BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI – 620 024.
M.Sc. NUTRITION AND DIETETICS - Course Structure under CBCS
Applicable to the candidates admitted from the academic year 2008-2009 onwards)

Semester	Course	Course Title	Ins. Hrs / Week	Credit	Exam Hrs	Marks		Total
						Int.	Extn.	
I	Core Course – I (CC)	Applied Physiology	6	5	3	25	75	100
	Core Course – II (CC)	Biomolecules and Intermediary Metabolism	6	4	3	25	75	100
	Core Course – III (CC)	Techniques for Clinical Nutrition - Practical	6	5	3	40	60	100
	Core Course – IV (CC)	Nutrition through Development Milestones	6	4	3	25	75	100
	Core Course – V (CC)	Community Nutrition	6	5	3	25	75	100
		Total	**30**	**23**				**500**
II	Core Course – VI (CC)	Advanced Food Science	6	4	3	25	75	100
	Core Course – VII (CC)	Advanced Dietetics - Theory	6	5	3	25	75	100
	Core Course – VIII (CC)	Advanced Dietetics Practical and Internship	6	4	3	40	60	100
	Core Course – IX (CC)	Food Biotechnology	6	5	3	25	75	100
	Elective – I	Advances in Food Microbiology	6	4	3	25	75	100
		Total	**30**	**22**				**500**
III	Core Course – X (CC)	Research Methods and Applied Statistics	6	5	3	25	75	100
	Core Course – XI (CC)	Techniques for Food Analysis - Practical	6	4	3	25	75	100
	Core Course – XII (CC)	Micro Nutrients	6	5	3	25	75	100
	Elective - II	Computer Applications in Nutrition and Dietetics	6	4	3	25	75	100
	Elective – III	Food Packaging	6	4	3	25	75	100
		Total	**30**	**22**				**500**
IV	Core Course – XIII (CC)	Micro Nutrients	6	5	3	25	75	100
	Project Work	Dissertation – 80 marks [2 reviews –20+20=40 marks Report Valuation = 40 marks] Viva = 20 Marks	12	10	-	-	-	100
	Elective - IV	Food Product Development and Marketing	6	4	3	25	75	100
	Elective - V	Bakery and Confectionery	6	4	3	25	75	100
		Total	**30**	**23**				**400**
		Grand Total	**120**	**90**				**1900**

Note:

Core Courses include Theory, Practicals & Project

No. of Courses	14 - 17
Credit per Course	4 - 5
Total Credits	70

Elective Courses

(Major based / Non Major / Internship)

No. of Courses	4 – 5
Credit per Course	4 – 6
Total Credits	20

	Internal	External
Theory	25	75
Practicals	40	60

Project

Dissertation	80 Marks	[2 reviews – 20+20	=	40 marks
		Report Valuation	=	40 marks]
Viva	20 Marks			20 marks

Passing Minimum in a Subject

CIA	40%	Aggregate 50%
UE	40%	

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SEMESTER I

CORE COURSE – I (CC) - APPLIED PHYSIOLOGY

Objectives:

To enable the students

1. understand the structure and Physiology of various organs in the body
2. obtain a better understanding of the principles of Nutrition and Dietetics through the study of Physiology

UNIT I: IMMUNOLOGY

Definition and topics of immunity, lymphocytes in immunity, antigens, development of cellular immunity, development of humoral immunity, antibodies, immune deficiency diseases, autoimmune diseases, allergy and immunology, hyper sensitivity reactions.

UNIT II: BLOOD, HEART AND CIRCULATION

a) Blood: Composition, functions,
RBC – Structure, functions, erythropoiesis, haemoglobin.
WBC – Structure, functions, classification.

b) Blood platelets: Structure, functions, reticule endothelial system.
Blood groups – Rh factor. Blood coagulation.
Spleen – Structure and functions.
Lymph – Lymphatic system.

c) Heart and Circulation: Heart - Anatomy and Physiology.

Blood vessels – Structure of artery, vein, capillaries, cardiac output, arterial blood pressure, clinical measurement of blood pressure, properties of cardiac muscle, origin and conduction of heart beat, cardiac cycle, regulation of heart action.

Related Experience

Estimation of haemoglobin, RBC and WBC count.
Determination of blood groups. Identification of different types of white blood cells.
Arterial blood pressure and pulse rate

UNIT III : RESPIRATORY, DIGESTIVE AND EXCRETORY SYSTEMS

a. Respiratory System: Structure of respiratory organs, mechanics of respiration, structure of lung, chemistry of respiration, artificial respiration, control of respiration.

b. Digestive System: General anatomy of digestive system. Digestion in the mouth, stomach and intestines. Movements of small intestine, role of Pancreas. Liver – structure and function.

c. Excretory System: Physiology of kidney-nephron, formation of urine, voiding of urine.

Skin – structure and functions, regulation of body temperature.

UNIT IV : ENDOCRINE AND REPRODUCTIVE SYSTEMS

a. Endocrinology: Structure and functions of thyroid, pituitary, parathyroid, adrenals, islets of langerhans of pancreas, sex glands.

b. Reproductive System: General anatomy – Female and male reproductive system. Testis – Spermatogenesis, male sex hormones, ovaries, female sex hormones and menstrual cycle.

UNIT V: NERVOUS SYSTEM AND SPECIAL SENSES

a. Nervous System: Spinal cord : Structure and functions. Ascending and descending tracts, reflex action.

Brain – Structure and functions of cerebrum, optic thalamus, mid brain, pons, medulla oblongata, hypothalamus, cerebellum.

Autonomic Nervous System: Sympathetic and parasympathetic.

b. Special senses: Physiology of vision: structure of eye, dark and light adaptation, accommodation of the eye, visual fields, common defects due to abnormalities – presbyopia, cataract, astigmatism, blindness.

Ear – Structure and physiology of hearing.

Reference Books

1. Astrand, P.O. and Rodahi, K., 1981. Textbook of work Physiology, McGraw Hill Book Company, New York.
2. Best, H. and Taylor, B., 1992. The Physiological basis for Medical Practice, 8th edition. The Williams and Wilkins Company.
3. Chatterjee, C.C., Juman, 1987. Human Physiology, Vol. I and II, Medical Allied Agency, Calcutta.
4. Guyton, A.C., 1991. Textbook of Medical Physiology, 14th edition, W.B. Saunders Company, Philadelphia.
5. Samson and Wright, 1989. Applied Physiology, Tandon Publication.

Journals

1. The Journal of Laboratory and Clinical Medicine, C.V. Mosby Company.
2. The Indian Journal of Clinical Nutrition, American Society for Clinical Nutrition, Inc., U.S.A.

CORE COURSE – II (CC)

BIOMOLECULES AND INTERMEDIARY METABOLISM

Objectives: To enable the students

obtain in depth knowledge in the study of Biochemistry of major nutrients and metabolic pathway

UNIT I: CARBOHYDRATES

Introduction, classification, structure and properties of monosaccharides (hexoses and pentoses). Reactions of monosaccharides – oxidation, reduction and reaction with phenyl hydrazine. Biological significance of important monosaccharides and their derivatives.

UNIT II: METABOLISM OF CARBOHYDRATES

Glycolysis, TCA cycle, HMP shunt, energy production in the above pathways – oxidative phosphorylation and electron transport chain, gluconeogenesis, uronic acid pathway.

UNIT III: AMINO ACIDS AND PROTEINS

Classification of proteins and amino acids. Isolation and purification of proteins. Criteria of purity. Denaturation, structure of proteins with special reference to insulin, myoglobin and haemoglobin, structure of amino acids. Metabolism of amino acids – General pathways of metabolism of amino acids. Metabolism of glycine. Phenylalanine, tyrosine, tryptophan, histidine and methionine.

UNIT IV: LIPIDS

Classification – triglycerides (fats), phospholipids and other non-phosphorylated lipids – characterization of fats. Rancidity of fats. Essential fatty acids.

Metabolism of lipids – oxidation of fatty acids, biosynthesis of fatty acids (palmitic acid), biosynthesis of triglycerol, phospholipids, cholesterol and bile salts, fatty liver.

UNIT V: ENERGY

Unit of energy, determination of energy content of food Basal Metabolic Rate, determination of BMR, determination of total energy requirements, SDA of food, factors affecting total energy requirements. Carbohydrate, protein and fat as sources of energy.

References Books:

1. Ambika Shanmugam, 1987. Biochemistry for Medical students.
2. Antia, F., 1973. Clinical Nutrition and Dietetics.

3. Deb, A.C., 2002. Fundamentals of Biochemistry, New Central Book Agency (PP Ltd.
4. Glick, B.R. and Pasternack, J.J., 1998. Molecular Biotechnology, 2nd edition, ASM Press, Washington.
5. Happer, 1980. Review of Physiological Chemistry.
6. Lehniger, A.L., 1979. Textbook of Biochemistry.
7. Swaminathan, M., Biochemistry for Medical students.

CORE COURSE – III (CC)

TECHNIQUES FOR CLINICAL NUTRITION (Practical)

Objectives : To enable the students

1. get practical experience in the Laboratory
2. develop skills to undertake research work

1. Analysis of Blood for

a. Glucose
b. Haemoglobin – 1. Cyanmeth Haemoglobin Method
   2. Wong's Method
c. Cholesterol
d. Serum A/G ratio and total protein
e. Serum phospholipid
f. Serum vitamin A
g. Serum Alkaline phosphatase
h. Serum Glutamic oxaloacetate Transaminase
i. Serum Glutamic pyruvate Transaminase
j. Serum Bilirubin

2. Analysis of urine

a. Creatinine
b. Urea
c. Total nitrogen
d. Calcium
e. Phosphorus
f. Vitamin – C

References:

Books

1. Jayaraman, J. 1996. Laboratory manual in Biochemistry, New Age International Ltd., Publishers, V Print. New Delhi.
2. Oser, B.L., Hawks., 1954. Physiological Chemistry, XIV edition, Tata McGraw Hill Publishing Company, Ltd., Bombay.
3. Reghuramulu, N. Nair, K.M., Kalyanasundaram, S.A., 1983. Manual of laboratory Techniques, National Institute of Nutrition, ICMR, Silver Prints, Hyderabad.
4. Sadasivam, S. and Manickam, A., 1996. Biochemical methods, Second Edition. New Age International Pvt. Ltd., Publishers, New Delhi.
5. Varley, H., Gowenlak, A.H., and Hell, M., 1980. Practical Clinical Biochemistry, William Itinmaon Medical Books, London.

CORE COURSE – IV (CC)

NUTRITION THROUGH DEVELOPMENTAL MILESTONES

Objectives:

To enable the students

1. understand the role of nutrition in different stages of life cycle
2. gain knowledge about the methods of assessment of nutritional problems and their implications

UNIT I : FOOD GROUPS AND RECOMMENDED ALLOWANCES

Different food groups, recommended allowances for Indians. Basis for requirements. Balanced menu.

Nutritional requirements for special events

Nutritional requirements and food modification in higher altitudes, space travel and sea voyage. Sports nutrition.

UNIT II : NUTRITION IN PREGNANCY AND LACTATION

Nutrient requirements and general health. Weight gain during pregnancy and nature of weight gain. Intrauterine growth of foetus from conception till full term. Storage of nutrients in normal pregnancy. Physiological cost, complications of pregnancy. Physiological adjustments during lactation.

Lactation in relation to growth and health of infants. Efficiency of milk production. Diet for lactating women. Implications of health programmes.

Related Experience

Planning diets to meet the requirements at different economic levels – low, middle and high income for the following conditions.

1. Pregnancy
2. Lactation

UNIT III : NUTRITION IN INFANCY

Nutritional status of infants. Rate of growth, weight as the indicator. Nutritional allowances for infants. Breastfeeding versus formula feeding. Weaning foods suitable for infants. Feeding the premature infant.

NUTRITION FOR PRESCHOOL CHILDREN

Growth and development of preschool children. Food habits and nutrient intake of preschool children, dietary allowances, supplementary foods, effect of food on brain and brain development in preschool age.

Related Experience

Planning diet to meet the requirements at different economic levels – low, middle and high income for preschool age.

UNIT IV : NUTRITION DURING SCHOOL AGE

Physical Development, school lunch programmes. Food habits and nutritional requirements, behavioural characteristics. Attention span and exploratory behaviour.

Related Experience

Planning diet to meet the requirements at different economic levels – low, middle and high income for school age.

NUTRITION DURING ADOLESCENCE

Changes of growth, characteristics of adolescents. Nutritional needs of the adolescents.

Related Experience

Planning diet to meet the requirements at different economic levels – low, middle and high income for adolescents.

UNIT V: NUTRITION FOR THE ADULTS

Basis for requirement. Nutritional requirements, nutrition and work efficiency.

Related Experience

Planning diet to meet the requirements at different economic levels – low, middle and high income for adult

NUTRITION FOR THE AGED

Socio-economic and psychological factors. Nutritional requirements, advances in geriatric nutrition.

Related Experience

Planning diet to meet the requirements at different economic levels – low, middle and high income for old people

References:

Books

1. Davidson, Sir Stanely, Passmore and Brook, J.F., 1993. Human Nutrition and Dietetics,
   R & S Livingston Ltd., Edinburgh, 9th edition.
2. Gopalan C.V. and Rama Sastry. Nutrient Requirements and Recommended Dietary Allowances for Indians, Indian Council of Medical Research – Recent edition.
3. Jelliffe, D.B., 1989. Assessment of the Nutritional status of the community, Second edition.
   WHO, Geneva.
4. Robinson, C.H., Lawler, M.R., 1998. Normal and Therapeutic Nutrition, 19th edition, McMillan Publishing Co., New York.
5. Shanthi Ghosh, 1992. The feeding and care of infants and young children, 6th edition. Health Association of India, New Delhi.

Journals

1. Indian Journal of Nutrition and Dietetics, Avinashilingam Deemed University, Coimbatore.
2. Indian Journal of Medical Research, New Delhi.
3. Proceedings of the Nutrition Society of India, NSI, Hyderabad.

CORE COURSE –V - COMMUNITY NUTRITION

Objectives: To enable the students

1. gain insight into the national nutritional problems and their implications
2. develop skills in organizing and evaluating nutrition projects in the community

UNIT I : NUTRITION AND NATIONAL DEVELOPMENT, ECOLOGY OF MALNUTRITION

Introduction of nutrition to national development in terms of socio-economic, industrial and agricultural development.

Consequences of malnutrition, reduced physical work capacity and mental efficiency, cost of wastage due to malnutrition in pregnancy, childhood etc.

IMR, NMR, MMR, prevalence of common nutritional problems – PEM, Vitamin – A deficiency, diseases, anaemia, iodine deficiency disorders and fluorosis.

Ecological factors leading to malnutrition such as income, size of families, dietary pattern, occupation, customs, food fads, fallacies, ignorance and other factors.
Synergism between malnutrition and infection.

UNIT II : STRATEGIES TO OVERCOME MALNUTRITION

Measures to overcome malnutrition, increased agricultural production, animal husbandry with emphasis on nutritious foods and nutrition gardens, food technology, food fortification and enrichment, nutrition education. Nutrition Intervention programmes.

Environmental sanitation and health. Nutrition Intervention programmes. Genesis, objectives and operation of Nutrition Intervention programmes in India. School lunch programme, CMNMP, ICDS, TINP. National Nutrition Policy – Thrust areas. Implementation at national level, impact of national nutrition policy.

Assessment of nutritional status. Dietary survey, anthropometry, clinical examination, laboratory examination.

Related Experience

A community nutrition camp for 15 days in a village.

UNIT III : NATIONAL AND INTERNATIONAL VOLUNTARY ORGANISATIONS TO COMBAT MALNUTRITION

ICMR, CHEB, CSWB, SSWB, NIN, NNMB, CFTRI, DFRI, NIPCCD.
International organizations – FAO, WHO, UNICEF, WORLD BANK, FFHB, IBP.
Voluntary Services – AIWC, BGMS, KGNMT, CARE, CWS, CRS, AFPRO, HSAI.

UNIT IV : NUTRITION EDUCATION

Meaning, nature and importance of nutrition education to the Community.
Training workers in nutrition education. Programmes for integration of nutrition education.

Related Experience

Community related experience in planning, conducting and evaluating nutrition education programmes in a selected community.

UNIT V : ORGANISATIONS OF NUTRITION EDUCATION PROGRAMMES

Principles of planning, executing and evaluating nutrition education programme, problems of nutrition education programme.

Reference Books

1. Astrand, P.O., and Rodahi,K. Text book of Work Physiology, McGraw Hill Book Company
2. Bell, G.H., Davidson, J.N. and Scarborough, H. The Text book of Physiology and Biochemistry
3. Best H., and Taylor B., 1992. The Physiological basis for Medical Practice, 8th edition, The Williams and Wilkins Company,
4. Burke and Taylor, 1986. The Living Body, Saunder's Company.
5. Chatterjee C.C., 1987. Human Physiology, Vol. I and II, Medical Allied Agency, Calcutta.
6. Clark, N., 1997. Sports Nutrition Guide Book, Versa Press, USA.
7. Draper H.H., 1980. Adva Hobbies: Reading books, Hearing Music, Dancing and Cookingnces in Nutritional Reseach, Vol.2, Plenum Press, New York.
8. Draper H.H., 1980. Advances in Nutritional Reseach, Vol.3, Plenum Press, New York.
9. ELBS edition, 1970. The English Languate Book Society.
10. Greten, H,1976. Lipoprotein Metabolism, Springer, Veriog, Berin, Heldeberg, New York.
11. Guyton, A.C., 1991. Text of Book of Medical Physiology, 14th Edition, W.S. Saunders Company, Philadelphia .
12. Hoffman, W.W., 1970. The Biochemistry of Clinical Medicine, 4th Edition, Year Book Medical Publishers.
13. Lankford, R.T. Marie P. and Steward, J., 1985. Nutrition and Physical Fitness, Foundation of Normal and Therapeutic Nutrition, Wiley Medical Publication, New York.
14. Samson and Wright, 1989. Applied Physiology, Tandon Publication.
15. Sandhu, K. 1993. Sports Dynamics, Gagotia publishing Company, New Delhi.
16. Sembulingam and Prema Sembulingam, 2000. Essentials of Medical Phyiology, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.
17. Thomson, R.H.S. and King E.O. 1980. Biochemical disorders of human diseases, A.P. New York.
18. Tletz, N.W. 1975. Fundamentals of Clinical Chemistry, W.B. Saunders Company, Philadelphia.
19. Varley, H.A. Practical Clinical Biochemistry, Indian Edition, Gulab Vizirani for Arnold Helnemann Publishers (India).
20. Williams, M.H. 1995. Nutritional Aspects of Human, Physical and Athletic Performance, II Edition, Spring field Publication, Illinois.

Journals:

1. Israel Journal of medical Sciences, Israel Medical Association, National Council for Research and Development.
2. The Journal of Laboratory and Clinical Medicine, C.,V. Musby Company
3. The Indian Journal of Clinical Nutrition, American Society for Clinical Nutrition, Inc., USA.

SEMESTER II

CORE COURSE – VI (CC) - ADVANCED FOOD SCIENCE

Objectives : To enable the students

1. gain knowledge on source and properties of food
2. develop skills to judge the quality of cooked foods

UNIT I : PHYSIOLOGICAL CHANGES

Physical properties of water and ice, absorption phenomena, solutions and colloidal properties, freezing and ice structure.
Colloidal salts, stabilization of colloidal systems, properties of colloids.

Rheology of food dispersion, foam structure formation and stabilization. Denaturation of proteins, emulsions, stabilizers, browning reaction – enzymatic and non-enzymatic.

SUGAR COOKERY AND SWEETENERS

Sugar cookery, sources, uses, properties, syrups, sugar artificial sweeteners, chemistry related to usage in food products. Structural relationship to sweetness, perception hydrolytic reaction, solubility and crystallization, Textural contribution, fermentation.
Amorphous and crystalline candies, fondant, caramel, brittles and fudge.

Related Experience

Sugar cookery stages, preparation of fondant, fudge, caramel, pulled toffee and brittles. Preparation of gulab jamun, coconut burfi, brittle.

UNIT II : STARCH COOKERY

Sources, uses and chemical characteristics, factors affecting viscosity of starch pastes.
Batters, doughs - types, properties, flour and flour quality, extruded foods, breakfast cereals, wheat, bulgar, puffed and flaked cereals, fermented foods – (cereal based products).

Related Experience

Starch – Microscopic examination, gelatinisation of starch, preparation of idli, dosai, appam, chappathi, paratha, poori.

LEGUMES

Pulses – Grams, dhal, nuts, processing, composition, methods of cooking. Effect of processing such as cooking, decortication germination and fermentation.

Related Experience

Pulse – effect of soaking (time and types of water), germination.

UNIT III : FATS AND OILS

Sources, composition of fats and oils. Chemical changes in fat during storage and cookery. Fat substitutes and fat deterioration. Antioxidants, hydrolysis, interesterification of fats.

Related Experience

Smoking temperature, factors affecting absorption of fat.
Deep fat fried foods, preparation of pastries.

MILK AND MILK PRODUCTS

Milk and milk products, composition and nutritive value, physical and chemical properties.
Milk protein, coagulation, factors affecting coagulation, problems in milk cookery.
Cream types, uses of butter, cheese types and making cheese.
Cultured milk, yoghurt, whey, concentrated dried products, whey substitutes.

Related Experience

Principles involved in the preparation of tomato soup. Cooking vegetables in milk, cheese, setting of curds.

UNIT IV: FLESHY FOODS

Meat structure and composition, cuts of meat, postmortem changes, methods of cooking, tenderizers, factors affecting tenderness.

Fish - Classification and kinds, nutritive value, selection and methods of cooking.
Poultry - nutritive value, selection and methods of cooking.

Related Experience

Meat, fish, poultry changes in cookery on tenderness, different methods of cooking.

EGG COOKERY

Structure and composition, selection and testing for freshness of eggs.
Coagulation of egg protein, factors affecting.
Egg processing, egg cooked in shell, poached egg, custard, omelettes, angel cake, sponge cake, low cholesterol egg, double yolk eggs.

Related Experience

Coagulation of egg white and egg yolk, boiled egg, poached egg, custard cake, emulsion, mayonnaise. Egg quality testing.

UNIT V: PLANT PIGMENTS

Fruits and vegetables, structure, texture, pigments in vegetables and fruits, effect of acid, alkali etc, on pigment. Cellulose and pectic substances, browning reaction in fruits and vegetables and preventive methods. Different methods of cooking and the effect on structure and pigment of volatile substances.

Related Experience

Effect of acid and alkali. Effect of heat on pigments in fruits and vegetables.

ACCEPTABILITY TESTING

Evaluation of foods by subjective and objective methods, factors affecting the acceptability of foods. Selection of taste panel.

Difference, preference and descriptive tests, microscopic examinations.
Physical and chemical methods, physical characteristics - colour, appearance, texture, density, tenderness. Viscosity and surface tension, moisture content, loss of weight.

Related Experience

Evaluating the quality acceptability of foods, subjective and objective methods.

POST HARVEST TECHNOLOGY

Post harvest losses, reasons for losses, techniques to overcome losses.

Reference Books

1. Charley, H. and Weaner, C.M., 1998. Foods – A Scientific Approach, IIIrd edition, Prentice Hall, Colombus.
2. Paul, D.C. and Palmer, H.H. 1992. Food theory and applications. John Wiley and Sons,
   New York.
3. Pennema, L.R., 1996. Food chemistry, IIIrd Edition, Marcel, Dekker, Inc., New York.

Journals

1. Journal of food Science, The Institute of Food Technologists, Illinois, U.S.A.
2. Nutrition and Food Science and Technology, Association of Food Technologists.

CORE COURSE – VII (CC) - ADVANCED DIETETICS - Theory

Objectives:

To enable the students

1. understand the role of dietitian
2. gain knowledge about the principles of diet therapy and different therapeutic diets
3. develop aptitude for taking up dietetics as a profession

UNIT I : ROLE OF DIETETIAN IN THE HOSPITAL AND COMMUNITY

Education and personal qualifications, Professional ethics and obligations.

FEEDING THE PATIENTS

Psychology of feeding the patient, assessment of patients' needs.

ROUTINE HOSPITAL DIETS

Regular diet, solid diet, full liquid diet, clear diet and tube feeding, diets for surgical conditions and allergic conditions.

UNIT II: MODIFICATIONS OF DIETS, DIET COUNSELING AND DIET PLANNING FOR FOLLOWING CONDITIONS

Acute, chronic and recurrent fevers, typhoid, rheumatic fever. poliomyelitis, cholera, tuberculosis and malaria

GASTRO-INTESTINAL DISORDERS

Etiology and modifications of diet in peptic ulcer, gastritis, diarrhoea, constipation, malabsorption syndrome, ulcerative colitis, enteritis and carcinoma.

LIVER, GALL BLADDER AND PANCREATIC DISORDERS

Etiological factors, dietary regimen in jaundice, cirrhosis, hepatitis, hepatic coma, cholecystitis, cholelithiasis and pancreatitis.

UNIT III : METABOLIC DISORDERS

Predisposing factors and modification of diet in diabetes mellitus, obesity, underweight. Hypothyroidism, hyperthyroidism, gout.

UNIT IV : CARDIOVASCULAR DISORDERS

Risk factors and dietary regimen – Acute and chronic cardiac disease, vascular disease atherosclerosis, hypercholesterol, hyperlipo-proteinemia, essential hypertension.

UNIT V : RENAL DISORDERS

Contributory factors and dietary modifiction, acute and chronic glomerulonephritis, nephrosis, nephrosclerosis, uremia, nephrolithiasis.

References:

Books

1. Antia, F.E., Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 1973, 1989.
2. Copper, et al., 1963. Nutrition in Health and Disease 4th edition, Bippincolt Compl.
3. Davidson passmore, P. and Brock J.P. 1975, 1986. Human Nutrition and Dietetics. The English Language Book Society, Livingstone.
4. Gopalan, C., Ramasastri, B.V. and Balasubramaniam, S.C. 1994. Nutritive value of Indian Foods. National Institute of Nutrition, Hyderabad.
5. Howa, R. 1971. Basic Nutrition in Health and Disease, W.B. Saunders Co., Philadelphia.
6. Krause, M.V. Horsch, M.A. 1972. Food Nutrition and Diet Therapy, W.B. Saunders Company, Philadelphia.
7. Mehan, L.K. and Arlin, M.T. 1992. Krause's Food Nutrition and Diet Therapy, W.B. Saunders Company, Philadelphia.
8. Robbinson, H. 1972, 1987. Normal and Therapeutic Nutrition, Oxford and IBH Publishing, Calcutta, Bombay.
9. Shils, E.M., Olson, A.J. and Shike M.C. 1994. Modern Nutrition and Health and Diseases Vol.II, Lea and Febriger, Philadelphia.
10. Sue Rod Williams, 1989. Nutrition and Diet therapy, Times Mirror mosby college, St. Louis, Toronto, Bosion.
11. Swaminathan, M. 1974. Essentials of Food and Nutrition, Vol. I & II, Ganesh and Company, Madras.
12. William, S. R. 1989. Nutrition and Diet Therapy, C.V. Mosby Company. Saint Lowin.

Journals

1. American Journal of Clinical Nutrition.
2. Applied Nutrition, Journal of Indian Dietetics Association, Pratabchakraborthy Pub. Secretary of Indian Dietetic Association 27/1 Manoharpuku, Calcutta – 700 029.
3. Clinical Nutrition, Sales Promotion, Department , Churchill Livingstone Medical Journals
   Robers Stevenson House, 1-3, Baxter's place, Edinburgh EHI, EAF. Uk.

4. Diabetes care. Pub. By American Diabetic & American Dietetics Association, Professional section membership, 1960 Duke Street, Alexandra, V.A. 22314.
5. Food and Nutrition Bulletin, The Editor, The United Nations University, Cambridge, Programme Officer, Massachusatts Inst. of Technology, E-38-756, Cambridge Mass, 02139, USA.
6. Indian Journal of Medical Research.
7. Indian Journal of Nutrition and Dietetics.
8. International Journal of Sport Nutrition, Human kinetics Publishers, Inc., Box 5076, Champaign IL, 61825-5076.
9. International Journal of Vitamin and Nutrition Research. Hogrefe and Huber Publishers, Toronto, Ontario M4P2S3. Canada.
10. Journal of American Dietetics Association.
11. Journal of Royal Society of Medicine, The Royal Society of Medicine, Wimpole Street, London.
12. Nigerian Journal of Nutritional Sciences, Dr.O.B. Oloyeda, Dept. of Biochemistry University of Illorin, P.M.B.1515, Illorin, Nigeria.
13. Nutrition Bulleting. The British Nutrition Foundation. 5, Belgrave square, London Swix.
14. Nutrition Reviews.
15. The British Journal of Nutrition, Cambridge University, Press Journals Dept. 46, West 20th Street, New York, 10011-4211.
16. The Journal of Nutrition, Subscription Dept. Rockville pick, Bethesda MD 20814-3990.
17. The New England Journal of Medicine, Massachysetts Medical Society, England by passmore International Redlec. Herts.

CORE COURSE – VIII (CC)

ADVANCED DIETETICS PRACTICALS AND INTERNSHIP

Objectives: To enable the students

1. develop skills in planning and therapeutic diets
2. develop skills in diet counseling and feeding of patients
3. develop capacity for taking up dietetics as a profession

PRACTICAL AND RELATED EXPERIENCES

1. Practical experience in weighing and measuring food items.
2. Preparation of clear and full liquid diets and soft diet
3. Planning and preparing diets for:
    a. Febrile conditions
    b. Surgical conditions
    c. Gastro-intestinal disorders
    d. Liver and gall bladder disorders
    e. Metabolic disorders
    f. Cardiovascular disorders

g. Renal disorders
h. Obesity and underweight
i. Nutritional deficiency

4. Planning and preparing paediatric diets

a. Lactose free diet b. Juvenile diabetes c. diet for inborn errors of metabolism

5. Visit to three hospitals

The practical work consists of internship in a teaching hospital for four weeks.

1. Visits to different wards to observe patients requiring special diets.
2. Experience in calculating and planning modified diets.
3. Supervising and handling the food preparation and service in the dietary department of the hospital.
4. Case study
   Selecting and observing patients requiring therapeutic diet in relation to Patient's dietary history – income, occupation, food habits and social factors.
   Calculating the diet according to medical prescription.
   Accompanying the doctor while visiting the patient.
   Counselling and patient education.

CORE COURSE – IX (CC)

FOOD BIO TECHNOLOGY

Objectives: To enable the Students

1. understand the application of biotechnology in the field of Nutrition and Dietetics
2. create interest in related activities

UNIT I : GENETIC ENGINEERING

Definition, Introduction, historical background, scope and importance . Tools of genetic engineering, enzymes – exonucleases, endonucleases, restriction endonucleases, tigases, reverse transcriptases cloning vectors – Plasmids, bacteriophage, cosmids, phasmids.

FERMENTATION SYSTEMS AND ENZYME TECHNOLOGY

Fermentation Systems – Batch and continuous process, fermenter design, bioprocess control. Soluble enzymes, immobilized enzymes, analyses, invertase, glucose isomerase – Synthesis, process and applications in food industries.

UNIT II : TISSUE CULTURE

Plant and animal tissue culture – principles and procedure, culture media, applications. New breeding lines and plant varieties, transgenic plants, terminator seed technology, artificial seeds.

SINGLE CELL PROTEIN AND MYCOPROTEIN

Production of microbial protein, SCP, substrates, nutritional value, harvesting – spirulina, mushroom culture and yeast biomass production.

Related Experience

Visit to a plant tissue culture laboratory.

UNIT III : REGULATORY ASPECTS OF BIOTECHNOLOGICAL METHODS

Downstream processing, biosensors, biochips, limiting factors and regulation.
Impact of biotechnology on the nutritional quality of foods.

UNIT IV : XENOBIOTICS

Definition, components, drug adverse reactions, nutrient drug interaction, industrial chemicals. Bio-dynamics of xenobiotics, overall metabolic fate of xenobiotics in the body.

NATURALLY OCCURRING FOOD TOXICANTS AND THEIR ELIMINATIONS

Sources, toxicity, elimination – protease inhibitors, goitrogens, haemagglutinins, glucosinolates, cyanogens, saponins, gossypols, lathyrogens, favism and carcinogens.

UNIT V : ROLE OF BIOTECHNOLOGY IN FOOD INDUSTRIES

a) Food additives, synthesis, acidulants – citric acid, gluconic acid, lactic acid. Sweeteners – glucose syrup and High Fructose Corn Syrup (HFCS), thickeners and gelling agents, xanthangums.

b) Vitamins – Vitamin A, ergosterol, riboflavin, Vitamin-B12, fatty acid, amino acids – lysine, methionine, glutamate.

c) Food fermentations – Alcoholic beverages, cheese making, fermented soya based foods, meat fermentation, vinegar, safety aspects of foods produced by biotechnology and genetic engineering.

References Books

1. Dubey , R.C., 1996. A textbook of Bio-technology, S.Chand and Company Ltd., New Delhi.
2. Knappa, H.R.L., 1990. Nutrient Drug Interactions in present knowledge in Nutrition 6th Edition.

3. Murray, R.K. Metabolism of xenobiotic in Harphers Biochemistry, 22nd Ed, V.W. Prentice
Hall Inc.
4. Owen, P. Ward., Fermentation Bio-technology, Principles, Processes and Products, Prentice
Hall, New Jersey.
5. Parar. F.S.K. Adverse drug reactions and treatment of poisoning and drug interactions, S.
Chand and Co, New Delhi.

SEMESTER III - CORE COURSE – X (CC) –

RESEARCH METHODS AND APPLIED STATISTICS

Objectives: To enable the Students

1. understand the fundamental principles and techniques of methodology concerning research
2. apply statistical procedure to analyse numerical data and draw inference

UNIT I : TYPES OF RESEARCH

Different types of research and their applications.

METHODS OF COLLECTING DATA

Conducting enquiries to collect primary data. Source for secondary data, preparation of schedules and questionnaires, Processing data, interview method of enquiry, training of interviewers. Editing and coding the data.

UNIT II : CLASSIFICATION AND ORGANISATION OF DATA

Classification by the categories and measurements, discrete and continuous variables. Tabulation scheme, preparation of tabular forms, methods of securing accuracy in tabulation.

REPRESENTATION OF THE DATA

Graphical and diagrammatic representations. Use of computers in data processing and presentation.

UNIT III : SAMPLE SURVEYS

Choice of the sample, random samples, systematic samples, Cluster samples / multistage sample and quota sample. Sources of bias and methods of reducing bias.

EXPERIMENTATION AND THESIS WRITING

Principles, Planning of experiments. Presentation of data, writing reports, footnotes and bibliographical citations.

UNIT IV : MEASURES OF CENTRAL TENDENCY

Mean, median, mode, their relative advantages and disadvantages, Measures of dispersion, mean deviation, coefficient of variation, percentiles and percentile ranks.

CORRELATION

Association of attributes, contingency table, correlation, coefficient of correlation and its interpretation, rank correlation, regression equations and predictions.

UNIT V : PROBABILITY

Rules of probability and its applications.

DISTRIBUTION

Normal, binomial, their properties. Importance of these distributions in statistical studies. Large and small samples, X and F tests, tests for independence using contingency, Analysis of Variance and applications.

References:
Books

1. Devadas, R.P. 1971. Handbook of Methodology of Research, Sri Ramakrishna Mission Vidhyalaya, Coimbatore.
2. George, E. Forguson 1971, Statistical analysis in Psychology and Education, McGraw Hill Book Co.,
3. Gupta, S.P. 1977. Statistical Methods, Sultan Chand and Co., New Delhi.
4. Monsen, E.R. (Ed). 1992. Research successful statistics, American Dietetics Association T X 367, R-4.
5. Ramasamy, M.P., 1970. Theory and application of statistics, Kalaikadir Publications.
6. Seetharaman, V.A. 1973. Textbook of Statistics, Revised edition.
7. Shukla, M.C. and Gulshan, S.R. 1970. Statistics, Sultan Chand and Co., Ramnagar, New Delhi.

CORE COURSE –XI -TECHNIQUES FOR FOOD ANALYSIS - PRACTICAL

Objectives: To enable the students

get practical experience in the laboratory and develop the skills to undertake research work

Experiments in Nutrition : (Individual Experiments)

1. Analysis of food for
   a) Energy
   b) Fibre – crude and dietary
   c) Moisture
   d) Nitrogen by Kjeldhal Method
   e) Ash
   f) Calcium
   g) Phosphorus
   h) Iron
   i) Carotene
   j) Vitamin – A
   k) Thiamine
   l) Riboflavin
   m) Vitamin – C
   n) Fat

2. Glycogen – Extraction and estimation
3. Fats, saponification value
4. Iodine number
5. Acid number and RM value
6. Extraction of lipids from egg yolk.

References:
Books

1. Jayaram, I., 1996. Laboratory Manual in Biochemistry, New Age International Ltd., Publishers,
Fifth reprint, New Delhi.
2. Raghuramulu, N., Nair, K.M., Kalayanasundaram, S.A., 1983. Manual of Laboratory Techniques, National Institute of Nutrition, ICMR.
3. Sadasivam, S. and Manickam, A., 1996. Biochemical Methods, New Age International Pvt. Ltd.,
Publishers, II edition, New Delhi.
4. Varley, H., Gowenlak, A.H. and Hell, M., 1980. Practical Clinial Biochemistry, William
Itinmaon Medical Books, London.

CORE COURSE – XII (CC) – MACRONUTRIENTS

Objectives: To enable the students

1. obtain indepth knowledge on major nutrients
2. develop competentey for undertaking nutritional investigations

UNIT I: DEVELOPMENT OF NUTRITION AS A SCIENCE IN INDIA AND ABROAD

Historical review. Role of nutrition scientists.
Carbohydrates – Nutritional importance of carbohydrates, classification, function, digestion and absorption. Dietary fibre – components, sources, role of dietary fibre in human nutrition. Abnormalities in the regulation of glucose homeostasis, inherited disorders of carbohydrate metabolism.

UNIT II: FATS AND LIPIDS

Review of digestion and absorption of fats, transport of lipids in blood. Lipid transformation in the liver. Role of essential fatty acids, deposition of fat in the body. Effect of deficiency and excess of fats.

Role of fat in the etiology of atherosclerosis.

UNIT III: ENERGY

Historical background, energy content of foods, energy measurements – direct and indirect calorimetry energy utilization in cells. Energy balance and control of body weight.

UNIT IV: PROTEINS AND AMINO ACIDS

Historical review, functions and sources of proteins. Protein turnover, synthesis and storage, protein as source of energy, review of digestion, absorption and utilization of proteins. Protein requirements – ICMR, FAO and WHO. Computation of protein requirements through factorial method and balance study.

Amino acids requirements, essential amino acids, amino acid balance, imbalances and toxicity. Evaluation of protein quality. Role of novel proteins and vegetable protein mixtures in combating malnutrition.

UNIT V:

Water – Distribution and functions of water, water balance – maintenance and determination. Physiological variations in the intake and output of water.

Hormones, water retention and depletion requirements.

References:
Books
1. All monographs and Technical Reports of FAO and WHO.
2. Balaji, S., 1985. Insulin and metabolism, Elsevior North Holland Inc. 53, Vanderbi Ave: New York.
3. Berdanier, C.D., 1995. Advanced Nutrition, Macronutrients, CRC Press, USA.

4. Schrunch. B, and Scrimshaw, N.S., 1990. Activity, energy expenditure and energy requirements of infants and children, B Report of the IDECG workshop published by IDECG.
5. Scrimshaw, N.S. and Schurnch, B., 1992. Protein Energy Interactions Proceedings of and IDECG workshop.
6. Stryuer, L.. 1984. Biochemistry, II edition, Nutrition Foundation, Inc.
7. World Review of Nutrition and Dietetics – All volumes.

Journals:

1. American Journal of Clinical Nutrition, The American Society for Clinical Nutrition, Inc. USA.
2. Annual Reports, National Institute of Nutrition, Hyderabad.
3. Indian Journal of Medical Research, Indian Council of Medical Research, New Delhi.
4. Nutrition, Newsletter, Food and Agricultural Organization of United Nations.
5. Proceedings of the Nutrition Society of India, Nutrition Society of India, Hyderabad.
6. The Indian Journal of Nutrition and Dietetics, Sri Avinashilingam Education Trust Institutions for Women.

CORE COURSE – XIII (CC) - MICRONUTRIENTS

Objectives: To enable the students

1. obtain indepth knowledge on the study of major nutrients
2. develop competence for undertaking investigations

UNIT I: CALCIUM AND PHOSPHORUS

Distribution in the body, calcium phosphorus ratio, absorption and utilization, phosphates in blood, Therapeutic uses and toxicity of phosphates. Calcium absorption and utilization, calcium balance, requirement and sources. Hypocalcemia and hypercalcemia.

MAGNESIUM, SULPHUR, SODIUM AND POTASSIUM

Distribution, absorption and utilization, sources, requirement, deficiency and toxicity. Sodium potassium balance.

UNIT II: IRON, IODINE AND FLUORINE

Distribution, absorption, transport and utilization, functions, sources, requirements and deficiency. Assessment of nutritional status and toxicity. Methods of assessing iron availability, effect of excess iron retention and deficiency.

ZINC AND OTHER TRACE ELEMENTS

Metabolism, functions, sources, deficiency, toxicity, requirements.

UNIT III : VITAMINS

Number and naming of vitamins, units and measurements of vitamins. Factors influencing the utlilization of vitamins.

Fat soluble vitamins – A, D, E and K – History, structure, chemistry, physiological actions, absorption, transport, utilization, storage, excretion and methods of assay, biopotency. Dietary sources and losses in preparation and handling. Conversion of carotenes into vitamin-A in human beings. Recommended intakes. Human deficiency and diagnosis.

UNIT IV: WATER SOLUBLE VITAMINS

Vitamins, Thiamine, riboflavin, niacin, vitamin B_{12}, folic acid and pyridoxine – History, structure, chemistry, physiological action, biochemical utilization and storage, transport, biosynthesis, sources, losses in preparation and handling. Recommended intakes. Human deficiency.

Vitamins – Pantothemic acid, Biotin, pseudo vitamins and ascorbic acid – History, structure, chemistry, physiological action, utilization and storage, transport, sources, losses in preparation and handling. RDA deficiency, diagnosis.

UNIT V : INTERRELATIONSHIP OF NUTRIENTS

Interrelationship between nutrients and hormones in general, interrelationship between calcium, phosphorus, vitamin D and Parathyroid, interrelationship between the vitamins, between the minerals and between vitamins and minerals.

References:
Books

1. All monographs and Technical Reports of FAO and WHO.
2. Berdonier, C.D. 1998. Advanced Nutrition – Macronutrients, CRC Press, Washington.
3. Bodwell, C.E. and Erdman, J.W. 1988. Nutrient Interaction, Marcel Dekker Inc. New York.
4. Brown, M.L., 1990. Present knowledge in Nutrition, 6th Edition. Inter-national Life Sciences Institute, Nutrition Foundations, Washington.
5. Helen, A. Guthrie, 1989. Introductory Nutrition, 7th ed. Times Mirror / Mosby College Publishing Co. Toronto.
6. Mahtab S.Bamji, Palhad Rao. R, and Vinodhini Reddy, 1996. Textbook of Human Nutrition, Oxford and IBH Publishing Co., Pvt., New Delhi.
7. Proceedings of the Nutrition Society of India.
8. Reports of the International Vitamin A Consultative Group.
9. Scientific Reports of the Nutrition Foundations of India, New Delhi.
10. Smith, K.L. and Dekker, M., 1990. Trace mineral in Foods, Inc. New York and Bases.

11. Underwood, E.J. Trace elements in Human and Animal Nutrition, Academic Press, New York.
12. World Review of Nutrition and Dietetics – all volumes.

Journals

1. American Journal of Clinical Nutrition, the American Society for Clinical Nutrition, Inc., USA.
2. Annual Reports, National Institute of Nutrition, Hyderabad.
3. British Journal of Nutrition, Cambridge University Press, London.
4. Indian Journal of Medical Research, Indian Council of Medical Research, New Delhi.
5. Nutrition, Newsletter, Food and Agricultural Organization of United Nations.
6. Proceedings of the Nutrition Society of India, Nutrition Society of India, Hyderabad.
7. The Journal of Nutrition, American Institute of Nutrition, Betherdam, Maryland.
8. The Indian Journal of Nutrition and Dietetics, Sri Avinashilingam Education Trust Institutions for Women, Coimbatore.
9. Nutrition Reviews, The Nutrition Foundations Inc., New York.
10. Nutrition Health Bureau, The Nutrition Foundation Inc., New York.
11. New England Journal of Medicine, Massachusetts Medical Society, USA.
12. Lancet, Bed for square, London, England.
13. Journal of Biochemistry, American Society of Biological Chemistry, USA.

ELECTIVE – I (EC) - ADVANCES IN FOOD MICROBIOLOGY

Objectives:

To enable the students

1. gain deeper knowledge on micro-organisms in humans and environment
2. understand the importance of micro-organisms in food spoilage and learn advanced techniques used in food preservation
3. understand the latest procedures adopted in various food operations to prevent food – borne disorders and legal aspects involved in these areas

UNIT I : INTRODUCTION AND MICRO ORGANISMS OF IMPORTANCE IN FOOD

Introduction to historical developments in food preservation, spoilage, infections and legislation. Their primary sources in foods, morphology, cultural characteristics and biochemical activities.

UNIT II : FACTORS AFFECTING THE GROWTH OF MICRO-ORGANISMS IN FOOD

Intrinsic and extrinsic parameters that affect microbial growth.

Related Experience

Study of environment around us as sources of transmission of micro-organisms in foods.

METHODS OF ISOLATION AND DETECTION OF MICRO-ORGANISMS OR THEIR PRODUCTS IN FOOD

Methods:

Conventional Methods:

Rapid Methods (Newer techniques)

Immunological Methods: Fluorescent, antibody, radioimmunoassay, ELISA etc.

Chemical Methods: Thermos table nuclear, ATP measurement and PCR (Polymers chain reactions) only principles in brief.

Related Experience

Assessment of surface sanitation of food preparation units 'swab and rinse' techniques.
Isolation of micro-organisms, different methods and maintenance of cultures of micro-organisms.

UNIT III : SPOILAGE OF DIFFERENT GROUPS OF FOODS AND FOOD PRESERVATION

Spoilage : Cereal and cereal products, vegetables and fruits, meat and meat products, eggs and poultry, fish and other sea foods, milk and milk products and canned food.

Preservation: Physical methods – Drying, freeze drying, cold storage, heat treatments, irradiation and high pressure processing.

Related Experience

Bacteriological analysis of foods both processed and non processed like vegetables, fruits, cereals, spices and canned foods using conventional methods, yeast and mold count in foods.

UNIT IV : FOOD BORNE DISEASES, INDICATORS OF FOOD SAFETY AND QUALITY

Bacterial and viral food-borne diseases. Important food-borne animal parasites and mycotoxins.

Microbiological criteria of foods and their significance.
HACCP system and food safety used in controlling microbiological hazards.

Related Experience

Biochemical tests used in identification of commonly found bacteria in foods. IMVIC ureases, H_2S, catalase coagulation and fermentation.

UNIT V : ROLE OF MICROBES IN FERMENTED FOODS

Role of microbes in fermented foods and genetically modified foods.

Related Experience

Visit to food processing unit dealing with advanced methods in food microbiology.

References:
Books

1. Atlas, M. Ronald , 1995. Principles of Microbiology, 1st Edition, Mosby-year book, Inc., Misouri, U.S.A.
2. Banwact, G., 1989. Basic Food Microbiology, 2nd Edition, CBS Publishers.
3. Block, J.G., 1999. Microbiology, Principles and Explorations, 4th Edition, John Niley and Sone Inc.
4. Frazier W.I.C. 1988. Food Microbiology, McGraw Hill, Inc., 4th Edition.
5. Garbutt, J., 1997. Essentials of Food Microbiology, 1st Edition, Arnold International students Edition.
6. Jay, James, M., 2000. Modern Food Microbiology, 6th Edition, Aspen Publishers Inc., Maryland.
7. Pelezar, M.I. and Reid, R.D., 1993. Microbiology, 5th edition. McGraw Hill Book Company, New York.
8. Roday, S., 1999. Food Hygiene and Sanitation, 1st Edition, Tata McGraw Hill, New Delhi.
9. Topley and Wilson's, 1983. Principles of Bacteriology, Virology and Immunity, Edited by S.G Wilson, A Miles and M.T. Parkar, Vol 1: General Microbiology and Immunity II : Systematic Bacteriology, 7th Edition, Edward Arnold Publisher.

Journal

1. Journal of Food Science Published by the Institute of Food Technologies, Chicago, U.S.A.
2. Journal of Food Science and Technology published by the Association of Food Scientists and Technologists, CFTRI, Mysore.

ELECTIVE – II (EC)

COMPUTER APPLICATION IN NUTRITION AND DIETETICS

Objectives: To enable the students

1. understand the concept of working knowledge of Computer
2. develop ability in working of projects

UNIT I : INTRODUCTION OF COMPUTERS IN BIOLOGICAL SCIENCES

History and development of computers. main frame, mini, macros and super computer systems, BITS, BYTES.
General awareness of computer hardware – CPU input and output devices, main and auxiliary stage devices.

UNIT II : OPERATING SYSTEMS

Introduction – Operating systems. Windows, applications, interaction to MS-Office – MS-Word – Excel, Access, Power Point.

MS-OFFICE PROGRAMMING

Visual basic, application to projects, data types and control structures.

UNIT III : COMPUTER NETWORKS

Computer network – LAN, WAN, Intranet, extranet, Internet and Internet service providers. Modern Fibre Optics.
Basics of HTML, WWW, URL, TCP / IP.

UNIT IV : MULTIMEDIA

Basic elements, hardware, application of multimedia.
Introduction to Multimedia authorizing tool.

UNIT V : PROGRAMMING

Message box and input functions. Graphics for application. Visual basic events. Creation of application projects, check boxes, option buttons, controls.

Related Experience

Basic knowledge and working mechanism of Computers.

References:

Books

1. O'leary, Timothy, J., 2000. Microsoft Word 2000, Tata Mcgrew Hill Publications, New Delhi.

2. Rajaraman, V., 1999. Fundamentals of Computers, Prentice – Hall of India, New Delhi.
3. Ramesh, B., 2000. Learning Power Point 2000, Khanna Book Publications, Delhi.
4. Ramesh, B., 2001. Learning Autocad, 2000, Khanna Book Publications, Delhi.
5. Ravichandran, D., 2001. Introduction to Computers and Communications, Tata McGraw Hill
6. Roger, H., 2000. Computers and Common sense, Public Hall of India, New Delhi.
7. Russel, Cheris, 2000. Internet and E-mail in easy steps, Dreamtech Press, New Delhi.
8. Stallings, William, 2000. Data and Computer Communications, Prentice Hall of India, New Delhi.

ELECTIVE – III (EC) - FOOD PACKAGING

Objectives: to enable the students

1. gain knowledge about various packaging materials and importance of packaging
2. be familiar with testing and evaluation of packing media
3. be familiar with packaging laws and regulations
4. be able to select appropriate packaging material for a variety of food stuffs vis-à-vis the need for preventing environment degradation

UNIT I : PACKAGING

Concepts, definition, significance, classification. Development, unit/Retail. Fresh and processed, general characteristics and food preservation.

UNIT II : PRIMARY PACKAGING MEDIA

Properties and applications.

a. Paper boards, metals, plastics, wood and plywood, glass, flexible, etc.
b. Labels, caps and closures, waxes, adhesives, inks and lacquers, cushioning materials.

UNIT III : FOOD PRODUCTS

General classification and packaging types.

PACKAGING SYSTEMS AND METHODS

Vacuum packaging, gas flush Packaging, CAP and MAP, aseptic and retort packing bag-in-boxete.

Related Experience

Visit to a Packing Industry.

UNIT IV : STORAGE, HANDLING AND DISTRIBUTION OF PACKAGES (FOODS)

Palletisation and containerization. Marketing - barcoding and marketing.

UNIT V : PACKAGING LAWS AND REGULATIONS

FDA, FPO, packaging commodity. Rules, Weight and Measures Act.

Reference Books

1. Bhatia, S.C., Canning and Preservations of Fruits and Vegetables – New Delhi, Inc.
2. Darry, R. Blackie. T. Principles of Applications of MAP – Academic Professions.
3. Hotchikess, Food and Packaging Interaction- American Chemical Society.
4. Multon, J.K. Food packaging Technology, (Vol.1 and 2) VCH – Publishers, Inc. New York.
5. Robertson, G.L., Food Packaging – Marcell, Dekker, Inc, New York.
6. Sacharow & Griffini, Food Packing, AVI Publications.

ELECTIVE IV (EC)

FOOD PRODUCT DEVELOPMENT AND MARKETING

Objectives: To enable the students

1. develop products which meet consumer needs nutritionally and commercially viable
2. recognize the potential for entrepreneurship through marketing

UNIT I : NEW FOOD PRODUCTS

Definition , classification, characterization. Factors affecting new product development – social concerns, health concerns, impact of technology and market influence.

Reasons for new product development (corporate, market, technological, governmental influences).

Related Experience

Market survey

UNIT II : INTRODUCTION TO PHASES IN FOOD PRODUCT DEVELOPMENT

Idea generation, screening, development, production, consumer trials and test market. Generation of new product. Ideas – Internal, external sources of ideas. Market analysis.

Related Experience

Consumer survey to identify new products.

UNIT III : SCREENING

Team approach and involvement of various departments. Objectives, criteria of screening.
Development Process. Market sector Perspective, technical development, newer food stabilizing systems – Thermal Processing, ohmic heating, stabilizing with high pressure, other non-thermal stabilizing systems, control of water. Controlled modified atmosphere packaging. Irradiation of low temperature stabilization.

Related Experience

Screeningthe products. Developing criteria for screening and scaling up.

UNIT IV : TEST MARKETING, SCREENING PROCEDURE FOR PRODUCT

Evaluating result and analysing.
Sensory evaluation. Shelf-life, testing product, integrity and conformance to Standards.

Related Experience

Market Research
Test marketing.

UNIT V : ENTREPRENEURSHIP OF NEW PRODUCTS IN FOOD SERVICE INDUSTRY

Plant location, investments, financing the project.
New products in market, food service industry of Food Ingredient Industry.

Related Experience

Project Report

References:
Books

1. Fuller, G.W., 1994. New Food Product Development from Concept to Market Place, RC Press, New York.
2. Graf, E. and Saguy, I.S., 1991. Food Product Development from concept to the Market place.
3. Man, C.M.D. and Jomes, A.A., 1994. Shelf Life Evaluation of Foods, Blackie Academic and Professional, London.
4. Shapton, D.A. and Shapton, N.F., 1991. Principles and Practices for the Safe Processing of Foods, Butterworth, Heinemann Ltd., Oxford.

Journals:

1. International Journal of Food Science and Technology
2. Food Technology
3. Journal of Food Technology
4. Trends in Food Science and Technology
5. Clinical Reviews in Food Science and Nutrition

ELECTIVE V (EC) - BAKERY AND CONFECTIONARY

Objectives: To enable the students

1. learn the baking process
2. apply the knowledge in practical baking

UNIT – I: INTRODUCTION OF BAKERY

(a) Definition, principle and classification of baked products.
(b) Major / minor equipments required to start a small bakery Unit.

UNIT – II: ROLE OF MAJOR AND MINOR INGREDIENTS IN BAKING

(a) Role of flour (gluten), fat and egg in baking
(b) Leavening agents – definition, types (physical, biological and chemical) and role in baking.
(c) Sugar-Sources. Types and role in baking.
(d) Role of minor ingredients – Milk, water, salt, fruit and nuts.

UNIT – III: PREPARATION OF BAKERY ITEMS

a) Bread: Types, methods, faults, bread diseases and improvers.
b) Cake : Ingredients, types, methods and faults.
c) Biscuits and cookies – Ingredients, types, methods.

UNIT – IV: ICING – CAKE DECORATIONS

Introduction, types of icing – basic and royal

UNIT – V : TYPES

a) Oven at different temperatures (medium, hot, very hot). Types of Oven.
b) Quality Control.

PRACTICAL

1. Visit to a well established bakery unit
2. Bread Making
3. Preparation of Cakes and Sponge
4. Short Crust Pastry and Jam tarts
5. Muffins, Puff, Pastry

Related Experience:

Model assignment on Profile on Bakery Entrepreneurship.

Reference:

Books

1. Bernard clayton, New complete Book of Breads, Fireside Rockfeller center, New York.
2. Carole elements, Beautiful Baking, Richard blady publishing.
3. Dubey S.C., Basic Baking Science and Craft.
4. Gaur M.K. & Manish Gaur, Baking made simple, Bakers Machinery & Consultancy Company, Bangalore.
5. Kritika A. Mathew, Perfect Baking at Home, Bangalore.
6. Sultan, Practical Baking.

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