



UNIVERSITY OF CALCUTTA

Notification No.CSR/20/2023

It is notified for information of all concerned that in terms of the provisions of Section 54 of the Calcutta University Act, 1979, (as amended), and, in exercise of her powers under 9(6) of the said Act, the Vice-Chancellor has, by an order dated 25.07.2023 approved the syllabus of the under mentioned subjects semester wise Four-year (Honours & Honours with Research) /Three-year (Multidisciplinary) programme of U.G. courses of studies, as applicable under CCF,2022, under this University, as laid down in the accompanying pamphlet.

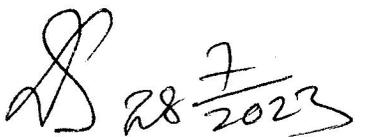
- ✓ 1. Food & Nutrition
2. Defence Studies
3. Human Development
4. Sanskrit (Revised syllabus after incorporating some amendments, in the syllabus published in CSR/18/23,dt.24.7.23)
5. Persian
6. Computer Science
7. B.Mus.(Honours) and Music (Minor)
8. Marks distribution for semesters 1 & 2 and Amendments in the syllabus of English (4-year Honours/3-year MDC)
9. Amendments in SEC paper of Physiology (Honours & Honours with Research) Courses (as mentioned in CSR/13/23,11.07.2023)
10. Environmental Science (Revised syllabus after incorporating some amendments, in the syllabus published in CSR/18/23, DT.24.7.2023)

The above shall take effect from the academic session 2023-2024.

SENATE HOUSE

Kolkata-700073

The 28th July ,2023


Prof.(Dr.) Debasis Das

Registrar

SYLLABUS FOR UNDERGRADUATE MAJOR COURSE IN FOOD AND NUTRITION UNDER NEP FOR FIRST AND SECOND SEMESTER, 2023

Semester	Category of Course	Course Title	Credits		
			Theory	Practical/OP/TU	Total
I	DSC/Core (Major) (C-1)	Basic Food Science I	3	1	4
	Minor-1	Basic Food Science I	3	1	4
	IDC/MDC*		2	1	3
	SEC-1	Nutrition and Health Education	4		4
	AEC				
	CVAC				
II	DSC/Core (Major) (C-2)	Basic Food Science II	3	1	4
	Minor-2	Basic Food Science II	3	1	4
	IDC/MDC*		2	1	3
	SEC-2	Nutritional Epidemiology & Public Health	4		4
	AEC				
	CVAC				

***From other discipline**

FIRST SEMESTER

DSC/Core (Major)-C 1-TH: BASIC FOOD SCIENCE I

(3 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.

4. Dietary Fibre-Classification, sources, composition, properties & nutritional significance

DSC/Core (Major) C 1-P : BASIC FOOD SCIENCE I (PRACTICAL) (1 CREDIT)

1. Identification of Mono, Di and polysaccharides

2. Identification of Proteins

3. Identification of glycerol

MINOR 1-TH: BASIC FOOD SCIENCE I

(3 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.

4. Dietary Fibre-Classification, sources, composition, properties & nutritional significance

MINOR 1- P: BASIC FOOD SCIENCE I (PRACTICAL)

1 CREDIT

1. Identification of Mono, Di and polysaccharides

2 . Identification of Proteins

3 .Identification of glycerol

SEC 1- TH: NUTRITION AND HEALTH EDUCATION**4 CREDITS**

1. Concept, objectives and importance of nutrition and health education.
2. Principles of health education.
3. Nutrition Educators' - criteria. Target groups for Nutrition and Health education: Infants, pre-schooler, school children, adults, and elderly.
4. Nutrition and health education communication process.
5. Steps in planning health and nutrition education.
6. Channels for nutrition Education in the community
7. Methods involved in nutrition and health education
8. Evaluation of nutrition and health education programmes

SECOND SEMESTER**DSC/Core (Major) C-2- TH : BASIC FOOD SCIENCE-II****3 CREDITS**

1. Minerals & Trace Elements, Bio-Chemical and Physiological Role, bio-availability & requirements, sources, deficiency & excess (Calcium, Sodium, Potassium Phosphorus, Iron, Fluoride, Zinc, Selenium, Iodine, Chromium)
2. Vitamins - Biochemical and Physiological role, Bio-availability and requirements, sources, deficiency & excess (Fat soluble and water-soluble vitamins), Provitamin, Antivitamin, Pseudo vitamin and Vitamers.
3. Water - Functions, daily requirements, Effect of excess and deficiency. Water balance.

DSC/Core (Major) C-2- P: BASIC FOOD SCIENCE-II (PRACTICAL)**1 CREDIT**

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.

MINOR -2-TH : BASIC FOOD SCIENCE-II

3 CREDITS

1. Minerals & Trace Elements, Bio-Chemical and Physiological Role, bio-availability & requirements, sources, deficiency & excess (Calcium, Sodium, Potassium Phosphorus, Iron, Fluoride, Zinc, Selenium, Iodine, Chromium)
2. Vitamins - Bio-Chemical and Physiological Role , bio-availability and requirements, sources, deficiency & excess (Fat soluble and water soluble vitamins), Provitamin, Antivitamin, Pseudo vitamin and Vitamers.
3. Water - Functions, daily requirements, Effect of excess and deficiency. Water balance.

MINOR- 2- P: BASIC FOOD SCIENCE-II (PRACTICAL) 1 CREDIT

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.

SEC 2-TH: NUTRITIONAL EPIDEMIOLOGY & PUBLIC HEALTH (4 CREDITS)

1. Definition of Health, Dimension of Health: Positive health versus Absence of disease, Determinants of Health, Indicators of health – Mortality, Morbidity, Disability, Nutritional Status, Health care Delivery, Environmental, Socioeconomics, Health care Policy
2. Epidemiology: Definition, Aims, Tools of Measurement – Rates, Ratios and Proportions. Study designs in epidemiology, Descriptive epidemiology, Analytical epidemiology, Data collection and sources of data.
3. Secondary Sources of Community Health data: Sources of relevant vital statistics of infant, child & maternal mortality rates, Under- 5 mortality, Birth Rate, Crude death rate.
4. Immunization: Importance and Immunization schedule for children, adults and for foreign travellers.
5. 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.
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.

SUGGESTED BOOKS AND JOURNALS

BASIC FOOD SCIENCE

1. SrilakshmiB(2017): Nutrition Science,6th Multicolour Ed. New Age International (P) Ltd.
2. RodayS(2012): Food Science and Nutrition, 2nd Ed. Oxford University Press.
3. Mann J and TruswellS(2017) : Essentials of Human Nutrition, 5th Ed. Oxford University Press.
4. Wilson K and Walker J(2000): Principles and Techniques of Practical Biochemistry, 5th Ed. Oxford University Press.
5. Sadasivan S and ManikamK(2007): Biochemical Methods, 3rd Ed. New Age International (P) Ltd.
6. Oser B L(1965). Hawk's Physiological Chemistry, 14th Ed. McGraw-Hill Book
7. Nath RL and NathRK(1990). Practical biochemistry in clinical medicine, 2nd Ed. Academic Publishers.
8. Sen AR, Pramanik NK and Roy SK(2001): A treatise on analysis of food fat and oil, Oil Technologists Association of India (EZ), Kolkata, 76, 119.
- 9.Plummer D(2017): An introduction of Practical Biochemistry, 3rd Ed. McGraw Hill Education.
- 10.SwaminathanM(2007): Essentials of Food and Nutrition(Vol. I & II), 2nd Ed. Bappco.
- 11.Meyer LH (2004): Food Chemistry, CBS Publishers & Distributors

NUTRITION AND HEALTH EDUCATION

- 1.Park K(2017): Textbook of Preventive and Social Medicine,24th Ed. BanarsidasBhanot Publishers
- 2.Mahajan BK, Roy RN , Saha I, Gupta, MC (2013):Text book of Preventive and Social Medicine, 4th Ed. Japee Brothers
3. Pandya R(2010):Community Health Education, Rawat Publications.

NUTRITIONAL EPIDEMIOLOGY & PUBLIC HEALTH

- 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. 23rd edition.M/s. BanarasidasBhanot. Jabalpur.

3.SeshubabuVVR(2011): Review in Community Medicine, 2nd Ed, Paras Medical Books Pvt Ltd.

4.Mahajan BK, Roy RN , Saha I, Gupta, MC (2013):Text book of Preventive and Social Medicine, 4th Ed. Japee Brothers.

5.Vir SC(2011): Public Health Nutrition in Developing Countries, Woodhead Publishing India.

6.Willett W(2012): Nutritional Epidemiology, 3rd Ed. Oxford University Press,USA

**SYLLABUS FOR IDC OFFERED BY FOOD AND NUTRITION UNDER NEP FOR
OTHER DISCIPLINES, 2023**

PUBLIC HEALTH (THEORY)

(2 CREDITS)

1. Introduction to Public Health: Definition and scope of public health, Historical development and milestones in public health and preventive medicines, Core values and functions of public health
2. Health and Dimension of Health: Positive health versus Absence of disease, Different Indicators of health, Secondary Sources of Community Health data: Sources of relevant vital statistics of infant, child & maternal mortality rates. under -5 mortality, birth rate, death rate
3. Concept of Epidemiology, Study of the epidemiologic approach, Uses of Epidemiology.
4. 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. 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.

PUBLIC HEALTH (PRACTICAL)

(1 CREDIT)

1. Preparation of 3 audio visual aids like charts, posters, models related to public health and nutrition.
2. Field visit (Health centre / ICDS/ MCH centre/ NGOs etc.) and report writing.

SUGGESTED BOOKS & JOURNALS

PUBLIC HEALTH

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.
3. Seshubabu VVR (2011): Review in Community Medicine, 2nd Ed, Paras Medical Books Pvt Ltd.
4. Mahajan BK, Roy RN, Saha I, Gupta, MC (2013): Text book of Preventive and Social Medicine, 4th Ed. Japee Brothers.
5. Vir SC (2011): Public Health Nutrition in Developing Countries, Woodhead Publishing India.
6. Willett W (2012): Nutritional Epidemiology, 3rd Ed. Oxford University Press, USA

SYLLABUS FOR THREE YEAR B.A/B.Sc. (MULTIDISCIPLINARY) COURSE OF STUDIES IN FOOD AND NUTRITION UNDER NEP, 2023

Semester	Category of Course	Course Title	Credits		
			Theory	Practical/OP/TU	Total
I	DSC/Core (CC1-1)	Basic Food Science I	3	1	4
II	DSC/Core (CC1-2)	Basic Food Science II	3	1	4
	SEC offered*	Food Safety and Quality Control	3	1	4

***Students can opt SEC in First/Second/Third Semester**

FIRST SEMESTER

CC1-1 TH: BASIC FOOD SCIENCE I

(3 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.

4. Dietary Fibre-Classification, sources, composition, properties & nutritional significance

CC1-1 P : BASIC FOOD SCIENCE I (PRACTICAL)

(1 CREDIT)

1. Identification of Mono, Di and polysaccharides

2 .Identification of Proteins

3 .Identification of glycerol

SECOND SEMESTER

CC1-2 TH: BASIC FOOD SCIENCE-II

3 CREDITS

1. Minerals & Trace Elements, Bio-Chemical and Physiological Role, bio-availability & requirements, sources, deficiency & excess (Calcium, Sodium, Potassium Phosphorus, Iron, Fluoride, Zinc, Selenium, Iodine, Chromium)
2. Vitamins - Bio-Chemical and Physiological Role , bio-availability and requirements, sources, deficiency & excess (Fat soluble and water soluble vitamins), Provitamin, Antivitamin, Pseudo vitamin and Vitamers.
3. Water - Functions, daily requirements, Effect of excess and deficiency. Water balance.

CC1-2- P: BASIC FOOD SCIENCE-II (PRACTICAL)

1 CREDIT

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.

SEC Offered

SEC : FOOD SAFETY AND QUALITY CONTROL 3 CREDITS

1. Food Quality: Meaning and definition of food quality, Quality factors in foods, indicators of food quality, importance and ways of Food Quality Assessment
2. Introduction to Food Hazards: Definition, types of hazard-physical, chemical (naturally occurring, environmental and intentionally added) and biological, factors affecting (food borne pathogens bacteria, viruses and eukaryotes; sea food and shellfish poisoning and mycotoxins)
3. Hygiene and Sanitation : Principles of food hygiene, personal hygiene, kitchen hygiene and sanitation. water quality assessment, insect and pest control, waste treatment and disposal, food vending and packaging standards, employees' health
4. Food Safety Management Tools: Basic concept, prerequisites-GHPs, GMPs. HACCP, ISO series. National Food Standards (BIS, AGMARK) and Food Laws (PFA and FSSAI).

SEC : FOOD SAFETY AND QUALITY CONTROL (PRACTICAL) 1 CREDIT

Detection of adulterants in the following Foods- Milk, Edible Oil, Sugar, Spices, honey, Flours, Ghee, Beverages (one method of detection for each food item).

1. To detect the adulterants like dyes and argemone in the fats, oils and ghee.
2. To detect the presence of adulterants like water, urea, formalin, detergent, sugar and starch in the milk.
3. To detect the adulteration of insoluble substance, chalk powder and washing soda in sugar.
4. To detect the adulteration of brick powder in chilli powder, Metanil yellow in turmeric.
5. To detect colouring agents in fruit juices and sweets.

SUGGESTED BOOKS AND JOURNALS

BASIC FOOD SCIENCE

1. SrilakshmiB(2017): Nutrition Science,6th Multicolour Ed. New Age International (P) Ltd.
2. RodayS(2012): Food Science and Nutrition, 2nd Ed. Oxford University Press.
3. Mann J and TruswellS(2017) : Essentials of Human Nutrition, 5th Ed. Oxford University Press.
4. Wilson K and Walker J(2000): Principles and Techniques of Practical Biochemistry, 5th Ed. Oxford University Press.
5. Sadasivan S and ManikamK(2007): Biochemical Methods, 3rd Ed. New Age International (P) Ltd.
6. Oser B L(1965). Hawk's Physiological Chemistry, 14th Ed. McGraw-Hill Book
7. Nath RL and NathRK(1990). Practical biochemistry in clinical medicine, 2nd Ed. Academic Publishers.
8. Sen AR, Pramanik NK and Roy SK(2001): A treatise on analysis of food fat and oil, Oil Technologists Association of India (EZ), Kolkata, 76, 119.
- 9.Plummer D(2017): An introduction of Practical Biochemistry, 3rd Ed. McGraw Hill Education.
- 10.SwaminathanM(2007): Essentials of Food and Nutrition(Vol. I & II), 2nd Ed. Bappco.
- 11.Meyer LH (2004): Food Chemistry, CBS Publishers & Distributors

FOOD SAFETY & QUALITY CONTROL

1. Food Hygiene and Sanitation by S. Roday
2. Singhal, R. S. (1997) Handbook of indices of food quality and authenticity. Cambridge Woodhead Publishing, New York.
3. Essentials of food safety and sanitation by David Ms Swane, Nancy Rue and Richard Linton
4. Text Book of Food Safety and Quality Control by Pulkit Mathur
5. Essentials of Food Sanitation by Marriott, Norman
6. Food Safety, Sanitation and Personal Hygiene by BC Cook Articulation Committee and The BC Cook Articulation Committe