



SCHOOL OF ALLIED HEALTH SCIENCES

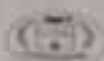
DEPARTMENT OF CLINICAL NUTRITION & DIETETICS

MINUTES OF THE BOARD OF STUDIES MEETING (12th JUNE, 2023)

The Board of Studies Meeting was held on **12th June 2023** at **10 am**.

Agenda for the BOS meeting:

- ☐ Dr. L. Inbathamizh, Head, Clinical Nutrition & Dietetics chaired the meeting and welcomed all the members to the BOS meeting.
- ☐ Dr. L. Inbathamizh introduced the internal members to the External member.
- ☐ Dr. L. Inbathamizh briefed the infra-structure facilities and activities at Sathyabama Institute of Science and Technology
- ☐ Dr. S. Padma Priya presented the proposal of converting B.Sc. Clinical Nutrition & Dietetics Program from non-semester to semester pattern, Regulations 2023, Curriculum and Syllabi of the new syllabus of B.Sc. Clinical Nutrition & Dietetics to the members for comments and suggestions.
- ☐ Having confirmed the quorum of the meeting, the agenda of the meeting was taken up for discussion and accepted by the board members.
- ☐ The External members appreciated the ample infra-structure facilities available at Sathyabama Institute of Science and Technology.
- ☐ The External Members suggested the following refinements for betterment of the program
- ☐ Each paper may be distributed with 5 units uniformly in order to meet the criteria of hours / credits
- ☐ Along with English, soft skills may also be included in the syllabus in one semester
- ☐ Food Science Lab part of Human Physiology & Food Science Lab in I semester seemed to be very extensive, it could be concised for completion within the semester and as it is along with the other part-Human Physiology Lab
- ☐ Metabolism and hydrolysis of protein to be included in Nutritional Biochemistry in Semester-II.
- ☐ Clinical Training can be both internal & external
- ☐ Academic Project need not be mandatory for under graduate students
- ☐ Discipline specific electives can be more specific to the discipline
- ☐ Course codes for the respective programs were included in the syllabi



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

APPROVED TO BE UNIVERSITY

Accredited "A++" Grade by NAAC / ISO Status by ISO / Approved by AICTE

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Following members were present during the meeting:

S.No	Name	Designation	Affiliation	Signature
1	Dr.L.Inbothamiah (Chair person)	Assistant Professor & HOD,	Department of Clinical Nutrition & Dietetics, Allied Health Sciences, Sathyabama Institute of Science and Technology	
2	Dr.P.Venkata Lakshmi (External Member)	Chief Dietitian & HOD & Associate Professor	Gleneagles Global Health City Dr.MGR Medical University	
3	Dr.J.Premkumar (Member)	Associate Professor & HOD	Department of Medical Laboratory Technology, Allied Health Sciences, Sathyabama Institute of Science and Technology	
4	Dr. S. Padma Priya (Member)	Assistant Professor	Department of Clinical Nutrition & Dietetics, Sathyabama Institute of Science and Technology	
5	Ms. Priya S (Member)	Assistant Professor	Department of Clinical Nutrition & Dietetics, Sathyabama Institute of Science and Technology	
6	Ms. Kanya S (Member)	Assistant Professor	Department of Clinical Nutrition & Dietetics, Sathyabama Institute of Science and Technology	
7	Ms. Roshni M (Member)	Assistant Professor	Department of Clinical Nutrition & Dietetics, Sathyabama Institute of Science and Technology	

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.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max. Marks: 100****Exam Duration: 3 Hrs.****PART A :** 10 Questions of 2 marks each - No choice**20 Marks****PART B :** 5 Questions from each unit with internal choice, each carrying 16 marks**80 Marks**

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.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max. Marks: 100****Exam Duration: 3 Hrs.****PART A :** 10 Questions of 2 marks each - No choice**20 Marks****PART B :** 5 Questions from each unit with internal choice, each carrying 16 marks**80 Marks**

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

- C01** - Understand the fundamentals of food science and differentiate the suitable cooking method that can be adopted for each food groups.
- C02** - Elucidate the nutritive value and changes that cereal & pulses undergo during cooking
- C03** - Apply relevant knowledge and techniques to minimize nutrient loss in vegetables and fruits
- C04** - Apply different preparation techniques for processing meat & its products.
- C05** - Analyze the principles of cooking in oil & sugar
- C06** - 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.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A : 10 Questions of 2 marks each - No choice

20 Marks

PART B : 5 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

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 muta rotation, 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.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max. Marks: 100****Exam Duration: 3 Hrs.****PART A :** 10 Questions of 2 marks each - No choice**20 Marks****PART B :** 5 Questions from each unit with internal choice, each carrying 16 marks**80 Marks**

SACB2101	HUMAN PHYSIOLOGY & FOOD SCIENCE LAB	L	T	P	EL	Credits	Total Marks
		0	0	4	0	2	100

COURSE OBJECTIVES

- To learn the basic physiology lab procedures and to examine the microorganisms under the microscope.
- To apply the physiological aspects to clinical studies
- To apply the principles of Food Science

PHYSIOLOGY**SUGGESTED LIST OF EXPERIMENTS**

Compound Microscope
 Determination of Blood groups
 Measurement of Human blood pressure
 Respiratory rate and pulse rate
 Estimation of hemoglobin
 RBC Estimation
 WBC Estimation
 Microscopic study of different tissues - epithelial, Connective, Muscular and Nervous

FOOD SCIENCE**SUGGESTED LIST OF EXPERIMENTS**

1. Gluten formation and gelatinization of starch
2. Germination and factors affecting cooking of pulses.
3. Egg Cookery - Ferrous sulphide formation in boiled egg. Factors affecting egg foam formation.
4. Stages of sugar cookery.
5. Milk Cookery - Factors affecting coagulation of milk.
6. Common test to detect adulteration in foods.

COURSE OUTCOMES

On completion of the course, students will be able to

- CO1** - Recognize and identify the principle tissue structures.
CO2 - Perform, analyze and interpret the experiments of blood parameters.
CO3 - Measure blood pressure, respiratory rate and pulse rate essential during therapies and surgeries.
CO4 - Understand the application of gluten and gelatinization.
CO5 - Develop knowledge on various egg cookery.
CO6 - Equip knowledge on food chemistry.

TEXT / REFERENCE BOOKS

1. Joshi, VD, physiology- Preparation Manual for undergraduates, Churchill Livingstone. New Delhi, 1995.
2. Peckham G C., Foundations of Food preparation, The Macmillan publishing Co, N.Y., 1979
3. Grisworld R. M., The Experimental study of foods, Houghton Mifflin Co, Boston, 1979

SCYB2102	BASIC CHEMISTRY LAB	L	T	P	EL	Credits	Total Marks
		0	0	3	0	2	100

COURSE OBJECTIVES

1. To understand the basic concepts of Organic Chemistry.
2. To study the Qualitative and Quantitative Analysis.
3. To learn the functional groups of organic chemistry

I. Volumetric Analysis

1. Estimation of Sodium hydroxide using standard Sodium Carbonate.
2. Estimation of Hydrochloric acid using standard Oxalic acid.
3. Estimation of calcium from calcium tablets using EDTA

II. Systematic analysis of Organic compounds

The analysis must be carried out as follows

- a) Functional group tests - Carboxylic acid, Benzoic acid, phthalic acid, Phenol, Urea, Glucose, Benzaldehyde, Aniline
- b) Detection of elements (N, S, Halogens)
- c) Distinguish between aliphatic and aromatic
- d) Saturated and unsaturated compounds

COURSE OUTCOMES

On completion of the course, students will be able to

- CO1** - Acquire Quantitative skills in volumetric analysis.
- CO2** - Develop the skill in analyzing special elements present in the organic substances.
- CO3** - Evaluate the aliphatic and aromatic nature of the organic substances.
- CO4** - Identify the different functional group present in the organic substances.
- CO5** - Estimate the analytes present in samples.
- CO6** - Determine the functional group of food materials.

BOOK/ TEXTBOOK REFERENCES

1. Basic Principles of Practical Chemistry, Venkateswaran, Veerasamy& Kulandaivel S Chand & Co.
2. Gopalan R. and Sundaram S., Allied Chemistry, Sultan Chand & Sons Publishers, New Delhi 2nd ed.
3. Soni P.L. and Mohan Katyal, Text Book of Inorganic Chemistry, Sultan Chand and Company Pvt. Ltd, New Delhi, 20th ed.
4. Bahl B.S. and Arun Bahl, A text book of Organic Chemistry 21st ed., S. Chand and Company.

SHSB1202	GENERAL ENGLISH LANGUAGE LEARNING - II	L	T	P	EL	Credits	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 - Flicker.

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

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max. Marks: 100****Exam Duration: 3 Hrs.****PART A :** 10 Questions of 2 marks each - No choice**20 Marks****PART B :** 5 Questions from each unit with internal choice, each carrying 16 marks**80 Marks**

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.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max. Marks: 100****Exam Duration: 3 Hrs.****PART A :** 10 Questions of 2 marks each - No choice**20 Marks****PART B :** 5 Questions from each unit with internal choice, each carrying 16 marks**80 Marks**

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, Co-enzyme 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

Shanmugam, Ambika, Fundamentals of biochemistry to medical students. NAV Bharat Printers & traders 56, Peters Road, Chennai 86.1985.

Ramadevi K, Ed: Ambika Shanmugam's Fundamentals of biochemistry for medical students, 8th edition, Wolters Kluwer Health, India, 2016

Albert L. Lehninger, David L. Nelson, Michael M. Cox (2008). Lehninger Principles of Biochemistry. 5th Ed. W.H. Freeman & Company.

Chatterjee, M. N., Shinde and Rana, (2005). Textbook of Medical Biochemistry 6th Ed. New Delhi Jaypee Brothers Medical Publishers.

Thomas, D. M (Ed) (2010). Textbook of Biochemistry with Chm, Corr. New York: John Wiley and Sons Inc

Robert K. Murray, David Bender, Victor Rodwell, Kathleen M. Botham, P. Anthony Weil, Peter J. Kennelly (2012).

Harper's Illustrated Biochemistry, 29th Edition (Lange Basic Science). McGraw Hill Company.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A : 10 Questions of 2 marks each - No choice

20 Marks

PART B : 5 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

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**9 Hrs.**

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

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A : 10 Questions of 2 marks each - No choice

20 Marks

PART B : 5 Questions from each unit with internal choice, each carrying 16 marks

80 Marks

SACB2201	NUTRITIONAL BIOCHEMISTRY LAB	L	T	P	EL	Credits	Total Marks
		0	0	4	0	2	100

COURSE OBJECTIVES

- To develop laboratory skills of selected and relevant biochemical techniques.
- To enable students to learn biochemical analysis of various biomolecules.
- To understand qualitative and quantitative analysis techniques for nutrients.

1. Qualitative test for carbohydrates - glucose, fructose, lactose, maltose
2. Qualitative test for proteins - albumin, casein and gelatin
3. Qualitative test for individual amino acids -Tyrosine, Cysteine, Methionine, Tryptophan.
4. Estimation of serum protein (Biuret method and Lowry method)
5. Estimation of total nitrogen in foods (Micro or Macro Kjeldahl methods)
6. Determination of total oil content by Soxhlet method
7. Determination of iodine value
8. Estimation of blood creatinine
9. Determination of Ash Content from green leafy vegetable
10. Estimation of starch by Anthrone reagent

COURSE OUTCOMES

On completion of the course, students will be able to

- CO1** - Interpret the serum levels of components of nutritional significance
- CO2** - Understand the methodology of estimation of blood parameters and nutritionally significant markers
- CO3** - Develop skills in qualitative tests and quantitative estimation of nutrients.
- CO4** - Identify macro and micro nutrients based on qualitative analysis
- CO5** - Explore the presence of various biomolecules
- CO6** - Analyse various constituents of biological fluids

TEXT / REFERENCE BOOKS

1. Nielson S, Food analysis laboratory Manual, 3rd edition, Springer International Publishing, 2017
2. Cheung PCK and Mehta BM (eds), Handbook of food chemistry, 1st edition, Springer - Verlag Berlin Heidelberg, 2015
3. Harold Varley, Practical Clinical Biochemistry, 4th edition, CBS Publishers & Distributors Pvt.Ltd., 2005

SACB2202	FOOD MICROBIOLOGY LAB	L	T	P	EL	Credits	Total Marks
		0	0	4	0	2	100

COURSE OBJECTIVES

- To examine the microorganisms under the microscope.
- To perform simple tests to identify different types of micro-organisms.
- To understand sterilization methods.

LIST OF EXPERIMENTS

1. Identification of prepared slides-- Algae, yeast, moulds, Protozoa and Bacteria.
2. Examination of Unstained Organisms- wet methods and hanging drop preparations.
3. Examination of stained Organisms- Simple Staining and Gram staining.
4. Common culture media and uses.
5. Direct microscopic count of organisms in milk. Standard plate count in milk. Reductase test for milk. Methylene Blue Reduction test.
6. Sterilization of glassware using hot air oven, autoclave
7. Microbiological quality of water (MPN)
8. Microbiological quality of milk
9. Bacterial Count in food Products (TVC)
10. Thermal destruction of microbes TDT and TDP

COURSE OUTCOMES

On completion of the course, students will be able to

- CO1** - Demonstrate the best practices relating to sterilization and disinfection appropriate to various settings to promote healthy, safe and eco-friendly environment
- CO2** - Understand the different types of microorganisms and their characteristics
- CO3** - Explore the staining techniques
- CO4** - Enhance ability to check the quality of food product for microbial content
- CO5** - Understand different techniques in destruction of microbes
- CO6** - Explore staining techniques

TEXT / REFERENCE BOOKS

1. Purohit, S. S Microbiology - Fundamentals and applications, 6th edition, Agro bices, Indiana, 2002
2. Garg N and Garg KL, Laboratory Manual of food Microbiology, 1st edition, KG Mukerji Publishers, 2010

SBBB1101	ENVIRONMENTAL SCIENCE	L	T	P	EL	Credits	Total Marks	
		3	0	0	0	3	CAE	ESE
							50	50

COURSE OBJECTIVES

- To impart knowledge on the issues related to environment and to emphasize the importance of a clean environment.
- To understand the Ecosystems and Biodiversity.
- To learn the social issues and human population.

UNIT 1 INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES**9 Hrs.**

Definition, scope and importance, need for public awareness, forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams, floods, drought, conflicts over water, dams-benefits and problems, mineral resources: use effects on forests and tribal people. water resources: use and over-utilization of surface and ground water, exploitation, environmental effects of extracting and using mineral resources, case studies food resources: world food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy sources: Case studies. Land resources: land as a resource, land degradation, man induced landslides, soil erosion and desertification, role of an individual in conservation of natural resources, equitable use of resources for sustainable lifestyles.

UNIT 2 ECOSYSTEMS AND BIODIVERSITY**9 Hrs.**

Concept of an ecosystem, structure and function of an ecosystem - producers, consumers and decomposers - energy flowing the ecosystem, ecological succession, food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). Introduction to biodiversity, definition: genetic, species and ecosystem diversity - biogeographical classification of India - value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, biodiversity at global, national and local levels. India as a mega-diversity nation, hotspots of biodiversity, threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, endangered and endemic species of India, conservation of biodiversity, in-situ and exsitu conservation of biodiversity.

UNIT 3 ENVIRONMENTAL POLLUTION**9 Hrs.**

Definition - causes, effects and control measures of: (a) air pollution (b) water pollution (c) soil pollution (d) marine pollution (e) noise pollution (f) thermal pollution (g) nuclear hazards. Solid waste management: causes, effects and control measures of urban and industrial wastes, role of an individual in prevention of pollution, pollution case studies, disaster management: floods, earthquake, cyclone and landslides.

UNIT 4 SOCIAL ISSUES AND THE ENVIRONMENT**9 Hrs.**

From unsustainable to sustainable development, urban problems related to energy, water conservation, rain water harvesting, watershed management, resettlement and rehabilitation of people; its problems and concerns, case studies, environmental ethics: issues and possible solutions, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. Wasteland reclamation, consumerism and waste products – environment protection act: air (prevention and control of pollution) act - water (prevention and control of pollution) act, wildlife protection act; forest conservation act. Issues involved in enforcement of environmental legislation, Key initiatives of Rio declaration, Vienna convention, Kyoto protocol, Johannesburg summit and public awareness.

UNIT 5 HUMAN POPULATION AND THE ENVIRONMENT**9 Hrs.**

Population growth, variation among nations, population explosion, family welfare programme, environment and human health, human rights, value education, HIV / AIDS, women and child welfare, role of information technology in environment and human health, case studies. Visit to a local area to document environmental assets river/ forest / grassland / hill /mountain. Visit to a local polluted site-urban/rural/ industrial/agricultural-study of common plants, insects, birds- study of simple ecosystems, pond, river, hill slopes etc.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1** - Recognize the need of conservation of natural resources for the future generations.
- CO2** - Differentiate the uniqueness of each and every ecosystem and biodiversity.
- CO3** - Identify the environmental pollution and to control them in a sustainable way.
- CO4** - Execute the possible solutions to manage the natural and manmade disasters for the sustainable living.
- CO5** - Distinguish the reasons for over population and give awareness to people through media to control population growth.
- CO6** - Solve the environment related problems by conserving the natural resources for the future generations.

TEXT / REFERENCE BOOKS

1. Meenakshi P., Elements of Environmental Science and Engineering, 1st Edition, Prentice Hall of India, New Delhi, 2009.
2. Ravikrishnan A., Environmental Science & Engineering, 3rd Edition, Sri Krishna Publications, Chennai, 2008.
3. Wrigh R.T. &Nebel B.J., Environmental science-towards a sustainable future by Richard, 8th Edition, Prentice Hall of India, New Delhi, 2006.
4. Erach Bharucha, Text Book of Environmental Studies, 2nd Edition, University Press, Chennai, 2006.

SACB1204	FUNDAMENTALS OF COMPUTING	L	T	P	Credits	Total Marks
		3	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 forming; 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

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

END SEMESTER EXAM QUESTION PAPER PATTERN**Max. Marks: 100****Exam Duration: 3 Hrs.****PART A:** 10 Questions of 2 mark each - No choice.**20 Marks****PART B:** 2 Questions from each unit of internal choice, each carrying 16 marks.**80 Marks**