BANKURA UNIVERSITY

(West Bengal Act XIX of 2013- Bankura University Act, 2013)

Main Campus, Bankura Block-II, P.O.: Purandarpur, Dist.: Bankura, Pin- 722155, West Bengal

Office of the Secretary

Faculty Council for Undergraduate Studies

BKU/FCUG/ 189 /2023 Date: 11/07/2023

NOTIFICATION

As directed, the undersigned is pleased to inform all concerned that Bankura University has initiated the process to implement New Curriculum and Credit Framework for Undergraduate Programme, UGC 2022 (as per NEP 2020) for 4-years Undergraduate programme with Nutrition as Major, Minor etc. from the academic session 2023-2024. The Syllabus for the purpose will be framed and finalized as per the guidelines of appropriate authority. As an important corollary to the process, the workshop through online mode will be organized on the date mentioned herewith to get the feedback from the stakeholders. Present Students, Alumni, Guardians, Academicians and other stakeholders related to the specific programme/course are requested for their kind participation in the workshop and to present their views/ observations etc. The stakeholders may go through the draft syllabus attached herewith and convey their observations to the office of the undersigned on ugsecretaryoffice@bankurauniv.ac.in within seven days from the date of publication of notice.

Date: 15th July, 2023.

Time: 11.30 AM onwards

Google Meet joining info

Video call link: https://meet.google.com/zdj-nihq-bjq

Sd/-
Secretary
Faculty Council for Undergraduate Studies

BKU/FCUG/ 189(6) /2023 Date: 11/07/2023

Copy forwarded for information and necessary action to:
1. Registrar (Addl. Charge), Bankura University.
2. Dean (Officiating), Faculty Council of P.G. Studies in Arts, Science etc.
3. Chairman/Convenor, Undergraduate Board of Studies in Nutrition
4. System Administrator, Bankura University with request to upload this in website.
5. Secretary, Hon'ble Vice Chancellor, Bankura University.
6. Guard File

Sd/-
Secretary
Faculty Council for Undergraduate Studies

SYLLABUS UNDER NEP

FOR

SEMESTER I & SEMESTER II

OF

UNDER-GRADUATE COURSE IN

NUTRITION (*w.e.f. 2023*)

BANKURA UNIVERSITY

BANKURA

WEST BENGAL

PIN 722155

Kazi Layla Khaled Gargi Bose Malay Kumar Pata

Mousmita Dutta Himangshu Das

SYLLABUS FOR UNDERGRADUATE COURSES IN NUTRITION FOR SEMESTER I AND II UNDER NEP

Semester	Category of Course	Course Code	Course Title	Credits		
				Th	Pr	Total
I	Major	S/NUT/MJC-1	Food Science and Basic Nutrition I	3	1	4
	Minor	S/NUT/MN-1	Food Science and Basic Nutrition I	3	1	4
	Multidisciplinary	S/NUT/MD-1	Fundamentals of Food and Nutrition	3	0	3
	Skill Enhancement Course	S/NUT/SEC-1	Nutritional Enrichment of Common Indian Dishes	0	3	3
II	Major	S/NUT/MJC-2	Food Science and Basic Nutrition II	3	1	4
	Minor	S/NUT/MN-2	Food Science and Basic Nutrition II	3	1	4
	Multidisciplinary	S/NUT/MD-2	Food Groups and Cooking Methods	2	1	3
	Skill Enhancement Course	S/NUT/SEC-2	Practical Approaches in Food and Nutrition	0	3	3

Detailed Syllabus

Semester I

Course Code: S/NUT/MJC-1

Course Category: Major

Course Title: Food Science and Basic Nutrition I

1. **Basic concept of food and nutrition:** Definition and classification of food and nutrients; Meaning of nutrition and balanced diet.
2. **Carbohydrates:** Definition, Classification, General physical properties of sugars and non-sugars; General chemical properties of carbohydrates –
    - Structure and configuration of glucose, fructose and galactose.
    - Isomerisms: epimers, anomers, D & L sugars, aldoses and ketoses, pyranoses and furanoses with proper examples and configurations.
    - Optical activity and mutarotation of glucose.
    - Chemical reactions of glucose – oxidation, reduction, acetylation, cyanohydrins formation, oxime formation, osazone reaction (glucose and fructose).
    - Chain lengthening of aldoses: Killiani sysnthesis.
    - Chain shortening of aldoses: Ruff degradation.
    - Conversion of aldose to isomeric ketose and ketose to isomeric aldose.
    - Molecular structure of disaccharides: sucrose, lactose and maltose.
    - Reducing and non-reducing sugar.

    Dietary sources, functions, role in human health and disease, requirements of carbohydrates.
3. **Lipids:** Definition, Classification, General physical properties, General chemical properties–
    - General structure of glycerides.
    - Simple and mixed glycerides.
    - Distinction between fats and oils.
    - Hydrolysis, hydrogenation, hydrogenolysis, drying and rancidification of fats & oils.
    - Analysis of fats and oils: Saponification number, Iodine number, Acid number, Reichert-Miessl number, soaps and detergents, Acetyl number.

    Dietary sources, functions, role in human health and disease, requirements of fats and lipids.
4. **Amino acids and Proteins:** Definition, Classification;
    - General properties of amino acids and proteins – Zwitterion, isoelectric point, peptide linkage, colloidal nature, denaturation.
    - General chemical properties of proteins – formation of salts, hydrolysis, oxidation.
    - Colour reaction of proteins – Xanthoproteic test, Biuret test, Milon's test, Ninhydrin test, Hopkins-Cole test.
    - Quality of proteins – BV, NPU, PER, Net Dietary Protein Energy Ratio, Amino Acid Score, PDCAAS.

    Dietary sources, functions, role in human health and disease, requirements of proteins.
5. **Dietary fibre:** Sources, classification and nutritional significance.

Food Science and Basic Nutrition (Practical)

1. Qualitative detection of carbohydrates: Molisch's test, Benedict's test, Barfoed's test, Seliwanoff's test, Iodine test, Fehling's test.
2. Qualitative detection of fats.
3. Biuret test, xanthoproteic test, ninhydrin test.

Suggested reading:

1. U. Satyanarayan, U. Chakrapani. Biochemistry. ELSEVIER.
2. MN Chatterjea, Rana Shinde. Textbook of Medical Biochemistry. JAYPEE.
3. Antonio Blanco, Gustavo Blanco. Medical Biochemistry. Academic Press.
4. Debajyoti Das. Biochemistry. Academic Publishers.
5. Shivananda Nayak B. Handbook of Biochemistry & Nutrition. JAYPEE.

Course Code: S/NUT/MN-1

Course Category: Minor

Course Title: Food Science and Basic Nutrition I

1. **Basic concept of food and nutrition:** Definition and classification of food and nutrients; Meaning of nutrition and balanced diet.
2. **Carbohydrates:** Definition, Classification, General physical properties of sugars and non-sugars; General chemical properties of carbohydrates –
    - Structure and configuration of glucose, fructose and galactose.
    - Isomerisms: epimers, anomers, D & L sugars, aldoses and ketoses, pyranoses and furanoses with proper examples and configurations.
    - Optical activity and mutarotation of glucose.
    - Chemical reactions of glucose – oxidation, reduction, acetylation, cyanohydrins formation, oxime formation, osazone reaction (glucose and fructose).
    - Chain lengthening of aldoses: Killiani sysnthesis.
    - Chain shortening of aldoses: Ruff degradation.
    - Conversion of aldose to isomeric ketose and ketose to isomeric aldose.
    - Molecular structure of disaccharides: sucrose, lactose and maltose.
    - Reducing and non-reducing sugar.

    Dietary sources, functions, role in human health and disease, requirements of carbohydrates.
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    - General structure of glycerides.
    - Simple and mixed glycerides.
    - Distinction between fats and oils.
    - Hydrolysis, hydrogenation, hydrogenolysis, drying and rancidification of fats & oils.
    - Analysis of fats and oils: Saponification number, Iodine number, Acid number, Reichert-Miessl number, soaps and detergents, Acetyl number.

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4. Debajyoti Das. Biochemistry. Academic Publishers.
5. Shivananda Nayak B. Handbook of Biochemistry & Nutrition. JAYPEE.

Course Code: S/NUT/MD-1

Course Category: Multidisciplinary

Course Title: Fundamentals of Food and Nutrition

1. Basic terms used in food and nutrition
2. Functions, dietary sources, clinical manifestations of deficiency/ excess of the following nutrients:
   - Carbohydrates, lipids and proteins
   - Fat soluble vitamins – A, D, E and K
   - Water soluble vitamins – thiamine, riboflavin, pyridoxine, folate, vitamin B12 and vitamin C
   - Minerals – calcium, iron and iodine
3. Food groups and Food pyramid. Concept of balanced diet. Reference man and woman
4. Concept of dietary reference intakes
5. Dietary guidelines for Indians

Suggested reading:

1. B. Srilakshmi. Nutrition Science. New Age International Publishers
2. U. Satyanarayan, U. Chakrapani. Biochemistry. ELSEVIER.
3. Ravinder Chadha. Pulkit Mathur. Nutrition. Orient BlackSwan

Course Code: S/NUT/SEC-1

Course Category: Skill Enhancement Course (SEC)

Course Title: Nutritional Enrichment of Common Indian Dishes

1. Weights and measures of common foods - (Raw and Cooked weight)

2. Preparation of various dishes using different methods of cooking

   - Boiling / steaming
   - Roasting
   - Frying-Deep/shallow
   - Pressure cooking
   - Hot air cooking/Baking

3. Preparation of nutrient rich dishes

- Protein rich dish
- Carbohydrate rich dish
- Fat rich dish
- Vitamins rich dish
- Fiber rich dish
- Minerals rich dish

Suggested reading:

1. B. Srilakshmi. Food science. New Age International Publisher
2. N. Shakuntala Manay, M. Shadaksharaswamy. Foods, Facts and Principles. New Age International Publisher
3. Prasanta Mukherjee. Textbook of Food Commodities. Aman Publications

Semester II

Course Code: S/NUT/MJC-2

Course Category: Major

Course Title: Food Science and Basic Nutrition II

1. Vitamins: Dietary sources, requirements, physiological and biochemical roles and effects of deficiencies and excesses of

- Fat soluble vitamins
    - Vitamin A
    - Vitamin D
    - Vitamin E
    - Vitamin K
- water-soluble vitamins
    - Thiamine
    - Riboflavin
    - Niacin
    - Pantothenic acid
    - Pyridoxin
    - Folic acid
    - Cobalamin
    - Ascorbic acid
- Anti-vitamin, Provitamin, Pseudovitamin and vitamers.

2. Minerals: Dietary sources, requirements, functions and effects of deficiencies and excesses of calcium, phosphorus, sodium, potassium, iron, iodine, selenium, zinc, fluoride, magnesium, chromium and copper. Absorption of calcium and iron.

3. Water: Requirement, functions, deficiencies and excesses. Water balance and its regulation.

Food Science and Basic Nutrition (Practical)

1. Colorimetric estimation of carbohydrate (Anthrone method), Protein (Lowry method).
2. Estimation of calcium using EDTA by titration.
3. Estimation of ascorbic acid by using 2, 6 dichlorophenol indophenol method.

Suggested reading:

1. U. Satyanarayan, U. Chakrapani. Biochemistry. ELSEVIER.
2. MN Chatterjea, Rana Shinde. Textbook of Medical Biochemistry. JAYPEE.
3. Antonio Blanco, Gustavo Blanco. Medical Biochemistry. Academic Press.
4. Debajyoti Das. Biochemistry. Academic Publishers.
5. Shivananda Nayak B. Handbook of Biochemistry & Nutrition. JAYPEE.

Course Code: S/NUT/MN-2

Course Category: Minor

Course Title: Food Science and Basic Nutrition II

1. Vitamins: Dietary sources, requirements, physiological and biochemical roles and effects of deficiencies and excesses of

- Fat soluble vitamins
    - Vitamin A
    - Vitamin D
    - Vitamin E
    - Vitamin K
- water-soluble vitamins
    - Thiamine
    - Riboflavin
    - Niacin
    - Pantothenic acid
    - Pyridoxin
    - Folic acid
    - Cobalamin
    - Ascorbic acid
- Anti-vitamin, Provitamin, Pseudovitamin and vitamers.

2. Minerals: Dietary sources, requirements, functions and effects of deficiencies and excesses of calcium, phosphorus, sodium, potassium, iron, iodine, selenium, zinc, fluoride, magnesium, chromium and copper. Absorption of calcium and iron.

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3. Antonio Blanco, Gustavo Blanco. Medical Biochemistry. Academic Press.
4. Debajyoti Das. Biochemistry. Academic Publishers.
5. Shivananda Nayak B. Handbook of Biochemistry & Nutrition. JAYPEE.

Course Code: S/NUT/MD-2

Course Category: Multidisciplinary

Course Title: Food Groups and Cooking Methods

1. Nutritional contribution and changes during cooking of the following food groups:
    - Cereals
    - Pulses
    - Fruits and Vegetables
    - Milk and Milk products
    - Eggs
    - Meat, Poultry and Fish
    - Fats and Oils
2. Food Adjuncts: Spices and Herbs; Food Additives
3. Different methods of cooking: Dry heat, Moist heat, Shallow fat frying, Deep fat frying, Braising
4. Effects of cooking on nutritive value of foods

Food Groups and Cooking Methods (Practical)

1. Weight measurement of raw materials
2. Preparation of dishes involving each food group
3. Determination of nutritive value of foods

Suggested reading:

4. B. Srilakshmi. Food science. New Age International Publisher
5. N. Shakuntala Manay, M. Shadaksharaswamy. Foods, Facts and Principles. New Age International Publisher
6. Prasanta Mukherjee. Textbook of Food Commodities. Aman Publications

Course Code: S/NUT/SEC-2

Course Category: Skill Enhancement Course (SEC)

Course Title: Practical Approaches in Food and Nutrition (Practical)

- Market survey on consumer behavior of food purchase and awareness regarding nutritional labelling of food products and deciphering nutrition label of packaged food and beverages.
- Identification of adulterants in locally available common food items.

Suggested reading:

1. B. Srilakshmi. Food science. New Age International Publisher
2. Food Safety and Standards Authority of India. Detect Adulteration with Rapid Test.

3. Food Safety and Standards Authority of India. Food Safety and Standards (Labelling And Display) Regulations, 2020