



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

Ref: BKU/FCUG/173/2026

Date: 25/06/2026

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 as framed / drafted and partially implemented deserves to be analysed after receiving feedback from different stakeholders. As an important corollary to the process, a workshop 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 this notice.

Date: 02.07.2026

Time: 12 noon

Google Meet joining link : <https://meet.google.com/fcp-kzki-ipd>

Sd/-

Dr. Arindam Chakraborty

Secretary

Faculty Council for Undergraduate Studies

Ref: BKU/FCUG/173(6)/2026

Date: 25/06/2026

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

Sd/-

Dr. Arindam Chakraborty

Secretary

Faculty Council for Undergraduate Studies

SYLLABUS FOR
FOUR YEARS UNDER-GRADUATE COURSE
WITH SINGLE MAJOR IN NUTRITION
(w.e.f. 2023)



BANKURA UNIVERSITY, BANKURA
WEST BENGAL PIN
722155

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO	Description
PSO 1	Apply knowledge of nutrition, food science, and metabolism to solve health and dietary problems.
PSO 2	Analyze nutritional issues using scientific, biochemical, and statistical approaches.
PSO 3	Design appropriate dietary interventions for metabolic disorders and health conditions.
PSO 4	Apply laboratory and analytical techniques used in food science and nutrition research.
PSO 5	Interpret research data and apply statistical methods in nutrition and health studies.
PSO 6	Demonstrate awareness of food safety, toxicology, and quality control in the food industry.
PSO 7	Develop communication and professional skills for community nutrition and health promotion.

SEMESTER- VII

Course Type	CourseCode	Course Title	Credit	Marks			No. of Hours		
				I.A	ESE	Total	Lec	Tu.	Pr.
Major	S/NUT/701/MJC-17	Inborn Errors of Metabolism and Food Allergies	4 (3+1)	10	40 (25+15)	50	3	NA	2
Major	S/NUT/702/MJC-18	Advanced Techniques in Food Technology	4 (3+1)	10	40 (25+15)	50	3	NA	2
Major	S/NUT/703/MJC-19	Food Toxicology	4 (3+1)	10	40 (25+15)	50	3	NA	2
Major	S/NUT/704/MJC-20	Biostatistics	4 (3+1)	10	40 (25+15)	50	4	1	NA
Minor	S/NUT/706/MN-7	Management of Inherited Metabolic Diseases and Food Allergy	4 (3+1)	10	40 (25+15)	50	3	NA	2

I.A. – Internal Assessment; ESE- End Semester Examination; Lec. – Lecture; Tu. – Tutorial; Pr. - Practical

Detailed Syllabus

Semester VII

Course Code: S/NUT/701/MJC-17

Course Category: Major

Course Title: Inborn Errors of Metabolism (IEM) and Food Allergies (Theory & Practical)

Course Outcomes:

- Explaining the basic concepts of genetic mutations, enzyme deficiencies, and the mechanisms involved in inborn errors of metabolism
- Identification, description and nutritional management of major disorders of carbohydrate, protein, amino acid and lipid metabolism
- Understanding the differences between food allergies and food intolerances, the underlying immunological basis, elimination diets and management plans
- Apply theoretical knowledge to practical situations through case study analysis and develop diet plans for metabolic disorders and food allergies

Course Type: Theory

Course Title: Inborn Errors of Metabolism and Food Allergies (Theory)

- 1. Introduction to metabolism and genetic disorders:** Concept of Inborn Errors of Metabolism, Genetic mutations and enzyme deficiencies
- 2. Disorders of carbohydrate metabolism and nutritional management:** Concept of disorders of carbohydrate metabolism. Glycogen storage diseases, Lactose intolerance, Galactosemia
- 3. Disorders of protein and amino acid metabolism and nutritional management:** Phenylketonuria, Maple Syrup Urine Disease, Tyrosinemia and homocystinuria
- 4. Disorders of lipid metabolism and nutritional management:** Fatty acid oxidation disorders, Lipoprotein metabolism disorders
- 5. Food Allergies and Intolerances:** Immunological basis of food allergy, Types of food allergy, Pathophysiology of anaphylaxis, Difference between allergy and intolerance, Major food allergens (milk, egg, peanut, fish, wheat), Celiac Disease, Diagnosis and elimination diets

Course Type: Practical

Course Title: Inborn Errors of Metabolism and Food Allergies (Practical)

1. Diet planning for PKU, lactose intolerance, galactosemia
2. Elimination diet planning based on different cases of food allergy
3. Case study analysis of metabolic disorders
4. Exposure to sophisticated health facilities to learn about commercial formulation for managing inborn errors of metabolism and allergies.

Suggested Reading:

1. L. Kathleen Mahan & Janice Raymond - Krause's Food & the Nutrition Care Process; Elsevier Health Sciences
2. F. P. Antia & Philip Abraham - Clinical Dietetics and Nutrition; Oxford University Press
3. B. Srilakshmi - Nutrition Science; New Age International Publishers
4. Victor W. Rodwell et al. - Harper's Illustrated Biochemistry; McGraw-Hill Education
5. MN Chatterjea & Rana Shinde - Medical Biochemistry; Jaypee Brothers Medical Publishers
6. Dean D. Metcalfe et. al. - Food Allergy: Adverse Reactions to Foods and Food Additives; Wiley-Blackwell

Course Code: S/NUT/702/MJC-18

Course Category: Major

Course Title: Advanced Techniques in Food Technology (Theory & Practical)

Course Outcomes:

- Understanding the principles and applications of modern food processing technologies
- Explaining advanced packaging technologies in improving food quality and shelf life.
- Understanding the role and importance of fermentation technology in food processing
- Learning about the principles and applications of analytical instruments used in food science
- Demonstration and hands-on training of laboratory techniques

Course Type: Theory

Course Title: Advanced Techniques in Food Technology (Theory)

1. **Modern Food Processing Technologies:** High-pressure processing, Extrusion technology, Food additives as preservatives, membrane technology, ohmic heating, pulsed electric field, ozonization
2. **Packaging Technologies:** MAP, Active and intelligent packaging, Shelf-life testing
3. **Fermentation technology in food processing**
4. **Instrumentation in Food Science:** Chromatography: TLC, HPLC and Gas Chromatography (GC), paper chromatography, spectroscopy, electrophoresis, laminar air flow, refractometry

Course Type: Practical

Course Title: Advanced Techniques in Food Technology (Practical)

1. Demonstration of TLC
2. Electrophoresis
3. Spectroscopy in food analysis
4. Refractometry

Suggested Readings:

1. P. J. Fellows - Food Processing Technology: Principles and Practice; Woodhead Publishing (Elsevier)
2. Sunetra Roday - Food Science and Nutrition; Oxford University Press
3. B. Srilakshmi - Food Technology; New Age International Publishers
4. R. Paul Singh and Dennis R. Heldman - Introduction to Food Engineering; Academic Press (Elsevier)
5. S. Suzanne Nielsen - Food Analysis; Springer
6. Douglas A. Skoog, F. James Holler, and Stanley R. Crouch - Principles of Instrumental Analysis; Cengage Learning
7. William C. Frazier and Dennis C. Westhoff - Food Microbiology; Tata McGraw-Hill Education
8. James M. Jay, Martin J. Loessner, and David A. Golden - Modern Food Microbiology; Springer.

Course Code: S/NUT/703/MJC-19

Course Category: Major

Course Title: Food Toxicology (Theory & Practical)

Course Outcomes:

- Understanding the basic principles of toxicology including dose–response relationship
- Studying the principles of toxicokinetics and toxicodynamics of food toxins including
- Identifying different types of natural, environmental and anthropogenic food toxins and related health hazards
- Analyzing and evaluating toxic substances generated during food processing
- Developing practical skills in calculating LD₅₀ values and performing qualitative identification of food toxins

Course Type: Theory**Course Title: Food Toxicology (Theory)**

- 1. Introduction to Toxicology:** Principles of toxicology, Dose-response relationship, Threshold dose, LD₅₀ and LC₅₀, ADI (Acceptable Daily Intake)
- 2. Toxicokinetics and toxicodynamics:** Absorption, metabolism, and excretion of toxins, fundamental concept of biotransformation (Phase I and Phase II reactions), Acute vs chronic toxicity, Bioaccumulation and biomagnification
- 3. Natural Food Toxins:** Types, mode of contamination, hazardous effects and preventive measures - Plant toxins (cyanogenic glycosides, lectins, Solanine, Goitrogens, Phytohemagglutinins) Mushroom toxins, Marine toxins (Paralytic shellfish poisoning); Microbial Toxins (Mycotoxins - aflatoxins, Bacterial toxins)
- 4. Chemical Contaminants:** Pesticide residues, Heavy metals (lead, mercury, cadmium, arsenic), veterinary drug residues
- 5. Toxins Generated During Food Processing:** Heat-Induced Toxicants - Acrylamide formation, Heterocyclic amines (HCAs), Polycyclic aromatic hydrocarbons (PAHs); Chemical Changes During Processing - Nitrosamines in processed meat, Lipid oxidation products, Advanced glycation end products (AGEs); Packaging and Storage Hazards - Migration of chemicals from packaging and storage

Course Type: Practical**Course Title: Food Toxicology (Practical)**

1. LD50 calculation
2. Qualitative identification of food toxin

Suggested Reading:

1. Curtis D. Klaassen – Casarett and Doull's Toxicology: The Basic Science of Poisons; McGraw-Hill Education
2. A. Wallace Hayes – Principles and Methods of Toxicology; CRC Press (Taylor & Francis Group)
3. Takayuki Shibamoto and Leonard F. Bjeldanes – Food Toxicology; Academic Press (Elsevier)
4. S. S. Deshpande – Essentials of Food Toxicology; CRC Press (Taylor & Francis Group)
5. S. Suzanne Nielsen – Food Analysis; Springer
6. William C. Frazier and Dennis C. Westhoff – Food Microbiology; Tata McGraw-Hill Education
7. James M. Jay, Martin J. Loessner, and David A. Golden – Modern Food Microbiology; Springer

Course Code: S/NUT/704/MJC-20**Course Category: Major****Course Title: Biostatistics (Theory & Practical)****Course Outcomes:**

- Understanding the basic concepts, definitions, and importance of statistics in nutrition and health sciences
- Differentiation between various types of data (qualitative and quantitative, discrete and continuous) and their application in nutrition studies
- Classification, organization and analysis of data using standard principles of statistics
- Diagrammatic and graphical presentation of data interpretation in nutrition research
- Understanding sampling and basic statistical tests such as hypothesis testing, level of significance, t-test, chi-square test, and Pearson correlation, and understand their application in nutrition and health research

Course Type: Theory**Course Title: Biostatistics (Theory)**

- 1. Introduction to Statistics and Data:** Basic Concepts, Definition and importance of statistics in nutrition and health science

2.Types of Data and methods of data collection: Qualitative vs quantitative data, Discrete and continuous variables, Primary and secondary data, Sources of data in nutrition studies. Surveys, Questionnaires, Dietary assessment methods, Anthropometric measurements for data collection.

3. Classification of Data and tabulation: Frequency distribution, Class intervals, Cumulative frequency, Construction of tables, Types of tables, Tabulation rules

4: Diagrammatic and Graphical Presentation: Bar diagrams, Pie charts, Histograms, Frequency polygons. Application in nutrition research.

5. Measures of Central Tendency: Mean, Median, Mode, Skewness, kurtosis use of central tendency in research and interpretation in nutrition surveys

6. Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation and Variance, Coefficient of Variation. Application of statistical measures of dispersion in research.

7. Probability and Sampling: Basic Concepts of Probability, Sampling Techniques - Random sampling, Systematic sampling, Stratified sampling, Cluster sampling. Importance of sampling in nutrition surveys.

8. Basic Statistical Tests: Null and alternative hypothesis, Level of significance, Type I and Type II errors, t-test (conceptual introduction), Chi-square test, Correlation (Pearson correlation). Application in nutrition and health research.

Course Type: Practical

Course Title: Biostatistics (Practical)

1. Data posting and analysis of datasets by application of principles of biostatistics through computer software

Suggested Readings:

2. S. P. Gupta – Statistical Methods; Sultan Chand & Sons.
3. B. K. Mahajan – Methods in Biostatistics for Medical Students and Research Workers; Jaypee Brothers Medical Publishers.
4. Daniel W. Wayne – Biostatistics: A Foundation for Analysis in the Health Sciences; Wiley India / John Wiley & Sons.
5. Bernard Rosner – Fundamentals of Biostatistics; Cengage Learning.
6. R. R. Pagano and K. Gauvreau – Principles of Biostatistics; Cengage Learning.
7. S. K. Sharma – Biostatistics in Nursing and Health Sciences; Elsevier India.
8. K. Park – Park's Textbook of Preventive and Social Medicine; Banarsidas Bhanot

Course Code: S/NUT/706/MN-7

Course Category: Minor

Course Title: Management of Inherited Metabolic Diseases and Food Allergy (Theory & Practical)

Course Outcomes:

- Understanding the basic aetiological concepts involved in inherited metabolic diseases
- Identification, description and nutritional management of major disorders of carbohydrate, protein and lipid metabolism
- Understanding the differences between food allergies and food intolerances, the underlying immunological basis, elimination diets and management plans
- Apply theoretical knowledge to practical situations through case study analysis and develop diet plans for metabolic disorders and food allergies

Course Type: Theory

Course Title: Management of Inherited Metabolic Diseases and Food Allergy (Theory)

1. Introduction to metabolism and genetic disorders: Concept and aetiology of inherited metabolic diseases

- 2. Disorders of carbohydrate metabolism and nutritional management:** Concept of disorders of carbohydrate metabolism. Lactose intolerance, Galactosemia.
- 3. Disorders of protein and amino acid metabolism and nutritional management:** Phenylketonuria, Maple Syrup Urine Disease.
- 4. Disorders of lipid metabolism and nutritional management:** Fatty acid oxidation disorders, Lipoprotein metabolism disorders
- 5. Food Allergies and Intolerances:** Immunological basis of food allergy, Types of food allergy, Difference between allergy and intolerance, Major food allergens (milk, egg, peanut, fish, wheat), Diagnosis and elimination diets

Course Type: Practical

Course Title: Management of Inherited Metabolic Diseases and Food Allergy (Practical)

1. Diet planning for PKU, lactose intolerance, galactosemia
2. Elimination diet planning based on different cases of food allergy

Suggested Reading:

7. L. Kathleen Mahan & Janice Raymond - Krause's Food & the Nutrition Care Process; Elsevier Health Sciences
8. F. P. Antia & Philip Abraham - Clinical Dietetics and Nutrition; Oxford University Press
9. B. Srilakshmi - Nutrition Science; New Age International Publishers
10. Victor W. Rodwell et al. - Harper's Illustrated Biochemistry; McGraw-Hill Education
11. MN Chatterjea & Rana Shinde - Medical Biochemistry; Jaypee Brothers Medical Publishers
12. Dean D. Metcalfe et. al. - Food Allergy: Adverse Reactions to Foods and Food Additives; Wiley-Blackwell