



UNIVERSITY OF CALCUTTA

GURUPADA SAREN

SECRETARY

COUNCILS FOR UNDERGRADUATE STUDIES,
UNIVERSITY OF CALCUTTA.

Ref.No : CUS/93/18

Dated the 22nd February, 2018

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To
The Principals/T.I.C.
of all the Undergraduate Colleges
offering B.Sc. (Honours) in Food & Nutrition
affiliated to the University of Calcutta

Sir/Madam,

The undersigned is to inform you that the proposed **revised semesterised draft Syllabus for Food & Nutrition (Honours) Courses of Studies under CBCS has been uploaded in the Calcutta University website (www.caluniv.ac.in).**

The said syllabus has been prepared by the **U.G. Board of Studies in Food & Nutrition, C.U.**, suppose to be implemented from the academic session 2018-2019

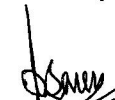
You are requested kindly to go through it and send your feedback within 09th March, 2018.

In this regard you may send your observation/ suggestion to the **Department of U.G. Councils, C.U.** or through email (u.g.councilsc.u@gmail.com), and you also may contact **Prof. Santa Dutta (De)**, Department of Home Science, C.U. through e-mail (drsantade@yahoo.co.in).

Your cooperation in this regard will be highly appreciated. Kindly treat the matter as urgent.

Thanking you,

Yours faithfully,


Secretary 22/02/18

**COURSE CURRICULUM FOR UNDERGRADUATE
COURSES UNDER CHOICE BASED CREDIT SYSTEM**

PROPOSED DRAFT SYLLABUS

FOR

**BSc. (HONOURS)
IN
FOOD AND NUTRITION**



UNIVERSITY OF CALCUTTA

SCHEME AND SYLLABUS FOR CHOICE BASED CREDIT SYSTEM FOR B.Sc. HONOURS FOOD AND NUTRITION

SEMESTER	CORE COURSE (14)	ABILITY ENHANCEMENT COMPULSORY COURSE (AECC) (2)	SKILL ENHANCEMENT COURSE (SEC) (2)	DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE) (4)	ELECTIVE: GENERIC COURSE (4)
I	CT1: BASIC FOOD SCIENCE-I CP1: BASIC FOOD SCIENCE-I (PRACTICAL)	AECC1: LANGUAGE COMMUNICATION			GE-1
	CT2: HUMAN PHYSIOLOGY-I CP2: HUMAN PHYSIOLOGY-I (PRACTICAL)				
II	CT3: BASIC FOOD SCIENCE-II CP3: BASIC FOOD SCIENCE-II (PRACTICAL)	AECC2:ENVIRONMENTAL SCIENCE			GE-2
	CT4: HUMAN PHYSIOLOGY-II CP4: HUMAN PHYSIOLOGY-II (PRACTICAL)				
III	CT5: HUMAN NUTRITION-I CP5: HUMAN NUTRITION-I (PRACTICAL)		SEC-1		GE-3
	CT6: COMMUNITY NUTRITION CP6:COMMUNITY NUTRITION (PRACTICAL)				
	CT7: FOOD COMMODITIES CP7: FOOD COMMODITIES (PRACTICAL)				
IV	CT8: HUMAN NUTRITION-II CP8: HUMAN NUTRITION-II (PRACTICAL)		SEC-2		GE-4
	CT9: DIET THERAPY-I CP9: DIET THERAPY-I (PRACTICAL)				

	CT10: NUTRITIONAL BIOCHEMISTRY-I CP10: NUTRITIONAL BIOCHEMISTRY-I (PRACTICAL)				
V	CT11: DIET THERAPY-II CP11: DIET THERAPY-II (PRACTICAL)			DSE-1	
	CT12: NUTRITIONAL BIOCHEMISTRY-II CP12: NUTRITIONAL BIOCHEMISTRY-II (PRACTICAL)			DSE-2	
VI	CT13:FOOD MICROBIOLOGY CP13: FOOD MICROBIOLOGY (PRACTICAL)			DSE-3	
	CT14: FOOD PRESERVATION CP14: FOOD PRESERVATION (PRACTICAL)			DSE-4	

DISTRIBUTION OF CREDITS IN THE COURSE CURRICULUM

Semester	Name of the Course					Total
	Core Course (CC)	Ability Enhancement Compulsory Course (AECC)	Skill Enhancement Course (SEC)	Discipline Specific Elective (DSE)	Generic Elective (GE)	Credits
I	6x2= 12	2x1=2	---	---	6x1=6	20
II	6x2= 12	2x1=2	---	---	6x1=6	20
III	6x3=18	---	2x1=2	---	6x1=6	26
IV	6x3=18	---	2x1=2	---	6x1=6	26
V	6x2=12	----	---	6x2=12	--	24
VI	6x2=12	----	----	6x2=12	----	24
Total	14 (CC)	2 (AECC)	2 (SEC)	4 (DSE)	4 (GE)	140
Course	(14×6)=84 credits	(2x2)=4credits	(2×2)=4credits	(4×6)=24 credits	(4x×6)=24 credits	

NOTE:

1. 14 Core Courses (CCs) should be compulsorily studied for BSc. Food and Nutrition (Honours) students.
2. 4 DSE & 2 SEC to be chosen by the Food and Nutrition (Honours) students (Choice based).
3. 4 GE subjects in Food and Nutrition Syllabus are to be studied by other discipline students.
4. Food and Nutrition Honours students have to choose chemistry as GE course.

CORE COURSE (CC)

FIRST SEMESTER

[TOTAL CREDITS: 6 (THEORY-4, PRACTICAL-2)]

C1T: BASIC FOOD SCIENCE

4 CREDITS

1. Basic concept on Food, Nutrition and Nutrients. Classification of Food, Classification of Nutrients.
2. Carbohydrates - Definition, Classification, Structure and properties.
Monosaccharides - glucose, fructose, galactose.
Disaccharides - Maltose, lactose, sucrose
Polysaccharides - Dextrin, starch, glycogen, resistant starch.
Carbohydrates - Sources, daily requirements, functions. Effects of too high and too low carbohydrates on health. Digestion and absorption of carbohydrate.
2. Lipids -Definition, Classification & Properties. Fatty acids-composition, properties, types. Lipids - sources, daily requirements, functions. Digestion & Absorption of nutrients. Role & nutritional significances of PUFA, MUFA, SFA, W-3 fatty acid.
3. Proteins- Definition, Classification, Structure & properties. Amino acids- Classification, types, functions. Proteins - Sources, daily requirements, functions. Effect of too high - too low proteins on health. Digestion & absorption. Assessment of Protein quality (BV, PER, NPU). Factors affecting protein bio-availability including anti-nutritional factors.

CP1: FOOD SCIENCE (PRACTICAL)

2 CREDITS

1. Identification of Mono, Di and polysaccharides
2. Identification of Proteins

3. Identification of glycerol

REFERENCE BOOKS/JOURNALS:

1. An introduction of Practical Biochemistry : D. Plummer
2. Practical Biochemistry : K Wilson and Walker
3. Biochemical Methods : S. Sadasivan and K Manikam
4. Hawk's Physiological Chemistry : B. L. Oser (ed)
5. Practical biochemistry : R. L. Nath.
6. A treatise on Analysis of Food, Fats and Oils : A. R. Sen, N.K. Pramanik and S.K. Roy.
7. B. Srilakshmi : Nutrition Science, New Age International Publishers.
8. Sunetra Roday : Food Science & Nutrition, Oxford University Press.
9. Mann and Truswell: Essentials of Human Nutrition, Oxford University Press.

CT2: HUMAN PHYSIOLOGY-I

4 CREDITS

1. Unit of Life: Structure and functions of cell with special reference to Plasma membrane (Fluid Mosaic Model), Mitochondria, Ribosome, Endoplasmic reticulum. Nucleus (nuclear membrane, nuclear chromatin and nucleolus). Nucleotide, Homeostasis, Positive and negative feed back
2. Circulatory and Cardiovascular system: Blood and its composition, formed elements, Blood groups, Mechanism of blood coagulation, Introduction to immune system, Erythropoiesis and anaemia, Structure and functions of heart, Cardiac cycle, cardiac output, blood pressure and its regulation.
3. Digestive system: Structure and functions of G.I. tract, Process of digestion and absorption of food, Structure and functions of liver, gallbladder and pancreas.
4. Respiratory system: Structure of Lungs and gaseous exchange (oxygen and carbon dioxide transport).
5. Musculoskeletal System: Formation and functions of muscles, bones and teeth. Muscle energetic, Isometric and isotonic muscle contraction.

CP2: HUMAN PHYSIOLOGY (PRACTICAL)**2 CREDITS**

1. Determination of pulse rate in Resting condition and after exercise (30 beats/10 beats method)
2. Determination of blood pressure by Sphygmomanometer (Auscultatory method).
3. Measurement of Peak Expiratory flow rate.(By spirometer)
4. Determination of Bleeding Time (BT) and Clotting Time (CT).
5. Detection of Blood group (Slide method).
6. Measurement of Haemoglobin level (Sahli's or Drabkin method).

REFERENCE BOOKS/JOURNALS:

1. Chatterjee CC (1988). Text Book of Physiology – Vol I & II.
2. Chaudhuri SK (2000). Concise Medical Physiology. New Central Book Agency (P) Ltd.
3. Guyton AC, Hall JE (1966). Text book of Medical Physiology. 9th Ed. Prism Books (Pvt.) Ltd. Bangalore.
4. Guyton AC (1985). Function of the Human Body, 4th Edition, W.B. Sanders Company, Philadelphia.
5. Hadley ME (2000). Endocrinology. 5th ed. Pearson Education.
6. Hoar WS (1984). General and comparative Physiology. 3rd ed. Prentice-Hall of India.
7. Wilson (1989). Anatomy and Physiology in Health and Illness. Edinburgh, Churchill Livingstone.
8. Winword (1988): Sear's Anatomy and Physiology for Nurses. London, Edward Arno ll.

SECOND SEMESTER**[TOTAL CREDITS: 6 (THEORY-4, PRACTICAL-2)]****CT3: BASIC FOOD SCIENCE-II****4 CREDITS**

1. Dietary Fibre-Classification, sources, composition, properties & nutritional significance.
2. Minerals & Trace Elements, Bio-Chemical and Physiological Role, bio-availability & requirements, sources, deficiency & excess (Calcium, Sodium, Potassium Phosphorus, Iron, Fluoride, Zinc, Selenium, Iodine, Chromium)

3. Vitamins - Bio-Chemical and Physiological Role Physiological role, bio-availability and requirements, sources, deficiency & excess.
4. Water - Functions, daily requirements, Water balance.

CP3: BASIC FOOD SCIENCE-II

2 CREDITS

1. Determination of Ash content in food
2. Determination of Moisture content in food
3. Determination of calcium, iron, and Vitamin C content in foods.

REFERENCE BOOKS/JOURNALS:

1. An introduction of Practical Biochemistry : D. Plummer
2. Practical Biochemistry : K Wilson and Walker
3. Biochemical Methods : S. Sadasivan and K Manikam
4. Hawk's Physiological Chemistry : B. L. Oser (ed)
5. Practical biochemistry : R. L. Nath.
6. A treatise on Analysis of Food, Fats and Oils : A. R. Sen, N.K. Pramanik and S.K. Roy.
7. B. Srilakshmi : Nutrition Science, New Age International Publishers.
8. Sunetra Roday : Food Science & Nutrition, Oxford University Press.
9. Mann and Truswell: Essentials of Human Nutrition, Oxford University Press.

CT4: HUMAN PHYSIOLOGY-II

4 CREDITS

1. Excretory system: Structure and function of skin, Regulation of temperature of the body, Structure and functions of kidney in special reference to nephron, Physiology of urine formation.
2. Reproductive system: Structure and functions of gonads, concept on menstrual cycle, Brief idea of pregnancy, parturition, lactation and menopause, Brief concept on spermatogenesis and Oogenesis process.

3. Nervous System: Concept on sympathetic and parasympathetic nervous system, Brief anatomy and functions of cerebrum, cerebellum, hypothalamus and neuron, Concept on synapse and synaptic transmission. Reflexes, Special senses.
4. Endocrine system: Structure and functions of pituitary, thyroid, parathyroid and adrenal gland, Structure and functions of pancreas.

CP4:HUMAN PHYSIOLOGY-II (PRACTICAL)

2 CREDITS

1. Test for Visual acuity, Colour vision.
2. Identification with reasons of histological slides (Lung, Liver, Kidney, Small intestine, Stomach, Thyroid, Adrenal, Pancreas, Testis, Ovary and Muscle of mammals).
3. Qualitative determination of glucose in blood or urine.
4. Total count (TC) and Differential count (DC)

REFERENCE BOOKS/JOURNALS:

1. Winword (1988): Sear's Anatomy and Physiology for Nurses. London, Edward Arno ll.
2. Chatterjee CC (1988). Text Book of Physiology – Vol I & II.
3. Chaudhuri SK (2000). Concise Medical Physiology. New Central Book Agency(P) Ltd.
4. Guyton AC, Hall JE (1966). Text book of Medical Physiology. 9th Ed. Prism Books (Pvt.) Ltd. Bangalore.
5. Guyton AC (1985). Function of the Human Body, 4th Edition, W.B. Sanders Company, Philadelphia.
6. Hadley ME (2000). Endocrinology. 5th ed. Pearson Education.
7. Hoar WS (1984). General and comparative Physiology. 3rd ed. Prentice-Hall of India.
8. Wilson (1989). Anatomy and Physiology in Health and Illness. Edinburgh, Churchill Livingstone.

[TOTAL CREDITS: 6 (THEORY-4, PRACTICAL-2)]

CT5: HUMAN NUTRITION-I

4 CREDITS

1. Concept and definition of terms-Nutrition, Malnutrition and Health: Scope of Nutrition.
2. Minimum Nutritional Requirement and RDA: formulation of RDA and Dietary Guidelines Reference Man and Reference Woman, Adult consumption unit.
3. Energy in Human Nutrition: Idea of Energy and its unit, Energy Balance, Assessment of Energy Requirements—deficiency and excess, Determination of Energy in food, B.M.R. and its regulation, S.D.A.
4. Growth & Development from infancy to adulthood: Somatic, physical, brain and mental development, puberty, menarch, pre-pubertal and pubertal changes, Factors affecting growth and development. Importance of Nutrition for ensuring adequate development.
5. Growth monitoring and promotion: Use of growth charts and standards, Prevention of growth faltering.

CP5: HUMAN NUTRITION-I (PRACTICAL)

2 CREDITS

1. Process involved in cooking: pressure cooking, microwave ,steaming, grilling ,deep fat frying.
2. General concepts of weights and measures. Eye estimation of raw and cooked foods
3. Preparation of food from different food groups and their significance in relation to health.
4. Preparation of supplementary food for different age group and their nutritional significance.
5. Planning and preparation of low cost diet for Grade I and Grade II malnourished child

REFERENCE BOOKS/JOURNALS:

1. B. Srilakshmi: Dietetics, New Age International Publishers.
2. Guthrie, A. H.: Introductory Nutrition, 6th Ed. The C. V. Mosby Company.
3. Robinson, C. H. Lawler, M. R.; Chei Toweth, W. L. and Garwick, A. E. : Normal and Therapeutic Nutrition. 17th Ed. Mac Millan Publishing Co.
4. Swaminathan, M. : Essentials of Foods and Nutrition, Vols -1 and II. Ganesh and Co. Madras.
5. Gopalan, C. et. al : Nutritive value of Indian Foods, Indian Council of Medical Research.

6. Indian Council of Medical Research : Nutrient Requirements and Recommended Dietary Allowance for Indians, New Delhi.
7. FAO/WHO/UNO : Technical Report Series, 724 (1985). Energy and Protein Requirement, Geneva.
8. WHO Technical Reports Series for different Nutrients.
9. Ghosh, S.: The Feeding and Care of Infants and Young Children, VHAI. 6th Ed. Delhi.
10. WHO : A growth chart for International use In Maternal and Children Health Care, Geneva.
11. Mann and Truswell: Essentials of Human Nutrition, Oxford University press.

CT6: COMMUNITY NUTRITION

4 CREDITS

1. Concept of Community, types of Community, Factors affecting health of the Community.
2. Nutritional Assessment and Surveillance: Meaning, need, objectives and importance
 1. Nutritional assessment of human: Clinical findings, nutritional anthropometry, biochemical tests, biophysical methods.
 2. Diet survey : Need and importance, methods of dietary survey, Interpretation - concept of consumption unit, individual and total distribution of food in family, adequacy of diet in respect to RDA, concept of family food security.
 3. Clinical Signs: Need & Importance's, identifying signs of PEM, vitamin A deficiency and iodine deficiency, Interpretation of descriptive list of clinical signs.
 4. Nutritional anthropometry: Need and importance, standard for reference, techniques of measuring height, weight, head, chest and arm circumference, interpretation of these measurements. Use of growth chart.
 5. International, national, regional agencies and organisations. Nutritional intervention programmes to combat malnutrition.

CP6:COMMUNITY NUTRITION (PRACTICAL)**4 CREDITS**

1. Anthropometric Measurement of infant - Length, weight, circumference of chest, mid - upper arm circumference, precautions to be taken.
2. Comparison with norms and interpretation of the nutritional assessment data and its significance. Weight for age, height for age, weight for height, Z scores, body Mass Index (BMI) Waist - Hip Ratio (WHR).
3. Growth charts - plotting of growth charts, growth monitoring and promotion.
4. Clinical assessment and signs of nutrient deficiencies specially PEM (Kwashiorkor, marasmus) I vitamin A deficiencies, Anaemia, Rickets, B-Complex deficiencies.
5. Estimation of food and nutrient intake: Household food consumption data, adult consumption unit, 24 hours dietary recall 24 hours record, Weighment method, food diaries, food frequency data, use of each of the above, information available through each individual, collection of data, estimation of intakes.

REFERENCE BOOKS/JOURNALS:

1. Jelliffe, D. B. : Assessment of the Nutritional Status of the Community; World Health Organisation.
2. Sain, D. R. Lockwood, R., Scrimshaw, N. S.: Methods the Evaluation of the Impact of Food and Nutrition Programmes, United Nations University.
3. Ritchie, J.A.S. : Learning Better Nutrition FAO, Rome.
4. Gopalon. C. : Nutrition Foundation of India, Special Publication service.
5. Beghin, I. Cap. M: Dujardan. B. : A Guide to Nutrition Status Assessment. W.H.O. Geneva.
6. Gopaldas, t. Seshadri, S. : Nutrition Monitoring a Assessment: Oxford University Press.
7. Mason, J. B., Habicht, J. P.; Tabatabai. H. Valverde. U.: Nutritional Surveillance, W.H.O.

CT7: FOOD COMMODITIES**4 CREDITS**

1. Cereals and Millets: Structure, processing, storage, use in various preparation, variety, selection and cost. Cereal products, breakfast cereals, fast food.
2. Pulses and Legumes: Structures, Selection and variety. Storage, Processing and use in different preparations, Nutritional aspects and cost.
3. Milk and Milk products : Composition, Classification, Selection Quality and Cost, Processing, Storage and uses in different preparations, Nutritional aspects, shelf life and spoilage.
4. Eggs: Production, grade, quality selection, storage and spoilage, cost nutritional aspects and use in different preparations.
5. Meat, Fish and Poultry: Types, Selection, Purchase, Storage, Uses, preparations Cost, Spoilage of fish Poultry and meat.
6. Vegetables and Fruits: Variety, Selection, purchase, storage, availability causes and nutritional aspects of raw and processed products and use in different preparations.
7. Sugar and sugar Products: Types of natural, sweeteners, manufacture, selection, storage and use as preserves, stages in sugar cookery.
8. Fats and Oils: Types and sources (animal and vegetable), Processing, uses in different preparations, storage, cost and nutritional aspects.
9. Raising and Leavening agents: Types, constituents, uses in cookery and bakery, storage.
10. Food Adjuncts: Spices, condiments, herbs, extracts; concentrates essences, food colours, origin, classification, description, uses, specifications, procurements and storage.
11. Convenience Foods: Role, types, advantages, uses, cost and contribution to diet.
12. Salt: Types and uses.
13. Beverages: Tea; Coffee. Chocolate and Cocoa Powder-Processing, cost and nutritional aspects, other beverages-Aerated beverages, juices.

1. Detection of starch, sucrose, formalin, boric acid, and urea in milk.
2. Detection of urea in puffed rice.
3. Detection of Vanaspati in Ghee/Butter.
4. Detection of Khesari flour in besan.
5. Detection of Metanil yellow in turmeric/coloured sweet products.
6. Detection of Argemone oil in edible oil.
7. Detection of artificially colour / foreign matter in tea (dust/leaves).

REFERENCE BOOKS/JOURNALS:

1. B. Srilakshmi : Food Science
2. Lavies, S (1998): Food Commodities Ltd. London.
3. Hughes, O. and Bennion, M (1970); Introductory Foods, Macmillan & Co., New York.
4. Pyke, M. (1974); Catering Service and Technology, John Murrey Pube,' London.

FOURTH SEMESTER

[TOTAL CREDITS/ CORE COURSE: 6 (THEORY-4, PRACTICAL-2)]

CT8: HUMAN NUTRITION-II

4 CREDITS

1. Nutrition During Pregnancy: Factors (non-nutritional) affecting pregnancy outcome, importance of adequate weight gain during pregnancy, antenatal care and its schedule, Nutritional requirements during pregnancy and modification of existing diet and supplementation, Deficiency of nutrients, specially energy, iron folic acid, protein, calcium, iodine. Common problems of pregnancy and their managements, specially -

nausea, vomiting, pica, food aversions, pregnancy induced hypertension, obesity, diabetes. Adolescent pregnancy.

2. Nutrition during Lactation: Nutritional requirements during lactation, dietary management, food supplements, galactogogues, preparation for lactation. Care and preparation of nipples during breast feeding.
3. Nutrition during Infancy: Infant physiology relevant to feeding and care, Breast feeding-colostrum, its composition and importance in feeding, Initiations of breast feeding. Advantages of exclusive breast feeding. Basic principles of breast feeding. Introduction of supplementary foods, initiation and management of weaning, Baby-led weaning. Bottle feeding-circumstances under which bottle feeding is to be given. Care & sterilization of bottles. Preparation of formula. Mixed feeding, breast feeding and artificial feeding.
4. Management of preterm and low birth weight babies.
5. Nutritional needs of toddlers, preschool, school going children-and adolescents- Dietary management

CP8: HUMAN NUTRITION-II (PRACTICAL)

2 CREDITS

Planning and preparation of adequate meal for different age groups with special reference to different physiological conditions: infants, pre-schooler, school children, adolescents, adults, pregnancy, lactation and old age.

REFERENCE BOOKS/JOURNALS:

1. B. Srilakshmi: Dietetics, New Age International Publishers.
2. Guthrie, A. H.: Introductory Nutrition, 6th Ed. The C. V. Mosby Company.
3. Robinson, C. H. Lawler, M. R.; Chei Toweth, W. L. and Garwick, A. E. : Normal and Therapeutic Nutrition. 17th Ed. Mac Millan Publishing Co.
4. Swaminathan, M. : Essentials of Foods and Nutrition, Vols -1 and II. Ganesh and Co. Madras.
5. Gopalan, C. et. al : Nutritive value of Indian Foods, Indian Council of Medical Research.
6. Indian Council of Medical Research : Nutrient Requirements and Recommended Dietary Allowance for Indians, New Delhi.
7. FAO/WHO/UNO : Technical Report Series, 724 (1985). Energy and Protein Requirement, Geneva.
8. WHO Technical Reports Series for different Nutrients.

9. Ghosh, S.: The Feeding and Care of Infants and Young Children, VHAI. 6th Ed. Delhi.
10. WHO : A growth chart for International use In Maternal and Children Health Care, Geneva.
11. Mann and Truswell: Essentials of Human Nutrition, Oxford University press.

CT9: DIET THERAPY-I

4 CREDITS

1. Basic concepts of diet therapy: Therapeutic adaptations of normal diet, principles and classification of the therapeutic diets.
2. Team approach to health care. Assessment of Patient's needs.
3. Routine Hospital Diets: Regular, light, soft, fluid, parenteral and enteral feeding.
4. Diets for different febrile conditions: influenza, malaria and typhoid.
5. Etiological factors, symptoms, and management of common diseases of stomach- Gastritis and Peptic ulcer.
6. Etiology, symptoms, and management of intestinal diseases: Diarrhoea, steatorrhoea, Diverticular disease, inflammatory bowel disease, Ulcerative Colitis, Flatulence, Constipation, Irritable Bowel Syndrome.
7. Diseases of the liver and Biliary System: Liver function tests. Etiology, symptoms, dietary care and general management of Viral Hepatitis and Cirrhosis of liver. Dietary care and management of Gall Bladder diseases –Cholecystitis and Cholelithiasis.
8. Anaemias: General concept, aetiology, classification, and dietary management of Nutritional anaemia.

CP9: DIET THERAPY-I (PRACTICAL)

2CREDITS

1. Planning and preparation of normal diets.
2. Planning and preparation of fluid diets.

3. Planning and preparation of soft/semi solid diets.
4. Planning and preparation of Diets for the following diseases:
 - i) Peptic ulcer
 - ii) Viral hepatitis
 - iii) Anaemia

REFERENCE BOOKS/JOURNALS:

1. Anderson, L., Dibble, M.V., Tukki, P.R., Mitchall, H.S., and Rynbergin H.J.: Nutrition in Health and Disease, 17th edition, J. B. Lipincott & Co. Philadelphia.
2. Anita F. P.: Clinical Dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
3. Mahan, L. K., Arlin, M. T.: Krause's Food, Nutrition and Diet Therapy. 8th edition, W. B. Saunders Company, London.
4. Robinson. C.H. Lawler, M.R. Chenoweth, W. L., and Garwick, A. E. (1986): Normal and Therapeutic Nutrition. 17th edition, MacMilian Publishing Co.
5. Williams. S. R.: Nutrition & Diet Therapy, 6th edition, Times Mirror/Mosby College Publishings, St. Louis.
6. Raheena, Begum: A textbook of food, nutrition and dietetics Sterling Publishers, New Delhi.
7. Joshi, S. A. : Nutrition and Dietetics, Tata McGraw Hill, Publications, New Delhi.

CT10: NUTRITIONAL BIOCHEMISTRY-I

4 CREDITS

1. Introduction to Biochemistry: Definition, objectives, scope and inter relationship between biochemistry and other biological science.
2. Enzymes: Definition, types and classification of enzymes, definition and types of coenzymes, Functions of coenzymes and cofactors, Specificity of enzymes, Isozymes, enzyme Kinetics including factors affecting enzyme action, velocity of enzyme catalysed reactions, regulations of enzyme activity, zymogen, allosteric enzymes, enzyme inhibition.

3. Intermediary metabolism: Carbohydrate Metabolism, Glycolysis, TCA cycle & energy generation, HMP Shunt pathway, gluconeogenesis, glycogenesis, glycogenolysis, blood sugar regulation.
4. Lipids: Oxidation and biosynthesis of fatty acids (saturated & mono-unsaturated), Synthesis and utilization of ketone bodies, Ketosis, fatty livers, Essential Fatty acids, Cholesterol and its clinical significance.

CP10: NUTRITIONAL BIOCHEMISTRY-I (PRACTICAL)

2 CREDITS

1. Qualitative analysis of carbohydrates (monosaccharides, Disaccharides, polysaccharides)
2. Quantitative estimation of Sugars (Glucose, lactose, starch)
3. Estimation of acid value, iodine value, Saponification value of fats
4. Estimation of blood Glucose
5. Estimation of serum cholesterol

REFERENCE BOOKS/JOURNALS:

1. Murray, R. K. Grannen, D. K.; Mayes, P. A. and Rodwell. V. W: Harper's Biochemistry. Lange Medical Book.
2. Handler, P.: Smith E.I.; Stelten, D. W. : Principles of Biochemistry, Me. Grew Hill Book Co.
3. Lehninger, A.L.; Nelson, D. L. and Cox, M. M. Principles of Biochemistry. CBS Publishers and Distributors.
4. Devlin, T. M. : Text Book of Biochemistry with Clinical Co-relations. John Wiley and Sons.
5. Stryer. L. Biochemistry. Freeman W.H. and Co.
6. Assaini. J. Kaur. Text Book of Biochemistry. C.B.S. Publication.

FIFTH SEMESTER

[TOTAL CREDITS: 6 (THEORY-4, PRACTICAL-2)]

CT11: DIET THERAPY-II

4 CREDITS

1. Energy modifications and nutritional care for weight management: Assessment, etiology, complications, prevention and treatment of obesity and underweight.
2. Diet in disease of the endocrine pancreas: Diabetes Mellitus: Classification, symptoms, diagnosis, management -insulin therapy, oral hypoglycaemic agents, glucose monitoring at home, dietary care and nutrition therapy, meal plan (with and without insulin), special diabetic foods and artificial sweeteners.
3. Hypertension: classification, aetiology, symptoms and dietary management.
Diseases of the cardiovascular system: Definition of infarct, ischemia, angina pectoris, myocardial infarction, heart attack and stroke.

Atherosclerosis and hyperlipidaemias – classification, symptoms, dietary and lifestyle management. Prevention of cardiovascular diseaseS.
4. Renal Diseases: Etiology, symptoms and dietary management of acute and chronic Glomerulonephritis. Nephrotic syndrome - dietary management. Uraemia – dietary Nephrolithiasis - dietary management. Use of sodium and potassium exchange list.

CP11: DIET THERAPY-II (PRACTICAL)

2 CREDITS

Planning and preparation of Diets for the following diseases:

- i) Obesity and Underweight
- ii) Diabetes mellitus
- iii) Hypertension and Atherosclerosis
- iv) Acute and chronic glomerulonephritis

REFERENCE BOOKS/JOURNALS:

1. Anderson, L., Dibble, M.V., tukki, P.R., Mitchall, H.S., and Rynbergin H.J.: Nutrition in Health and Disease, 17th edition, J. B. Lipincott & Co. Philadelphia.

2. Anita F. P.: Clinical Dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
3. Mahan, L. K., Arlin, M. T.: Krause's Food, Nutrition and Diet Therapy. 8th edition, W. B. Saunders Company, London.
4. Robinson. C.H. Lawler, M.R. Chenoweth, W. L., and Garwick, A. E. (1986): Normal and Therapeutic Nutrition. 17th edition, MacMillan Publishing Co.
5. Williams. S. R.: Nutrition & Diet Therapy, 6th edition, Times Mirror/Mosby College Publishings, St. Louis.
6. Raheena, Begum: A textbook of food, nutrition and dietetics Sterling Publishers, New Delhi.
7. Joshi, S. A. : Nutrition and Dietetics, Tata McGraw Hill, Publications, New Delhi.

CT12: NUTRITIONAL BIOCHEMISTRY-II

4 CREDITS

1. Brief Introduction of biological membranes to understand molecular transport, Transport of Large molecules, Receptor mediated endocytosis, exocytosis, Molecular aspects of transport; Passive diffusion, facilitated diffusion, active transport.
2. Introduction to Nucleic acids: Structure, replication, transcription, genetic code (in brief) elementary knowledge of biosynthesis of proteins.
3. Proteins: General reaction of amino acid metabolism, urea cycle. Lipoproteins: Types, composition, role and significance in disease(in brief)
4. Vitamins: Chemistry and biochemical role of fat soluble vitamins. A. D. E. and K. Water soluble vitamins – B1, B2, B6 niacin and C.
5. Minerals: Biochemical role of inorganic elements.

CP12: NUTRITIONAL BIOCHEMISTRY-II (PRACTICAL)

2 CREDITS

1. Qualitative analysis of amino acids
2. Qualitative analysis of proteins
3. Estimation of serum Protein
4. Estimation of serum creatinine
5. Estimation of serum Urea
6. Estimation of serum Iron, phosphorus, calcium

REFERENCE BOOKS/JOURNALS:

1. Murray, R. K. Grannen, D. K.; Mayes, P. A. and Rodwell. V. W: Harper's Biochemistry. Lange Medical Book.
2. Handler, P.: Smith E.I.; Stelten, D. W. : Principles of Biochemistry, Me. Grew Hill Book Co.
3. Lehninger, A.L.; Nelson, D. L. and Cox, M. M. Principles of Biochemistry. CBS Publishers and Distributors.
4. Devlin, T. M. : Text Book of Biochemistry with Clinical Co-relations. John Wiley and Sons.
5. Strayer. L. Biochemistry. Freeman W.H. and Co.
6. Assaini. J. Kaur. Text Book of Biochemistry. C.B.S. Publication

SIXTH SEMESTER

[TOTAL CREDITS: 6 (THEORY-4, PRACTICAL-2)]

CT13: FOOD MICROBIOLOGY

4 CREDITS

1. Brief history of food microbiology and introduction to important microorganisms in foods.
2. Cultivation of microorganisms, Nutritional requirements of microorganisms, types of media used, methods of isolation.
3. Primary sources of microorganisms in foods, physical and chemical methods used in the destruction of microorganism in foods: (Sterilisation & Disinfection).
4. Fundamentals of control of microorganism in foods: Extrinsic and intrinsic parameters affecting growth and survival of microbes, use of high and low temperature, dehydration, freezing, freeze-drying, irradiation and preservatives in food preservation.

5. Food Spoilage: Contamination and microorganisms in the spoilage of different kinds of foods and such as cereal and cereal products, vegetable and fruits, fish and other sea foods, meat and meat products, eggs and poultry, milk and products, canned foods.

CP13: FOOD MICROBIOLOGY (PRACTICAL)

2 CREDITS

1. Introduction to microbiology:
Use of equipments

Understanding and use of compound microscope

Use of Autoclave

Use of Incubator and Inoculation chamber
2. Microscopic identification of microorganisms (prepared slides) : Bacterial, fungal strains
3. Preparation of liquid and solid media for culture of microorganisms.
4. Staining Techniques to study of Morphology of bacterial cells

Simple staining with methylene blue, methyl violet, carbol fuschion, etc

Differential staining with Gram stain technique
5. Microbiological techniques: Pure culture technique-Spread plate, Pour plate and Streak plate.

REFERENCE BOOKS/JOURNALS:

1. Frazier, W. C. and Westhoff, D. C. (1988): 4th edition, Food Microbiology, McGraw Hill Inc.
2. Jay James. N. (1986) : 3rd edition, modern Food Microbiology, Van Nestrand Reinhold Company Inc.

3. Pelczar, M.I. and Reid, K. D. (1978): Microbiology, McGraw Hill Company, New York.
4. Benson Harold, J. (1990) : Microbiological Application, Publishers, U.S.A.
5. Colling, C.E. and Lyne, P.M. (1976) : Microbiological Methods Butterworth. London
6. Jay JM, Modern Food Microbiology, CBS Publication New Delhi 3rd Ed. 1987
7. Bamrart George J, Basic food Microbiology, CBS Publication, New Delhi, 1987
8. Brain J. Wood Elsierver, Microbiology of Fermented Foods, Vol II & I, Applied Science Publication.
9. Joshi, Biotechnology: Food Fermentation Microbiology, Biochemistry & Technology, Vol II
10. Pelczar MJ, Microbiology, Tata Mc Graw Hill Publishing Company Limited, New Delhi, 1993

CT14: FOOD PRESERVATION

4 CREDITS

1. Food preservation: definition, objectives and principles of food preservation. Different methods of food preservation.
2. Preserved Products: Jam, Jelly, Marmalade, Sauces, Pickles, Squashes, Syrups- types, composition and manufacture, selection, cost, storage, uses and nutritional aspects.
3. Food Standards : ISI, Agmark, FPO, MPO, PFA.

CP14: FOOD PRESERVATION (PRACTICAL)

2 CREDITS

1. Different methods of Food preservation – Drying, Freezing, Frying, canning, bottling etc.
2. Aseptic handling: Sources of contamination of foods.
3. Preparation of pickles, tomato sauce, chili sauce, jelly, tomato puree, squashes etc.

REFERENCE BOOKS/JOURNALS:

1. Subalakshmi, G and Udipi, S.A. Food processing and preservation; New Age International Publishers, New Delhi, 2001.
2. Srilakshmi, B. Food Science. New Age International Publishers, New Delhi, 2003.
3. Potter, N.N. and Hotchkiss J. H. Food Science. CBS publishers and distributors. 1996.
4. Srivastava, R.PO and Kumar, S. Fruit and vegetable preservation, International Book distribution Company, Lucknow, 1994.
5. MC Williams, M and Paine, H. Modern Food preservation. Surjeet Publications, Delhi, 1984.
6. Cruess, W.V. Commercial Fruits and Vegetable Products, Anees Offset press, New Delhi, 1997

DSE SYLLABUS

DSE1 T: PUBLIC HEALTH

4 CREDITS

1. Health and Dimension of Health: Positive health Versus Absence of disease.
2. Secondary Sources of Community Health data :Sources of relevant vital statistics of infant, child & maternal mortality rates
3. Immunization: Importance and Immunization schedule for children, adults and for foreign travellers.
4. Community Water and Waste Management: Importance of water to the community, etiology and effects of toxic agents, water borne infectious agents, sources of water, safe drinking water, potable water, waste and waste disposal, sewage disposal and treatment, solid waste and disposal, liquid waste disposal.
5. Concept of Epidemiology: Study of the epidemiologic approach-determinants of disease preventive & social means.
6. Communicable and infective disease control: Nature of communicable and infectious diseases, infection, contamination, disinfections, decontamination, transmission-direct & indirect, vector borne disease infecting organisms and positive agents, environmental agents and epidemiological principles of disease control.
7. Public health hazards due to contaminated foods: Food borne infections and intoxications: symptoms, mode of transmission and methods of prevention, investigation and detection of food borne disease out-break.

DSE1 P: PUBLIC HEALTH (PRACTICAL)

2 CREDITS

1. Preparation of 3 audio visual aids like charts, posters, models related to health and nutrition education.
2. Formulation and preparation of low cost and medium cost nutritious/ supplementary recipe.
3. Field visit(health centre, immunization centre, ICDS, MCH centre, NGOs etc.)

REFERENCE BOOKS/JOURNALS:

1. Smith, G.W.: Preventive Medicine and public health. 2nd edition. McMillan Co. New York.

2. Park: Park's Textbook of preventive and Social Medicine. 9th edition. M/s. Banarasidas Bhanot. Jabalpur.

DSE2 T: FOOD SERVICE MANAGEMENT

4 CREDITS

1. Organization of food service management: Definition, Various types of Food Service institutions, their characteristics and functions.
2. Planning a food service unit, layout design, planning of different work areas – preparation, cleaning, storing, serving and dining areas. Lighting and ventilation, working heights in relation to equipment.
3. Institutional Menu Planning: Factors influencing menu planning, principles of menu planning, different kinds of menus.
4. Quality food Service – types-Centralized, de-centralized objectives. Styles of service.
5. Importance of sanitation and hygiene in food, kitchen hygiene, Hygienic handling of Food, employee's health, hygiene of food service unit.
6. Personnel Management- selection, training and supervision of personnel, criteria for selection of Dietitian and Food Service staff.

DSE2 P: FOOD SERVICE MANAGEMENT (PRACTICAL)

2 CREDITS

1. Visit to catering Institute to make an idea for organising ,preparing and serving food for different meals.
2. Cleaning and setting of cutlery, crockery and other equipments
3. Preparation of dishes from Indian and continental cuisines

REFERENCE BOOKS/JOURNALS:

1. Food Service Operations, Mahmood A. Khan Avi Publication Co. 1987
2. Table Layout and Decoration, Dorothy Tompkins, Ward Lock Co. Ltd, 1969
3. The Theory of Catering, Ronald Kinton and Victor Caserani, 6th Edition, ELBS, 1989
4. Food Service Facilities Planning by Kazarian Edward, 3rd Edn, 1989

DSE3 T: SPORTS NUTRITION CREDITS

4

1. Definition of physical activity, exercise, physical fitness, sports physiology and sports nutrition.
2. Components of physical fitness. Benefits of physical activity and exercise.
3. Energy system in exercise.
4. Nutritional requirements for sports person.
5. Pre- event meal
6. Ergogenic aids for improving athletic performance.

**DSE3 P: SPORTS NUTRITION (PRACTICAL)
CREDITS**

2

1. Calculation of energy requirement according to physical activity level of sports person.
2. Nutritional assessment of athletes.
3. Review on ergogenic nutritional products and supplements available in market.

REFERENCE BOOKS/JOURNALS:

1. Sports Nutrition: Enhancing Athletic Performance Bill I CampBell . CRC Press, Taylor& Francis, 2014.
2. Essentials of Sports Nutrition Study Guide, G. Gregory Haff, Humana Press,2008.
3. Nutritionfor Sport and Exercise, M. Dunford and J. A. DoyleThomson Wadsworth,2008

DSE4 T: GERIATRIC NUTRITION

4 CREDITS

1. Definition of ageing, senescence, old age or aged people, gerontology, geriatrics, and Geriatric nutrition. Classification of old population.
2. Physiological and biochemical changes during old age.
3. Assessment of nutritional status of older adults.
4. Nutritional requirements and general dietary guidelines for elderly .
5. Major nutritional and health problems during old age.

DSE4 P: GERIATRIC NUTRITION (PRACTICAL)

2 CREDITS

1. Visit to old- age homes.
2. Preparation of dishes suitable for older person- soft ,semisolid and easily digestible balanced diet.

REFERENCE BOOKS/JOURNALS:

1. Human Nutrition by H. Guthrie and M.F. Piccianom, WCB McGrawHill,1995.

2. Normal and Therapeutic Nutrition by Robinson, Lawler, Chenoweth & Garwick, Revised 17th Ed. 1991, Benjamin Cummings
3. Nutrition by P. M. Insel, R. E. Turner, D. Ross, Jones & Bartlett Learning, 2004

DSE5 T: NON-FORMAL ADULT AND LIFE LONG EDUCATION

4 CREDITS

1. Non Formal Education, Difference between formal & Non-Formal Education, Significance of Non-Formal Education in India New education policy & NFE Scope of NFE in communities- Techniques of community study, Domains of Non-Formal Education
2. Organizing NFE programmes- target group; Physical aspects; organizing and implementation Publicity of Non-Formal Programme; Planning and implementing publicity plan.
3. Adult Education: Meaning, concept and scope of Adult Education, Adult Education programme in India, Adult Education and Extension, Characteristics of Adult Learners, Difference between Adult & Child learning Learning theories; Characteristics of Adult learning, developmental tasks of Adults, Factors associated with Adult learning, Motivating and sustaining Adult learners.
4. Life Long Education : Definition, meaning and concept of Life Long Education, Life Long Education: Historical and contemporary perspectives, Components and objectives of Life Long Education, Significance of Life Long Education in contemporary society, Forms and domains of Life Long Education, Principles of Life Long Education
5. Methods and Material for Non Formal/Adult/ Life Long Education: Methods and approaches for organizing NFE programmes for different target groups, Scope of communication methods and materials for NFE objectives
6. Programmes of Non Formal/Adult/ Life Long and Continuing Education: National and international programmes. Local, State, National and international agencies- policy and programmes, Monitoring and evaluation of NFE /Adult/ Life Long and Continuing Education programmes .

DSE5 P: NON-FORMAL ADULT AND LIFE LONG EDUCATION (PRACTICAL)

2 CREDITS

1. Visits to different NGO's involved in Non Formal/Adult/Life Long Education
2. Inviting experts from Government/Universities/ NGO's to share their experience of Non Formal/Adult/Life Long Education.
3. Reporting of Literacy news, events from periodicals and news papers.
4. Planning and organizing NFE/ continuing education programmes

5. 5. Monitoring and Evaluation of programmes.

REFERENCE BOOKS/JOURNALS:

1. Mishra. L., Adult Education, A study of the trials, APH Publishing Corporation, New Delhi.
2. Chandra A., Shah A. 1987, Non Formal Education for All, Sterling Publishers, New Delhi.
3. Singh M., 2007, New Companion to Adult Educators, International Institute of Adult and Life Long Education, New Delhi.
4. Singh N. K, 2010, Adult Education, Saurabh Publishing House, New Delhi.
5. Khajuria D. P., New Trends in Indian Education, Narendra Publishing House, Jalandhar.

DSE6 T: THEORIES OF HUMAN DEVELOPMENT

4 CREDITS

1. Introduction to theories in Human Development : Key themes in the study of Human Development- Nature/nurture, active/ passive, continuity/discontinuity, individual differences and similarities Understanding a theory, Role of theories in understanding Human Development.
2. Perspectives on Human Development : Evolutionary and Ethological /Biological: Darwin, Lorenz, Bowlby, Ecological: Bronfenbrenner, Behavioural: Pavlov, Skinner, Bandura
3. Selected theories of human development : Psychodynamic; psychosexual and psychosocial theories; Freud, Erikson, Cognition: Piaget, Vygotsky, Models and Theories of Intelligence: Guilford, Spearman and Gardner, Humanistic: Maslow and Rogers.
4. Theories in everyday life: Eclectic theoretical orientation, Ethno theories.

DSE6 P: THEORIES OF HUMAN DEVELOPMENT (PRACTICAL)

4 CREDITS

1. Biography of a theorist with a focus on his/her family life and childhood experiences.
2. Depict the 'eco-cultural' network for a child using the ecological model of Bronfenbrenne .
3. Verification of selected theories using multiple methods
4. Observe/ analyze creation of media product for children or product such as toys/ clothes using theoretical base
5. Locate a tool/ scale of psychometric tests and administer it
6. Autobiography

REFERENCE BOOKS/JOURNALS:

1. Berger, J.M. (2010). Personality (8th ed.). Belmont, CA: Thomson/Wadsworth
2. Allen, B.P. (2006). Personality theories: Development, growth and diversity (5th ed.). Needham Heights, MA: Allyn and Bacon
3. Santrock, J.W. (2007). Lifespan Development (3rd ed.). New Delhi, Tata- McGraw Hill

4. Rice, P. (1995). Human Development: A Lifespan Approach. New Jersey, Prentice-Hall. Inc

**DSE7 T: CHILDHOOD DISABILITY AND SOCIAL ACTION
CREDITS**

4

1. Understanding Disability and Inclusion: Defining and understanding disability, Rights of persons with disability and UNCRPD, Perspective on disability: Individual and social, Attitudes towards disability- family, school, society and media
2. Types of Disability: Identification, assessment and etiology with reference to: Physical disabilities, Intellectual disability, Sensory disabilities- Visual and auditory IV. Learning disability, Autism
3. Disability and society: Overview of practices and provisioning related to addressing disability in India, Prevention, therapy, education and management, Families of children with disabilities, Policy and laws

**DSE7 T: CHILDHOOD DISABILITY AND SOCIAL ACTION (PRACTICAL)
CREDITS**

2

1. Visits- Government and Private Institutions and Organisations (CGC, schools, NGO's, Hospitals)
2. Observe the context
3. Case profile of child with disability
4. Program planning
5. Planning developmentally appropriate material for children with disability

REFERENCE BOOKS/JOURNALS:

1. Chopra, G., (2012). *Early Detection of Disabilities and persons with disabilities in the community*. New Delhi: Engage publications
2. Chopra, G., (2012). *Stimulating Development of Young Children with Disabilities at Anganwadi and at Home: A Practical Guide*. New Delhi: Engage publications.
3. Sharma, N. (Ed)(2010). *The Socail Ecology of Disability-Technical Series -3* Lady Irwin College. Delhi: Academic Excellence
4. Mangal, S. K. (2007). *Exceptional children: An introduction to special education*. New Delhi: Prentice Hall of India

5. Jangira, N.K.(1997) “Special Educational Needs of Children and Young Adults: An Unfinished Agenda,” *Education and Children with Special Needs: From Segregation to Inclusion*,Ed. Seamus Hegarty, Mithu Alur, Thousand Oaks: Sage Publications Inc.
6. Karna, G. N. (1999). *United Nations and rights of disabled persons: A study in Indian perspective*. New Delhi: A.P.H. Publishing Corporation.
7. Mani, R. (1988). *Physically handicapped in India*. Delhi: Ashish Publishing House.
8. Mastropieri, M. A., & Scruggs, T. E. (2004). *The inclusive classroom: Strategies for effective instruction*. NY: Pearson

DSE8 T: CHILD RIGHTS AND GENDER JUSTICE

1. Introduction to Child Rights: Concept of Child rights, Demographic profile of Indian children, Disadvantage, deprivation and social exclusion with reference to children, Laws, policies and programmes for children in India, UNCRC.
2. Children in need of care and protection: Vulnerable groups: causes and consequences. Street, homeless, institutionalized and working children
Child Abuse, Child Trafficking, Children in conflict with the law, Children living with: chronic illness, HIV.
3. Social construction of gender Socialization for gender: gender roles, stereotypes and identity, Gender in the workplace and in public spaces, Contemporary influences: media and popular culture, Demographic profile of women and children in India.
4. Gender and Indian society : Sex and Gender, Masculinity and Femininity, biological and cultural determinants, Patriarchy and social institutions, Being male and female in Indian society-social traditions and contemporary issues, Exploring the issues of violence against females, Laws, policies and programmes for children and women.

DSE8 P: CHILD RIGHTS AND GENDER JUSTICE(PRACTICAL) CREDITS

2

1. Visits to organizations working in the area of Child Rights and Gender to understand their objectives programmes and experiences.
2. Workshops on relevant issues like Gender, domestic violence, gendering of public spaces
3. Understanding child rights and gender issues in diverse social groups through field visits and interactions
4. Media portrayals of women and children.

REFERENCE BOOKS/JOURNALS:

1. Agarwal, A. & Rao, B.V. (2007). *Education of Disabled Children*. New Delhi: Eastern Book Corporation.
2. Agnes, F. (1999). *Law and Gender Inequality: The politics of Women’s Rights in India*.

SKILL ENHANCEMENT COURSE (SEC):

SEC1. MARKET SURVEY ON FOOD COMMODITIES

2 CREDITS

Market survey on nutritional significance, cost, consumer acceptability, availability in the local market

1. Cereal and pulse based food.
2. Fats and oils (conventional and unconventional)
3. Fast food, convenience food, junk food,
4. Frozen food, processed vegetables, processed meat & fish
5. Health drinks
6. Beverages

SEC2. TRAINING IN BAKERY INDUSTRY/TECHNOLOGY

2 CREDITS

1. Training programme in Bread/biscuit/cake/pastry Industries for 7-15 days.

2. Development of concept on materials used, machineries, technology involved, production, packaging, shelf life and marketing of finished products.

SEC3.DIET COUNSELING AND PATIENT CARE

2 CREDITS

Visit and training to hospitals/nursing homes for 7-15 days :

1. Taking Case history and study
2. Routine Hospital diet
3. Distribution of food from kitchen to individual patient with specific diet.
4. Dietary management of patient in different diseases and diet chart for the particular patient.
5. Role of dietitian /nutritionist in diet counseling

SEC 4. VISIT AND TRAINING OF MUSHROOM CULTURE

2 CREDITS

Visit and training to Mushroom Culture Centers/ Farms for 7-15 days :

1. Process involved in mushroom cultivation
2. Types and varieties of mushroom
3. Identification of edible and poisonous mushroom
4. Marketing