FOUR YEAR UNDERGRADUATE PROGRAM2024-28
FACULTY OF Home Science
COURSE CURRICULUM

PART A: Introduction				
Program: **Bachelor in Home Science** *(Degree/Honors)*			**Semester : V**	**Session:2024-25**
1	Course Code	**HSSC- 13T**		
2	Course Title	Nutritional Biochemistry		
3	Course Type	DSC		
4	Pre-requisite (if any)	***As per Program***		
5	Course Learning. Outcomes (CLO)	• To understand concepts of Biochemistry. • To classify metabolic cycles related to Carbohydrates. • To identify metabolic cycles related to Protein & Lipids. • To assess Chemistry and functions of Hormones. • To examine kinetics of Enzymes.		
6	Credit Value	**3 C**	***1 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 he per period) : 45Period (45 hours)		
Unit	**Topics (Course Contents)**	**No. of Period**
I	**Introduction to Biochemistry** - definition, objectives, scope and Inter-relationship between Biochemistry and other biological sciences. Carbohydrates - Definition, classifications functions and properties of Monosaccharide's - Glucose, Fructose, Galactose , Disaccharides- Maltose, Lactose, Sucrose Polysaccharides Dextrin, Starch, Glycogen Glycolysis, Gluconeogenesis, Glycogenesis, Glycogenolysis, citric and cycle. Blood sugar regulation.	12
II	**Lipids** - Definition, composition, importance and classification Fatty Acids - Functions, properties Significance of Acid value, Iodine value and saponification value. Chemistry and function of Phospholipids, Glycolipids and sterols. Metabolism - B (Beta) Oxidation. Aspects of transport-Passive diffusion, Facilitated diffusion, Active transport.	11

III	**Proteins** - Definition composition function and classification. Amino acids- Essential and Nonessential. Metabolism - Urea cycle, Nitrogen balance, Amino acid pool. Enzymes- Definition, properties, classification, Mode of action oi enzymes, factors affecting velocity of enzyme catalyzed reactions, coenzymes.	11
IV	**Hormones**- Biological roles of hormones of Pituitary, Adrenal cortex and medulla, Thyroid, Parathyroid, Pancreas, Sex glands. Urine - Formation and Composition. **Energy** - Definition, Unit, calorimeter, caloric value of foods, BMR, RQ, SDA of Foods. Nucleic Acid and Nucleo-proteins - Chemistry, composition, structure, Functions.	11
Keywords: - Biochemistry, Carbohydrate Metabolism, Gluconeogenesis, Glycogenolysis, Urea Cycle, Beta Oxidation of Fatty Acids, Energy Metabolism, Nucleic Acid, Hormones, Urine synthesis, Enzymes.		

Part C :

Learning Resources : Text Books. Reference Books, Other Resources

Text books Recommended –

1. Biochemistry-O.P Agrawal, 5th Edition, Prasad's Publication.
2. Lehninger's Principles of Biochemistry-H. Lehninger, 6th Edition, Macmillan publication.
3. Biochemistry- Harper Illustrated Biochemistry, 31st Edition, Mac Graw Hill publication.
4. Biochemistry- Asha Chaudhary, , 11th edition, Shiva Publication.
5. Microbiology- RC Dubey & Maheswari, 4th Edition, S.Chand Publication.
6. Biochemistry- Ranjana Chawala & Sushmita Nyer, 5th Edition, Jaytee Brothers publication
7. Textbook of Biochemistry & Human Biology - G.P. Talwar, 3rd edition, PHI Publication.
8. Fundamentals of Biochemistry - A.C. Deb,6th Edition, NCBI Publication.
9. Text book of Microbiology – Purohit, 6th edition, Agrobios Publication.
10. Food Microbiology – M J Pelzar,Indian Edition, Mac Graw Hill education publisher.
11. Food Microbiology – W.C.Frazier, 5th edition, Mac Graw Hill education publisher.

Online Resources:

- The Active Site of enzymes : https://youtu.be/x_KvWqdzSII
- Applications and importance of factors affecting enzyme action : https://youtu.be/LbXx3j7b7hE
- Coenzymes and cofactors : https://youtu.be/bubY2Nm7hVM
- Sources of Ammonia : https://youtu.be/gSB4bshZcMU
- Ammonia detoxification : https://youtu.be/x0BAnbfK5f8
- Disorders of ammonia metabolism : https://youtu.be/WVhbn6OspZk
- Overview of neurotransmitter metabolism with emphasis on myasthenia gravis and Parkinson disease : https://youtu.be/N6OpSyzyOJY
- Formation and fate of bilirubin : https://youtu.be/r2s0RPnCfZA
- Disorders of ammonia metabolism : https://youtu.be/WVhbn6OspZk
- Bilirubin formation : https://youtu.be/qX0_q0ZJtCA
- Biochemical basis for jaundice : https://youtu.be/bBUCKxeqeAQ
- Jaundice: A introduction classification &causes of each type with emphasis on physiologic jaundice : https://youtu.be/wmllt0D2nY8
- Investigations for differential diagnosis of jaundice : https://youtu.be/Y11f9xQVHlo
- Alcohol metabolism : https://youtu.be/TMbGJTsRQpk

PART D:Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks:	**100 marks**	
Continuous Comprehensive Evaluation(CCE):	**30 Marks**	
Semester End Exam (SEE):	**70 Marks**	
Internal Assessment: Continuous Internal Assessment (CIA)	Internal Test / Quiz(2) –**20+20** Assignment/Seminar – **10** Total Marks– **30**	Better marks out of the two tests/ 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=20Marks** Section B: Descriptive answer type qts.,**1 out of 2** from each unit-**4x10=40 Marks**	

Name and Signature of Convener & Members of BOS

Dr. B. Sethi

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2	Course Title	Nutritional Biochemistry (Practical)		
3	Course Type	DSC		
4	Pre-requisite (if any)	*As per Program*		
5	Course Learning. Outcomes (CLO)	• To define concepts of Biochemistry based identification tests. • To apply various qualitative tests of major nutrients. • To evaluate quantitative tests of nutrients. • To identify Titration methodology. • To learn formation and uses of Haemin crystals from human blood. • To assess Idiometric method for quantative estimation of Ascorbic Acid. • To understand quantative estimation of Serum Hemoglobin level to assess the condition of anemia.		
6	Credit Value	**1 C**	*1 Credit = 15 Hours - learning & Observationand*	
7	Total Marks	**Max. Marks: 50**		**Min Passing Marks : 20**

PART B: Content of the Course		No. of Periods
1 Credit = 30 Hrs Laboratory/ Field learning/ Training		
Module	**Topics (Course Content)**	
Lab/ Field Training/ Experiment contents of the course	1. Identification of Glucose, Fructose, Maltose, Lactose, Sucrose, Starch. 2. Colour and precipitation reactions of Protein. 3. Colour reactions of Cholesterol. 4. Estimation of Glucose by Benedict's method. 5. Estimation of Ascorbic acid by Idiometric method. 6. Estimation of Glycine by Titration. 7. Estimation of Hemoglobin by Acid Hematin method. 8. Preparation of Haemin crystals. 9. Action of Salivary amylase on conversion of starch. 10. Visit to pathology lab. 11. **Project**-Recording Hemoglobin level ,its correlation with age , sex, weight.	30
Key Words	Titration, Sapofification Value, Bendict'smethod, Quantative estimations	

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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**		
Internal Assessment: Continuous Internal Assessment (CIA)	Internal Test / Quiz (2) - **10 & 10** Assignment/Seminar+ Attendance - **05** Total Marks - **15**	Better marks out of the two tests/ Quiz + Obtained marls in Assignment shall be considered against **15** Marks
End Semester Exam(ESE):	**Laboratory / Field Skill Performance : on spot Assessment** **A.Performed the task based on Lab work - 20 marks** **B.Spotting based on tools & Technology (written) - 10 marks** **C.Viva –voce (based on principle/ Technology) - 05 Marks**	

Signature of Convener and Members (CBoS):

(Dr. Amita Sehgal) Dr. B. Sethi