FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
Department of Biochemistry
Course Curriculum

PART- A: Introduction				
Program: Bachelor in Science *(Honors / Honors with Research)*		**Semester - VII**	Session: **2024-2025**	
1	**Course Code**	**BCSE - 08 T**		
2	**Course Title**	**Nutritional and Environmental Biochemistry**		
3	**Course Type**	**Discipline Specific Elective (Theory)**		
4	**Pre-requisite (if, any)**	As per Program		
5	**Course Learning. Outcomes (CLO)**	*On successful completion of the course, the student shall be able to:* ➢ Explain the basic components of food stuff and balance diet. ➢ Analyze the food vitamins and minerals with nutritional disorder. ➢ Analyze the effect of toxic substances on environment. ➢ Interpret the effect of toxic chemicals on body parts and their cure.		
6	**Credit Value**	**3 Credits**	***Credit = 15 Hours - learning & Observation***	
7	**Total Marks**	**Max. Marks: 100**	**Min Passing Marks: 40**	

PART -B: Content of the Course

Total No. of Teaching–learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Composition of balanced vegetarian and non-vegetarian diets**; recommended dietary allowance (RDA) for different categories of the human beings. Food preservation standards, food adulterations and precautions, government regulations on preservation and quality of food. Food processing and loss of nutrients during processing and cooking. Basal metabolism and methods of measuring basal metabolic rate (BMR); energy requirements during growth, pregnancy, lactation and various physical activities.	12
II	**Nutritional aspects of Food**: carbohydrates, lipids and protein: nutritive value, requirements, and functions. Nutritional aspects of the vitamins and minerals: requirement and functions Malnutrition, its implications, relationship with dietary habits and prevention. Disorders related to the nutrition: Protein energy malnutrition, Starvation, Obesity.	11
III	**Environmental Pollution:** Types, Outdoor and indoor Air pollution, sources, structure and control strategies. Water and Soil Pollution.Eco–toxicology and its environmental significance.Xenobiotic metabolism, Phase I reaction – oxidation – reduction, hydrolysis and hydration. Phase II reaction – conjugation and methylation.	11
IV	**Pesticide toxicity** – insecticides, fungicides, herbicides and biopesticides. Toxicology of food additives.Metal toxicity – arsenic, mercury, lead and cadmium. Toxicity testing – Test control, genetic toxicity testing. Occupational toxicology: Occupational hazards and their assessment.	11
Keywords	Food, BMR, Nutrition, Pollution, toxicity	

Name and Signature of Convener & Members of CBoS:

PART–C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

- LG Corkerhem and BSS Shane Basic Environmental Toxicology
- T Shibamato& L F Bzeidanes Introduction to Food Technology
- M. Stipanuk Biochemical, Phys. & Mol. Aspects of Human Nutrition
- Tom Brody Nutritional Biochemistry
- DA Bender Nutritional Biochemistry of the Vitamins

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: **100 Marks**

Continuous Internal Assessment (CIA): **30 Marks**

End Semester Exam (ESE): **70 Marks**

Continuous Internal Assessment (CIA): **(By Course Teacher)**	Internal Test / Quiz-(2): **20 +20** Assignment / Seminar - **10** Total Marks - **30**	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against **30** Marks
End Semester Exam (ESE):	**Two section – A & B** Section A: **Q1.** Objective – **10 x1= 10** Mark; **Q2.** Short answer type- **5x4 =20 Marks** Section B: Descriptive answer type qts.,**1out of 2** from each unit-**4x10=40 Marks**	

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1	**Course Code**	**BCSE - 08 P**		
2	**Course Title**	**Nutritional and Environmental Biochemistry**		
3	**Course Type**	**Discipline Specific Elective (Practical)**		
4	**Pre-requisite (if, any)**	As per Program		
5	**Course Learning. Outcomes (CLO)**	*On successful completion of the course, the student shall be able to:* ➢ Analyse the contents of mineral and vitamin in food samples. ➢ Analyse the chemical and microbial contents in various effluents. ➢ Demonstrate TLC for different food components. ➢ Analyse the adulterants present in food samples.		
6	**Credit Value**	**1 Credits**	***Credit =30 Hours Laboratory or Field learning/Training***	
7	**Total Marks**	**Max. Marks: 50**	**Min Passing Marks: 20**	

PART -B: Content of the Course

Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period
Lab./Field Training/ Experiment Contents of Course	➢ Separation and purification of sub-cellular organelles and assay of marker enzymes. ➢ Protein fractionation - salt, solvent and isoelectric precipitation. ➢ Identification and assay of certain toxicants. ➢ Effect of various toxicants on serum enzymes and proteins ➢ Effect of various toxicants on liver and kidney metabolism ➢ Estimation of carbohydrate, protein and fat in food materials. ➢ Titrimetric method of ascorbic acid estimation in fruit. ➢ Separation of casein protein from milk	**30**
Keywords	Toxins, metabolism, Separation	

Name and Signature of Convener & Members of CBoS:

PART–C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

- DA Bender Nutritional Biochemistry of the Vitamins
- R.L. Pike and M.L. Brown Nutrition: An integrated approach -
- G.P. Talwar Text book of Biochemistry and Human Biology
- DWS Wong Mechanism and theory in food chemistry
- M.S. Banji N P. Rao& V. Reddy Text book of Human Nutrition
- Linten Nutritional Biochemistry and Metabolism

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks
Continuous Internal Assessment (CIA): 15 Marks
End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): **(By Course Teacher)**	Internal Test / Quiz-(2): **10 & 10** Assignment/Seminar +Attendance - **05** Total Marks - **15**	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against **15** Marks	
End Semester Exam (ESE):	**Laboratory / Field Skill Performance: On spot Assessment** **Performed the Task based on lab. work - 20 Marks** **Spotting based on tools & technology (written) – 10 Marks** **Viva-voce (based on principle/technology) - 05 Marks**		**Managed by Course teacher as per lab. status**

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