



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

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School of Allied Health Sciences

Department of Clinical Nutrition & Dietetics

1.1.3 - Total number of courses having focus on employability/ entrepreneurship/ skill development offered by the University during the year 2023-2024

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SACB1201	HUMAN NUTRITION I	L	T	P	EL	Credits	Total Marks
		4	0	0	2	4	100

COURSE OBJECTIVES

- To introduce the students to the principles of Human Nutrition.
- To assess the importance of various macronutrients in relation to health.
- To understand the energy metabolism of human body

UNIT 1 NUTRITION & HEALTH

12 Hrs

History of Nutrition – Development of Nutrition as a Science – Definition of Nutrition – Under nutrition, over nutrition and malnutrition. Introduction to nutrition - food as a source of nutrients, function of foods, definition of nutrients, adequate, optimum and good nutrition. Inter relationship between nutrition and health.

UNIT 2 ENERGY

12 Hrs

Energy - Introduction, Units, determination of energy value of food, physiological fuel value, Benedict's Oxy- calorimeter, relation between oxygen required and calorimeter value. Respiratory quotient, Specific dynamic action of food (Thermic effect of food). Definition of BMR and factors affecting BMR - determination of energy metabolism, during work- energy requirements for various types of activities, factorial methods for calculation of the daily energy requirements of an adult for varying degrees of physical activity, RDA.

UNIT 3 CARBOHYDRATES

12 Hrs

Carbohydrates - Definition, composition, classification, functions of carbohydrates in the body, food sources, digestion, absorption and utilization of carbohydrates, hormonal regulation of blood glucose levels. Glycemic index, glycemic load, types of resistant starch. Dietary fibre - Definition, types, sources, RDA, physiological effects of dietary fibre.

UNIT 4 PROTEINS

12 Hrs

Protein - Classification, functions, Food sources, Requirements and RDA. Digestion, absorption and metabolism of proteins. Amino acids - Indispensable and dispensable amino acids – therapeutic applications of specific amino acids. Protein Energy Malnutrition – KWASHIORKOR and MARASUMS – etiology, clinical features, treatment and prevention. Evaluation of protein quality – PER, BV, NPU and NPR, chemical score, nitrogen balance, mutual amino acid supplementation of proteins.

UNIT 5 LIPIDS

12 Hrs

Lipids - Classification, functions of EFA, MUFA, PUFA, SFA, food sources, Requirements, RDA, digestion and absorption. Characteristics of animal and vegetable fats, cholesterol - function, food sources, phospholipids - functions. Omega fatty acids functions, role in good health, food sources. Role of dietary lipids and CVD.

Max. 60 Hrs

COURSE OUTCOMES

On completion of the course, students will be able to

CO1 - List or define key terms related to macro nutrients, micronutrients and its relation health.

CO2 - Electrolyte as in sources, losses during processing, deficiency and RDA.

CO3 - Classify macronutrients and examine/ discuss carbohydrate functions, metabolism and deficiencies

CO4 - Define and explain the relationship between protein and its functions, metabolism and deficiencies.

CO5 - Identify and analyze the distribution, functions, metabolism, deficiency of lipids.

CO6 - Identify the role of nutrients in maintaining good health

TEXT / REFERENCE BOOKS

1. M. Swaminathan "Principles of Nutrition and Dietetics", 1993, Bappeo 88, Mysore Road, Bangalore -560 018
2. Srilakshmi. B "Nutrition Science", ISBN 10: 8122432239 / ISBN 13: 9788122432237, Published by New Age International (P) Limited, 2015
3. Gordon. M. Wardlaw et.al; Contemporary Nutrition, 2nd edition, Publishing by Mosby, 2004.
4. Srilakshmi. B; Dietetics, 7th edition, New Age International (P) Limited Publishers, 2014
5. William's; Nix; Basic Nutrition and Diet therapy, 14th edition, Publishing by Mosby, 2013.
6. Mahtab S. Bamji, Prasad Rao, N. Vinodini Reddy; Textbook of Human Nutrition, Second Edition Oxford and IBH Publishing Co. Pvt .Ltd, 2003.



-Employability

SACB1101	HUMAN PHYSIOLOGY	L	T	P	EL	Credits	Total Marks
		4	0	0	2	4	100

COURSE OBJECTIVES

- To impart knowledge on structure and functions of different organs
- To understand the physiological functioning of various system of the body
- To introduce the interrelationship between nutritional science and physiological functions

UNIT 1 CELL

12 Hrs

Cell: Structure and functions (Review) Tissues –classification, structure and functions of –epithelial, connective, muscular and nervous tissue. Blood –composition, RBC, WBC, Platelets; structure and function; Blood Groups – Blood coagulation; Body defense against diseases. Bones: Classification, structure, function and chemical composition of bone. Bone mineral density.

UNIT 2 NERVOUS SYSTEM

12 Hrs

Nervous system: Physiology of nerve and muscle –Conduction of nerve impulses along nerve and muscle fibres, physiology of muscle contraction, Synapse. Central and Peripheral Nervous System – General Anatomy –Functions of cerebrum, cerebellum, medulla oblongata, pons, Spinal cord. Autonomic nervous system –Sympathetic, parasympathetic–functions.

UNIT 3 CARDIAC & RESPIRATORY SYSTEM

12 Hrs

Heart and circulation – Anatomy of Heart, Properties of cardiac muscle, Origin and conduction of heart beat –cardiac cycle, cardiac output and heart sounds; Blood pressure, Factors affecting blood pressure, ECG. Respiratory system –Anatomy of respiratory organs, Gaseous exchange in lungs and tissues, Transport of oxygen and carbon dioxide, Muscles of inspiration and expiration.

UNIT 4 DIGESTIVE & EXCRETORY SYSTEM

12 Hrs

Digestive system – Anatomy of Gastrointestinal Tract, digestion and absorption of Carbohydrates, fats and proteins. Excretory system – Structure of kidney, Urine Formation, Acid – base balance. Skin – structure and function. Body temperature regulation.

UNIT 5 ENDOCRINE & REPRODUCTIVE SYSTEM

12 Hrs

Endocrine system –Pituitary, Thyroid, Parathyroid, Adrenal Gland and pancreas – List of Hormones with its functions. Reproductive system – Anatomy of Reproductive Organs (Review). Spermatogenesis and Oogenesis: menstrual cycle and ovarian cycle. Influence of hormones on fertilization, conception and lactation.

Max. 60 Hrs.

COURSE OUTCOMES

On completion of the course, students will be able to

CO1 - Identify the major levels of organization, major components of each organ and define the relationship between anatomy and physiology

CO2 - Explain the concept of homeostasis, negative and positive feedback mechanisms and usage of anatomical terms to describe the body

CO3 - Understand the anatomy and function of cardiac and respiratory system

CO4 - Distinguish the interaction between separate systems to yield the integrated physiological responses in the body

CO5 - Develop competency to analyze relationship between health, disease and physiology

CO6 - Understand the pathophysiological conditions related to nutritional disorders

TEXT / REFERENCE BOOKS

1. Guyton AC & Hall JE, Textbook of Medical Physiology, 10th Edition, Harcourt Asia P.Ltd Singapore, 2001.
2. Sembulingam K, Essentials of Medical Physiology, 6th edition, Jaypee Medical Publishers, New Delhi, 2013
3. Chatterjee, C.C - Human Physiology – Volume I & II, 11th edition, 1992.
4. Ross and Wilson Anatomy and Physiology in Health and Illness, Anne Waugh, Allison
5. William Arnould-Taylor, A Textbook of Anatomy and Physiology, 3rd edition, Nelson Thornes, 1998
6. Kimber, D.E; Gray, C.E; Stackpole, C.E and Leavel, L.C; Anatomy and physiology. The Mac Millan Co., New York, 2009.
7. Lippincott, Anatomy and Physiology, Lippincott Williams & Wilkins, 2002.



-Employability

SCYB1102	BASIC CHEMISTRY	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To understand the fundamentals of organic chemistry and their role in chemical reactions.
- To learn the role of carbohydrates, proteins and lipids in living things.
- To highlight on the structural activity of antibiotics and vitamins in living systems.

UNIT 1 FUNDAMENTALS OF ORGANIC CHEMISTRY

9 Hrs

Introduction-Types of Reactions – Reaction Mechanism – Electrophilic substitution reactions in aromatic compounds - mechanisms of nitration - halogenation - sulphonation - Friedel-Craft's acylation and alkylation – Aliphatic nucleophilic substitutions - Mechanisms of SN1, SN2 and SNi reactions - effects of structure of substrate - solvent - nucleophile and leaving groups – Nucleophilic addition reactions – Nucleophilic addition to carbonyl groups.

UNIT 2 CARBOHYDRATES

9 Hrs.

Carbohydrates –Definition and Classification of carbohydrates with examples. Mono saccharides glucose and fructose - epimers and anomers with examples. Mechanism mutarotation, osazone formation. Absolute configurations of glucose and fructose. Structural elucidation of glucose and fructose (including cyclic and Haworth structure). Interconversions, ascending and descending the sugar series. Disaccharide - Sucrose, Maltose - Structural elucidation. Polysaccharide - Starch and Cellulose (Elementary treatment).

UNIT 3 PROTEINS & LIPIDS

9 Hrs.

Amino acids - Classification, General methods of preparation and reactions, zwitter ion, isoelectric point. Peptides and proteins - Peptide linkage- Preparation of dipeptides by Bergmann's method Classification of proteins, primary structure (End group analysis - Sanger's method and Edman method) - secondary structure, tertiary structure, denaturation. Lipids – Introduction to Lipids, Simple Lipids - Fats and oils, Waxes. Compound lipids Phospholipids - Lecitins, Cephlins, Plasmalogens; Glycolipids

UNIT 4 ANTIBIOTICS & VITAMINS

9 Hrs.

Antibiotics: Introduction, Isolation, Constitution and properties of Penicillin, Streptomycin, Chloramphenicol. Chemistry of vitamins A, B1, B2, B6, B12, C, D, E and K- Structure only with biological functions.

UNIT 5 SEPARATION TECHNIQUES

9 Hrs.

Distillation techniques: Fractional distillation - Steam distillation - Vacuum distillation. Chromatography: Elution analysis - Paper chromatography - Thin layer chromatography - Liquid chromatography – Identification of impurities in food samples using High performance liquid chromatography (HPLC) - Gas chromatography (GC) (applications only).

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, students will be able to

- CO1** - Predict the mechanism of chemical reactions.
- CO2** - Explain the classification of carbohydrates and their structural elucidation.
- CO3** - Understand the chemical reactions of protein in nutrition science.
- CO4** - Predict the structural activity of antibiotics and vitamins
- CO5** - Apply the distillation and separation techniques in food chemistry.
- CO6** - Relate the basic chemistry concepts in Nutritional science.

TEXT / REFERENCE BOOKS

1. Gopalan R. and Sundaram S., Allied Chemistry, Sultan Chand & Sons Publishers, New Delhi 2nd ed.
2. Bahl B.S. and Arun Bahl, A text book of Organic Chemistry 21st ed., S. Chand and Company Pvt. Ltd.
3. Puri B.R., Sharma L.R. and Pathania M.S., Principles of Physical Chemistry, 47th ed., Vishal Publishing Company, 2016.
4. Soni P.L. and Mohan Katyal, Text Book of Inorganic Chemistry, Sultan Chand and Company Pvt. Ltd, New Delhi, 20th ed



-Employability

SACA1501	ADVANCED DIETETICS	L	T	P	Credits	Total Marks
		4	0	0	5	100

COURSE OBJECTIVES

- To know the importance and principles of dietetics as a distinct therapy for diseases.
- Gain knowledge on the types and role of dietitians.

Unit I

Concept of Diet therapy: growth and source of dietetics, purpose and principles of therapeutic diets, modification of normal diet, classification of therapeutic diets.

Unit II

Role of Dietician: Definition of nutritional care, interpersonal relationship with patient, planning and implementary dietary care, Team approach to nutritional care.

Unit III

Routine hospital diets: Preoperative and postoperative diets, study and review of hospital diet. Basic concepts and methods of - (a) Oral feeding (b) Tube feeding (c) Parental nutrition (d) Intravenous feeding.

Unit IV

Diet in surgical conditions, burns and cancer, Obesity and leanness- causes, complication and health effects, dietary treatment and other recommendation, Diet in fever and infections- Types- metabolism in fever, general dietary consideration diet in influenza, typhoid fever, recurrent malaria and tuberculosis.

Unit V

Diet in gastritis, peptic ulcer- symptoms, clinical findings, treatment, dietary modification, adequate nutrition, amount of food, and intervals of feeding, Chemically and mechanically irrigating foods, four stage diet (Liquid, soft, convalescent, liberalized diet), Diet in disturbances of small intestine and color. • Diarrhoea- (child and adult)- classification, modification of diet, fibre, residue. Fluids & nutritional adequacy. • Constipation- flatulence - dietary considerations. • Ulcerative colitis (adults)- symptoms, dietary treatment. • Spruce, coeliac disease- disaccharide intolerance, dietary treatment.

Unit VI

Diet in diseases of the liver, gall bladder and pancreas, a) Etiology, symptoms and dietary treatment in - Jaundice, hepatitis, cirrhosis and hepatic coma. b) Role of alcohol in liver diseases. c) Dietary treatment in cholecystitis, cholelithiasis and pancreatitis, Gout- Nature and occurrence of uric acid, causes, symptoms and diet.

Unit VII

Diet in allergy and skin disturbances: Definition, classification, manifestations, common food allergies and test and dieteric treatment, Diet in Diabetes mellitus: a) Incidence and predisposing factors. b) Symptoms-types and tests for detection. c) Metabolism in diabetes d) Dietary treatment & meal management e) Hypoglycemic agent, insulin and its types. f) Complication of diabetes.

Unit VIII

Diet in Renal diseases: Basic renal function, symptoms and dietary treatment in acute and chronic glomerulonephritis, Nephrosis, renal failure, dialysis. urinary calculi-causes & treatment, acid and alkali producing and neutral foods and dietary treatment, Diet in Cardiovascular diseases: Role of

nutrition in cardiac efficiency, incidence of Atherosclerosis, dietary principles, Hyperlipidenmia, Hypertension- causes and dietary treatment, Sodium restricted diet, level of sodium restriction, sources of sodium, danger of severe sodium restriction.

COURSE OUTCOMES:

On completion of the course, students will be able to

CO1 Interpret and apply nutrition concepts to evaluate and improve the nutritional health of individuals with medical conditions

CO2 Integrate knowledge and skills in food and nutrition with issues affecting the nutrition and/or dietetics field

CO3 Apply principles and theories of management to the administration of human, physical and financial resource in food and nutrition services

CO4 Utilize advanced principles of health literacy, including critical thinking skills, literature searches, data collection and interpretation

CO5 Apply counseling methods to patients with different diseases

CO6 Utilize basic nutrition knowledge and the dietary guidelines for making food choices that will promote optimal health

TEXT / REFERENCE BOOKS

1. Modern Nutrition in Health & Disease – Eds – Maurice E. Shils, James A. Olson, 2012.
2. Clinical Dietetics and Nutrition – F P Antia and Philip Abraham, 2002.
3. Nutrition and Metabolism – Michael J. Gibney, Marinos Elia, Olle Ljungqvist, Julie Dowsett (Eds.) Nutrition Society Textbook series, Blackwell Publishers, 2005
4. Nutrition Science – B Sri Lakshmi, New Age International Publishers, 2017.
5. Normal and Therapeutic Nutrition – Robinson & Lawler, 17th edition, Mac Millan Publishers, 2001.
6. Text Book of Human Nutrition – Mahtab S Bamji, N Prahlada Rao, Vinodini Reddy, 2nd edition, Oxford & IBH Publishing Co. Pvt. Ltd, 2003.



-Employability

SACB1102	INTRODUCTION TO FOOD SCIENCE	L	T	P	EL	Credits	Total Marks
		4	0	0	0	4	100

COURSE OBJECTIVES

- To obtain knowledge on different food groups and their nutritive value.
- To enable the students to know about the composition and structure of individual food groups both raw and after cooking.
- To develop skill and techniques in food preparation with conservation of nutrients and palatability using cooking methods generally employed.

UNIT 1 FOOD GROUPS AND METHODS OF COOKING

12 Hrs.

Functions of food in relation to health - classification of foods based on nutrients and functions. Food groups - Basic Four, Basic Five and Basic Seven. Preliminary preparation of foods prior to cooking with special reference to conservation of nutrients and palatability, different methods of cooking on acceptability and nutritive value of foods. Advantages and disadvantages of dry, moist, microwave cooking and solar cooking.

UNIT 2 CEREALS AND PULSES

12 Hrs.

Cereal and Cereal products – structure, composition, nutritive value, effect of cooking on the nutritive value of cereals, gelatinization, retrogradation, dextrinization, crystallization, caramelization, gluten formation.

Pulses and legumes - structure, composition, nutritive value of grams, dhals, effect of cooking on pulses, biological value, effect of heat on protein- denaturation, coagulation and Maillard reaction, foam formation, fermentation, germination.

UNIT 3 VEGETABLES AND FRUITS

12 Hrs.

Vegetables and Fruits - classification, structure, composition and nutritive value, browning reaction - changes during cooking- methods to minimize the loss of nutrients, color, texture, flavor. Milk and milk products – composition, constituents and nutritive value, principles of milk cookery, coagulation, effect of cooking and processing on milk.

UNIT 4 FLESHY FOODS AND EGGS

12 Hrs.

Meat, Fish and Poultry – classification of fleshy food varieties, selection, cuts of meats, nutritive values, methods of cooking (Meat, Fish and Poultry), organ meat, marbling, post-mortem changes in meat-rigor mortis, tenderization of meat. Eggs - structure, composition, nutritive value, selection, principles and methods of egg cookery, use of eggs in cooking.

UNIT 5 NUTS AND OILSEEDS AND FATS AND OILS

12 Hrs.

Nuts and oil seeds – types, structure, composition and nutritive value. Fats and Oils - types, saturated and unsaturated fats, hydrogenation, invisible fats, use of fat in cooking, factors affecting absorption of fats, smoking point, peroxidation, rancidity. Spices and Condiments: types, nutritive value, use in cooking. Sugar and Sugar Products: types and its uses in Indian cookery, stages of sugar cookery, artificial sweeteners. Beverages - classification, nutritive value.

Max. 60 Hrs.

COURSE OUTCOMES

On completion of the course, students will be able to

CO1 - Understand the fundamentals of food science and differentiate the suitable cooking method that can be adopted for each food groups.

CO2 - Elucidate the nutritive value and changes that cereal & pulses undergo during cooking

CO3 - Apply relevant knowledge and techniques to minimize nutrient loss in vegetables and fruits

CO4 - Apply different preparation techniques for processing meat & its products.

CO5 - Analyze the principles of cooking in oil & sugar

CO6 - Implement knowledge of composition and processing of oilseeds and beverages.

TEXT / REFERENCE BOOKS

1. Manay, S. & Shadaksharaswami, M., Foods: Facts and Principles, 3rd Edition, New Age Publishers, 2008
2. B. Srilakshmi, Food science, 5th Edition, New Age Publishers, 2010
3. Vaclavik, Vickie, Christian, Elizabeth W, Essentials of Food Science, Springer Publication, 4th Edition, 2014.
4. Marion Bennion, Barbara Scheule, Introductory food Science, 14th Edition, 2014
5. Roday S, Food science and Nutrition, Oxford university press, New Delhi, 2007.
6. Potter NM and Hotchkiss JH, Food Science, C.B.S. Publishers, New Delhi, 1995.



-Entrepreneurship

SACB1202	NUTRITIONAL BIOCHEMISTRY	L	T	P	EL	Credits	Total Marks
		4	0	0	0	4	100

COURSE OBJECTIVES

- To introduce the students to the principles of Biochemistry
- To gain the basic understanding of the functions of biological systems in relation to Nutritional biochemistry.
- To get to know about various inborn errors of metabolism.

UNIT 1 INTRODUCTION TO BIOCHEMISTRY

12 Hrs.

Definition of Biochemistry and its relation to nutrition, Applications of Biochemistry. Enzyme, classification, Nomenclature, Factors affecting enzymatic activity, Mechanism of action, Coenzyme and prosthetic group - role of B vitamins as co-enzymes. Biological oxidation and Electron Transport Chain (ETC). Nucleic acids, Purine and Pyrimidine bases, nucleosides and nucleotides – structure and functions.

UNIT 2 CARBOHYDRATES

12 Hrs.

Structure, General reactions of mono, di, tri and oligosaccharides, Interconversion of sugars, Metabolism of carbohydrate, Glucose oxidation through glycolysis, Krebs - TCA cycle, Pentose phosphate cycle, Gluconeogenesis, glycogenolysis, Cori Cycle.

UNIT 3 PROTEINS

12 Hrs.

Aminoacids - Classification, Chemical properties due to amino and carboxyl groups, Chromatographic separation. Peptides - Structure and nomenclature, Determination of amino acid sequence. Proteins - primary, secondary, tertiary structure of proteins, Hydrolysis of proteins, Denaturation, Precipitation, Coagulation, Metabolism of proteins, General pathways of metabolism of aminoacids. Deamination, Transamination, Decarboxylation, Urea cycle, Fate of carbon skeleton of amino acids, Protein biosynthesis.

UNIT 4 LIPIDS

12 Hrs.

Classification, Chemical composition and properties of fat, beta - oxidation of fatty acids of oleic, linoleic and palmitic acid, desaturation of fatty acids, ketone bodies, ketogenesis. Dietary cholesterol - cholesterol bio - synthesis, regulation of cholesterol synthesis. Lipoproteins – Classification, their role and normal values.

UNIT 5 INTERMEDIARY METABOLISM

12 Hrs.

Interrelationship between carbohydrate, fat and protein metabolism - Hormonal regulation of metabolism. Inborn errors of metabolism - Carbohydrate – fructosuria (fructose intolerance), galactosemia, glycogen -Type I Von Gierke's Disease. Disorders of aromatic amino acids – Phenyl ketonuria, alkaptonuria, tyrosinosis, aminoaciduria. Disorders of sulphur -containing amino acids - Homocystinurias

Max. 60 Hrs.

COURSE OUTCOMES

On completion of the course, students will be able to

- CO1** - Define various inborn errors of metabolism
- CO2** - Outline the structure and classification of major biological macromolecules, specific micro molecules and enzymes.
- CO3** - Illustrate the major metabolic pathways and their interrelationship
- CO4** - Outline the process of biological oxidation and metabolic release of energy
- CO5** - Understand the interrelationship between carbohydrate, fat and protein metabolisms
- CO6** - Apply and relate the knowledge of biochemistry to nutrition, health and diseases.

TEXT / REFERENCE BOOKS

1. Shanmugam, Ambika, Fundamentals of biochemistry to medical students. NAV Bharat Printers & traders 56, Peters Road, Chennai 86.1985.
2. Ramadevi K, Ed: Ambika Shanmugam's Fundamentals of biochemistry for medical students, 8th edition, Wolters Kluwer Health, India, 2016
3. Albert L. Lehninger, David L. Nelson, Michael M. Cox (2008). Lehninger Principles of Biochemistry. 5th Ed. W.H. Freeman & Company.
4. Chatterjee, M. N., Shinde and Rana, (2005). Textbook of Medical Biochemistry 6th Ed. New Delhi Jaypee Brothers Medical Publishers
5. Thomas, D. M (Ed) (2010). Textbook of Biochemistry with Chm, Corr. New York: John Wiley and Sons Inc
6. Robert K. Murray, David Bender, Victor Rodwell, Kathleen M. Botham, P. Anthony Weil, Peter J. Kennelly (2012).
7. Harper's Illustrated Biochemistry, 29th Edition (Lange Basic Science). Mcgraw Hill Company.



-Entrepreneurship

SACB1203	FOOD MICROBIOLOGY	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To gain knowledge on the various types of microorganisms and its role in health and disease.
- To understand the role of micro-organisms in spoilage of various foods and in preservation.
- To know about the factors affecting the growth of microorganisms in food - Intrinsic and Extrinsic parameters that affect microbial growth

UNIT 1 GENERAL INTRODUCTION AND CHARACTERISTICS OF MICROORGANISMS

9Hrs

History of microbiology, development of laboratory - Technique to study micro -organisms - pure culture - isolation - cultivation, preservation. General characteristics of Bacteria, Viruses, Yeast, Moulds, protozoa, Algae - morphology, classification, functions.

UNIT 2 MICROBIAL GROWTH RESPONSE IN THE FOOD ENVIRONMENT

9 Hrs.

Growth curve, Thermal Death Time (TDT), effect of environmental factors in growth of microorganism (Intrinsic and extrinsic) - pH, oxygen availability, temperature and others. Water in food operations - microbiological assessment of water quality, removal of organisms from processed water, outgoing water and wastes. 3R technology of water purification.

UNIT 3 FOOD SPOILAGE AND TECHNIQUES OF DESTRUCTING MICROORGANISMS

9 Hrs

Spoilage - contamination sources, types, effect of food spoilage on the following: cereal and cereal products, sugar and sugar products, vegetables and fruits, meat and meat products, fish, egg and poultry, milk and milk products, canned foods. Microbial load testing in shelf-life analysis. Destruction of Microorganism - Sterilization, pasteurization, and disinfection. Environmental microbiology - Water and water borne diseases, air and air borne diseases, soil and soil borne diseases, microbial intoxication and infections.

UNIT 4 FOOD BORNE INFECTIONS AND INTOXICANTS

9 Hrs.

Sources of contamination of food, toxin production and physiological action, sources of infection of food by pathogenic organisms, symptoms. Bacterial exotoxins and endotoxins. Salmonellosis, Clostridium perfringens, Gastroenteritis enteropathogenic E. coli, Bacillus cereus, Gastroenteritis shigellosis, botulism, staphylococcus food intoxication and non-bacterial – aflatoxicosis, trichinosis.

UNIT 5 BENEFICIAL EFFECT OF MICROORGANISM

9 Hrs

Importance of microbes in food fermentations, – homo & hetero-fermentative bacteria, yeasts & fungi, Lactic acid bacteria fermentation and starter cultures, alcoholic fermentations – yeast fermentations - characteristics and strain selection, fungal fermentations. Microbes associated with typical food fermentations- yoghurt, cheese, fermented milks, breads, idli, soy products, fermented vegetables and meats. Probiotic organisms and products, single cell protein (SCP).

Max. 45 Hrs

COURSE OUTCOMES

On completion of the course, students will be able to

CO1 - Explain the basic understanding of microbial classification and identify the various microbes associated with foods.

CO2 - Explain the interactions between microorganisms and the food environment, and factors influencing their growth and survival.

CO3 - List out the microorganism control methods in food production

CO4 - Illustrate the role of pathogens in food borne infections.

CO5 - Analyse the various food intoxicants.

CO6 - Explain the beneficial effects of microorganisms in food.

TEXT BOOK / REFERENCE BOOKS

1. Frazier, W.C. and Westhoff, D.c, Food microbiology, 5th Edition, McGraw Hill Education India (Pvt) Ltd, New Delhi, 2013.

2. Manay, S. & Shadaksharaswami, M., Foods: Facts and Principles, 3rd Edition, New Age Publishers, 2008.

3. M. R. Adams, M. O. Moss, Food Microbiology, 3rd Edition, Published by The Royal Society of Chemists, UK, 2008.

4. Bibek Ray, Arun Bhunia (2013), Fundamental Food Microbiology, 5th Edition, CRC Press.

5. James.M.Jay, Modern Food Microbiology, 5th Edition, Wolters Kluwer Law & Business Publisher, 1996



-Entrepreneurship

SACA1305	PERSONNEL MANAGEMENT	L	T	P	Credits	Total Marks
		3	0	0	5	100

Course Objectives:

- To understand the Management and system at various levels in general and in certain specific organizations
- To help the students focus on and analyse the issues and strategies required to select and develop manpower resources.

Unit I

Organization and management, Definition and types of organization, Definition- functions and tools of management, Technique of effective management and its application to food preparation and science

Unit II

Food material management, Meaning, definition, and importance, Food selection, purchasing, receiving and store room management.

Unit III

Control in relation to the operations (material planning, budgeting, material identification, modification and standardization, inventory control, store keeping, definition, objectives, functions, factors underlying successful storekeeping, duties and responsibilities of a storekeeper, purchasing, organization, principle, procedure, systems and quality control).

Unit IV

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

Unit V

Labour policies and legislation: (Personnel policies related to salaries, other emoluments, allowances, leave, uniform and other prize benefit, laws and organization)

Unit VI

Laws affecting food service institution to study the following: (hospital, flight kitchen, hotel, restaurant, canteen, Industrial)

Unit VII

a. Organization b. Physical plan and layout. c. Food and silver equipment

Unit VIII

Sanitation and hygiene with personal emphasis on Hospital.

Course Outcomes:

On completion of the course, students will be able to

CO1 Understand the principles and tools of management for techniques of effective food preparation

CO2 Acquire the special characteristics and its operations of food service

CO3 Evaluate the quality control techniques for standardization

CO4 Analyse the Productivity skills in effective management of human in food service establishment

CO5 Demonstrate the laws and legislation in relation to food service Institution

CO6 Create components of layout with personal emphasis on hospital

Text / Reference books

1. Organization and Management, R.D. Agarwal, Tata McGraw-Hill Education
2. Human Resource Management by Dr. Roya Anvari
3. Personnel Management, C. B. Mamoria, Himalaya Publishing House
4. Rutherford, D.G. Hotel Management and operation, van Nostrand Reinhold. 115, fifth Avenue, New York, 10003, 2010.
5. West. B.B. Wood L., Harger, V.F. (2005) Food Service Institutions, John Wiley and sons, Inc., New York, V Ed
6. Waighrich, H. and Koontz, H (2000) Management – a global perspective. McGraw Hill. International



-Entrepreneurship

SHSB1103	GENERAL ENGLISH LANGUAGE LEARNING - I	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To develop and integrate the use of the four language skills i.e. Listening, Speaking, Reading and Writing.
- To enhance the vocabulary knowledge by learning various strategies.
- To train academic and professional skills like interview skills, ICT and Presentation skills.
- To enable the learner to communicate effectively and appropriately in real life situation.

UNIT 1 LANGUAGE AT THE WORD LEVEL

9 Hrs.

Parts of Speech – Kinds of sentences- Tense- Voice-Impersonal Passive – Reading: Comprehension passages – Writing: Letter writing – Job Application with CV- Speaking: Self Introduction, Listening: Introduction to Internet & World Wide Web - Creating and Managing Email Accounts.

UNIT 2 LANGUAGE AT THE SENTENCE LEVEL

9 Hrs.

Concord- Phrases and Clauses-Adjectives and adverbs-Modals - Prefix-Suffix–Identifying topic sentence, Connectives and discourse markers - Writing: Paragraph Writing- Compare/ contrast paragraphs, Bar diagrams- Tabular columns– Listening: Using audio and video to learn vocabulary and grammar.

UNIT 3 WRITING FOR THE SCREEN

9 Hrs.

Reported Speech, Compound nouns, Abbreviations/ Acronyms- Types of Sentences- Simple, Compound, Complex-Transformation of sentences- Flow chart-Writing process descriptive paragraphs/drawing diagram from the paragraph –Creating and writing online quiz tests using Kahoot application- E-mail writing- letters inviting dignitaries-Accepting and Declining.

UNIT 4 LANGUAGE AT DISCOURSE LEVEL

9 Hrs.

Cloze reading exercises- Developing dialogues- Question tags- Instructions- Recommendations-Group Presentations - Preparing Checklist-Posting Online feedback for any article- Writing classified Advertisements- Argumentative Essay writing- Creating Blogs using wordpress.com.

UNIT 5 CREATIVE THINKING

9 Hrs.

Identifying the topic sentences by reading the content - Group discussions on a given topic – Mock interview – Story cluster – Rearrange the story – News report – Ad making - Writing Letters – Job application – Accepting/Declining job offers.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, the student will be able to:

- CO1** - Analyze any piece of work critically employing reading and vocabulary strategies.
- CO2** - Understand the importance of vocabulary words used in verbal and written conversation.
- CO3** - Enhance critical thinking skills by composing questions in reasoning format.
- CO4** - Equip themselves with professional soft skills to meet the industry demands.
- CO5** - Construct and evaluate written discourse with advanced skill set.
- CO6** - Equip the students with the required Professional Skills

TEXT / REFERENCE BOOKS

1. Bhattacharya, Indrajit. An Approach to Communication Skills, Dhanpat Rai Co. Pvt Ltd; New Delhi.
2. Jones, Leo. Cambridge Advanced English: Student's Book New Delhi: Cambridge University Press, 1998.
3. Mohan, Krishna and Meenakshi Raman. Advanced Communicative English. New Delhi: Tata McGraw Hill Company Ltd., 2010.
4. Rajendra, Pal and Korlhalli. Essentials of Business Communication. J.S.Sultan Chand & Sons, 2007.
5. Seely, John. The Oxford Guide to Writing and Speaking Oxford: Oxford University Press, 1998.
6. English for Science and Technology (2013) by Department of English, Sathyabama



-Skill Development

SHSB1202	GENERAL ENGLISH LANGUAGE LEARNING - II	L	T	P	EL	Credit s	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To equip students to use the language effectively in daily life.
- To find the relevance of grammar in conversational skills
- To enhance creative writing for interactive media.

UNIT 1 LANGUAGE FOR EVERY DAY USAGE

9 Hrs.

Parts of speech- Tenses-Types of sentences - Degree of comparison – Dialogue writing- Building conversation with imaginary situation – Listening and Reading skills through teacher led practice – writing agenda for a meeting – note taking – Summary writing.

UNIT 2 SOCIAL MEDIA STRATEGIES

9 Hrs.

Editing the passage with respect to spelling, grammar and punctuation-Rearranging Jumbled sentences - Writing effective headlines – Giving feedback online-Letter to the editor- Problems and Solutions Campaign Leaflet and Writing Film Review.

UNIT 3 LANGUAGE FOCUS

9 Hrs.

WH questions-Framing open-ended questions -Auxiliaries - Finites - Non – finites: Modal auxiliaries: Verbs: use of Transitive, Intransitive verbs - Phrasal verbs – Quantifiers- Identifying the odd word out- Collocations- Writing informal mails to friends and relatives.

UNIT 4 PROFESSIONAL WRITING

9 Hrs.

Simile, Metaphor- Connotations- denotations- Idioms and Phrases-Letter to the editor with solutions to current problems –Essay writing- Paragraph writing – Line Graph- Creating Accounts - On line Groups - Twitter- Face book - Skype- Linked in - Research Gate-You Tube - Flickr.

UNIT 5 CREATIVE WRITING FOR INTERACTIVE MEDIA

9 Hrs.

Report Writing- Letter writing- Request for practical training-Projects – Creating PowerPoint Presentation and uploading – Creating Blogs and uploading data – Creative writing - stories and poems article writing and presentation.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, the students will be able to

- CO1 - Improve communication skills effectively in everyday conversation.
- CO2 - Use ICT tools efficiently to improve communication skills.
- CO3 - Enhance conversation skills, impromptu speech inculcating basic grammar.
- CO4 - Equip themselves with professional soft skills to meet the industry demands.
- CO5 - Construct creative articles demanded for interactive media.
- CO6 - Equip themselves with the required Professional Skills.

TEXT / REFERENCE BOOKS

1. Bhattacharya, Indrajit. An Approach to Communication Skills, Dhanpat Rai Co. Pvt Ltd; New Delhi.
2. Jones, Leo. Cambridge Advanced English: Student's Book New Delhi: Cambridge University Press, 1998.
3. Mohan, Krishna and Meenakshi Raman. Advanced Communicative English. New Delhi: Tata McGraw Hill Company Ltd., 2010.
4. Rajendra, Pal and Korlhalli. Essentials of Business Communication. J.S.Sultan Chand & Sons, 2007.
5. Seely, John. The Oxford Guide to Writing and Speaking Oxford: Oxford University Press, 1998.
6. English for Science and Technology (2013) by Department of English, Sathyabama



-Skill Development

SACB1204	FUNDAMENTALS OF COMPUTING	L	T	P	EL	Credits	Total Marks
		3	0	0	0	3	100

COURSE OBJECTIVES

- To understand the basics of parts of a computer.
- To Understand operation of word documents.
- To understand about files, spread sheets and Networking.

UNIT 1 INTRODUCTION TO COMPUTERS

9 Hrs.

Cassification of computers; Computers inside — Hardware (processing, memory i/o, storage etc), Software (Systems, application); Operating Systems —DOS, LINUX, UNIX, Windows; Programming — Overview, need and skills; Networking Basics; Virus; Hacking.

UNIT 2 WORD PROCESSING

9 Hrs.

Operating of word documents like open, close, save, print; Editing Text — tools, formatting, bullets, layout; Navigating word — Keyword, mouse, document formating; paragraph alignment — indentation, headers, footers, numbering; printing — preview, options.

UNIT 3 FILE

9 Hrs.

Importance of file management, backing of files, files and folders- editing, deleting, retrieving, renaming, subfolders; Manipulating windows — minimize, mazimize; power point basics- terminology- templates, viewing.

UNIT 4 SPREADSHEETS

9 Hrs.

MS Excel — opening, entering text and data, formatting, navigating; Formulas- entering, handling and copying; charts- creating, formatting and printing, header and footer, centering of data; printing.

UNIT 5 NETWORKING

9 Hrs.

Internet explorer; www — working, browsing, searching, saving; bookmark — features, favorite, create, delete; printing webpage; email — creating, receiving, reading and sending messages.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of this course students will be able to

CO1 - Understand the computing skills

CO2 - Understand the concept of input and output devices of Computers.

CO3 - Learn the functional units and classify types of computers, how they process information and how individual computers interact with other computing systems and devices.

CO4 - Understand an operating system and its working, and solve common problems related to operating systems.

CO5 - Able to apply Basic word processing, Spreadsheet and Presentation Graphics Software skills.

CO6 - Develop the basic skills to use the Internet safely, legally, and responsibly.

TEXT / REFERENCE BOOKS

1. Introduction to Computers — Peter Norton, Tata McGraw-Hill, India.
2. Microsoft 2003 — Jennifer Ackerman Kettel et al., Tata Mc-Graw Hill, India.
3. Working in Microsoft office 2006- Ron Mansfield, Tata Mc-Graw Hill, India.



-Skill Development