



UNIVERSITY OF CALCUTTA

GURUPADA SAREN

SECRETARY

COUNCILS FOR UNDERGRADUATE STUDIES,
UNIVERSITY OF CALCUTTA.

Ref.No : CUS/ 146 118
Dated the 28th March, 2018

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

Sir/Madam,

The undersigned is to inform you that the proposed **revised semester wise draft Syllabus for Food & Nutrition (General)** 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.**,

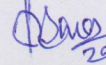
You are requested kindly to go through it and send your feedback within 13th April, 2018.

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,


29/03/18

Secretary


29/03/18

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

PROPOSED DRAFT SYLLABUS

FOR

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



UNIVERSITY OF CALCUTTA

2018

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

	CORE COURSE (CC) (12)	ABILITY ENHANCEMENT COMPULSORY COURSE (AECC) (2)	SKILL ENHANCEMENT COURSE(SEC) (2)	DISCIPLINE SPECIFIC ELECTIVE(DSE) (6)
I	CC-1AT: ELEMENTARY CHEMISTRY	ENGLISH/ MIL		
	CC-1AP: ELEMENTARY CHEMISTRY (PRACTICAL)			
	CC-2AT: FROM OTHER DISCIPLINE OF CHOICE			
	CC-2AP: FROM OTHER DISCIPLINE OF CHOICE			
	CC-3AT: FROM OTHER DISCIPLINE OF CHOICE			
	CC-3AP: FROM OTHER DISCIPLINE OF CHOICE			
II	CC-1BT: ELEMENTARY PHYSICS	ENVIRONMENTAL SCIENCE		
	CC-1BP: ELEMENTARY PHYSICS (PRACTICAL)			
	CC-2BT: FROM OTHER DISCIPLINE OF CHOICE			
	CC-2BP: FROM OTHER DISCIPLINE OF CHOICE			
	CC-3BT: FROM OTHER DISCIPLINE OF CHOICE			
	CC-3BP: FROM OTHER DISCIPLINE OF CHOICE			
III	CC-1CT: ELEMENTARY PHYSIOLOGY		SEC-1	
	CC-1CP: ELEMENTARYPHYSIOLOGY (PRACTICAL)			
	CC-2CT: FROM OTHER DISCIPLINE OF CHOICE			
	CC-2CP: FROM OTHER DISCIPLINE OF CHOICE			
	CC-3CT: FROM OTHER DISCIPLINE OF CHOICE			
	CC-3CP: FROM OTHER DISCIPLINE OF CHOICE			
IV	CC-1DT: BASIC NUTRITION AND FOOD SCIENCE		SEC-2	
	CC-1DP: BASIC NUTRITION AND FOOD SCIENCE (PRACTICAL)			
	CC-2DT: FROM OTHER DISCIPLINE OF CHOICE			
	CC-2DP: FROM OTHER DISCIPLINE OF CHOICE			

	CC-3DT: FROM OTHER DISCIPLINE OF CHOICE CC-3DP: FROM OTHER DISCIPLINE OF CHOICE			
V			SEC3	DSE-1A
				DSE-2A
				DSE-3A
VI			SEC-4	DSE-1 B
				DSE- 2B
				DSE-3B

DISTRIBUTION OF CREDITS IN THE COURSE CURRICULUM

Semester	NAME OF THE COURSE				Total Credits
	Core Course (CC)	Ability Enhancement Compulsory Course (AECC)	Skill Enhancement Course (SEC)	Discipline Specific Elective (DSE)	
I	6x3= 18	2x1=2			20
II	6x3= 18	2x1=2			20
III	6x3= 18		2x1=2		20
IV	6x3= 18		2x1=2		20
V			2x1=2	6x3=18	20
VI			2x1=2	6x3=18	20
Total credits	CC (12x6=72)	AECC (2x2=4)	SEC (4x2=8)	DSE (6X6=36)	120

NOTE:

- 12 papers for Core Courses (CCs) from 03 Disciplines of Choice(DSC) should be compulsorily studied for BSc. General students. 4 courses from each of the DSC subjects are to be studied by the BSc General students.

2. The CC or DSC is equivalent to Generic Elective (GE) for BSc. (Honours) students of other discipline .
3. 6 DSE & 1/2 SEC to be chosen by the Food and Nutrition(General) students (Choice based).
4. GE subjects in Food and Nutrition Syllabus are to be studied by other discipline students.

GENERIC ELECTIVE (GE)

CC-1AT: ELEMENTARY CHEMISTRY

4 CREDITS

1. Law of conservation of mass, chemical and physical changes, Mechanical mixtures and chemical compounds
2. Common Laboratory Processes: Sedimentation, Decantation, Filtration, Solution, Evaporation, Boiling, Desiccation, Distillation, Sublimation, Fusion, Ignition, Crystallisation, Efflorescence, Deliquescence.
3. Symbol, Valency, Formula, Equation, Naming of Compounds, Radicals.
4. General concept of acids, bases and salts, conjugate acids and bases, Classification of salts, Hydrolysis of salts, pH, Buffer solution. Equivalent weight of acids, bases and salts, neutralisation, Acid-Base indicators, Molar solution, Normal solution and Formula solution.
5. Diffusion and Osmosis, Osmotic pressure, Isotonic solution, Definition and examples.
6. Colloids: Definition, Types of colloidal systems, Important properties of colloidal sols, Dialysis.
7. Structure of atom: Discovery of atomic nucleus, Rutherford's atomic model, concept of Stationary orbit, Electronic arrangement of elements (Hydrogen to calcium), Atomic number, Isotopes, Chemical bonds – Electrovalent, Covalent and coordinate – covalent bonds, Hydrogen bonds.
8. Chemistry of carbon compounds: Classification of organic compounds based on structural characteristics and functional groups, isomerism, Concept of optical

isomerism. General methods of preparation, properties and reactions of structured and unstructured hydrocarbons, Aliphatic monohydric alcohols, Glycerol, Aldehyde, Ketones and fatty acids upto 3 atoms with nomenclature.

CC-1AP: ELEMENTARY CHEMISTRY (PRACTICAL)

2 CREDITS

1. Fitting of simple apparatus, experiment involving solution, filtration, distillation, and crystallization. Separation of constituents of mixture.
2. Titration of acids and bases. Determination of total hardness of water by soda reagent. Estimation of glucose.
3. Simple chemical tests for carbohydrate- Starch, glucose, cane sugar, lactose, and dextrin.
4. Qualitative tests-Protein in milk and egg, Calcium, phosphorus, and iron in foodstuff.

CC-1BT: ELEMENTARY PHYSICS

4 CREDITS

1. Units –C.G.S. and F.P.S. system
2. Measurement of mass and weight, common and spring balance.
3. Motion of body – displacement, velocity, acceleration units.
4. Gravity – Acceleration due to gravity.
5. Hydrostatics–Pressure at a point, Archimedes Principles, Specific gravity, viscosity and surface tension.
6. Thermometry.
7. Calorimetry.
8. Transmission of heat, Thermoflask.
9. Three types of matter, changes of state, pressure cooker, Ice-machine.
10. Static electricity – Changing by friction, conductor and Insulator.
11. Primary cell, storage cell.
12. Electroplating.
13. Definition of Potential, Current-relation between two.
14. Measurement of current by ammeter and potential differential by voltmeter.
15. Electricity and its application in daily life – lamp, Toaster, Geyser, iron, Micro-oven.
16. Refrigerator, cold storage.
17. Electric fuse.

CC-1BP: ELEMENTARY PHYSICS (PRACTICAL)

2 CREDITS

1. Use of balance(Weighing a body)
2. Determination of specific gravity of a solid (heavier and insoluble in water).
3. Determination of specific gravity of a liquid by hydrostatic balance.

4. Determination of specific gravity of a liquid by specific gravity bottle.
5. Reading of barometer.
6. Determination of lower and upper fixed point of a thermometer.
7. Fitting of electric fuses.

CC-1CT: ELEMENTARY PHYSIOLOGY

4 CREDITS

1. Animal cell: Structure and function.
2. Tissue: Definition, structure and functions of different types of tissue, e.g. epithelial, connective, nervous and muscular tissue (special emphasis on blood and bone).
3. Digestive system: Structure involve in digestive system (mouth, oesophagus, stomach, small intestine, large intestine, liver, pancreas, gall bladder) and their functions. Digestion and absorption of Carbohydrate, protein and fat.
4. Elementary idea of metabolism, enzymes and hormones- name and their important functions. Metabolism in brief (Glycolysis, Glycogenesis, Gluconeogenesis, Cori's cycle, Krebs's cycle, Deamination, Transamination. Role of hormones in carbohydrate metabolism.

CC-1CP: ELEMENTARY PHYSIOLOGY (PRACTICAL)

2CREDITS

1. Demonstration for determination of blood pressure of humans being- (a) systolic and b) diastolic.
2. Identification of slides (Blood cells, Stomach, Small intestine, large intestine, Liver, pancreas).
3. Determination of Bleeding Time (BT) and Clotting Time (CT).
4. Detection of Blood group.

CC-1DT: BASIC NUTRITION AND FOOD SCIENCE

4 CREDITS

1. Definition of Food, Nutrition, Nutrient, Nutritional status, Dietetics, Balance diet, Malnutrition, Energy (Unit of energy – Joule, Kilocalorie).
2. Carbohydrate, Protein, Fat, Vitamins and Minerals (calcium, phosphorus, sodium, potassium, iron, iodine, fluorine)- sources, classification, functions, deficiencies of these nutrients. Functions of water and dietary fiber.
3. B.M.R: Definition, factors affecting B.M.R. and Total Energy Requirement (Calculation of energy of individuals).
4. Basic five food groups: Nutritional significance of cereals, pulses, milk, meat, fish, vegetable, egg, nuts, oils, sugar.
5. Principles and objectives of meal planning. Diet for an infant (Breast feeding versus Bottle feeding).Preschool child, school child, Normal male and female of different occupation.

CC-1DP: BASIC NUTRITION AND FOOD SCIENCE (PRACTICAL) 2 CREDITS

1. Elementary idea of weight and measure.
2. Preparation of cereals, pulses, vegetable, egg, milk, fish, nuts.
3. Demonstration of jam, jelly, squash, pickles.
4. Planning and preparation of diet often adult male/female Modification of diet during pregnancy and lactation.

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSES

DSE1T: COMMUNITY NUTRITION**4 CREDITS**

1. Concept and types of Community. Concept of community nutrition.
2. Nutritional Assessment: Meaning, need, objectives and importance. A brief idea on methods of nutritional assessment.
3. Elementary idea of health agencies - FAO, WHO, ICMR, ICDS, ICAR, CSIR, ANP, VHAI, NIN and CFTRI. Role of voluntary health organisation in the improvement of Community health.
4. Nutritional Intervention programmes to combat malnutrition. Concept of food fortification and food enrichment.
5. Nutrition Education: Definition, objectives of nutrition education. Methods of imparting nutrition education.

DSE1P: COMMUNITY NUTRITION (PRACTICAL)**2CREDITS**

1. Preparation of homemade ORS.
2. Preparation of weaning foods for infants.
3. Preparation of low cost and medium cost school tiffin.
4. Diet survey by 24 hours recall method.

DSE2T: PUBLIC HEALTH**4 CREDITS**

1. Concept of health and community health. Factors affecting Community health.
2. Maternal and Child mortality: Definitions and causes, Role of health workers in the improvement of maternal and child health.
3. Immunization: Importance and Immunization schedule for children and adults.
4. General idea about the contamination of food (Chemical and microbial)-Sources and transmission, Elementary ideas about food toxins, aflatoxin & food toxicology with reference to Lead, Cadmium & Zinc.
5. Contamination of water and prevention of contamination, different methods of water purification, water -borne diseases, elementary idea of microbiology of water-borne

pathogens, diarrhoea, dysentery, typhoid, hepatitis, preventive measures and dietary management of such diseases.

DSE2P: PUBLIC HEALTH (PRACTICAL)

2 CREDITS

1. Calculation of BMI of an individual and interpretation of result.
2. Growth charts - plotting of growth charts for growth monitoring.
3. Formulation and demonstration of nutrition education tools such as charts, posters, models related to health and nutrition education.

DSE3T: CLINICAL NUTRITION

4 CREDITS

1. Definition of Dietetics, dietitian, Goals of Diet Therapy.
2. Basic concepts of Diet Therapy: Therapeutic adaptations of the normal diet. Routine hospital diets –Regular, soft, full fluid, clear fluid diet. Specially modified therapeutic diets.
3. Obesity and underweight: Causes, risk factors, dietary and general management of overweight and underweight.
4. Diarrhoea, Constipation and Jaundice: Causes, symptoms and dietary management.
5. Anaemia: Definition, causes, classification, and dietary management of Nutritional anaemia.
6. Hypertension, Atherosclerosis and Diabetes mellitus: Definition, Causes, Types, risk factors, Signs, Symptoms and dietary Management.
7. Fever: Definition, causes, types, symptoms and dietary management.

DSE3T: CLINICAL NUTRITION (PRACTICAL)

2 CREDITS

1. Planning and preparation of Therapeutic Diets for the following diseases:

- i) Diabetes mellitus
- ii) Hepatitis
- iii) Hypertension
- iv) Obesity

DSE4T: FOOD SAFETY AND QUALITY CONTROL

4 CREDITS

1. The relationship of microorganisms to sanitation, Effects of microorganisms on food degradation and food-borne illnesses.
2. Importance of personal hygiene of food handlers: Habits, clothes, illness, education of food handler in handling and serving food. Concept of food contamination.
3. Food Safety: Definition and factors affecting food safety, safety of left over foods. Control of Food spoilage.
4. Food Adulteration: Definition, reasons and types. Adulterants in common food items.
5. Food Laws and Standards:
 - i) Codex Alimentarius
 - ii) Prevention of Food Adulteration (PFA) Act
 - iii) Agmark
 - iv) Fruit Products Order (FPO)
 - v) Meat Products Order (MPO)
 - vi) Bureau of Indian Standards (BIS)
 - vii) Food Standards and Safety Authority of India (FSSAI)

DSE4T: FOOD SAFETY AND QUALITY CONTROL (PRACTICAL)

2 CREDITS

1. Detection of common adulterant in food:
 - i) Khesari flour in besan
 - ii) Vanaspati in Ghee/Butter.
 - iii) Dried papaya seeds in black pepper
 - iv) Metanil yellow in turmeric or coloured sweet products.
 - v) Artificially foreign matter in tea (dust/leaves).

SKILL ENHANCEMENT COURSE(SEC)

SEC1P: FOOD PRESERVATION

2 CREDITS

1. Elementary idea on food preservation: principles and different methods – drying, freezing, frying, canning etc.
2. Visit to food preservation centre/ industry and demonstration of preparation and packaging of jam, jelly, chilli sauce, tomato ketchup, squash, pickles etc.

SEC2T: NUTRITION AND FITNESS

2 CREDITS

1. Understanding Fitness: Definition of fitness, health and related terms. Assessment of fitness, Approaches for keeping fit.
2. Importance and benefits of physical activity: Physical Activity – frequency, intensity, time and type with examples Physical Activity, physical activity guidelines and physical activity pyramid.
3. Importance of nutrition Role of nutrition in fitness, Nutritional guidelines for health and fitness, Nutritional supplements.
4. Importance of diet and exercise for weight management.

REFERENCE BOOKS FOR FOOD AND NUTRITION GENERAL COURSE

CHEMISTRY AND PHYSICS

1. Maity S and Ganguly M (2010): Elements of chemistry (part- I & part-II) for H. S. Publishing Syndicate.
2. Palit SR(1975): Elementary Physical Chemistry, New Delhi: Book Syndicate Private Limited.
3. Rakshit PC (2004): Physical Chemistry. 7th ed. Sarat Book Distributers.
4. Mondal AK (2001). Degree Bhouto O Sadharan Rasayan. Sarat Book Distributers

5. Bahl BS and Bahl A (2012): Advanced Organic Chemistry. 21st ed. New Delhi: S. Chand Publishing.
6. Avery M. (1955). Household Physics: A Textbook for College Students in Home Economics. 3rd ed. Macmillan, Indiana University.
7. Guha S and Dutta S, Adhunik Babhaharyk Rasayan, Book Syndicate Pvt. Ltd.

PHYSIOLOGY:

1. Pearce Evelyn (2010): Anatomy and Physiology for Nurse, London: Faber & Faber Ltd.
2. Wilson (1989): Anatomy and Physiology in Health and Illness, Edinburgh, Churchill Livingstone.
3. Hoar WS (1984): General and comparative Physiology. 3rd ed. Prentice-Hall of India.
4. WinWord (1988): Sear's Anatomy and Physiology for Nurses. London, Edward Arno ll.

BASIC NUTRITION AND FOOD SCIENCE

1. Chattopadhyay Ghosh S and Base N. (2015). Uccha Madhymik Khadda O Pusti, Calcutta Book House.
2. Raut SK, Mitra K and Chowdhury P. Adhunik Pustibigyan, Book India Academic Publishers.
3. Arora K (2008). Theory Of Cookery, Frank Brothers.
4. Srilakshmi B.(2018).Nutrition Science. New Delhi: New Age International.
5. Sahoo S and Sahoo SK. (2016). Pustibigyan, Kolkata: Chaya Prakashani.
6. Sohi D. A Comprehensive Textbook of Nutrition & Therapeutic Diets, New Delhi: Jaypee Brothers Medical Publishers.
7. Mudambi SR and Rajagopal MV.(2012). Fundamentals of Foods, Nutrition and Diet Therapy. 6th ed. New Delhi: New Age International.

8. Mudambi SR, Rao SM and Rajagopal MV.(2006). Food Science, 2nd ed. New Delhi. New Age International.
9. Roday S. Food Science & Nutrition,Oxford University Press.
10. Mann and Truswell: Essentials of Human Nutrition, Oxford University Press.

COMMUNITY NUTRITION AND PUBLIC HEALTH

1. Chattopadaya Ghosh S and Basu N.(2015). Uchha Madhaymik Khadda O Pusti, Calcutta Book House.
2. Srilakshmi B. (2018). Nutrition Science, 6th ed. New Delhi: New Age International Publishers
3. Park K (2017).Textbook of Preventive and Social Medicine, 24th Ed. Jabalpur: Bhanot Pub.
4. VVR Seshubabu (2006).Review in Community Medicine, 2nd ed. Hyderabad: Paras Medical Books Publishing Ltd.

CLINICAL NUTRITION

1. Joshi SA. (2010). Nutrition and Dietetics. 3rd Ed. New Delhi: McGraw Hill Education (India) Put Ltd.
2. Raut SK., Mitra K and Chowdhury P., Adhunik Pustibigyan, Academic Publishers.
3. Srilakshmi B.(2018). Dietetics,. New Delhi: New Age International.
4. Sahoo S and Sahoo SK. (2016). Pustibigyan, Kolkata: Chaya Prakashani.
5. Sohi D. A Comprehensive Textbook of Nutrition & Therapeutic Diets, New Delhi: Jaypee Brothers Medical Publishers.
6. Mudambi SR and Rajagopal MV.(2012). Fundamentals of Foods, Nutrition and Diet Therapy. 6th ed. New Delhi: New Age International.
7. Begum MR, A Textbook Of Foods- Nutrition And Dietetics. Sterling Publishers Pvt. Ltd.

FOOD SAFETY AND QUALITY CONTROL

1. Srilakshmi B.(2018). Food Science. New Delhi: New Age International.
2. Roday S.(1998). Food Hygiene and Sanitation 10th Reprint. New Delhi: Tata McGraw-Hill Education.
3. Chattopaday Ghosh S and Basu N.(2015). Uccha Madhaymik Khadda O Pusti, Calcutta Book House

Please add more references for this paper.

FOOD PRESERVATION

1. Srilakshmi B.(2018). Food Science. New Delhi: New Age International.
2. Manay SN and Shadaksharaswamy M. Foods: facts and principles New Age International.
3. Potter NN. (2007). Food science . 5th ed. New Delhi :CBS.

Please add more references for this paper.

NUTRITION AND FITNESS

1. Campbell BI. (2014). Sports Nutrition: Enhancing Athletic Performance, CRC Press, Taylor& Francis,
2. Haff GG. (2008). Essentials of Sports Nutrition Study Guide, Humana Press.
3. Dunford M and Doyle JA. (2008). Nutrition for Sport and Exercise, Thomson Wadsworth.
4. Srilakshmi B. (2018). Dietetics, New Delhi: New Age International.
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