AC/27/06/2023/RS1

SIES College of Arts, Science & Commerce (Autonomous)

RISE WITH EDUCATION

NAAC REACCREDITED - 'A' GRADE

SIES College of Arts, Science and Commerce

(Autonomous)

Affiliated to University of Mumbai

Syllabus under NEP effective from June 2023

Programme: B.Sc.

Subject: Biochemistry

Skill Enhancement Course (SEC)

Class: F.Y.B.Sc. Semester : I and II

Choice Based Credit System (CBCS)

Content

Preamble

Biochemistry is a branch of biological science that delves into the chemical processes and information pathways governing the survival and propagation of life. It is an interdisciplinary science providing the learner an opportunity to elucidate molecular mechanisms and explore the intricate world of biomolecules and their applications. Under the aegis of New Education Policy-2020, the department offers a three-year BSc program and a four-year BSc Honours program with Biochemistry (major or minor). At the first year level, along with core Biochemistry course, the department also offers Vocational skill enhancement course and Skill enhancement course. In this program, we will embark on a comprehensive journey from the structure and function of biomolecules to their interactions and implications in health and disease. Through lectures, laboratory sessions, and interactive discussions, the student will not only gain insights of the biochemical processes and pathways, but also develop skills for employability and aptitude for research.

Objectives:

The goal of this interdisciplinary Biochemistry program is

1. Foundational knowledge: To build the foundation of Biochemistry and encourage the student to pursue Biochemistry at higher level.
2. Application of Biochemistry: To enable the student to recognize the application of biochemistry in areas of nutrition and food, pharmaceuticals, diagnostics, clinical research, bioinformatics, forensics, etc.
3. Laboratory skills: To develop essential laboratory skills for the experimental analysis of biochemical principles.

Program Outcome

At the end of the first year, the student should be able to:

- Comprehend the concepts in nutrition and importance of proper nutrition thus laying a foundation for the field of nutrition and dietetics
- Understand the physical and chemical properties of biomolecules
- Co-relate the structure of biomolecules with their properties and functions
- Explain the role of biomolecules in maintaining structural integrity as well as their role in cellular pathology
- Apply the experimental skills in studying biomolecules and cellular processes
- Recognize the application of biochemistry in diverse fields of food, nutrition, clinical research, drug discovery, diagnostics, forensics, genomics, proteomics and bioinformatics.
- Use basic computational skills in documentation and scientific data presentation.

Evaluation: Student's understanding of biochemistry will be evaluated through a combination of examinations, quizzes, laboratory reports, and class participation. These assessments are designed to gauge learner's comprehension of both theoretical concepts and practical applications.

Overall Credit Structure for F.Y. B.Sc.

Semester	Core I	Core II	OE	VSC, SEC (VSEC)	AEC, VEC, IKS	OJT, FP, CEP, CC	Credits/ semester	Degree/ cumulative credits
I	4C	4C	4C	VSC-2C SEC-2C	AEC-2C VEC-2C IKS-2C	Nil	22C	**UG Certificate 44C**
II	4C	4C	4C	VSC-2C SEC-2C	AEC-2C VEC-2C	CC-2C	22C	
Total Credits	8C	8C	8C	8C	10C	2C	44C	

OE: Open Elective/Generic open elective
VSC: Vocational Skill Course
SEC: Skill Enhancement Course
AEC: Ability Enhancement Course
VEC: Value Education Course
IKS: Indian Knowledge System
OJT: On-job training
FP: Field Project
CEP: Community engagement and service
CC: Co-curricular courses

Credit Structure of courses offered by Biochemistry department for F.Y. B.Sc. Biochemistry

Name of Program: B.Sc. Biochemistry **Name of Department:** Biochemistry						
Class	**Semester**	**Course Code**	**Course Title**	**Credits**	**No. of lectures/ per week**	**Marks**
FYBSc	I	SIUBCCC111	Foundations of Biochemistry	03	03	75
		SIUBCCCP111	Biochemistry Practical	01	02	25
		SIUBCVS111	Basic tools & techniques in Biochemistry	02 (01Th + 01P)	03 (01Th + 02P)	50
		SIUBCSE111	Good Laboratory Practices & Soft Skills	02 (01Th + 01P)	03 (01Th + 02P)	50
FYBSc	II	SIUBCCC121	Cell Biology	03	03	75
		SIUBCCCP121	Cell Biology Practical	01	02	25
		SIUBCVS121	Basic tools & techniques in Biochemistry	02 (01Th + 01P)	03 (01Th + 02P)	50
		SIUBCSE121	Good Laboratory Practices & Soft Skills	02 (01Th + 01P)	03 (01Th + 02P)	50

SI: SIES
U: Undergraduate
BC: Biochemistry
CC: Core Course
VS: Vocational Skill Course
SE: Skill Enhancement Course

Semester I and II
Syllabus- Skill Enhancement Course (SEC)

Course Title: Good laboratory practices & soft skills	
Course code: SIUBCSE111 and SIUBCSE121	
Credits: 02	**Hours/week: 01L + 02 P**

Course Outcome

On completing the Course, the learner should be able to

1. *Identify and follow good laboratory practices. Implement safety protocols.*
2. *Identify safe handling and storage procedures of chemicals.*
3. *Comprehend the working of common equipments and instruments and employ them in laboratory work.*
4. *Follow and create standard operating procedures for instruments.*
5. *Participate in group discussions. Express and communicate ideas effectively.*
6. *Apply basic MS office tools in scientific writing, data analysis and presentations.*

Sr no	Title	Theory (T)/ Practical (P)
1.	a. Reading & understanding of labels & symbols used on reagent bottles. b. Handling & storage of chemicals. c. Studying the physical & chemical changes that take place in a chemical. d. Safety protocols & hazard management. e. Introduction to MSDS	P
2.	a. Introduction to routinely used apparatus & equipment in a laboratory (Weighing balance, Desiccator, Fumehood, Buchner Funnel, UV Chamber) b. Determination of moisture content of sample.	T + P
3.	a. Sterilization & disinfection. b. Use of an autoclave & hot air oven c. Preparing SOPs	T
4.	Introduction to soft skills a. Oral communication (Group discussions, Presentation) b. Written communication (Email/Letter Writing)	T + P
5.	Introduction to MS Office a. MS Word b. MS Excel (plotting of graph) c. MS Powerpoint	T + P

REFERENCES FOR SEC

1. Microbiology, 5th edition- Michael Plczar Jr, E.C.S Chan, Noel Krieg.
2. Biophysical Techniques- Upadahyay, Upadhyay & Nath
3. Research Methodology- C.R Kothari
4. Butterfield Jeff Soft Skills for everyone.
5. Communication Skills for Engineers & Scientists- Sharma, Sangita and Binod Mishra.

Scheme of Examination:

Course Type	Credits	Distribution of Credits	Sem end	Internal	Practical	Total
SEC	2	without sem end exam	---	50	---	50

Details for Internal Assessment:

Weightage for Internal (marks)	Min. marks required for passing	Pattern of Evaluation
SEC 50 marks (without sem end exam)	20	20 marks- class test (No retest) + 30 marks- Open to Department OR 50 marks from Practical- journal+ viva+ exam etc (continuous evaluation)

Options for internal evaluation: Quizzes, Presentations, Surveys, Internship, Tutorials, Role Play,