

Department of Liberal Education

Era University, Lucknow

Course Outline

Effective From: 2023-24

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|---|---|---------------------------------------|--------------------------------|----------------------------------|--|
| Name of the Program | B.A. / B.Sc. (LIBERAL EDUCATION) | | | Year/ Semester: | 3rd Year/6th Semester |
| Course Name | Biochemistry of Nutrition | Course Code: | BCH307 | Type: | Theory |
| Credits | 04 | | | Total Sessions Hours: | 60 Hours |
| Evaluation Spread | | 50 Marks | | End Term Exam: | 50Marks |
| Type of Course | <input type="radio"/> Compulsory | <input checked="" type="radio"/> Core | <input type="radio"/> Creative | <input type="radio"/> Life Skill | |
| Course Objectives | As chemistry of biology is constantly derived from food, food consists of nutrition and nutrition is composed of biomolecules , minerals, vitamins and water, understanding the components of food and its assimilation in body gives an insight to the factors regulating health. | | | | |
| Course Outcomes(CO): <i>After the successful course completion,learners will develop following attributes:</i> | | | | | |
| Course Outcome (CO) | Attributes | | | | |
| CO1 | The students would understand the need of food and nutrition, ways for calculating the requirements and its role in staying healthy, growth and repair. | | | | |
| CO2 | The student would be able to identify the types of food, its various classifications depending on component or source or processing. | | | | |
| CO3 | Water, minerals and vitamins are vital component and food and the students would be able to identify the sources, role and importance of homeostasis in the body for healthy living. Further, the student would derive information about nutraceuticals, pre and probiotics, supplements and dietary management of inherited metabolic and physiological disorders. | | | | |
| CO4 | Food processing, specially fermentation and preservation is a biotechnical process which needs precision and technical knowledge which the student would learn through this course, along with identifying food adulterants and procedures to detect it. | | | | |
| Pedagogy | Interactive, discussion-bases, student-centered, presentation. | | | | |
| Internal Evaluation Mode | Mid-term Examination: 20 Marks Activity: 10 marks Class test: 05 Marks Online Test/Objective Test: 05 Marks Assignments/Presentation: 05 Marks Attendance: 05 Marks | | | | |

| Session Details | Topic | Hours | Mapped CO |
|-----------------|--|-------|-----------|
| Unit 1 | <p>Introduction:</p> <ul style="list-style-type: none"> • Food, nutrition, and its necessity • Basic terms used in study of food and nutrition and its history • Understanding relationship between food, nutrition and health: What, How, When ; • Classification of food according to source and function <p>Energy:</p> <ul style="list-style-type: none"> • Unit of Energy- Kcal, • Energy requirements • Measurements of energy • Respiratory quotient <p>Body Mass Index (BMI) and basic metabolism</p> <p>Basal Metabolic Rate (BMR) – determination and factors affecting calorific value of foods.</p> <p>Biological value of proteins, carbohydrates & lipids :</p> <ul style="list-style-type: none"> • sources and roles of essential and nonessential amino acids • digestible, non- digestible • carbohydrates; importance of dietary fibers; • essential and non-essential fatty acids <p>Activity: Organizing a camp for creating awareness about BMI and BMR and its impact on health</p> | 15 | CO1 |
| Unit 2 | <p>Structure and function of following foods:</p> <ul style="list-style-type: none"> • Cereals- Structure of cereals, Nutritive value of cereals, Golden Rice, Whole grains as functional foods, cereal protein & starch, effect of moist heat, effect of dry heat • Pulses and legumes- Nutritive value, Storage & infestation, toxic constituents, Factors Affecting Cooking quality, Medicinal values of Pulses. • Fruits and vegetables – Nutritive value, Enzymatic and Non – Enzymatic Browning, Vegetables & Fruits as Functional foods. • Milk and other dairy products- Composition, Physical Properties, Nutritive Value, Effect of heat, pasteurization, acid, enzymes, phenolics compounds and salts, Milk substitutes, Role of milk& milk products in cookery. • Eggs- Structure, Composition, Quality of egg, Preservation, Role of Egg in Cookery. • Meat, fish and poultry – Meat Structure, Composition, Nutritive value, Poultry Composition, Nutritive value, Preservation & storage, Fish composition, selection, spoilage. <p>Activity: Preparing healthy meal for various purposes and awarding prizes for best and innovative preparations.</p> | 14 | CO2 |
| Unit 3 | <p>Water & electrolytes :</p> <ul style="list-style-type: none"> • Daily requirements, | 17 | CO1, CO3 |

| | | | |
|--------|--|----|-----|
| | <ul style="list-style-type: none"> • regulation of water metabolism, • distribution of body water <p>Electrolytes:</p> <ul style="list-style-type: none"> • Types, sources, composition of body fluids. • Maintenance of fluid & electrolyte balance ; • Over hydration, dehydration and water intoxication ; • Electrolyte imbalances <p>Vitamins & Minerals:</p> <ul style="list-style-type: none"> • Sources, • nutritional importance and deficiency disorders, • biological and nutritional importance of vitamins <p>Introduction to Nutraceuticals:</p> <ul style="list-style-type: none"> • Functional Food and Nutraceuticals • Definition, history, types and classification and benefits. Perceived effect of diet on disease prevention <p>Concept of pre-biotics and probiotics</p> <ul style="list-style-type: none"> • Perspective of food applications for the – Polyphenols: • Flavonoids & isoflavonoids, catechins, tannins; • Glucosinolates; Organosulphur compounds; Phytates • Nutritional management of Inborn error of metabolism - Lactose intolerance, • Niemann-Pick Phenylketonuria (PKU), • Tay-Sachs disease, • Wilson's disease <p>Other metabolic disorders :</p> <ul style="list-style-type: none"> • obesity, • Atherosclerosis • hyperlipidemia <p>Activity: Visiting Wellness Ward and learning more about the relationship between health and nutrition.</p> | | |
| Unit 4 | <p>Food and Industrial Microbiology Role of microbiology in food and industries;</p> <ul style="list-style-type: none"> • Basic design of fermentor; types of fermentors • Continuous and discontinuous culture; • Preparation of fermented food products such as yoghurt, curd and cheese. • Biochemistry of preparation of alcoholic beverages like wine and beer; acetic acid (vinegar) <p>Minimum Nutritional Requirement and RDA: Formulation of RDA and Dietary Guidelines Reference Man and Reference Woman, Adult consumption unit.</p> <p>Concept of Food Supplements and Fortification: Types and Roles</p> <p>Introduction to food adulterations: adulterants, testing and precautions</p> <p>Activity: Testing various food items for adulteration</p> | 14 | CO4 |
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| CO-PO and PSO Mapping | | | | | | | | | | | | | | |
|--|--|--|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
| CO1 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 2 | 2 | 2 | 2 | 1 |
| CO2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 3 |
| <i>Strongcontribution-3, Averagecontribution-2, Lowcontribution-1,</i> | | | | | | | | | | | | | | |
| Suggested Readings: | | | | | | | | | | | | | | |
| Text-Books | <ol style="list-style-type: none"> 1. Handbook of Applied Biochemistry, Nutrition and Dietetics By ShivanandaNayak. Jaypee Brothers Medical Publishers. 2. Nutritional Biochemistry, Sharma DC, Sharma D. CBC Publishers and Distributors. Latest edition. | | | | | | | | | | | | | |
| Reference Books | <ol style="list-style-type: none"> 1. Food science and nutrition. SunetraRoday. Oxford University Press. Latest edition. 2. Nutrition and Biochemistry for Nurses. Venkatraman S, Dandekar S. Elseveir Publications, 3th Edition. | | | | | | | | | | | | | |
| Para Text | <ul style="list-style-type: none"> • How To Check If Food Items In Your Kitchen Are Adulterated: https://youtu.be/Vz719gfUjOQ • https://timesofindia.indiatimes.com/life-style/food-news/food-adulteration-why-awareness-is-important/photostory/102207335.cms?from=mdr | | | | | | | | | | | | | |
| Recapitulation & Examination Pattern | | | | | | | | | | | | | | |
| Component | Marks | Pattern | | | | | | | | | | | | |
| Mid Semester | 20 | <p>Section A: Contains 10 MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries 0.5Marks.</p> <p>Section B: Contains 07 descriptive questions out of which 05 questions are to be attempted. Each question carries 03 Marks.</p> | | | | | | | | | | | | |
| Class Test | 05 | Contains 05 descriptive questions . Each question carries 01 Mark. | | | | | | | | | | | | |
| Activity | 10 | As decided by the teacher | | | | | | | | | | | | |
| Online Test/ Objective Test | 05 | Contains 10 multiple choice questions . Each question carries 0.5Marks . | | | | | | | | | | | | |
| Assignment/ Presentation | 05 | Assignment to be made on topics and instruction given by subject teacher | | | | | | | | | | | | |
| Attendance | 05 | As per policy | | | | | | | | | | | | |
| Total Marks | 50 | | | | | | | | | | | | | |

Course created by: Dr. Ghazala Zaidi

Signature:

Approved by: Prof. Sudhir Mehrotra

Signature: