semester**	
1	Course Code	BND 328	
2	Course Title	Therapeutic Nutrition-I	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Type	Major	
5	Course Objective	To understand the nutrition assessment, planning, implementation, monitoring and follow up in nutrition care process, the causative factors and metabolic changes in various diseases/disorders and acquire knowledge on the principles of diet therapy and comprehend principles of dietary Counselling and the rationale of prevention of various diseases/disorders.	
6	Course Outcomes	CO1:To define the diseases of GI tract and principles of diet modifications for its different therapeutic conditions CO2:To understand the principles of diet modifications for Diabetes mellitus CO3:To apply the principles of diet modifications for cardiovascular diseases CO4:To appraise the principles of diet modifications for Gout patient CO5: To evaluate the importance of diet for inborn error of metabolism CO6. To solve various diet related problems faced by the patients of various diseases	
7	Course Description	**Clinical nutrition** is concerned with **therapeutic** uses for **nutrition**, usually in medical settings, as part of a complete health care Programme. **Clinical** Nutritionists create effective **nutrition** plans aimed at disease prevention and treatment, strengthening of the immune system, and nourishment of the body.	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Diet in Gastrointestinal disease**	
	A	Diet in Gastrointestinal disease: Aetiology, Symptoms and dietary management of Oesophagitis, Gastro Oesophageal Reflux Disease (GERD), Dyspepsia, Gastritis, Peptic ulcer, Constipation, Diarrhoea, Ulcerative colitis, Flatulence, Irritable bowel syndrome, Inflammatory bowel disease, Diverticulitis	CO 1
	B	Diarrhoea, Ulcerative colitis, Flatulence, Irritable bowel syndrome, Inflammatory bowel disease, Diverticulitis	CO1
	C	Malabsorption syndrome – Lactose intolerance, Steatorrhoea, Celiac disease, Tropical sprue.	CO1
	Unit 2	**Diet in Diabetes Mellitus**	
	A	Types, Aetiology, Symptoms, factors affecting normal blood sugar level	CO2
	B	Diagnosis, Treatment, Dietary modifications, food exchange system, Glycemic Index, Glycemic load	CO2
	C	Complications of diabetes, Nutrition in complication of diabetes, hypoglycemic agents and supportive therapy.	CO2

	Unit 3	**Diet in Cardiovascular diseases**				
	A	Aetiology, Symptoms, Risk factors, pathophysiology, dietary management and prevention of Atherosclerosis, Coronary Artery Disease				CO3
	B	Role of Functional foods in preventing Cardiovascular Diseases				CO3,CO6
	C	Hypercholesterolemia, Hypertension – classification, sodium restricted diet, dangers of severe sodium restriction.				CO3
	Unit 4	**Diet in Gout**				
	A	Etiopathology				CO4
	B	Clinical features, complications				CO4
	C	Dietary management				CO3, CO6
	Unit 5	**Diet in Inborn Errors of Metabolism**				CO6
	A	Phenylketonuria, Maple Syrup Urine Disease (MSUD)				CO5
	B	Tyrosinemia				CO5
	C	Homocystinuria, Galactosemia				CO5
	Mode of Examination	Theory				
	Weightage distribution	CA	MTE	ETE		
		15%	10%	75%		

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	3	2	1	1	1	-	3
CO2	3	2	2	3	2	1	2	1	3	-
CO3	2	1	2	3	1	2	1	1	-	2
CO4	3	1	1	3	2	2	1	-	2	1
CO5	3	2	1	3	1	1	1	2	3	-
CO6	3	2	1	3	1	2	1	1	-	2

Practical Subjects

School: SSAHS		**Batch:** 2023-27	
Programme: MFN		**Current Academic Year:** 2025-26	
Branch:		**Semester: 5th Semester**	
1	Course Code	BND 368	
2	Course Title	Therapeutic Nutrition Lab	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Major	
5	Course Objective	To understand the nutrition assessment, planning, implementation, monitoring and follow up in nutrition care process, the causative factors and metabolic changes in various diseases/disorders and acquire knowledge on the principles of diet therapy and comprehend principles of dietary Counselling and the rationale of prevention of various diseases/disorders.	
6	Course Outcomes	CO1:To define the methods of food preparation for GI patients CO2:To understand the methods of food preparation for diabetic diet CO3:To apply the methods of food preparation for CVD CO4:To analyse the methods of food preparation for Gout patient CO5: To evaluate the methods of food preparation for inborn errors of metabolism CO6. To solve various diet related problems faced by the patients of various diseases	
7	Course Description	**Clinical nutrition** is concerned with **therapeutic** uses for **nutrition**, usually in medical settings, as part of a complete health care Programme. **Clinical** Nutritionists create effective **nutrition** plans aimed at disease prevention and treatment, strengthening of the immune system, and nourishment of the body.	
8	Outline syllabus		CO Mapping
	Unit 1	**Preparation of diets for GI therapeutic conditions**	
	A	Diet plan for the therapeutic condition	CO1
	B	Calculations of the requirements of the diet for given condition	CO1
	C	Diet preparation for GI therapeutic condition	CO1,CO6
	Unit 2	**Preparation of diet for Diabetic diseases**	
	A	To study the diet plan for diabetic patients	CO2
	B	Calculations for the nutritive vale	CO2
	C	Diet preparation for the diabetic patients	CO2, CO6
	Unit 3	**Preparation of diets for cardiovascular diseases**	
	A	To prepare the diet plan for CVD	CO3
	B	Calculations for the nutritive value	CO3

	C	Diet preparation for CVD patients			CO3,CO6
	Unit 4	**Preparation of diets for gout**			
	A	Diet plan			CO4
	B	Calculations			**CO4**
	C	Diet preparation			CO4,CO6
	Unit 5	**Preparation of diets for inborn errors**			
	A	Diet plan for inborn errors			CO5
	B	Calculations for nutrition for given disease			CO5
	C	Diet preparation for inborn errors			CO5,CO6
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	3	1	1	1	1	3
CO2	3	2	1	1	3	1	1	2	3	-
CO3	3	1	1	1	3	2	1	1	-	-
CO4	3	1	1	1	3	2	1	-	2	1
CO5	3	2	1	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Practical Subjects

School: SSAHS		**Batch: 2023-27**	
Programme: BND		**Current Academic Year: 2025-2026**	
Branch:		**Semester: 5th semester**	
1	Course Code	BND 370	
2	Course Title	Food Service Management (LAB)	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course Objective	To prepare students to meet the challenges associated with the Food and Beverage Industry. Students will gain a basic understanding of the Food and Beverage industry by analysing the industry's various processes	
6	Course Outcomes	CO1: Understand the methods for planning and organizing for industrial canteen CO2: Understand the methods for planning and organizing for railway base kitchen CO3: Understand the methods for planning and organizing for birthday party CO4: Understand the practical working of food service establish CO5: Understand the planning and preparation of prospectus	
7	Course Description	A **food service management** Programme provides you with theoretical and practical knowledge, and you usually spend extensive time applying your coursework in real-world restaurant environments. The **courses** you take include **food service** sanitation, nutrition, culinary arts, dining room **management** and business practices.	
8	Outline syllabus		CO Mapping
	Unit 1	**Planning and organizing meals for**	
	A	Industrial canteen	CO1
	B	Calculations	CO1
	C	Recipe preparation	CO1
	Unit 2	**Planning and organizing meals for**	
	A	Railway base kitchen	CO2
	B	Calculations	CO2
	C	Recipe preparation	CO2
	Unit 3	**Planning and organizing meals for**	
	A	Birthday party	CO3
	B	Calculations	CO3
	C	Recipe preparation	CO3
	Unit 4	**Visit to a food service establishment**	
	A	Visit	CO4
	B	Record preparation	**CO4**

	C	Record preparation			CO4
	Unit 5	**Preparing a planning guide/prospectus**			
	A	Preparation			CO5
	B	Preparation			CO5
	C	Preparation			CO5
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	3	1	1	1	1	3
CO2	3	2	1	1	3	1	1	2	3	-
CO3	3	1	1	1	3	2	1	1	-	-
CO4	3	1	1	1	3	2	1	-	2	1
CO5	3	2	1	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Practical Subjects

School: SSAHS		**Batch: 2023-2027**	
Programme: BND		**Current Academic Year: 2025-26**	
Branch: Nutrition and Dietetics		**Semester: V**	
1	Course Code	BND 371	
2	Course Title	Food Adulteration (LAB)	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Major	
5	Course Objective	After studying this paper the students will know – a. To educate about common food adulterants and their detection. b. To impart knowledge in the legislatory aspects of adulteration. c. To educate about standards and composition of foods and role of consumer	
6	Course Outcomes	Students will be able to CO1: Gain the knowledge about characteristics milk adulteration. CO2: Understand the testing methods of ghee adulteration. CO3: Apply the methods for detection of adulteration in oil and fats. CO4: Analyse spices and condiments adulteration. CO5: Gain the knowledge about the food adulteration CO6: Identify the sources of adulteration in the edible oils	
7	Course Description	After the completion of this course students will be able to identify the adulteration in the different types of foods and drinks.	
8	Outline syllabus		CO Mapping
	Unit 1	Testing adulteration of Milk and products	**CO1**
		• Briefing • Demo • Practical	
	Unit 2	Testing adulteration of Adulteration of Ghee:	**CO2**
		• Briefing • Demo • Practical	
	Unit 3	Testing adulteration of oils and fats:	**CO3, CO6**
		• Briefing • Demo • Practical	
	Unit 4	Testing adulteration of spices and condiments.	**CO4**
		• Briefing • Demo • Practical	
	Unit 5	Food adulteration awareness campaign – know your food quality	**CO5**
		• Briefing	

		• Demo • Practical			
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	CE	ETE	
		25%	25%	50%	
	Text book/s*	Laboratory Manual			
	Other References	-			

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3
CO1	3	2	3	3	2	3	2	3	2	2	2	3
CO2	3	2	2	3	3	3	2	1	2	2	2	3
CO3	3	2	3	3	2	3	2	-	2	2	2	3
CO4	-	2	3	3	-	3	2	-	2	2	2	3
CO5	3	2	2	3	2	3	2	3	2	2	2	3
CO6	-	3	3	2	3	2	3	-	1	-	3	3

BND Sixth Semester

Theory Subject

School: SSAHS		**Batch:** 2023-27	
Programme: BND		**Current Academic Year:** 2025-26	
Branch: SSAHS		**Semester: 6th Semester**	
1	Course Code	BND 331	
2	Course Title	Therapeutic Nutrition-II	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Type	Core Course	
5	Course Objective	To understand the nutrition assessment, planning, implementation, monitoring and follow up in nutrition care process, the causative factors and metabolic changes in various diseases/disorders and acquire knowledge on the principles of diet therapy and comprehend principles of dietary Counselling and the rationale of prevention of various diseases/disorders.	
6	Course Outcomes	CO1:To define the principles of diet modifications for Paediatric Patients. CO2:To understand the principles of diet modifications for liver diseases CO3: To apply the principles of diet modifications for renal diseases CO4:To analyse the diet modifications for different types of cancers CO5: To evaluate various effects of diet and drug interactions on the body CO6: To solve various problems related to diet and its modifications for various diseases.	
7	Course Description	**Clinical nutrition** is concerned with **therapeutic** uses for **nutrition**, usually in medical settings, as part of a complete health care Programme. **Clinical** Nutritionists create effective **nutrition** plans aimed at disease prevention and treatment, strengthening of the immune system, and nourishment of the body.	
8	**Outline Syllabus**		CO Mapping
	Unit 1	**Diet Modification for paediatric patients**	
	A	Dietary management of PEM	CO 1
	B	Nutritional management of LBW	CO1
	C	Dietary management of other deficiency disease present in paediatric patients.	CO1
	Unit 2	**Diet in Diseases of Liver and Gall Bladder**	

	A	Aetiology, Symptoms, Dietary treatment in Jaundice, Hepatitis, Pancreatitis, Cirrhosis, Hepatic Coma	CO2
	B	Role of food and alcohol in developing liver diseases.	CO2
	C	Biliary Tract Diseases- Cholecystitis, Cholelithiasis, and Choledocholithiasis	CO2
	Unit 3	**Diet in Renal disease**	CO6
	A	Causes, Symptoms and dietary management in Nephritis, Nephrosis	CO3
	B	Acute and chronic renal failure, Renal calculi, Acid and alkali producing foods	CO3
	C	End Stage Renal Diseases (ESRD), Dialysis.	CO3
	Unit 4	**Diet in Cancer**	
	A	Tumor markers and their applications, Types of cancer, Risk factors	CO4
	B	Symptoms, Metabolic alterations and Nutritional problems of cancer and cancer therapy	CO4
	C	Medical Nutrition Therapy, Role of food in prevention of cancer.	CO4,CO6
	Unit 5	**Diet and Drug interaction**	
	A	Basic Concept	CO5
	B	Effect of nutrition on drugs	CO5
	C	Clinical significance and risk factors for drug-nutrient interactions	CO5, CO6
	Mode of Examination	Theory	
	Weightage distribution	CA: 10% / CE: 15% / ETE: 75%	
	Text Book	Swaminathan, M (1989), Hand Book of Food and Nutrition, Bangalore Printing and Publishing Co, Bangalore. Gibney M J., Elia.M, Lingqvist. O (2005), Clinical Nutrition, Blackwell Science publishing Co. Guthrie, H.A and Picciano, M.F, (1995), Human Nutrition, Mosby Publishing Co, New York.	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3

CO1	3	1	1	3	2	1	1	1	-	3
CO2	3	2	2	3	2	1	2	1	3	-
CO3	2	1	2	3	1	2	1	1	-	2
CO4	3	1	1	3	2	2	1	-	2	1
CO5	3	2	1	3	1	1	1	2	3	-
CO6	3	2	1	3	1	2	1	1	-	2

Theory Subjects

School: SSAHS		**Batch:** 2023-27	
Programme: MFN		**Current Academic Year:** 2025-26	
Branch:		**Semester: 6th Semester**	
1	Course Code	BND 333	
2	Course Title	Food Product Development and Sensory Analysis	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Major	
5	Course Objective	This course will provide each student with an exposure about sensory quality parameters and methods of sensory evaluation of foods	
6	Course Outcomes	CO1To explain the strategies for development of new food products in food industry. CO2 To understand the main factors of a food product development process CO3 To apply the role of consumers, advertisement and marketing in food product development CO4 To analyse various sensory evaluation techniques for determining quality changes of food samples as effect of storage or treatment. CO5 To evaluate the result of using different kind of sensory panels for evaluation CO6 To create knowledge for applying sensory evaluation techniques for determining quality changes.	
7	Course Description	*Food product development* has become the key strategic focus for successful *food* industry companies and this *course* examines the principles and practices of new product development and its analysis. Organoleptic evaluation is very important form of evaluation hence this Couse provide details of both aspects.	
8	**Outline syllabus**		CO Mapping
	Unit 1	Food product development	
	A	Objectives, needs and importance of product development Product life cycle and its role in product development	CO1, CO2
	B	Role of creativity and strategy in product development	CO1
	C	Forecasting of raw materials, ingredients, and product needs Use of input – output analysis in forecasting	CO1
	Unit 2		
	A	Forecasting of raw materials, ingredients, and product needs Use of input – output analysis in forecasting	CO1,CO2
	B	Product development process indulging opportunity analysis Generation and evaluation of ideas Testing of concept v/s product	CO1, CO2

	C	Prototype product Positioning of product and market research Planning product development project using job progress bar chart and PERT technique				CO2
	Unit 3					
	A	Market survey, consumer trends, trials and survey Various quality control techniques (viz. total quality assurance, SQC, GMP, HACCP & ISO – 9000 series)				CO3
	B	Applicable to product development and regulatory frame work for new produce.				CO3
	C	Product launching Advertisement and marketing IPR and patents				CO3
	Unit 4	Sensory Evaluation				
	A	Selection of sensory panelists; Factors influencing sensory measurements				CO4,CO5
	B	Sensory quality parameters-Size and shape, texture, aroma, taste, color and gloss				CO4,CO5
	C	General analysis conditions for sensory evaluation Requirements of sensory laboratory				CO4,CO5,CO6
	Unit 5	Methods of Sensory Evaluation				CO6
	A	Different tests for sensory evaluation–Paired comparison test, Duo-trio test, Triangle test, Ranking test, Two sample difference test, multiple sample difference test,				CO5, CO6
	B	Hedonic rating test, composite scoring test, sensitivity threshold test, dilution test, descriptive flavor profile test				CO5, CO6
	C	Statistical analysis of sensory data				CO5
	Mode of examination					
	Weightage distribution	CA	MTE	ETE		
		15%	10%	75%		
	Text book/s*	• Arlington. Food Product Development • Desrosier NW and Desrosier JN. Economics of New Product Development • Graf, E and Israel SS. Food Product Development from Concept to Market Place • Amerine MA, Pangborn RM & Rossles E B. 1965.Principles of Sensory Evaluation of Food. Academic Press. • Jellinek G. 1985. Sensory Evaluation of Food - Theory and Practice. Ellis Horwoood. •Lawless HT & Klein BP.1991.Sensory Science Theory and Applicatons in Foods. Marcel Dekker				

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3

CO1	3	2	1	1	3	3	1	3	-	3
CO2	3	2	1	1	3	3	1	1	3	-
CO3	2	2	1	1	3	3	1	3	-	2
CO4	3	1	1	2	3	3	1	3	2	1
CO5	3	2	1	2	3	3	1	2	3	-
CO6	3	2	2	2	3	3	1	1	-	2

School: SSAHS		**Batch:**2023-27	
Programme: BND		**Current Academic Year: 2025-2026**	
Branch: SSAHS		**Semester: 6th Semester**	
1	Course Code	BND 332	
2	Course Title	**Principles of Food Preservation**	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Type	Major	
5	Course Objective	To equip students with advanced knowledge of preservation of food	
6	Course Outcomes	CO1: To define the principles of food preservation CO2: To understand the concept of dehydration and drying CO3: To apply the concept of preservation by high temperature CO4: To analyse the concept of preservation in food industry. CO5: To evaluate preservation by low temperature methods CO6: To create knowledge of food preservation for its application in food industry	
7	Course Description	**Preservation** by chilling, freezing, canning, fermentation, concentration, dehydration, smoking, by chemical agents and novel non thermal **techniques**.	
8	**Outline Syllabus**		CO Mapping
	Unit 1	**Introduction to food preservation**	
	A	Introduction to food preservation –definition methods of food preservation , principles of food preservation	CO 1
	B	Packaging of foods – definition, Functions of packaging; Type of packaging materials;	CO1
	C	Selection of packaging material for different foods; Selective properties of packaging film; Methods of packaging.	CO1
	Unit 2	**Dehydration and drying of food items**	
	A	Dehydration- definition and objectives, method of preservation,	CO2
	B	factors affecting rate of drying, sun drying, water activity,	CO2
	C	Types of dehydrators -air convection, drum, freeze and vacuum driers etc. Packaging of dehydrated foods.	CO2
	Unit 3	**Preservation by high temperature**	

	A	Introduction: pasteurisation , sterilization	CO3
	B	Canning: Preservation principle of canning of food items, spoilage in canned foods .	CO3
	C	Role of food packaging in food preservation, packaging of fruits and vegetables. Point to be considered before designing a packaging systems	CO3,CO6
	Unit 4	**Preservation by preservatives**	
	A	Preservation by preservative : Objective , methods, chemical preservative , natural preservatives .	CO4
	B	Food Additives- Food colours, antioxidants, emulsifiers and stabilisers, sweeteners.	CO4
	C	Innovative food packaging : types of packaging- MAP,CAP, active packaging , vacuum packaging , aseptic packaging	CO4,CO6
	Unit 5	**Preservation by low temperature:**	
	A	Definition and objectives, difference between freezing and refrigeration, systems of refrigeration,	CO5
	B	method of preservation. slow freezing process, quick freezing process	CO5,CO6
	C	steps in freezing fruits and vegetables, cryogenic freezing, effect of freezing on nutritive value.	CO5,CO6
	Mode of Examination	Theory	
	Weightage distribution	CA: 15% / MTE: 10% / ETE: 75%	
	Text Book	Anderson, F. (1996), Home Appliance Servicing Taraporwals Sons. & Co. Arora, K., (2002), Theory of Cookery, Frank Bros. & Co., Ltd., New Delhi. □Berry, M., (1995), Complete Cook Book, Dorling Kindersley Ltd., London. Hsiung, D.T., (1994), Chinese Cantonese Cooking, Parragon Book Service Ltd., England. Johnson, J.B, (1995), Equipment for Modern Living, Macmillan company Ltd □Khan, M.A. (1987), Food Service Operations, Avi Publishing Company. Lillicrap, D.K., (1989), Food and Beverage Service, 2nd edition, BLBS.	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3

CO1	3	1	1	1	3	3	1	1	-	3
CO2	3	1	2	1	3	3	1	1	3	-
CO3	2	2	1	1	3	2	1	1	-	2
CO4	3	1	2	1	2	3	1	-	2	1
CO5	3	1	2	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Theory Subjects

School: SSAHS		**Batch:** 2023-27	
Programme: BND		**Current Academic Year: 2025-2026**	
Branch: Nutrition and Dietetics		**Semester: 6th Semester**	
1	Course Code	BND 334	
2	Course Title	**Food Toxicity**	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Major II	
5	Course Objective	The objectives of this course are to: • Further expose students to toxicants that are associated with both plant and animal foodstuffs that occur as natural constituents and contaminants; • Introduce students to methods for evaluating different levels of toxicity in foodstuffs	
6	Course Outcomes	Students will be able to CO1 demonstrate a fundamental knowledge of food adulteration; CO2 acquire mastery with the major issues, concepts, and subject areas in food toxicology CO3. differentiate between natural constituents that are toxicants and natural contaminants that act as toxicants CO4. be able to demonstrate a fundamental knowledge of risk assessment and food safety as it is applied to toxic agents in the human food chain; CO5. acquire mastery of sourcing and synthesizing information in aspects of Food Chemistry, Toxicology, and Microbiology as it applies to chemical food safety and food toxicology. CO6 able to acquire knowledge about food toxicity	
7	Course Description	After the completion of this course students will be able to identify the adulteration in the different types of foods and drinks.	
8	Outline syllabus		CO Mapping
	Unit 1	Food Adulteration	**CO1**
		Food adulteration and contamination, common food contaminants & adulterants Nature of adulterants, methods of evaluation of food adulterants and toxic constituents in foods, common food adulterants & their detection on various foods like a) Milk and Milk products b) Oils and fats c) Spice and condiments d) Wheat and other flours e) Sugar and Preserve f) Fruit and Vegetable products g) Beverages Alcoholic and Non-Alcoholic	
	Unit 2	Introduction to food toxicology	**CO2**
		classification, dose, determinants of toxins in foods;	

		naturally occurring toxins from animals, bacterial and fungal and sea food sources. Risk assessment in food toxicology; laws and regulation of safety assessment of foods including food additives, environmental contaminants, pesticides and antibiotic residues			
	Unit 3	Allergens, toxic constituents and anti-nutritional factors			**CO3, CO6**
		Allergens, toxic constituents and anti-nutritional factors of plant foods (enzyme inhibitors, trypsin and chymotrypsin inhibitor, amylase inhibitor, flatulence causing sugars, phyto lectins).			
	Unit 4	Agricultural and industrial contaminants in foods			**CO4**
		Pesticides residues in fruits and vegetables, metal contaminants in foods and their toxicity in human body; animal drug residues in food and water, dioxins and related compounds in food; metals such as lead, arsenic and mercury.			
	Unit 5	Food additives as toxicants			**CO5,CO6**
		artificial colors, preservatives, sweeteners; toxicants formed during food processing such as nitrosamines, maillard reaction products acrylamide, benzene, heterocyclic amines and aromatic hydrocarbons and irradiation; risk of genetically modified food, food supplements, persistent organic pollutants, toxicity implications of nanotechnology in food.			
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		15%	10%	75%	
	Text book/s*				
	Other References	1. Shibamato T. and Bjeldanes L., Introduction to Food Toxicology, Academic Press, Inc. San Diego, CA. ISBN 0-12640025-3 2. Deshpande, S.S. (2002). Handbook of Food Toxicology, Marcel Dekker Inc. NY ISBN 0-8247-0760-5 3. William H. W., Essentials of Environmental Toxicology. Taylor & Francis, Philadelphia, PA. ISBN 1-56032-470-4 4. Fennema, O, Food Chemistry. Marcel Dekker 1997			

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	1	1	3	2	1	1	1	-	3
CO2	1	2	2	3	2	1	2	1	3	-
CO3	1	1	2	3	1	2	1	1	-	2

CO4	1	1	1	3	2	2	1	-	2	1
CO5	1	2	1	3	1	1	1	2	3	-
CO6	1	2	1	3	1	2	1	1	-	2

Practical Subjects

School: SSAHS		**Batch:** 2023-27	
Programme: BND		**Current Academic Year: 2025-2026**	
Branch:		**Semester:6th semester**	
1	Course Code	BND 371	
2	Course Title	Therapeutic Nutrition-II	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Major	
5	Course Objective	To understand the nutrition assessment, planning, implementation, monitoring and follow up in nutrition care process, the causative factors and metabolic changes in various diseases/disorders and acquire knowledge on the principles of diet therapy and comprehend principles of dietary Counselling and the rationale of prevention of various diseases/disorders.	
6	Course Outcomes	CO1: To define the methods of food preparation for **paediatric** CO2: To understand the methods of food preparation for liver disease CO3: To apply the methods of food preparation for renal disease CO4: To analyse the methods of food preparation for gall bladder CO5: To evaluate the methods of food preparation on oncogenic diet CO6: To solve various problems related to diet and its modifications for various diseases.	
7	Course Description	**Clinical nutrition** is concerned with **therapeutic** uses for **nutrition**, usually in medical settings, as part of a complete health care Programme. **Clinical** Nutritionists create effective **nutrition** plans aimed at disease prevention and treatment, strengthening of the immune system, and nourishment of the body.	
8	Outline syllabus		CO Mapping
	Unit 1	**Preparation of diets for paediatric conditions**	
	A	Diet plan for paediatric	CO1
	B	Calculations for the diet	CO1
	C	Diet preparation	CO1,CO6
	Unit 2	**Preparation of diet for liver disease**	
	A	Diet plan for liver disease	CO2
	B	Calculations for the diet	CO2
	C	Diet preparation	CO2,CO6
	Unit 3	**Preparation of diets for renal disease**	
	A	Diet plan for renal disease	CO3
	B	Calculations for the diet	CO3
	C	Diet preparation	CO3,CO6
	Unit 4	**Preparation of diets for gall bladder**	
	A	Diet plan for gall bladder	CO4
	B	Calculations for the diet	**CO4**
	C	Diet preparation	CO4,CO6
	Unit 5	**Preparation of oncogenic diets**	

	A	Diet plan for oncogenic diet			CO5
	B	Calculations for the diet			CO5
	C	Diet preparation			CO5,CO6
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		25%	25%	50%	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	3	2	1	1	1	-	3
CO2	3	2	2	3	2	1	2	1	3	-
CO3	2	1	2	3	1	2	1	1	-	2
CO4	3	1	1	3	2	2	1	-	2	1
CO5	3	2	1	3	1	1	1	2	3	-
CO6	3	2	1	3	1	2	1	1	-	2

School: SSAHS		**Batch :** 2023-27
Programme: BND		**Current Academic Year: 2025-2026**
Branch: SSAHS		**Semester: 6th** Semester
1	Course Code	BND 372
2	Course Title	Community Connect
3	Credits	2
4	Contact Hours (L-T-P)	00-00-4
	Course Type	Compulsory
5	Course Objective	1. The objective of assigning the project related to community work is to expose our students to different health issues faced by the people in different sections of society. 2. This type of project work will help the students to develop better understanding of problems of people living in disadvantage position in the society, may be socially, medically, economically, or otherwise. 3. This type of live project work will help our students to connect their class-room learning with practical issues/problems in the society.
6	Course Outcomes	CO1:The community posting project will enable our students to acquire knowledge and skills which will help them take up projects or assignments in industry or hospital. CO2: These types of activities will give practical exposure to our students. It will help them understand different current issues. CO3: They will learn to do research. CO4:These activities will add value to students CO5:Students will understand practical implication of nutrition and health
7	Theme	Major sub-themes for research: • Mal-Nutritional issues • Nutritional education • Assessment of Nutritional Status
8	**Guidelines for faculty members**	It will be a group assignment. There should be not more than 5 students in each group. The faculty guide will guide the students and approve the project title and help the student in preparing the questionnaire and final report. The questionnaire should be well design and it should carry at least 20 questions (Including demographic questions). The faculty will guide the student to prepare the PPT. The topic of the research should be related to nutritional problems and assessment concerning the common man.

		The report should contain 1500 to 2000 words and relevant charts, tables and photographs. The student should **submit the report** to CCC-Coordinator signed by the faculty guide by 25 November 2019. The students have to send the hard copy of the **report and PPT**, and then only they will be allowed for ETE.	
	Role of Coordinator	The Coordinator will supervise the whole process and assign students to faculty members.	
	Layout of the Report	a. Introduction b. Literature review(optional) c. Objective of the research d. Research Methodology e. Finding and discussion f. Conclusion and recommendation g. References Note: Research report should base on primary data.	
	Guideline for Report Writing	**Title Page: The following elements must be included:** • Title of the article; • Name(s) and initial(s) of author(s), preferably with first names spelled out; • Affiliation(s) of author(s); • Name of the faculty guide and Co-guide **Abstract:** Each article is to be preceded by a succinct abstract, of up to 250 words, that highlights the objectives, methods, results, and conclusions of the paper. **Text: Manuscripts should be submitted in Word.** • Use a normal, plain font (e.g., 12-point Times Roman) for text. • Use italics for emphasis. • *Use the automatic page numbering function to number the pages.* • *Save your file in docx format* (Word 2007 or higher) or doc format (older Word versions) **Reference list:** The list of references should only include works that are cited in	

		the text and that have been published or accepted for publication. The entries in the list should be in alphabetical order. Journal article Hamburger, C.: Quasimonotonicity, regularity and duality for nonlinear systems of partial differential equations. Ann. Mat. Pura Appl. 169, 321–354 (1995)	
	Format	**The report should be Spiral** The Design of the Cover page to report will be given by the Coordinator Cover page Acknowledgement Content Project report Appendices	
	ETE	**The students will be evaluated by panel of faculty members on the basis of their presentation.**	

BND Seventh Semester

Theory Subjects

School: SSAHS		**Batch:2023-27**	
Programme: BND		**Current Academic Year: 2026-27**	
Branch:		**Semester:**7th Semester	
1	Course Code	BND411	
2	Course Title	Applied Physiology	
3	Credits	4	
4	Contact Hours (L-T-P)	4-0-0	
	Course Type	Major	
5	Course Objective	To understand the normal structure and functioning of various organ systems of the body and their interactions and to be able to comprehend the pathophysiology of commonly occurring diseases	
6	Course Outcomes	CO1: Remembering the current state of knowledge about the functional organization of the human body. CO2: Understand insight of normal functioning of all the organ systems of the body and their interactions. CO3: Apply the knowledge of physiology in pathophysiology of commonly occurring diseases. CO4: Analyse the physiology with various disorders and their pathogenesis. CO5: Evaluate the defence mechanism of human body CO6: Create the knowledge of physiological functions of different body organs	
7	Course Description	The course in Physiology and Anatomy cover the first year is designed to give the students a depth knowledge of fundamental functions of different systems of human body. The major topics to be covered include the following: the cell, muscle& nervous tissue; blood; lymphoid tissues; respiratory system; blood vessels; circulation; heart; gastro intestinal tract; endocrine & Reproductive system, excretory system, central nervous system and special senses.	
8	**Outline syllabus**		CO Mapping
	Unit 1	**DIGESTIVE AND EXCRETORY SYSTEM**	
	A	Structure and functions of gastrointestinal tract Structure and functions of liver Functions of gastrointestinal secretions Role of enzymes in digestion Gut flora, role of prebiotics and probiotics in the maintenance of health of digestive system	CO1,CO2

	B	Structure and functions of kidney Urine formation Organic constituents of urine Inorganic constituents of urine	CO1,CO2
	C	Physiology of different diseases related to digestive and excretory system	CO1,CO6
	Unit 2	**RESPIRATORY AND NERVOUS SYSTEM**	
	A	Structure and functions of nose and nasal cavity, pharynx, larynx, trachea, bronchi and lungs Mechanism of respiration, Oxygen transport, Carbon dioxide transport Respiratory rate, Air volume in lung in different situations Respiratory abnormalities; Hypoxia, Hypercapnia, carbon monoxide poisoning, Asphyxia, Cyanosis, High altitude sickness	CO2,CO1,CO6
	B	Emphysema, Asthma, COPD Structure of nerve cell, nerve impulses Classification of nervous system, Structure and functions of brain, spinal cord Peripheral nervous system Cerebrospinal fluid, Blood Brain Barrier, Neurotransmitters Alzheimer's disease, Parkinson's disease	CO1, CO3
	C	Physiology of different diseases related to respiratory and nervous system	CO2, CO6
	Unit 3	**BLOOD AND CIRCULATORY SYSTEM**	
	A	Structure and functions of heart and blood vessels Pulmonary, Systemic and Portal circulation Blood pressure, Heart rate, Factors affecting BP and heart rate Regulation of Cardiac output Composition of blood	CO3, CO1

	B	Plasma proteins; Functions, role in fluid balance Organic and Inorganic compounds in plasma Blood Lipids – Chylomicrons, VLDL, LDL, HDL,Cholesterol, Triglycerides Enzymes in blood Blood coagulation	CO3
	C	Physiology of different diseases related to blood and circulatory system	CO3,CO6
	Unit 4	**ENDOCRINE SYSTEM**	
	A	Endocrine glands, Formation and secretion of hormones Control of hormone secretion, mechanism of hormone action Pituitary gland: Hormones secreted and their functions, abnormalities Thyroid gland: Structure of thyroid gland, formation of thyroid hormones, functions of thyroid hormones, hypothyroidism, hyperthyroidism Adrenal gland: Structure of adrenal gland, secretions of adrenal cortex and their functions, hypoadrenalism, hyperadrenalism Secretions of adrenal medulla and their functions	CO4
	B	Parathyroid gland: Structure of parathyroid gland, functions of parathormone, hypo and hyper secretion of parathormone Islets of Langarhans: Structure of islets of Langarhans, functions of Insulin, deficiency of insulin, functions of glucagon Testes: Structure of testes, functions of testosterone, deficiency of testosterone Ovaries: Structure of ovaries, functions of estrogens and progesterone	CO4,CO3
	C	Physiology of different diseases related to Endocrine system	CO4, CO3, CO6
	Unit 5	**Excretory Physiology and Exercise Physiology**	

	A	Acid Base balance Pathophysiology of Renal Stones, Urinary Tract Infection, Glomerulonephritis Water and electrolyte balance				CO5
	B	Concept of Fitness, Adaptations to exercise				CO5,CO3
	C	Energy Metabolism in Sports				CO5
	Mode of examination	Theory				
	Weightage Distribution	**CA**	**MTE**	**ETE**		
		15%	10%	75%		
	Text book/s*	Text book of physiology- A.K. Jain Essentials of medical physiology- K.Sembulingam				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	-	-	1	1	2	-	-
CO2	3	1	2	2	1	2	1	1	-	-
CO3	2	3	3	2	1	1	1	3	-	-
CO4	3	2	1	2	1	1	1	2	-	-
CO5	3	2	2	-	1	1	1	3	-	-
CO6	3	2	2	-	1	1	1	1	-	-

Theory Subjects

School: SSAHS		**Batch:2023-27**	
Programme: BND		**Current Academic Year: 2026-27**	
Branch:		**Semester:**7th Semester	
1	Course Code	BND412	
2	Course Title	Advanced Nutritional Biochemistry and Instrumentation-I	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Type	The course is an detail discussion to nutritional biochemistry. The students will learn how nutrients effect biochemical processes and signal transduction pathways and how this can lead to development of nutrition related diseases.	
5	Course Objective	CO1:Define the process of carbohydrate metabolism CO2: Understand the process of lipid metabolism CO3: Apply the knowledge of Protein metabolism in human body CO4: Analyse the mechanism of biological oxidation CO5: Evaluate the functioning of analytical instruments Co6: Create the knowledge of different metabolic functions	
6	Course Outcomes	Nutritional Biochemistry provides students with knowledge and understanding of the delivery and function of cellular nutrients and metabolism in the human body. It involves integrated learning between the areas of Biochemistry and Nutrition.	
7	Course Description	The students will learn how nutrients effect biochemical processes and signal transduction pathways and how this can lead to development of nutrition related diseases.	
8	**Outline syllabus**		CO Mapping
	UNIT 1	**Carbohydrate Metabolism**	CO1
	A	Carbohydrate chemistry (in brief) and metabolism-An overview, Glycolysis,TCA cycle, Gluconeogenesis,Metabolism of glycogen,HMP shunt pathway	CO1, CO6
	B	Regulation of carbohydrate metabolism at substrate level, enzyme level, hormonal level and organlevel.	CO1
	C	Intestinal transport of carbohydrates and Transport of glucose across various cells	CO1
	Unit 2	**Lipid Metabolism**	CO2
	A	Metabolism of lipids (beta-oxidation, denovo synthesis of fatty acids, synthesis and breakdown of unsaturated fatty acids, cholesterol and alcohol)	CO2, CO6
	B	Lipoprotein metabolism, VLDL, LDLandHDL	CO2, CO6

	C	Ketone bodies and ketosis				CO2
	Unit 3	**Protein Metabolism**				CO3
	A	Absorption and Biosynthesis of protein (translation)				CO3
	B	Catabolism of protein Urea cycle transamination, one-carbon metabolism				CO3
	C	Essential and non-essential amino acids and non-protein functions of amino acids				CO3
	Unit 4	**Biological Oxidation**				CO4
	A	Biological Oxidation, Enzymes and co-enzymes involved in oxidation and reduction, respiratory chain				CO4,CO6
	B	Role of electron transport chain or respiratory chain				CO4
	C	Mechanism of Oxidative phosphorylation; Uncouplers				
	Unit 5	**Basic Instrumentation**				CO5
	A	Centrifuge and weighing balance				CO5
	B	Water bath and pH meter				CO5
	C	Colorimeter and Spectrophotometer				
	Mode of examination	Theory				
	Weightage Distribution	**CA**	**MTE**	**ETE**		
		15%	10%	75%		
	Text book/s*	• BergJM, Tymoczko JL and Stryer L. (2002) Biochemistry 5th ed. W.H. Freeman. • Clinical Correlations 5th ed. John Wiley and Sons.				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	-	1	2	-	1	-	-
CO2	3	1	2	1	2	2	-	2	-	-
CO3	3	1	2	1	2	2	-	3	-	-
CO4	3	1	2	1	2	1	1	3	-	-
CO5	2	2	2	1	3	3	-	1	-	-
CO6	3	1	2	1	3	2	-	1	-	-

Theory Subjects

School: SSAHS		**Batch:2023-27**	
Programme: BND		**Current Academic Year: 2026-27**	
Branch:		**Semester:**7th Semester	
1	Course Code	BND413	
2	Course Title	Nutrition Science	
3	Credits	4	
4	Contact Hours (L-T-P)	4-0-0	
	Course Type	Major	
5	Course Objective	This course will enable the students to gain in-depth knowledge of the physiological and metabolic role of macronutrients and micronutrients and their importance in human nutrition. It enables the understanding of basis of human nutritional requirements and recommendations through the life cycle and translate the knowledge into practical guidelines for dietary needs and also of various vitamins and their implications.	
6	Course Outcomes	CO1:To define various nutritional components of the food and their interaction in human health. CO2:To understand the human nutrition principles and guidelines CO3:To apply the requirements of the nutritional components for different age, sex and physiological groups. CO4:To analyse the gained knowledge in practical conditions CO5: To evaluate concepts of micronutrients and effect of its deficiency. C06: To create knowledge of different nutrient functioning and its deficiencies	
7	Course Description	This course is a description of Metabolic processes which involve essential dietary components and methods of evaluating nutrition status. It helps in appreciate the importance of nutrition immunity interactions and their implication and to learn various measures for enhancing nutritional quality of diets.	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Human Nutritional Requirements – Development and Recent Concepts**	
	A	Methods of determining human nutrient needs Definition of basic terms and concepts in relation to human nutritional requirements	CO1,CO2
	B	Basic terminology in relation to Nutritional knowledge Methods of studying the nutrient requirements	CO1
	C	International and National Recommendations on Nutritional Requirements, Goals of National and International Requirement Estimates and RDAs	CO2
	Unit 2	**Body Composition , Energy**	

	A	**Body Composition:** Significance of body composition and changes through the life cycle, Methods for assessing body composition (both classical and recent) and their applications	CO1
	B	**Energy:** Components of energy requirements: BMR, RMR, thermic effect of feeding, physical activity. Factors affecting energy requirements, Methods of measuring energy expenditure	CO1,CO2
	C	Estimating energy requirements of individuals and groups, Regulation of energy metabolism and body weight: Control of food intake – role of leptin and other hormones.	CO2
	Unit 3	**Carbohydrates**	
	A	Nutritional significance of carbohydrates Changing trends in dietary intake of different types of carbohydrates and their implications	CO1,CO2
	B	Dietary fibre: Types, sources, role and mechanism of action,	CO1,CO2
	C	Resistant starch, fructo-oligosaccharides, other oligosaccharides: Chemical composition and physiological significance, Glycemic Index and glycemic load.	CO2
	Unit 4	**Proteins and Lipids**	
	A	**Protein:** Nutritional significance of proteins in the body. Protein quality and methods of determining protein and amino acid contents of food Nutritional requirements and R DA at different stages of life cycle., Therapeutic applications of specific amino acids.	CO3
	B	**Lipids** Lipids: Common types and properties,Function of fats and oils. Nutritional significance of fatty acids – SFA, MUFA, PUFA: functions and deficiency	CO3
	C	Role of n-3 and n-6 fatty acids, Prostaglandins, Trans Fatty Acids, Conjugated linoleic acid, Nutritional Requirements for different age group. Dietary guidelines (International and National) for visible and invisible fats in diets.	CO3,CO6
	Unit 5	**Vitamin and Minerals**	
	A	History, structure, sources, absorption, transport, utilization, storage, excretion, functions, bioavailability, requirements and RDA, deficiency, toxicity, assessment of status and alteration in requirements in various clinical and metabolic disorders. **Macro minerals:** Calcium, Phosphorus, Magnesium,	CO3,CO4,CO6

		Sodium, Potassium.				
	B	**Micro minerals:** Iron, Copper, Iodine, Fluoride, Zinc etc				CO3, CO4,CO6
	C	**Fat Soluble Vitamins:** Vitamin A and Carotenoids, Vitamin D, Vitamin E, Vitamin K, **Water Soluble Vitamins:** Ascorbic acid, Thiamin, Riboflavin, Niacin, Pyridoxine, Folic acid, Vitamin B12				CO3, CO4,CO6
	Mode of examination	Theory				
	Weightage Distribution	**CA**	**MTE**	**ETE**		
		15%	10%	75%		
	Text book/s*	• Shills, M.E.; Olson, J.; Shike, M. and Roos, C. (1998): Modern Nutrition in Health and Disease. 9th edition. Williams and Williams. A Beverly Co. London. • Indian Council of Medical Research. Recommended Dietary Intakes for Indians – Latest Recommendations. • Indian Council of Medical Research. Nutritive Value of Indian Foods – Latest Publication.				

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	3	3	1	1	-	3
CO2	3	1	2	1	3	3	1	1	3	-
CO3	2	2	1	1	3	2	1	1	-	2
CO4	3	1	2	1	2	3	1	-	2	1
CO5	3	1	2	1	3	2	1	2	3	-
CO6	3	2	1	1	3	3	1	1	-	2

Theory Subjects

School: SSAHS		**Batch:2023-27**	
Programme: BND		**Current Academic Year: 2026-27**	
Branch:		**Semester:** 7th Semester	
1	Course Code	BND 414	
2	Course Title	Food Chemistry	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Type	Compulsory	
5	Course Objective	The course aims to provide systematic knowledge and understanding of chemistry of food components like water, proteins, carbohydrates and lipids, various aspects of food product development and get an insight in to the additives that are relevant to processed food industry for shelf life extension, processing aids and sensory appeal.	
6	Course Outcomes	CO1: To define the chemistry of various food components of food. CO2:To understand the properties and reactions of various food components CO3: To apply basic concepts of new food product development. CO4: To analyse the food additives and its application in food industry. CO 5:To evaluate the utilisation of functional property of food component CO6: To create the knowledge of novel product development and value addition of foods.	
7	Course Description	This course focuses on providing an introduction to food science and nutrition in general and particularly stressing upon the chemistry aspects of different kinds of foods. Food chemistry is the discipline that mainly deals with chemical composition of foods, basic bio molecules, with chemical structure and properties of food constituents. The course basic scientific principles to food systems and practical applications. The course is divided into different units which gives the learner the basic information about chemical composition of main types of foods, bio molecules such as carbohydrates, proteins and enzymes, lipids, vitamins, pigments, flavors, minerals and other micro components, additives and contaminants.	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Water in Food**	
	A	Water in foods, water activity, phase diagram of water, phase transition of food containing water, interaction of water solute and food compounds	CO1
	B	Water activity and its influence on quality and stability of foods,	CO1
	C	Methods for stabilization of food systems by control of water activity, sorption isotherm.	CO2
	Unit 2	**Protein and Enzymes**	
	A	Physical, chemical, nutritional property of protein	CO1
	B	Functional properties of protein and interactions with other food constituents	CO1,CO2
	C	Classification, application of enzymes in food industry and immobilized enzymes	CO2
	Unit 3	**Carbohydrate and Lipids**	
	A	Composition and properties of different types of sugars, their application in food systems, crystallization, caramelization, Maillard reaction and its industrial application.	CO1,CO2
	B	Properties of fats, functional properties of fats and oils, fat stabilizers, fat deterioration and antioxidants,	CO1.CO2
	C	Emulsions such as mayonnaise, interesterification of fats, auto-oxidation of lipids and rancidity	CO2

	Unit 4	**Basic concepts of new product development**				
	A	Stages of product development and standardization				CO3, CO6
	B	Sensory evaluation of foods, packaging, labelling				CO3, CO6
	C	marketing of new food products.				CO3, CO6
	Unit 5	**Food Ingredients and additives**				
	A	Food additives- definitions, classification and functions, Preservatives, antioxidants, colours and flavours (synthetic and natural),				CO4, CO6
	B	emulsifiers, hydrocolloids, sweeteners, acidulants, buffering salts, anticaking agents, etc. - chemistry, food uses and functions in formulations				CO4, CO6
	C	Indirect food additives; toxicological evaluation of food additives.				CO4, CO6
	Mode of examination	Theory				
	Weightage Distribution	**CA**	**MTE**	**ETE**		
		15%	10%	75%		
	Text book/s*	Branen AL, Davidson PM &Salminen S. (2001) Food Additives. 2nd Ed. Marcel Dekker. • Fellows P J (2002) Food Processing Technology- Principles and Practices, 2nd Edition. Woodhead Publishing Ltd. • Food and Agriculture Organization. (1980) Manual of Food Quality Control. Additive Contaminants Techniques. Rome.				

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	3	2	1	-	3
CO2	2	2	2	2	1	3	2	1	3	-
CO3	3	1	1	1	1	3	2	1	-	2
CO4	2	1	2	2	2	1	2	-	2	1
CO.5	2	2	1	1	2	2	2	2	3	-
CO6	-	1	1	1	1	3	2	1	-	2

1	**Course Code**	**BND 451**	
2	**Course Title**	Advanced Nutritional Biochemistry and Instrumentation-I **(LAB)**	
3	**Credits**	**1**	
4	**Contact Hours (L-T-P)**	**0-0-2**	
5	Course Outcomes	CO1: To describe the importance of Preparation of protein free filtrate CO2: To explain the importance of Glucose estimation CO3: To apply the importance of Glucose tolerance test CO4: To appraise the importance of Total protein estimation CO5: To compare the clinical importance of Albumin, Globulin and A: G ratio determination CO6: To create understanding of biochemical parameters used in nutrition analysis	
6	Course Description	• Preparation of protein free filtrate • Glucose estimation and Glucose tolerance test • Total protein estimation • Albumin estimation • A:G ratio determination	
	Practical's		CO mapping
	Unit 1	Preparation of protein free filtrate	CO1
		a. Briefing about apparatus and working principle b. Demonstration of the practical c. To estimate the protein free filtrate	
	Unit 2	Quantitative estimation of Glucose	CO2

		a. Glucose estimation in normal sample b. Glucose estimation in abnormal sample c. Glucose estimation in unknown sample	
	Unit 3	Glucose tolerance test	CO3
		a. Briefing about the glucose intolerance test b. Demonstration of the working principle c. Practical and Clinical interpretation of curve	
	Unit 4	Quantitative estimation of Total Protein	CO4, CO6
		a. Total protein estimation in normal sample b. Total protein estimation in abnormal sample c. Total protein estimation in unknown sample	
	Unit 5	Albumin, Globulin and A: G ratio determination	CO5, CO6
		a. Estimation of Albumin b. Determination of Globulin concentration c. Calculation of A: G ratio	
	Mode of examination	Theory and Practical	
	Weightage Distribution for Practical's	CA: 25% / VIVA: 25% / ETE: 50%	
	Text book/s*	1. A text book of Medical Biochemistry by Chatterjee & Shinde 2. Text book of biochemistry for Medical students by Vasudevan and Sreekumari 3. Biochemistry by Lehringer	

		4. Clinical chemistry by Varley 5. Harpers Illustrated Biochemistry by Robert K.M.	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	3	2	1	1	1	-	3
CO2	3	2	2	3	2	1	2	1	3	-
CO3	2	1	2	3	1	2	1	1	-	2
CO4	3	1	1	3	2	2	1	-	2	1
CO5	3	2	1	3	1	1	1	2	3	-
CO6	3	2	1	3	1	2	1	1	-	2

BND Eight Semester

Theory Subjects

School: SSAHS		**Batch:2023-27**	
Programme: BND		**Current Academic Year: 2026-27**	
Branch:		**Semester: 8th Semester**	
1	Course Code	BND 405	
2	Course Title	Research Methodology and Biostats	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
6	Course Objective	1. To interpret and analyze a research problem 2. To introduce methods of literature Survey; what and where to look 3.To provide understanding for extracting appropriate information from a research problem so as to perform a hypothesis test 4. To differentiate and provide insights into qualitative and quantitative aspects of research 5. To introduce methods and tools for doing quantitative analysis 6. To introduce computational methods and software for quantitative analysis	
7.	Course Outcomes	The students will be able to : CO1: To frame a research problem and infer an appropriate statistical technique that may be applied to it to meaningful insight CO2: Explain and setup the null and alternative hypotheses correctly CO3:Apply hypothesis testing techniques to research problems / issues CO4: Demonstrate basic knowledge and understanding of data analysis and interpretation in relation to the research process. CO5: Integrate SPSS to simplify computational efforts and draw and interpret outputs obtained from these tools CO6: Develop the analytical knowledge of research	
8	Course Description	The course is designed to introduce various qualitative and quantitate aspects of research. With this basic understanding, the student will be able to take up research in the focussed area of study.	
9	Syllabus		CO Mapping
	Unit 1	**Introduction to Research Methodology and Scaling 10 Hrs**	
	A	**Introduction to Research:** What is research, Types of research, Problem identification, Research Design- Exploratory and Descriptive, Formulation of research design, Writing of research proposals, Research report, Impact factor of research journals, Citation Index of research papers, Plagiarism, Copy right, patents and intellectual property right	CO1
	B	**Attitude Measurement and Scaling:** Types of Measurement, Classification of scales, Single Item Vs. Multiple Item Scale, Comparative Vs. Non-Comparative scale, Measurement error	CO1

	C	**Questionnaire Designing:** Criterion, Types of questionnaire, types of questions, Testing reliability and validity , Pilot testing	CO1
	Unit 2	**DESCRIPTIVE ANALYTICS: 10 Hrs**	
	A	**Measures of central tendency:** Type of averages, choosing an appropriate average, Constructing Polygons and Ogives and using them to find median, quantiles and mode.	CO4
	B	**Measures of Dispersion:** Range, Inter-quartile range and deviation, Mean Deviation and Mean Absolute Deviation, Variance and Standard Deviation, Coefficient of variation. Measures of Skewness, Measures of Kurtosis, Constructing Stem and Leaf plot, Box-Whiskers Plot, Checking normality of data	
	C	**Probability & Probability Distributions:** Probability, basic concepts and approaches, Addition and Multiplication Theorem of Probability, Conditional Probability Probability Distributions: Random variable-Discrete and Continuous, Mean and Variance of Random Variable, Binomial, Poisson, Normal and Exponential distributions	
	Unit 3	**INFRENTIAL ANALYTICS: 15Hrs**	
	A	**Sampling and sampling distribution:** Census versus sample surveys. Simple random sampling, stratified sampling, systematic sampling, sampling with probability proportional to size. **Hypothesis Testing:** Formulation of null and alternative hypothesis, Level of Significance, Type I, Type II errors, Steps for hypothesis testing, One tail and Two tailed tests , p- value **Parametric Tests: Parametric Tests.** Errors, Checking normality of data, Hypothesis Testing, Confidence Interval, p-values, Z-test, t-test, F-test, Test of significance of correlation coefficient, **ANOVA.** **Non Parametric Tests:** Chi Square Test, Goodness of fit, Run Test , Sign Test-One sample and two sample,	CO2, CO3, CO4, CO6
	Unit 4	**PREDICTIVE ANALYTICS 10 Hrs**	CO2, CO3, CO4
	A	**Correlation Analysis**: Definition, types of correlation, Bivariate scatter plot, multiple scatter plot, Karl Pearson Coefficient of Correlation and its assumption, Partial correlation	
	B	Kendall Tau b and c correlation, Spearman's Rank Correlation	
	C	**Regression Analysis :**Introduction, Standard Multiple Regression Assumption, Multiple regression model ,Test of significance of Regression Parameters, Coefficient of Determination.	
	Unit 5	**Computational Methods 5 Hrs**	
	A	**SPSS:** **Entering and Editing**: Data Importing from Excel Characteristics of Variables Adding Value Labels Grouping Data Transforming Variables Selecting a Subset	CO4, CO5, CO6

		Producing summary statistics: Frequencies Percentages Averages Measures of spread **Charts**: Bar Charts Histograms Pie Charts Boxplots Cluster Bar Charts Scatter Diagrams			
	B	Using SPSS for performing techniques covered in Unit 2			CO4, CO5, CO6
	C	Solutions of examples discussed in Unit 2,3 and 4 using SPSS			CO4
10	Mode of examination	Theory/Practice Sessions/Viva			
11	Weightage Distribution	CA	MTE	ETE	
		15%	10%	75%	
12	Reading Materials for Unit 1	Kendra Cherry: Introduction to Research Methods: available for download at http://psychology.about.com/od/researchmethods/ss/expdesintro.htm Davis S. Walonick: Elements of a research proposal and report: available for download at http://www.statpac.com/research-papers/research-proposal.htm. 1.RESEARCH METHODOLOGY Professor Suresh Chandra			
	Readings for Unit 2:	•Basic Statistical Tools: available for download at http://www.fao.org/docrep/w7295e/w7295e08.htm#6 basic statistical tools. •DamodarGujrati and S. Sangeetha: Basic Econometrics, Mc Grow Hill, 2007. •Richard I. Levin and David S. Rubin: Statistics for Management, Pearson, 2010 •SP. Gupta & M.P. Gupta: Business Statistics, 16th Edition, Sultan Chand & Sons, New Delhi, 2012. •Roger D. Wimmer and Joseph Dominick: Mass Media Research, New Delhi, Wadsworth (Indian Edition), 2006.			
	Readings for Unit 3:	SPSS Beginners Tutorial: Available for download at https://www.spss-tutorials.com/basics/			

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO 1	3	2	1	1	2	2	1	3	3	3
CO 2	3	2	1	2	2	2	1	3	3	3
CO 3	3	2	1	1	2	2	1	2	3	3
CO 4	3	3	1	1	1	1	2	3	3	3
CO 5	3	2	1	1	2	1	1	3	3	3
CO6	3	2	1	1	2	1	2	2	3	2

***Theory Subjects**

School: SSAHS		**Batch:2023-27**	
Programme: BND		**Current Academic Year: 2026-27**	
Branch:		**Semester:8th** Semester	
1	Course Code	BND 406	
2	Course Title	Food Microbiology and Food Safety	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	This course will enable the students to gain deeper knowledge of role of micro-organisms in humans and environment and the importance of micro-organisms in food spoilage and to learn advanced, techniques used in food preservation.	
6	Course Outcomes	CO1 To describe the importance of micro-organisms in food spoilage and to learn advanced, techniques used in food preservation CO2 To explain the importance of micro-organisms in food spoilage and to learn advanced, techniques used in food preservation CO3To interpret the nature of microorganisms involved in food spoilage, food infections and intoxications. CO4 To analyse the principles of various preservation and control techniques CO5 To evaluate microbial safety in various foods operations CO6 To create the knowledge of food microbiology for better understanding of food spoilage	
7	Course Description	The course aims to provide theoretical and practical knowledge about the micro-organisms involved in the food spoilage, infections and intoxications. The course also enables to understand the concept of preservation and microbiological safety in various food operations.	
8	**Outline syllabus**		**CO Mapping**
	Unit 1	**Basic Microbiology**	
	A	Introduction to microbiology	CO 1
	B	Characteristics of microorganisms	CO1
	C	Factors effecting microbial growth	CO1
	Unit 2	**Food Spoilage and Preservation**	
	A	Cultivation of micro-organisms	CO2
	B	Controlling agents for micro-organism	CO2
	C	Food spoilage Principles and methods of food preservation	CO2, CO3,

			CO6
	Unit 3	**Beneficial Role of Food Microbes in Health**	
	A	Importance of normal flora, prebiotics and probiotics	CO3
	B	Single cell proteins	CO3
	C	Fermentation and Fermented food products	CO3
	Unit 4	**Food Borne Microbial Diseases**	
	A	Public health hazards: Food borne infections and intoxications	CO4
	B	Symptoms, mode of transmission and methods of prevention	CO4,CO6
	C	Emerging food pathogens	CO3
	Unit 5	**Food Safety and Quality Control**	
	A	Indicator micro-organisms	CO5
	B	Concept of Food Safety Management System, GHP and GMP	CO5
	C	HACCP, ISO 22000, Food Laws, Regulations and Standards	CO5,CO6
	Mode of examination	Theory	
	Weightage Distribution	CA: 15% / MTE: 10% / ETE: 75%	
	Text Book	Frazier, W.C. &Westoff, D.C. (2013*). Food Microbiology. 5th Edition*. Tata McGraw- Hill Publishing Co. Ltd. Garbutt, J. (1997). *Essentials of Food Microbiology*. Arnold London. Jay, J.M., Loessner, D.A. & Martin, J. (2006). *Modern Food Microbiology. 7th Edition.* Springer Banwart, G.J. (2004). *Basic Food Microbiology*. *2nd Edition*. CBS Publishers and Distributors, India. Pelczar, M.J., Chan, E.C.S., Krieg, N. (1993). *Microbiology. 5th Edition*. Tata McGraw- Hill Publishing Co. Ltd. *Manual of Methods of Analysis of Foods- Microbiological Testing*. (2012). Lab Manual 14. FSSAI, GoI, New Delhi.

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	3	3	3	2	1	1	2	1
CO2	3	3	2	3	2	2	1	3	1	2
CO3	1	2	3	3	2	1	3	1	1	1

CO4	1	2	3	3	2	1	3	2	1	1
CO5	3	3	3	2	3	1	2	3	3	2
CO6	3	2	3	1	1	1	1	2	2	1

Theory Subjects

School: SSAHS		**Batch:2023-27**	
Programme: BND		**Current Academic Year: 2026-27**	
Branch:		**Semester: 8th** Semester	
1	Course Code	BND 407	
2	Course Title	Clinical Nutrition	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Compulsory	
5	Course Objective	To understand the nutrition assessment, planning, implementation, monitoring and follow up in nutrition care process, the causative factors and metabolic changes in various diseases/disorders and acquire knowledge on the principles of diet therapy and comprehend principles of dietary counselling and the rationale of prevention of various diseases/disorders.	
6	Course Outcomes	CO1: To examine the importance of nutritional assessment in the care of patients. CO2: To understand about causative factors and metabolic changes in various diseases/disorders and the associated principles of diet therapy. CO3: To interpret the principles of dietary counselling. CO4: To comprehend the rationale of prevention of various diseases/disorders. CO5: To access various concept of paediatric nutrition CO6: To integrate the concept of nutrition as it relates to the prevention and treatment of diseases	
7	Course Description	The course deals with the nutritional aspects of diseases and clinical disorders by integrating students' existing knowledge of physiology, biochemistry and food science.	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Nutritional Assessment and Care of Patients**	
	A	Nutrition care process Nutritional screening and assessment of patients – out patient & hospitalized o Tools for screening o Nutritional interpretation of routine medical and laboratory data o Nutrition care plan and implementation o Monitoring and follow up o Ethical issues	CO1
	B	Dietary Counselling	CO1
	C	Nutrition Support: Enteral Nutrition	CO1, CO3
	Unit 2	**Medical Nutrition Therapy in metabolic diseases**	
	A	Diabetes Mellitus – Type 1, Type 2 and Gestational diabetes	CO2
	B	Endocrine disorders – Polycystic ovary disease, thyroid	CO1, CO3
	Unit 3	**Coronary Heart Diseases**	
	A	Etiopathophysiology, metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, dietary counselling and recent advances in	CO3, CO6
	B	Hypertension, dyslipidemia, Congestive heart failure	CO3
	C	Chronic Obstructive Pulmonary Disease	CO3,CO6

	Unit 4	**Overview of some degenerative disorders**				
	A	Cancer – General and specific cancers, effect of cancer therapy on MNT,				CO4
	B	Role of diet in aetiology and management				CO4
	C	Nutrition for bone health				CO4
	Unit 5	**Paediatric Nutrition**				
	A	Inborn errors of metabolism – Phenylketonuria, Galactosemia, Maple Syrup Urine Disease, Glycogen Storage Disease				CO5, CO6
	B	Severe Acute Malnutrition				CO5
	C	Cystic fibrosis				CO5
	Mode of examination	Theory				
	Weightage Distribution	**CA**	**MTE**	**ETE**		
		15%	10%	75%		
	Text book/s*	• Text book of physiology- A.K. Jain • Essentials of medical physiology- K.Sembulingam				

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	1	2	1	2	1
CO2	3	2	1	1	1	2	1
CO3	3	2	1	2	2	2	2
CO4	3	3	1	1	1	1	1
CO5	3	2	1	2	1	2	1
CO6	3	2	1	2	1	1	1

Theory Subjects

School: SSAHS		**Batch:2023-27**	
Programme: BND		**Current Academic Year: 2026-27**	
Branch:		**Semester: 8th** Semester	
1	Course Code	BND408	
2	Course Title	Nutrition in Emergency and Disaster	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Type	Major	
5	Course Objective	To introduce learners to the key concepts and practices of natural disaster management and develop understanding of the management of major emergencies with a nutritional component,	
6	Course Outcomes	CO1 To identify the nutritional management concepts during emergencies. CO2 To explain the knowledge of nutrition during emergency and disaster. CO3 To apply the food needs for nutrition relief and rehabilitation during emergency CO4 To analyse the nutritional status for emergency preparedness and response Programmemes CO5 To access the role of coordinated and effective action during emergencies. CO6 To create the awareness about the malnutrition in emergency	
7	Course Description	Hunger and malnutrition are rampant among refugees and displaced populations, representing currently around 40 million people worldwide, many of whom – infants, children, adolescents, adults and older people – suffer from one or more of the multiple forms of malnutrition. The levels of risk of malnutrition in emergencies depends on factors such as the degree of civil security, food availability and accessibility, access to health services, and adequacy of assistance delivery.	
8	**Outline syllabus**		**CO Mapping**
	Unit 1	**Disasters and emergency situations**	
	A	Famine, drought, flood, earthquake, cyclone, war, civil and political emergencies. Factors giving rise to emergency situation in these disasters.	CO 1
	B	Meeting nutritional requirements in emergency situations – principles, Meeting energy and protein requirements, Meeting micronutrient and other specific nutrient requirements	CO1

	C	Monitoring the adequacy of food access and intake.				CO1
	Unit 2	**Nutritional Problems in Emergencies**				
	A	Nutritional problems in emergencies in vulnerable groups, causes of malnutrition in emergency situations.				CO2
	B	Major nutritional deficiency diseases in emergencies- Protein-energy malnutrition- Causes and consequences, Symptoms and signs, Treatment.				CO2
	C	Specific deficiencies (micronutrient deficiencies) and nutritional relief				CO2
	Unit 3	**Communicable diseases in Emergencies**				
	A	Communicable diseases: surveillance, treatment and control of communicable diseases in emergencies				CO3, CO6
	B	Role of immunization and sanitation.				CO3,CO6
	C	Effective health Programmeme				CO3
	Unit 4	**Nutritional status Assessment and surveillance**				
	A	Assessment and surveillance of nutritional status in emergencies affecting population - Reasons for measuring malnutrition in emergencies: Indicators of malnutrition, Rapid nutritional surveys Individual screening, data collection, identification of population at nutrition risk				CO4, CO6
	B	Nutrition Relief and Rehabilitation -Assessment of food needs in emergency situation. Food distribution strategy – identifying				CO4
	C	General feeding Programmeme-Introduction, General principles, organizing general dry ration distribution, large scale cooked ration distribution Selective feeding Programmeme: supplementary feeding, Therapeutic feeding for children, treatment of severe wasting and famine				CO3
	Unit 5	**Emergency preparedness and response Programmeme**				
	A	Infant and young children feeding in emergencies Reaching the vulnerable group – Targeting Food Aid response, food pipeline ,logistic and distribution				CO5
	B	Preparedness and response strategies				CO5
	C	Public nutrition approach to tackle nutritional problems in emergencies				CO5
	Mode of Examination	Theory				
	Weightage distribution	CA	MTE	ETE		
		25%	25%	50%		

	Textbooks	1. Goyet, Fish V, Seaman, J. and Geijaer (1978). The management of nutritional emergencies in large populations, WHO, Geneva. 2. Refuge Nutrition Information system (RNIS). Newsletters UNACC / SCN Sub-Committee on Nutrition.	

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	3	2	1	-	3
CO2	2	2	2	2	1	3	2	1	3	-
CO3	3	1	1	1	1	3	2	1	-	2
CO4	2	1	2	2	2	1	2	-	2	1
CO.5	2	2	1	1	2	2	2	2	3	-
CO6	-	1	1	1	1	3	2	1	-	2

School: SSAHS		**Batch:2023-27**	
Programme: BND		**Current Academic Year: 2026-27**	
Branch:		**Semester: 8th** Semester	
1	Course Code	BND 409	
2	Course Title	Nutrition for Maternal and Child Health	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Type	Major	
5	Course Objective	To understand to concept of nutritional knowledge of nutrition and health system	
6	Course Outcomes	CO1:To examine the basic concept and definitions of Child Health and Nutrition CO2:To explain Common child hood illness CO3:To interpret and apply knowledge of child hood care with special need CO4:To appraise various theories and nutritional requirement of Pregnancy CO5: To assess the theories and nutritional requirement of Lactation CO6: To integrate the effect of maternal and child eating pattern on nutritional status	
7	Course Description	Maternal health is not a "women's issue". It is about the integrity of communities, societies and nations, and the well-being of all the men, women, boys and girls whose own prospects in life depend upon healthy women and mothers.	
8	**Outline syllabus**		CO Mapping
	Unit 1	**Child Health and Nutrition**	
	A	Nutrition during Infancy Nutrition during Early Childhood Health Care of the Child	CO 1
	B	Nutrition Related Disorders in Early Childhood	CO1
	C	Nutrition and Health Programmes	CO1
	Unit 2	**Common Childhood Illnesses, Their Prevention & Management-**	
	A	Some Disorders of the Respiratory System	CO2
	B	Some Infections of the Mouth and Throat	CO2
	C	Some Disorders of the Alimentary System	CO2
	Unit 3	**Child hood care**	
	A	Early Childhood Care and Education in Perspective	CO3

	B	Organizations for Children				CO3
	C	Introduction to Special Needs Services for Special Children				CO3
	Unit 4	**Nutrition During Pregnancy**				
	A	Concept of different food groups recommended dietary allowances for Indians, basis for requirement, computation of allowance. Concept of balance diet.• nutrition requirements during pre-pregnancy and pregnancy				CO4
		Storage of nutrients, physiological cost of pregnancy • Micronutrients- Iron and folic acid requirements and foetal undernutrition • Complication				CO6
	C	Nutrition in pregnancy - Stages of gestation, maternal physiological adjustments, weight gain during pregnancy and 20% nature of weight gain Maternal Mortality				CO3, CO6
	Unit 5	**Nutrition in Lactation**				
	A	Physiological adjustments during lactation, hormonal controls and reflex action, lactation in relation to growth and health of infants, physiology of milk production, problems of breast feeding, nutritional components of colostrum and mature milk, special foods during lactation, nutritional requirements during lactation.				CO5
	B	problems of breast feeding, nutritional components of colostrum and mature milk, special foods during lactation, nutritional requirements during lactation.				CO5
	C	Maternal Health Services				CO5, CO6
	Mode of Examination	Theory				
	Weightage distribution	CA	MTE	ETE		
		15%	10%	75%		

POs COs		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1		3	1	1	3	2	1	1	1	-	3
CO2		3	2	2	3	2	1	2	1	3	-
CO3		2	1	2	3	1	2	1	1	-	2
CO4		3	1	1	3	2	2	1	-	2	1
CO5		3	2	1	3	1	1	1	2	3	-
CO6		3	2	1	3	1	2	1	1	-	2

Theory Subjects

School: SSAHS		**Batch:2023-27**	
Programme: BND		**Current Academic Year: 2026-27**	
Branch:		**Semester: 8th**	
1	Course Code	BND 410	
2	Course Title	Public Health and Nutrition	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Type	Major	
5	Course Objective	The course will familiarize the students with understanding of the concept of public health nutrition and the national health care delivery system , the current concerns in public health nutrition and the strategies for improving the nutritional status of the communities. The course will also orient students towards concept of food and nutrition security and critical appraisal of the current scenario.	
6	Course Outcomes	CO1: To describe the concept and current concerns of Public Health Nutrition. CO2: To explain the National Health Care Delivery System. CO3. To interpret population dynamics and economics of malnutrition and how it impacts national development CO4: To analyse the causes and consequences of nutritional problems in the community. CO5: To evaluate the concept of food and nutrition security. CO6: To integrate the working in a community for providing nutrition education	
7	Course Description	This course will provide an introduction to the practice of public health nutrition, discussion of significant public health nutrition problems. and an overview of food and nutrition Programmes available to the community. Students will engage in skill-building and participatory activities, as well be introduced to case examples of creative and innovative approaches to community nutrition	
8	Outline syllabus		CO Mapping
	Unit 1	**Public Health Nutrition and Health Care System**	
	A	Aim, scope and content of public health nutrition	CO1,
	B	Current concerns in public health nutrition: An overview Role of public health nutritionists in national	CO1

		development Health - definition, dimensions, determinants, indicators Community health care	
	C	National Health Care Delivery System	CO1
	Unit 2	**Population Dynamics**	
	A	Demographic transition	CO2
	B	Population structure: Implications on quality of life	CO2
	C	Population Policy	CO2
	Unit 3	**Economics of Malnutrition**	
	A	Health Economics and Economics of Malnutrition	CO3
	B	Impact of malnutrition on productivity and national development	CO3
	Unit 4	**Approaches for improving nutrition and health status of the community**	
	A	Health based interventions including immunization, provision of safe drinking water/ sanitation, prevention and management of diarrhoeal diseases	CO4
	B	Food based interventions including food fortification, dietary diversification, supplementary feeding and biotechnological approaches.	CO4
	C	Education based interventions including growth monitoring and promotion (GMP), health / nutrition related social and behaviour change communication.	CO4, CO6
	Unit 5	**Food and Nutrition Security**	
	A	Concepts and definitions of food and nutrition security at national, regional, household and individual levels	CO5,CO6
	B	Impact of food production losses, distribution, access, availability, consumption on food and nutrition security- critical appraisal of the current scenario	CO5,CO6
	Mode of examination	Theory	
	Weightage Distribution	CA: 15% / MTE: 10% / ETE: 75%	
	Reference book/s*	• ICMR (1990). Nutrient Requirements and Recommended Dietary Allowances for Indians. • FAO/WHO/UNU (2004). Human Energy Requirements. Report of a Joint Expert Consultation. • WHO (2007). Protein and Amino-acid Requirements in Human Nutrition.	

Pos COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	1	3	2	2	1	1	1
CO2	3	3	2	1	2	1	2	2	1	3
CO3	2	2	3	3	3	2	1	1	1	3

CO4	2	3	2	2	1	2	1	2	1	2
CO5	3	1	1	3	3	2	2	2	2	2
CO6	3	3	1	3	3	3	2	3	1	3

Practical Subject

School: SSAHS		**Batch:2023-27**	
Programme: BND		**Current Academic Year: 2026-27**	
3Branch:		**Semester:8th semester**	
1	Course Code	BND 456	
2	Course Title	Clinical Nutrition	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Major	
5	Course Objective	To enable students to plan and prepare suitable therapeutic diets based on patient needs, provide dietary counselling for prevention/ treatment of various diseases/ disorders and familiarize with special therapeutic/ health foods	
6	Course Outcomes	CO1: To remember the methods of assessment of patient needs CO2: To Understand the methods of food preparation for diabetes CO3: To interpret the methods of food preparation for different diseases CO4:To analyse the methods of food preparation for different diseases CO5: To evaluatethe methods of food preparation for different diseases CO6:To Design nutrition care plan for the different disease condition	
7	Course Description	To understand the nutrition assessment, planning, implementation, monitoring and follow up in nutrition care process, the causative factors and metabolic changes in various diseases/disorders and acquire knowledge on the principles of diet therapy and comprehend principles of dietary counselling and the rationale of prevention of various diseases/disorders.	
8	Outline syllabus		CO Mapping
	Unit 1	Assessment of patient needs – nutritional assessment and screening	
	A	Panning	CO1
	B	Calculations	CO1
	Unit 2	Planning and preparation of diets for following diseases	
	A	Type 1 diabetes	CO2, CO6
	B	Type 2 diabetes	CO2
	C	Gestational Diabetes	CO2
	Unit 3	Planning and preparation of diets for following diseases	
	A	PCOD	CO3, CO6
	B	Peptic ulcer	CO3
	C	Hypertension and dyslipidaemia	CO3

	Unit 4	Planning and preparation of diets for following diseases			
	A	Congestive heart failure			CO4, CO6
	B	Ulcerative colitis			**CO4**
	C	Diverticular disease			CO4
	Unit 5	Planning and preparation of diets for following diseases			
	A	Cancer			CO5, CO6
	B	IEM			CO5, CO6
	C	SAM			CO5, CO6
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	VIVA	ETE	
		25%	25%	50%	