

Master of Science - Dietetics & Applied Nutrition

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Programme Structure

Curriculum & Scheme of Examination

2015

AMITY UNIVERSITY, HARYANA

GURGAON

M.Sc.-Dietetics & Applied Nutrition (Total Credits-130)

Programme Structure

FIRST SEMESTER

Course Code	Course Title	Lectures (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per Week	Total Credits
DAN4101	Advanced Nutrition-I	4	-	-	4
DAN4102	Nutritional Biochemistry-I	5	-	-	5
DAN4103	Human Physiology	4	-	-	4
DAN4104	Food Science-I	5	-	-	5
DAN4105	Therapeutic Nutrition-I	4	-	-	4
DAN4106	Nutritional Biochemistry Lab-I	-	-	2	1
DAN4107	Food Science-I lab	-	-	2	1
DAN4108	Therapeutic Nutrition Lab-I	-	-	2	1
	Open Electives				5
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development& Interpersonal Skills	1	-	-	1
LAN4151	Foreign Business Language-I	3	-	-	3
LAN4152	French-I				
LAN4153	German-I				
LAN4154	Spanish-I				
LAN4155	Russian-I				
LAN4156	Chinese-I				
LAN4157	Portuguese-I				
LAN4158	Korean-I				
	TOTAL				30

SECOND SEMESTER

Course Code	Course Title	Lectures (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per Week	Total Credits
DAN4201	Advanced Nutrition-II	4	-	-	4
DAN4202	Nutritional Biochemistry-II	5	-	-	5
DAN4203	Research Methodology	4	-	-	4
DAN4204	Therapeutic Nutrition-II	5	-	-	5
DAN4205	Dietetic Technique and Patient Counseling	4	-	-	4
DAN4206	Nutritional Biochemistry Lab-II	-	-	2	1
DAN4207	Advanced Nutrition Lab-II	-	-	2	1

DAN4208	Therapeutic Nutrition Lab-II	-	-	4	2
Open Electives					5
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioural Communication and Relationship Management	1	-	-	1
LAN4251	Foreign Business Language-II	3	-	-	3
LAN4251	French-II				
LAN4252	German-II				
LAN4253	Spanish-II				
LAN4254	Russian II				
LAN4255	Chinese-II				
LAN4256	Portuguese-II				
LAN4257	Korean-II				
LAN4258	Japanese-II				
TOTAL					31

THIRD SEMESTER

Course Code	Course Title	Lectures (L)Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per Week	Total Credits
DAN4301	Community Nutrition-I	4	2	-	6
DAN4302	Institutional Food Administration	5	-	-	5
DAN4303	Food Science-II	5	-	-	5
DAN4304	Food Microbiology-I	5	-	-	5
DAN4305	Community Nutrition Lab	-	-	4	2
DAN4306	Food Science Lab-II	-	-	4	2
DAN4307	Food Microbiology Lab-II	-	-	4	2
DAN4335	Summer Internship Evaluation	-	-	-	9
Open Electives					4
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
LAN4351	Foreign Business Language-III	2	-	-	2
LAN4351	French-III				
LAN4352	German-III				
LAN4353	Spanish-III				
LAN4354	Russian-III				
LAN4355	Chinese-III				
LAN4356	Portuguese-III				
LAN4357	Korean-III				
LAN4358	Japanese-III				
TOTAL					40

FOURTH SEMESTER

Course Code	Course Title	Lectures (L)Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per Week	Total Credits
DAN4401	Community Nutrition-II	6	-	-	6

DAN4402	Food Processing & Technology	4	-	-	4
DAN4403	Nutrition for Health and Fitness	4	-	-	4
DAN4404	Community Nutrition II Lab	-	-	4	2
DAN4405	Food Processing and Technology Lab	-	-	4	2
DAN4437	Dissertation	-	-	-	9
	Open Electives				2
CSS4451	Cross Cultural Communication	1	-	-	1
BEH4451	Professional Excellence	1	-	-	1
	TOTAL				29

Syllabus – First Semester

ADVANCED NUTRITION-I

Course Code: DAN4101

Credit Units: 04

Course Objectives

Course Contents:

Module – I: Body Composition:

General body composition, determination of body water acid-base balance, extra cellular water, cell mass and body fat. Change in body composition

Module – II: Physiology of hunger and Water

Regulation of food intake Water intake and loss, exchange of water in body, effect of low and excess water and intake and effect of electrolytes on water balance

Module – III: Energy

Components of energy requirements . Factors affecting energy expenditure and requirements. Factors affecting the thermic effect of food. Energy content of food stuffs –unit and determination of gross and physiological energy value of food Energy expenditure – factors affecting – BMR and its maintenance Determination of energy metabolism of humans by direct and indirect method , Thermogenesis; Specific dynamic action (SDA)

Module – IV: Carbohydrates:

Types, Classification, digestion, absorption and transport- review, dietary fiber, fructo-oligosaccharides. Glycemic index of foods. Sweeteners- nutritive and non nutritive. Role of carbohydrate in health and disease

Module – V: Proteins:

Functions of protein. Evaluation of protein quality. Improvement of quality of protein in diet. Methods of estimating and assessing protein requirements at different stages of life cycle. Deriving Nutritional requirements and recommended dietary allowances for different age groups. Hormonal control of protein Metabolism.

Module – VI: Lipids and Dietary Fiber

Classification, digestion, absorption, transport - review. Functions of EFA. Role of n-3, n-6 fatty acids in health and disease. Requirements of total fat and fatty acids. Tran's fatty acids Prostaglandins Components of dietary fiber - Physiological effects of dietary fiber , Potential health benefits of dietary fiber. Recommended intake of dietary fiber

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

A – Attendance , CT- Class Test , S- Seminar , V- Viva , Q –Quiz , HA – Home Assignment , EE – End Term Exam

Text and References:**Texts:**

- 1 Modern Nutrition in; Health and Disease – Goodhearth, R. S.
- 2 Recommended dietary allowance for Indian – I.C.M.R., 1980
- 3 Nutrition and Development- Winick 1973, Univ. of Calombia.
- 4 Biology of Nutrition – Eclames 1972, Palaniuma Press
- 5 Foods & Nutrition – Krause 1972, Saunders.
- 6 Proteins and Human Foods 1970, Lowrie, Avi. Pub. Co.
- 7 Nut. & Physical ;fitness-BoGert L.J.
- 8 Principles of Nut. – Wilson, L.D. and Fisher. K.H.
- 9 Standardised diets for Hospital – National Nut. Advisory Committee
- 10 Nutrition in Health & Disease – Cooper, L. Barher, L. Mitehell, Hand Rynheraen.

References:

- 11 Nutrition A comprehensive: Beaton and McHanery, Treatise Vol-1, II, & III.
- 12 Human Nut. & Dietectics- Davidson S., Passmore, R., Brook, J.E. and Truswell.
- 13 Foods and Nut.- Rankin, W. Munn. Hildath E.N.
- 14 Iron deficiency – Holiberth, H.C. Harvorth, vannotti, N.Y.
- 15 Trace Elements in Human and Animal Nut. – Underwood, N.Y.
- 16 Essays in Biochemistry – Samul Graff, Tandon Book Dept. Sec. –16
- 17 Diabetes Mellitus- The Williams and Wilkinas Co., U.S.A.

NUTRITIONAL BIOCHEMISTRY-I

Course Code: DAN4102

Credit Units: 05

Module – I :

Principles of Bioenergetics- Concept of free energy, Oxidation and reduction, concept of cell, high energy compounds (ATP, PEP, and Phosphogens), role of ATP/ADP cycle in transfer of high energy phosphates, concept of coupled reactions.

Module – II :

Carbohydrates-

Definition, classification.

Monosaccharides Classification, occurrence, structure, stereoisomerism (DL and RS systems) and Properties, derivatives of Monosaccharides- deoxy sugars and amino sugars.

Disaccharides of nutritional importance (sucrose, maltose, lactose),

Polysaccharides Homopolysaccharides- starch, glycogen, cellulose,

Heteropolysaccharides - glycoprotein, Proteoglycans, mucopolysaccharides, pectins.

Module – III :

Lipids : Definition, classification. Structure and functions of fatty acids (including essential fatty acids) Trans fatty acids, prostaglandins acylglycerols, phospholipids, sphingolipids, glycolipids, steroids (including role of cholesterol). Characterization of fats- saponification, iodine, acid, acetyl and peroxide value.

Module – IV :

Amino acids and Proteins: Common structural features, classification based on the nature of R group, non-protein amino acids, essential amino acids and titration curves of monoamino-monocarboxylic, monoamino-dicarboxylic and diamino-monocarboxylic acids. peptide bond, biological role of proteins, classification of proteins, levels of protein structure- primary, secondary (super secondary elements in brief), tertiary and quaternary structure, forces stabilizing protein structure, denaturation of proteins.

Module – V :

Enzymology: General Characteristics, classification and nomenclature, coenzyme, cofactor, prosthetic group, concept of holoenzyme and apoenzyme, units of enzyme activity, Enzyme kinetics- Michaelis-Menten and Lineweaver-Burk equation for monosubstrate reactions (turnover number), bisubstrate reactions.

Module – VI :

Nucleic acids: Nitrogenous bases, experimental proof of DNA and RNA as genetic material, Chargaff's rules, double helical model of DNA (A, B and Z), DNA packaging, types of RNA and their functions.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

A – Attendance , CT- Class Test , S- Seminar , V- Viva , Q –Quiz , HA – Home Assignment , EE – End Term Exam

Texts and References:**Texts:**

- 1 Harper's Biochemistry- Robert K. Murray
- 2 Textbook of Biochemistry- West and Todd
- 3 Bio chemical aspect of Nutrition – S.X.C.- Okoyo
- 4 Food Chemistry – O.R. Fennema
- 5 Biochemistry – Voet and Voet
- 6 Principles of Biochemistry – A.L. Lehninger

References:

- 7 Outlines of Biochemistry- E. E. Conn
- 8 Practical Clinical Biochemistry- Harold Varley

HUMAN PHYSIOLOGY

Course Code: DAN4103

Credit Units: 04

Course Objectives:

Course Contents:

Module – I :

Digestive System : Different parts of digestive system, Secretory and digestive functions of the salivary glands, stomach, pancreas, liver and intestines, mechanism of absorption of carbohydrates, proteins and fats.

Module – II :

Cardiovascular system: Structure and function of the heart, ECG, cardiac cycle, cardiac output, heart sounds, regulation of heart rate, blood pressure, Factors affecting it and hypertension, composition and function of blood: RBCs, WBCs, hemoglobin, plasma proteins, erythropoiesis, coagulation of blood, Rh factor, blood groups.

Module – III:

Respiratory system: Structure of respiratory organs, uptake and delivery of respiratory gases and regulation of breathing, Laryngitis, pharyngitis, bronchitis, asthma in brief.

Module – IV :

Reproductive system :Structure and function of testis and ovaries, Menstrual cycle, puberty, menopause, breast and cervical cancer, menstrual disorders, infertility, ultra sound imaging in brief.

Module – V :

Excretory System: Structure and function of kidneys, mechanism of urine formation and the role of the kidneys in water and electrolyte balance, renal stone, albuminuria, haematourea, oedema, uremia, incontinence, in brief.

Module – VI :Sensory System

General senses (types, structure and functions).Special senses (olfaction, vision, gestation, equilibrium and hearing).

Module – VII : Endocrine System

Structure, functions and the different syndromes resulting from hypo or hyperactivity of the following glands: Thyroid, parathyroid, adrenal cortex, adrenal medulla, endocrine pancreas, pituitary.

Module – VIII :Nervous system

Main divisions, structure and function of various parts of brain: brain stem, cerebral cortex, cerebellum and diencephalon, structure and function of spinal cord, cerebrospinal fluid, cranial and spinal nerves, introduction to autonomic nervous system, neuralgia, sciatica, coma, poliomyelitis, EEC, CT in brief.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

Text and Reference:***Texts:***

- 1 Stand, F.L. Modern Physiology the Macmillan Company Latest Ed.
- 2 Guyton, A.C. Text Book of Medical Physiology W.S. Saunders
- 3 Davidson, B. and Smith E., Text book of Physiology and Biochemistry, 1972 (8th Ed.).
- 4 Human Physiology – A.J. Vander
5. Principles of Anatomy and Physiology – Anagnastakes.

References:

1. Text Book of Physiology – Patton
2. Bloom W. & Favcott. D.W.A. – Text Book of Histology, W.B. Saunders and Company
3. Martini: Fundamentals of Anatomy and Physiology (6th & 7th Ed.)

FOOD SCIENCE – I

Course Code: DAN4104

Credit Units: 05

Course Contents:

Module – I

Physical & Physiological changes in food.

- a) Colloidal Chemistry as related to food emulsions, foams, sols & gels, osmotic pressure.
- b) Enzymatic browning immobilized enzymes & enzymes in food Processing..
- c) Denaturation of Protein.

Module – II :Cereal and cereal Products:

(A) Cereal grains, structure & composition , Cereal products, Breakfast Cereals. Leavening agents and products.

Module – III :Sugar and Sugar Products

Manufacturing Process of Sugar Stages of sugar Cookery. Starch Structure , gelatinization, Modified Food Starches.

Module – IV :Fruits & Vegetables:

Pigments and colour in Food.

Module – V :Milk & Milk Products:

Composition and properties of milk. Dairy Products: Cultured milk , Yoghurt, butter, Whey, cheese etc.

Module – VI :

Meat , Poultry & Egg: Postmortem changes in meat, tenderizing meat, heat induced changes in meat, meat substitutes.

Egg: Structure & composition , changes during storage, functional properties of egg, egg substitutes.

Module – VII :Food Additives

- a) Meaning, need of food additives.
- b) Antioxidants, chelating agents, coloring agents, curing agents.
- c) Nutrient supplements, Non nutritive sweeteners, pH control agents.
- d) Preservatives, stabilizers and thickeners, Other Additives.
- e) Additives & Food Safety.

Module – VIII :Food Adulteration and Sensory evaluation

Definition, meaning and various tests used in Sensory evaluation & food product development.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

A – Attendance , CT- Class Test , S- Seminar , V- Viva , Q –Quiz , HA – Home Assignment , EE – End Term Exam

THERAPEUTIC NUTRITION-I

Course Code: DAN4105

Credit Units: 04

Course Contents:

Module – I :

Therapeutic modification of the normal diet Principles of Diet therapy; Routine Hospital diet; Diet modifications for therapeutic care, enteral and parenteral nutrition

Module – II :

Etiology, clinical aberrations, prevention and nutritional management of Infection
Fever (Acute and chronic)
Allergy
Stress
Burns

Module – III :

Nutrition in surgical conditions -pre and post operative
Nutrition in bone and joint diseases – Arthritis, osteoarthritis, gout, rheumatoid arthritis

Module – IV :

Etiology, manifestations and dietary management of
a Gastro intestinal tract disorders- Peptic ulcer, diarrhea, constipation,
b mal absorption syndrome – carbohydrates, fat and lactose intolerance, sprue and celiac disease,

Module – V :

Inborn errors of metabolism, Introduction, clinical features, dietary management of phenylketonuria, Galactosemia, Alkaptonuria

Module – VI :

Etiology, manifestation and dietary management in disorders of Liver, and pancreas. - Infective hepatitis, cirrhosis, hepatic failure, s, pancreatitis – acute and chronic

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

A – Attendance , CT- Class Test , S- Seminar , V- Viva , Q –Quiz , HA – Home Assignment , EE – End Term Exam

Texts and References:

Texts:

1. Diet Therapy- Williams
- 2 Human Nutrition Mc Durt, Maxine
- 3 Applied Nutrition – Rajalakshmi, R.
- 4 Hand book of diet therapy: Dorothea, Turner.
- 5 Human Nutrition and dietetics- Davidson, S. Passmore, R. Brock- J.F. and Turswell A.S.
- 6 Clinical Dietetics and Nutrition - Antia, F.P.

References:

- 7 Modern Nutrition in health and disease by Goodhe
- 8 Nutrition and Physical fitness: Bogert, L.J.

NUTRITIONAL BIOCHEMISTRY LAB

Course Code: DAN4106

Credit Units: 01

1. Preparation of standard solutions.
2. Preparation of buffers using buffer tables and verify pH
3. Extraction and quantitative estimation of total sugars and reducing sugar from food stuffs.
4. Isolation and estimation of casein from milk.
5. Quantitative estimation of proteins by kjeldahl's, Biuret and lowary's method (any two methods).
6. Effect of pH, concentration, time and temperature of incubation on enzyme activity.
7. Estimation of activity of alkaline phosphatase in Moong been seeds.

Examination Scheme:

IA				EE		
A	PR	LR	V	PR	WT	V
5	10	10	5	25	25	20

FOOD SCIENCE – I LAB

Course Code: DAN4107

Credit Units: 01

Assessment of purity and quality of different food

- 1 Detection of metanil yellow in a given food sample .
- 2 Check the presence of rhodamine B in the given food sample.
- 3 Test the presence of sugar in honey.
- 4 Detection of NaHCO₃ in flour.
- 5 Check for the presence of vanaspati and rancidity in the ghee.
- 6 Check the milk for presence of protein, urea, sugar and starch.
7. Check the presence of mineral oil in the edible oil sample.

Sensory Evaluation of Foods

- 1 Design of sensory experiment – selection of panel, types of panel, training of panel, development of score card , data analysis and interpretation of results.
- 2 Determination of test threshold for the different sensations sweet, salty, sour.
3. Conduct test to know the acceptability of a new product using rating test.

Examination Scheme:

IA				EE		
A	PR	LR	V	PR	WT	V
5	10	10	5	25	25	20

Text and Reference:

Texts:

1. Sharma, S. Practical biochemistry, classic publishing house, Jaipur, 1993.
2. Mody, N.I. Experimental food chemistry, Avi publishing company, INC, Westport, Connecticut.
3. A manual of laboratory techniques, National Institute of Nutrition. 1983.
4. Sathe, A.V. (1999) A first course in food analysis, New age International (p) limited Publishers, New Delhi.

Reference:

5. Sethi M. and Rao, E.S. (2001) Food Science Experiments and Applications, CBS Publishers & Distributors, New Delhi.

THERAPEUTICS NUTRITION – I LAB

Course Code: DAN4108

Credit Units: 01

Planning, Calculation, Preparation, serving and evaluation of therapeutic diets for diseases covered in theory

Examination Scheme:

IA				EE		
A	PR	LR	V	PR	WT	V
5	10	10	5	25	25	20

Syllabus – Second Semester

ADVANCED NUTRITION–II

Course Code: DAN4201

Credit Units: 04

Course Contents:

Module – I

Proteins: Classification, digestion, absorption and transport - review. Protein quality, methods of evaluating protein quality. Protein and amino acid requirements. Therapeutic applications of specific amino acids: Branched chain, glutamine arginine, homocysteine, cysteine, taurine.

Module – II :

Vitamins : Historical background, food sources, absorption and transport, biochemical function. Interactions with other nutrients. Physiological, pharmacological and therapeutic effects, toxicity and deficiency with respect to the following

a) Fat soluble: Vitamins A, D, E & K.

b) Water soluble: Thiamine, riboflavin, niacin, biotin, pyridoxine, folic acid, pantothenic acid, ascorbic acid, cyanocobalamin, choline, inositol.

Module – III :

Minerals

(Note: For each nutrient sources, bioavailability, function requirements, RDI/ESADDI, deficiency and toxicity, interactions with other nutrients are to be discussed)

Macro minerals: calcium, phosphorus, magnesium sodium, potassium and chloride.

Micro minerals: Iron, copper, zinc, manganese, iodine, fluoride.

Trace minerals: Selenium, cobalt, chromium, vanadium, silicon, boron, nickel.

Module – IV :Nutrient

Nutrient interaction, drug-nutrient interaction.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

A – Attendance , CT- Class Test , S- Seminar , V- Viva , Q –Quiz , HA – Home Assignment , EE – End Term Exam

Texts and References:

Texts:

- 1 Modern Nutrition in Health and Disease – Goodhearth, R. S.
- 2 Recommended dietary allowance for Indian – I.C.M.R., 1980
- 3 Nutrition and Development- Winick 1973, Univ. of Calombia.
- 4 Biology of Nutrition – Eclames 1972, Palaniuma Press
- 5 Foods & Nutrition – Krause 1972, Saunders.
- 6 Proteins and Human Foods 1970, Lowrie, Avi. Pub. Co.
- 7 Nut. & Physical fitness-BoGert L.J.
- 8 Principles of Nut. – Wilson, L.D. and Fisher. K.H.

- 9 Standardised diets for Hospital – National Nut. Advisory Committee
10 Nutrition in Health & Disease – Cooper, L. Barher, L. Mitehell, Hand Rynheraen.

References:

1. Nutrition A comprehensive: Beaton and McHanery, Treatise Vol-1, II, & III.
2. Human Nut. & Dietetics- Davidson S., Passmore, R., Brook, J.E. and Truswell.
3. Foods and Nut.- Rankin, W. Munn. Hildath E.N.
4. Iron deficiency – Holiberth, H.C. Harvorth, vannotti, N.Y.
5. Trace Elements in Human and Animal Nut. – Underwood, N.Y.
6. Essays in Biochemistry – Samul Graff, Tandon Book Dept. Sec. –16
7. Diabetes Mellitus- The Williams and Wilkinas Co., U.S.A.

NUTRITIONAL BIOCHEMISTRY-II

Course Code: DAN4202

Credit Units: 05

Course Contents:

Module – I :

Metabolism of Carbohydrates: Review of glycolysis, fate of pyruvate: alcoholic and homolactic fermentation, Cori cycle, Citric acid cycle. Hexose monophosphate shunt, glycogenesis, glycogenolysis, gluconeogenesis, glyoxalate cycle. Regulation of blood glucose level.

Module – II :

Amino Acid Metabolism: Transamination, deamination, urea cycle, amino acids as biosynthetic precursors- biosynthesis of heme, biologically active amines and glutathione.

Module – III

Lipid Metabolism: Beta-oxidation of saturated and unsaturated fatty acids (including brief account of minor pathways of fatty acid oxidation), biosynthesis of fatty acids, triacylglycerols, Phospholipids, ketone body formation and their utilization, prostaglandins. Major alterations in carbohydrates, protein and fat metabolism in chronic nutrition related degenerative diseases.

Module – III :

Nucleotide Metabolism :Biosynthesis of purines and pyrimidines, DNA replication, transcription, translation, regulation of gene expression (Prokaryotes), mutagenesis and DNA repair, recombinant DNA technology and genetically modified foods.

Module – IV :

Enzymology :Mechanism of enzyme action (acid base catalysis, covalent catalysis, metal ion catalysis, electrostatic catalysis, proximity and orientation effect, preferential binding of the transition state complex, strain and distortion theory) Enzyme inhibition – irreversible(non-competitive, uncompetitive), reversible(competitive), feed back and product inhibition, regulation of enzyme activity by covalent modification, allosteric modification, isoenzymes, applications of enzymes in medicine and food industry

Module – V :

Biophysical Techniques: Chromatography- Column, Thin layer, Paper, Ionexchange, Affinity, Molecular exclusion, GLC and HPLC.

Electrophoresis- cellulose acetate and gel electrophoresis, isoelectric focusing.

Spectrophotometry- Beer Lambert's Law, determination and application of extinction coefficient.

Centrifugation- sedimentation velocity and analytical methods, ultracentrifugation. Immunochemical Methods – RIA, ELISA. Use of Isotopes in biochemistry. *Regulation of metabolic pathways should be discussed along with.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

A – Attendance , CT- Class Test , S- Seminar , V- Viva , Q –Quiz , HA – Home Assignment , EE – End Term Exam

Texts and References:

Texts:

- 1 Harper's Biochemistry- Robert K. Murray
- 2 Textbook of Biochemistry- West and Todd
- 3 Bio chemical aspect of Nutrition – S.X.C. - Okoyo
- 4 Food Chemistry – O.R. Fennema
- 5 Biochemistry – Voet and Voet

References:

- 6 Principles of Biochemistry – A.L. Lehninger
- 7 Outlines of Biochemistry- E. E. Conn
- 8 Practical Clinical Biochemistry- Harold Varley

RESEARCH MEHODOLOGY

Course Code: DAN4203

Credit Units: 04

Course Contents:

Module – I :

Nature of research in Home Science, scientific approach. Types of Research: Experimental, Field studies, Case study, and Survey research.

Designing research: Problem, hypothesis, concept and types of variables (dependent, independent, random, discrete, continuous, qualitative and quantitative).

Module – II

Methods of data collection: Interview, observation, questionnaire, rating scales. Research Designs: randomized groups, matched groups, pre and post test and factorial.

Sampling: Meaning, importance and types; random (simple, stratified, cluster), Non random (incidental, purposive, quota)

Module – III :

Statistics: Meaning, primary data, array, frequency, frequency distribution and its types.

Measures of central tendency: Mean, Median, Mode; Measures of dispersion: range, mean deviation, standard deviation, root mean square deviation, variance, moments about origin and moments about mean, Binomial and Normal distribution, Skewness and Kurtosis. Case studies of areas of current research. Formulating a research plan and its presentation

Module – IV :

Type of Articles (review, letters etc). Scientific paper format (Abstract, Introduction, Materials and Methods, Results, Discussion). Writing, evaluating, presenting and publishing the results of scientific research in the academic press (journals, conferences etc). Choosing the appropriate journal (Sources, Information, Instructions to authors, peer review system, journal evaluation)

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

A – Attendance , CT- Class Test , S- Seminar , V- Viva , Q –Quiz , HA – Home Assignment , EE – End Term Exam

Texts and References:

Texts:

1. S.C. Gupta & V.K. Kapoor: Fundamentals of Mathematical Statistics
2. S.C. Gupta: Fundamentals of statistics
- 3 G. Udny Yule, N.M.G. Kendall: An Introduction to the theory of Statistics

References:

- 4 Croxton, F.C. and Cowden, D. J. Applied General Statistics, Prentics hall Inc. 1955
- 2 Garrett. H. Statistical in Psychology and Education. Oxford book Co. 1960.
- 3 R.P. Hooda: Introduction to statistics. The MacMillon Co.
- 5 Scotharman, W. A. Textbook of Statistics, (Revised edition) 1973.
- 6 Kerlinge, Foundations of Behavioral Research
- 7 Sneeecer G. W. Statistical Methods. Applied Pacific Private Ltd., 1961.

THERAPEUTICS NUTRITION–II

Course Code: DAN4204

Credit Units: 05

Course Contents:

Module – I :

Etiology, manifestations and dietary management of Renal Disorders-
Glomerulonephritis,
Nephrotic syndrome,
Acute and chronic renal failure

Module – II :

Nutrition in AIDS and Cancer
Nutrition management in special conditions; space travel, high altitude/ low temperature, heavy manual labour in tropical climate

Module – III :

Etiology, metabolic and clinical aberrations, complications, prevention and nutritional management of:
a) Weight imbalances (over and under nutrition)
b) Diabetes mellitus
c) Cardiovascular disorders - Hypertension, Atherosclerosis, Coronary heart disease.

Module – IV : Chronic alcoholism – effect on digestion and absorption, alcohol nutrient interaction and dietary management.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

A – Attendance , CT- Class Test , S- Seminar , V- Viva , Q –Quiz , HA – Home Assignment , EE – End Term Exam

Texts and References:

Texts:

- 1 Mal-Nutrition and the Eye: Donala Sterart McLaren, Academic Press, New York and London.
- 2 Diabetes Mellitus: Williames and Wikins Co., USA
- 3 Nutrition and Physical fitness: Bogert, L.J.
- 4 Human Nutrition Mc Durt, Maxine
- 5 Applied Nutrition – Rajalakshmi, R.
- 6 Hand boom of diet therapy: Dorothea, Turner.

References:

- 7 Human Nutrition and dietetics- Davidson, S. Passmore, R. Brock- J.F. and Turswell A.S.
- 8 Clinical Dietetics and Nutrition - Anita, F.P.
- 9 Food Science and Technology: Pyke, Maonus.
- 10 Modern Nutrition in health and disease by Goodhearth R.S. Shills.

DIETETIC TECHNIQUES AND PATIENT COUNSELING

Course Code: DAN4205

Credit Units: 04

Module I

Dietitian as part of the Medical Team and Outreach Services.

Clinical Information - Medical History and Patient Profile Techniques of obtaining relevant information, Retrospective information, Dietary Diagnosis, Assessing food and nutrient intakes, Lifestyles, Physical activity, Stress, Nutritional Status. Correlating Relevant Information and identifying areas of need.

The Care Process - Setting goals and objectives short term and long term, Counselling and Patient Education, Dietary Prescription.

Module II

Motivating Patients. Working with -

B. Hospitalized patients (adults, pediatric, elderly, and handicapped), adjusting and adopting to individual needs.

C. Outpatients (adults, pediatric, elderly, handicapped), patients' education, techniques and modes.

Follow up, Monitoring and Evaluation of outcome, Home visits

Maintaining records, Reporting findings, Applying findings, Resources and Aids for education and counselling, Terminating counselling, Education for individual patients, Use of regional language, linguistics in communication process, Counselling and education.

Module III

Teaching aids used by dietitians- charts, leaflets, posters etc., preparation of teaching material for patients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis and cirrhosis.

NUTRITIONAL BIOCHEMISTRY-II LAB

Course Code: DAN4206

Credit Units: 01

1. Extraction and quantitative estimation of ascorbic acid.
- 2 Isolation and quantitative estimation of B1, B2 vitamins in various food stuffs.
- 3 Estimation of Moisture, Crude Fat, crude fiber and ash in the food stuffs.
- 4 Determination of energy value of foods using bomb calorie meter.
- 5 Determination of iodine value of given fat sample.
- 6 Determination of Sodium & Potassium of food /drinks through Flame Ph Meter
- 7 Separation of amino acids by paper chromatography, TLC.
8. Separation of proteins by gel electrophoresis

ADVANCED NUTRITION-II LAB

Course Code: DAN4207

Credit Units: 01

1. Market and consumer survey to identify new products
2. Product development from different food groups and their sensory evaluation by different methods.
3. Two Visit to Food Industry

THERAPEUTICS NUTRITION – II LAB

Course Code: DAN4208

Credit Units: 02

Course Contents:

- 1 Planning, Calculation, Preparation, serving and evaluation of therapeutic diets for diseases covered in theory
- 2 Study of the management of food services in selected Hospitals.
- 3 Visits to dietetic clinics in hospitals- case study of patients needing specific therapeutic diets.

Syllabus – Third Semester

COMMUNITY NUTRITION-I

Course Code: DAN4301

Credit Units: 06

Course Contents:

Module I :

Definition and brief study of community, family, village and block.

Malnutrition - causes, ecological factors, effects of malnutrition, protein deficiency diseases - PEM, Kwashiorkor - incidence, prevalence, epidemiology. The package programmes of immunization, nutrition education, feeding programmes, and measures to overcome malnutrition.

Vitamin deficiency - A, B1, B2, Niacin, C, D - prevalence, programmes to combat.

Nutritional Anaemia - Prevalence, programmes to control.

IDD and fluorosis - Prevalence, causes, symptoms and programmes to control.

Module II :

Assessing the food and nutrition problems in the community - socio economic diet survey, anthropometry, clinical examination, laboratory examination for common nutrition problems.

Module III :

Nutrition and National Development, National nutritional policy - Aim, objectives, guidelines and thrust areas. PDS - Public distribution system, Agricultural planning - New strategies.

Module IV :

Nutrition intervention Programmes - Objectives, operation of feeding programmes. ICDS, TINP, NNMS, IRDP, DWACRA.

National organizations - ICMR, NIN, NNMB, ICAR, CFTRI, NIPCCD.

International organizations - FAO, WHO, UNICEF, UNESCO, World Bank.

Module V:

Demographic changes due to malnutrition. IMR, MMR, Mortality, morbidity rate, birth rate, sex ratio, poverty level.

Nutrition education - Merits, planning, evaluation and conduct.

Health care delivery - PHC, School Health services and their role in preventing communicable diseases.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

A – Attendance , CT- Class Test , S- Seminar , V- Viva , Q –Quiz , HA – Home Assignment , EE – End Term Exam

Texts and References:

Texts:

1. Health and hygiene - A Lesties Banks and Hislop J.A, Universal Tutorial Press, London.
2. Challenges in Rural Development - Senha H.K, Discovery publishing.
3. Food consumption and planning - Vol 5, International encyclopedia.
4. Theory and Practice of Public Health, Oxford university press, London.

References:

5. Applied Nutrition and Health Education, Sabarwal .B, Common wealth publishers, New Delhi.
6. Foundations of Community Health Education, Mc Graw Hill, London.
7. Nutritional Problems of India, P.K.Shukla, Prentice Hall, India

INSTITUTIONAL FOOD ADMINISTRATION

Course Code: DAN4302

Credit Units: 05

Course Contents:

Module I :

Food service system and management

- (i) Introduction to food service system
- (ii) Evaluation of the food service industry
- (iii) Characteristics of the various types of food service units – commercial, institutional, hospital, military, any other
- (iv) Scope and development of food service institution in India
- (v) Effects of environmental changes on different types of establishments

Module II :

Food service management

- (a) Definitions, principles and functions of Management
- (b) Approaches to management – traditional, system approach, management by objectives
- (c) Financial management – (i) Definition, application of management accounting to catering operations
- (ii) Budgeting, determining the financial needs sources
- (iii) Book- keeping and accounting

Module III : Food service organization

- (a) Definition and types of organization in food
- (b) Tools of organization Chart, job description, job specification, work schedule and communication
- (c) Recruitment, induction, training, motivation and performance appraisal of personnel
- (d) Administrative leadership

Module IV: Planning and service of food

- (a) Menu planning
 - (i) Types of menu structure
 - (ii) Factors affecting menu planning
 - (iii) Menu evaluation

Module V :Delivery and service of food

- (a) Food service system Conventional, commissary, assembly service
- (b) Service of food: Self-service, tray service, waiter service, portable meals, banquets
- (c) Food service in selected types of organizations Hospitals, schools, colleges, industrial canteens, airlines and space
- (d) Customer relationships

Module VI :

Quality and Quantity control

- (a) Construction and selection of recipes by quantity cooking
- (b) Standardization of recipe, recipe format and adjustment
- (c) Product standard and production control

Module VII:**Food cost accounting / Analysis**

- (a) Importance of costing and food cost control
- (b) Methods of costing
- (c) Cost classification into materials, labor and overheads and their percentage analysis
- (d) Reports and trend analysis

Food purchasing, selection and storage

- (a) Purchasing –
 - (i) Forecasting, product selection, purchasing , specification
 - (ii) Methods and procedure of purchasing
- (b) Receiving –
 - (i) Elements of receiving process
 - (ii) Inventory control
- (c) Storage -
 - (i) Dry
 - (ii) Refrigerated and cold storage

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

A – Attendance , CT- Class Test , S- Seminar , V- Viva , Q –Quiz , HA – Home Assignment , EE – End Term Exam

Text and References:**Texts:**

1. West, B Bessie & Wood, Levelle (1988): Food service in institutions 6th Edition. Revised by F.V., Shuggart S.G. & Palgne-Palacio June Macmillian Publication company New York.
2. Sethi Mohini (1993): Catering Management An integrated approach 2nd Edition, Wiley publication.
3. Kotas Richard & Jayawardardene, C., (1994): Profitable Food and Beverage Management, Hodder Stoughton Publication.

References:

1. Brodner, J., Maschal, H.T., Carlon, H. M.(1982): Profitable Food and Beverage Operation 4th Edition, Hayden Book company New Jersey.
2. Green, E. F., Drake, C.G., Sweeny, J.F. (1972): Profitable Food and Beverage Management, Planning Operatio Hayden Book company New Jersey.
3. Knootz, H.O., Donnel C (1968): Principles of Management , McGraw Hill Book Company.

FOOD SCIENCE - II

Course Code: DAN4303

Credit Units: 05

Course Contents:

Module I :

Vegetables and fruits: Structure, texture, pigments and acids in vegetables and fruits, Browning reaction. Pectic substances: Characteristics, uses, theory of pectic gel formation, testing of pectin, factors affecting jelly formation.

Module II :

Eggs: Structure, composition and selection. Coagulation of eggs protein. Eggs cooked in shells, poached eggs, omelets

Meat: Structure, constituents of meat, post-mortem changes, Methods of cooking and changes in meat during cooking. Tenderness and juiciness.

Module III : Fish and sea food

Types and composition, Storage and changes during storages. Changes during processing. By products and newer products.

Module IV :

Milk and Milk products: Composition and constituents of milk. Coagulation of milk protein. Setting of curds, Creaming butter, different types of cheese.

Module V: Grams and Dhals:

Composition, methods of processing and cooking, Effect of processing such as roasting, parching, soaking, germination and fermentation.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

A – Attendance , CT- Class Test , S- Seminar , V- Viva , Q –Quiz , HA – Home Assignment , EE – End Term Exam

Text and References:

Texts:

- 1 Experimental Cookery: Low Bells.
- 2 Food Selection and Preparation: Sweetman, M.D.
- 3 Handbook of Food Preparation: A.N. Hime Ec. Asso.
- 4 Our Food : Swaminathan, M,. and Bhagiam, R.K.
- 5 Experimental Foods: Swaminathan
- 6 Food Science and Application: L Paul, C. Pauling.

References:

- 7 Food Science: Mudami, S.R. & Rao, S.M. 1994, Wiley Eastern Ltd. New Delhi
- 8 Food Facts & Principles: Maney N. S. & Shudarshan Swamy M. 1966. New Age International Pub. N. Delhi

FOOD MICROBIOLOGY-I

Course Code: DAN4304

Credit Units: 05

Course Contents:

Module I :

Microorganisms of importance in food- role of bacteria and fungi, sources, taxonomy, morphology, cultural and physiological characteristics and biochemical activities.

Module II :

Factors Affecting Growth of Microorganisms- intrinsic and extrinsic factors like pH, water activity, oxidation reduction potential, nutritional requirements, temperature, relative humidity, gaseous environment, biological structure of food and inhibitory substances.

Methods of Isolation and Detection of Microorganisms or their products in food

- (a) Conventional methods
- (b) Rapid methods (newer techniques)
- (c) Immunological methods- fluorescent, antibody, radio Immune assay, ELISA etc
- (d) Chemical methods- Thermo stable, nuclear, ATP measurement and PCR(Polymer chain reactions)- only principles in brief.
- (e) Microbiological Assays.

Module III :

Sources of contamination of food- Water, air, soil, sewage, animals, during handling and processing.

General principles underlying spoilage.

- (a) Chemical changes due to microbial spoilage.
 - (b) Spoilage of different groups of foods- cereal and cereal products, vegetables and fruits, meat and meat products, egg and poultry, fish and other sea foods, sugar, milk and milk products, canned food.
- Role of microbes in fermented foods and genetically modified foods oriented fermented foods, malt, bread, beverages, vinegar fermented vegetables, fermented dairy products, tea and coffee. Single cell protein, fats, amino acids and enzymes from microorganisms.

Module IV:

Food Preservation- physical methods- drying, freeze drying, cold storage, heat treatment, irradiation, high pressure processing. Chemical preservatives and natural antimicrobial compounds. Biologically based preservation systems and probiotic bacteria.

Food Borne Diseases- infections and intoxications. Bacterial and viral food borne disorders. Food borne important animal parasites. Mycotoxins

Food Sanitation- microbiology in food plant sanitation, bacteriology of water, sewage and waste treatment and disposal. Microbiology of the food product 10. Indicators of food safety and quality- microbiological criteria of foods and their significance.

Module V :

HACCP system and food safety- Introduction, need, benefits,& principles of HACCP.

- Guidelines for application of HACCP principles.

- The HACCP system in India

Food control and enforcement agencies-Food standards and regulation in India.

- Regulations related to genetically modified foods.

- International organizations and agreement in the area of food standard and quality control.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

A – Attendance , CT- Class Test , S- Seminar , V- Viva , Q –Quiz , HA – Home Assignment , EE – End Term Exam

Text and References:***Texts:***

1. Releazar, M.I and Reid, R.D.(1993): Microbiology, Mc Graw Hill Book Company New York 5th edition.
2. Atlas, M .Ronald (1995): Principles of microbiology 1st edition, Mosby Year Book, Inc, Missouri, USA.
3. Topley and Wilson's(1983): Principles of Bacteriology, Virology and Immunity Edited by S.G. Wilson, A. Miles and M.T. Parkar vol1; General Microbiology and Immunity II: Systematic Bacteriology 7th edition Edward Arnold Publisher.
4. Block, J.G. (1999) Microbiology Principles and Explanations 4th Edition, John Wiley and sons Inc.
5. Frazier, W.C. (1988) Food Microbiology Mc Graw Hill Inc 4th Edition.
6. Jay James, M(2000): Modern Food Microbiology 6th Edition Aspen Publishers Inc, Maryland.
7. Banwart, G(1989) Basic Food Microbiology 2nd Edition CBS Publisher.
8. Garbutt, J(1997): essentials of Food Microbiology, 1st Edition Arnold International Students Edition

References:

1. Doyle, P, Bemehat, L.R. and Mantiville, T.J(1997): Food Microbiology- Fundamentals and Frontiers, ASM Press, Washington, D.C.
2. Adams, M.R and M.G. Moss(1995): Food Microbiology 1st Edition New Age International(P) Ltd.
3. Benason, H.J.(1990) Microbiological applications C. Brown Publishers USA
4. Roday, S(1999) Food hygiene and sanitation 1st Edition Tata Mc Graw Hill, New Delhi.
5. Venderzant, C and D.F. Splitls Toesser(1992); Compendium of Methods for Microbiological Examinations of Foods 3rd Edition American Public Health Association, Washington, D.C.

COMMUNITY NUTRITION LAB

Course Code: DAN4305

Credit Units: 02

Conduct of socio - economic survey

Conduct of Diet survey

Conduct of Clinical Examination

Planning, conducting and Evaluating Nutrition Education Programme.

Examination Scheme:

IA				EE		
A	PR	LR	V	PR	WT	V
5	10	10	5	25	25	20

FOOD SCIENCE-II LAB

Course Code: DAN4306

Credit Units: 02

Practical related to theory papers i.e : Effect of various treatments on the foods mentioned in syllabi

Examination Scheme:

IA				EE		
A	PR	LR	V	PR	WT	V
5	10	10	5	25	25	20

FOOD MICROBIOLOGY- II LAB

Course Code: DAN4307

Credit Units: 02

1. Microbiological apparatus and equipments-a basic introduction, instruments needed for isolation, cultivation and maintenance of microbes, tools needed in microbiology laboratory for inoculation and culturing
2. Cleaning and sterilization procedures for glassware.
3. Preparation and sterilization of laboratory media.
4. Staining of bacteria- gram's staining, use of oil immersion lens, micrometry, and microscopic enumeration.
5. Spread plating, pour plating, streaking techniques.
6. Enrichment of isolated cultures, SPC, MPC. Coli count and coli confirmations.
7. Study of biochemical characteristics of isolated cultures-
 - Fermentation reaction · Starch cultures
 - IMVIC Tests · Catalase test
 - Oxidase test · Urease test
 - H₂S test · Coagulase test
8. Microbiological analysis of milk- raw, boiled and pasteurized - MBRT Test.
9. Demonstration of Techniques of
 - . Radio immune Assay (RIA)
 - . Enzyme Linked Immuno Sorbent Assay (ELISA)

Examination Scheme:

IA				EE		
A	PR	LR	V	PR	WT	V
5	10	10	5	25	25	20

SUMMER INTERNSHIP

Course Code: DAN4335

Credit Units: 09

Objectives:

Summer internships are usually eight weeks long and it is full time. The students are required to do internships during the summer than during any other time of the year. These short term experiences provide a real insight into what it's actually like working in a particular job or career field. There's ample time to get into a regular work routine and gain valuable knowledge and skills.

Internship objectives include:

- Developing personally and professionally while gaining confidence and real-world experience
- Meeting and networking with practitioners in one's area of interest
- Mentoring and performance feedback from the site supervisor
- Earning academic credit while getting paid or non paid.

General Guidelines:

Every student of post graduate courses will be required to undergo a practical training in an organization approved by the Institute for eight weeks, normally in the Summer Vacation, after the end of the fourth semester examinations. The candidates shall be required to undergo training in the various areas of the organization concerned. The organization may assign a specific project to the candidate, which will be completed by him/her during the period of training. The work done by the candidate during the training period shall be submitted in the form of a report as per the guidelines provided by the Department.

Chapter Scheme for the SIP Report:

Chapter I: Introduction	- 10 marks
Chapter II: Conceptual Framework/National/International Scenario	- 05 marks
Chapter III: Presentation, Analysis and Findings / Case Studies	- 20 marks
Chapter IV: Conclusion and Recommendations	- 10 marks
Hospital Chief Dietitian Marking	-30 marks

The Chief Dietitian is asked to evaluate the student based on his/her performance as well as their conduct. The report has to be written in font Times New Roman, 12 points, 1.5 line spacing on both sides of the paper, Spiral Bound. The report should comprise of a maximum of 70 pages and has to be submitted in two copies.

THE COMPONENTS OF A SIP REPORT

The outcome of Summer Internship is the Project Report. A project report should have the following components:

- 1) Cover Page: This should contain the title of the project proposal, to whom it is submitted, for which degree, the name of the author, name of the supervisor, year of submission of the project work, name of the University.
- 2) Acknowledgement: Various organizations and individuals who might have provided assistance /co-operation during the process of carrying out the study.
- 3) Table of Content: Page-wise listing of the main contents in the report, i.e., different Chapters and its main Sections along with their page numbers.
- 4) Body of the Report: The body of the report should have these four logical divisions

- a. *Introduction*: This will cover the background, rationale/ need / justification, brief review of literature, objectives, methodology (the area of the study, sample, type of study, tools for data collection, and method of analysis), Limitations of the Study, and Chapter Planning.
 - b. *Conceptual Framework / National and International Scenario*: (relating to the topic of the Project).
 - c. *Presentation of Data, Analysis and Findings / Case studies* : (using the tools and techniques mentioned in the methodology).
 - d. *Conclusion and Recommendations*: In this section, the concluding observations based on the main findings and suggestions are to be provided.
- 5) Bibliography or References: This section will include the list of books and articles which have been used in the project work, and in writing a project report.
- 6) Annexure: Questionnaires (if any), relevant reports, etc.

Evaluation Scheme:

SIP Report	Power Point Presentation & Viva
75 marks	25 marks

Syllabus – Fourth Semester

COMMUNITY NUTRITION-II

Course Code: DAN4401

Credit Units: 06

Module I:

Factors affecting food production & conservation- Per capita food availability and consumption, poverty, family planning, social & cultural values, education. Nutrition surveillance and planning National nutrition Policy.

Module II:

Assessment of Nutritional status of the Community

- a. Clinical,
- b. Biochemical
- c. Anthropometric measurements
- d. Dietary surveys

Module III:

Nutritional Programmes for improvement of Nutritional status :

Nutrition Education:

- a. Methods
- b. Planning and execution
- c. Evaluation and follow up

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

Books Recommended:

- 1 Nutritional evaluation of food processing, Roberts Haris John willy & Sons, N.Y. London.
- 2 Nutrition and Physical Fitness: Bogrert, L.J.
- 3 Nutrition in India: V.N.
- 4 Human Nutrition- M.C. Durt, Maxine
- 5 Applied Nutrition- Rajalakshmi-R.
- 6 Biology of nutrition – Elements 1972, Platinum Press
- 7 Nutritional Evaluation of Food

FOOD PROCESSING & TECHNOLOGY

Course Code: DAN4402

Credit Units: 04

Module I:

Processing technology of foods & nutritional implications for the following:

- Cereals & Pulses- Wheat grain characteristics and products, Rice processing, Pulses Processing & their elimination of toxic factors. Fermentation & Germination Nuts & Oilseeds- Nuts Oilseeds Processing, solvent extraction purification, hydrogenation and tempering products - butter, margarine etc
- Flesh Foods: Processing & Their Products.

Module II:

Milk and Milk Products:- Classification and standardization, Pasteurization, homogenization, packing of milk. Milk Products- Fortified milk, Skim milk, Concentrated milks, Cream, Butter, Cheese, Ice cream and Indigenous milk products: Khoa, Paneer, Curd, Yoghurt, Ghee.

Module III:

- Fruits & Vegetables: Physiological and biochemical changes during ripening, handling & storage & fruit processing. Processing of vegetables, canning, freezing, dehydration, pickles & chutneys. Beverages & Appetizers : Classification, Coffee, Tea, coco chocolates, Fruit beverages, soups, Vegetable Beverages, Carbonated & Noncarbonated beverages, Alcoholic beverages.

Module IV:

- a).Physical principles in Food Processing Operations:
- b).Food Deterioration, Methods of Preservation and Processing: Thermal Processing, Refrigeration, Freezing, Dehydration, Ionizing radiations, Fermentation, concentration.
- c).Chemical Principles of Food Processing:
- d).Preservation/processing by sugar, salt, smoke, acid and chemicals.
- e).Chemical & biochemical reactions affecting food quality & safety.

Some Recent concepts in Food Technology -

- Biotechnology in food.
- Algae as food - Spirulina
- Low cost nutrient supplement.
- Packaging of foods.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

NUTRITION FOR HEALTH & FITNESS

Course Code: DAN4403

Credit Units: 04

Module I:

Physical Fitness and health status: meaning, concept, assessment criteria and management

Healthy life style: Strategies, factors that promote life style changes, self management skills. Body composition in exercise and sport

Module II:

Physical Activity: need, principles of physical activity Energy input and output: Different energy systems for endurance and power activity, Fuels and nutrients to support physical activity.

Module III:

Nutrition in Sports: Sports specific requirement, Diet manipulation, Pre-game, during and post-game meals. Diets for athletes with high energy requirements, stress, fracture and injury

Water and electrolyte balance: Losses and their replenishment during exercise and sports events, effect of dehydration, sports drinks.

Module IV:

Special Nutrition considerations for female, older and disabled athletes. Nutrition of athletes in hot, cold and high altitude environments

Nutrition education of athletes and coaches.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

Books Recommended

- Ira Walinaky, (1998) Nutrition in Exercise and sport
- Charles B. Corbin, Ruth Lindsey and grey walk (2000) Concepts of fitness and wellness
- Robert A. Robergers and Scott O. Roberts (2000) exercise physiology.

COMMUNITY NUTRITION-II LAB

Course Code: DAN4404

Credit Units: 02

1. Conduct of socio - economic survey with Nutritional status parameters
2. Conduct of Dietary survey with detail calculations
3. Conduct of Clinical Examination with ICMR score card.
4. Planning, conducting and Evaluating Nutrition Education Programme.
5. Evaluation of various nutritional programmes conducted in villages.
6. Cooking of recipes for Low income group , Middle income group and High Income group.

Examination Scheme:

IA				EE		
A	PR	LR	V	PR	WT	V
5	10	10	5	25	25	20

FOOD PROCESSING AND TECHNOLOGY LAB

Course Code: DAN4405

Credit Units: 02

1. Determination of physical dimensions of grains (Length, Breadth, Thickness and Bulk density)
2. Determination of wet and dry gluten content of flours.
3. Testing the pectin strength of different fruits and vegetables.
4. Determination of PH and titrable acidity of a food sample.
5. Determination of Total solids as soluble and insoluble in foods
6. Test for adulterants
7. Food Evaluation using different sensory tests
8. Total microbial count
9. Determination of pasteurization effect in milk by MBRT
10. Preparation of culture media for different organisms

Examination Scheme:

IA				EE		
A	PR	LR	V	PR	WT	V
5	10	10	5	25	25	20

DISSERTATION

Course Code: DAN4437

Credit Units: 09

GUIDELINES FOR PROJECT FILE AND PROJECT REPORT

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critically analyzed by the faculty guide and corrected by the student at each stage.

PROJECT FILE

The Project File may be a very useful tool for undertaking an assignment along-with a normal semester, an exploratory study, sponsored projects, a project undertaken during summer period or any other period as per curricula where the researcher is working with a company/organization. The project/ assignment may also be a part of the bigger research agenda being pursued by a faculty/ institution/ department. The Project File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation. This file may be considered in continuous assessment.

In general, the File should be comprehensive and include:

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated objectives;
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen and may be useful to document for future reference.

PROJECT REPORT

The Project Report is the final research report that the student prepares on the project assigned to him. In case of sponsored project the lay out of the project could be as prescribed by the sponsoring organization. However, in other cases the following components should be included in the project report:

➤ **Title or Cover Page**

The title page should contain Project Title; Student's Name; Programme; Year and Semester and Name of the Faculty Guide.

➤ **Acknowledgement(s)**

Acknowledgment to any advisory or financial assistance received in the course of work may be given. It is incomplete without student's signature.

➤ **Abstract**

A good "Abstract" should be straight to the point; not too descriptive but fully informative. First paragraph should state what was accomplished with regard to the objectives. The abstract does not have to be an entire summary of the project, but rather a concise summary of the scope and results of the project. It should not exceed more than 1000 words.

➤ **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

➤ **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

➤ **Materials and Methods**

This section should aim at experimental designs, materials used (wherever applicable). Methodology should be mentioned in details including modifications undertaken, if any. It includes organization site(s), sample, instruments used with its validation, procedures followed and precautions.

➤ **Results and Discussion**

Present results, discuss and compare these with those from other workers, etc. In writing this section, emphasis should be laid on what has been performed and achieved in the course of the work, rather than discuss in detail what is readily available in text books. Avoid abrupt changes in contents from section to section and maintain a lucid flow throughout the thesis. An opening and closing paragraph in every chapter could be included to aid in smooth flow.

Note that in writing the various sections, all figures and tables should as far as possible be next to the associated text, in the same orientation as the main text, numbered, and given appropriate titles or captions. All major equations should also be numbered and unless it is really necessary, do not write in "point" form.

While presenting the results, write at length about the the various statistical tools used in the data interpretation. The result interpretation should be simple but full of data and statistical analysis. This data interpretation should be in congruence with the written objectives and the inferences should be drawn on data and not on impression. Avoid writing straight forward conclusion rather, it should lead to generalization of data on the chosen sample.

Results and its discussion should be supporting/contradicting with the previous research work in the given area. Usually one should not use more than two researches in either case of supporting or contradicting the present case of research.

➤ **Conclusion(s) & Recommendations**

A conclusion should be the final section in which the outcome of the work is mentioned briefly.

Check that your work answers the following questions:

- Did the research project meet its aims (check back to introduction for stated aims)?
- What are the main findings of the research?
- Are there any recommendations?
- Do you have any conclusion on the research process itself?

➤ **Implications for Future Research**

This should bring out further prospects for the study either thrown open by the present work or with the purpose of making it more comprehensive.

➤ **Appendices**

The Appendices contain material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

➤ **References**

References should include papers, books etc. referred to in the body of the report. These should be written in the alphabetical order of the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

Examples:

For research article:

Voravuthikunchai SP, Lortheeranuwat A, Ninrprom T, Popaya W, Pongpaichit S, Supawita T. (2002) Antibacterial activity of Thai medicinal plants against enterohaemorrhagic *Escherichia coli* O157: H7. *Clin Microbiol Infect* , **8** (suppl 1): 116–117.

For book:

Kowalski,M.(1976) Transduction of effectiveness in *Rhizobium meliloti*. SYMBIOTIC NITROGEN FIXATION PLANTS (editor P.S. Nutman IBP), **7**: 63-67

The Layout Guidelines for the Project File & Project Report:

- A4 size Paper
 - Font: Arial (10 points) or Times New Roman (12 points)
 - Line spacing: 1.5
 - Top and bottom margins: 1 inch/ 2.5 cm; left and right margins: 1.25 inches/ 3 cm

ASSESSMENT OF THE PROJECT FILE AND THE PROJECT REPORT

Essentially, the assessment will be based on the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.

The Project should fulfill the following **assessment objectives**:

- Range of Research Methods used to obtain information
- Execution of Research
- Data Analysis (Analyze Quantitative/ Qualitative information)
- Quality Control
- Conclusions

Assessment Scheme:

Continuous Evaluation:40% (Based on punctuality, regularity of work, adherence to plan and methodology, refinements/ mid-course corrections etc. as reflected in the Project File.)

Final Evaluation: 60% (Based on the Documentation in the file, Final report layout, analysis and results, achievement of objectives, presentation/ viva)