

#### IQAC recommendation

IQAC, Vivekananda College, Thakurpukur, met on 18/June/2022, to envisage, formulate and design Add-On Courses, beyond prescribed Curriculum. The IQAC has also decided to organise a program on staff training:

- A. It was decided that all the departments of Humanities, Science and Commerce would design and formulate 30 hour Add-On Courses for 2022-23, Academic calendar, as per UGC guidelines.
- B. It was decided that the Departments would be free to choose the Courses on the basis of their (subject) relevance, practicality and feasibility.
- C. It was decided that the Departments would have a Course Coordinator, who would design the Course and Course materials, in consultation with all teachers of the Department.
- D. It was decided that each Department would design their own format; and could follow a blended mode of instruction.
- E. It was decided that the Departments would be encouraged to use and utilize their own resources while formulating the Add-On Courses, rather than relying on Outsourcing.
- F. IQAC would send its recommendations to the Principal/TIC for perusal and implementation.
- G. The IQAC would also organise a Staff Training programme - 'Effective Working Style' Conducted by IPE Of Professional Excellence On 25th June 2022 .

  
18/6/22  
Co-ordinator  
IQAC  
Vivekananda College  
Kolkata-700 063



# VIVEKANANDA COLLEGE

(GOVT. SPONSORED) (NAAC ACCREDITED GRADE 'A')

(033) 2497 6824  
(033) 2497 6834

Ref. No.....

Date.....

## Notice

It is hereby notified that Vivekananda College, Thakurpukur, will offer Add-On Courses to All Honours students for the Academic year 2022-23.

Each Department will offer an Add-On Course as per UGC guidelines. Each Course will be structured & overseen by a Course Coordinator, selected from the respective Department. Departmental Heads are requested to take up the matter on an urgent basis.

  
Principal

Principal  
Vivekananda College  
Thakurpukur, Koi-63

**DEPARTMENT OF BIOCHEMISRY**

**Date: 29/08/22**

A departmental meeting will be held on 29.08.2022 at 12:00 noon to discuss the following agenda. All teachers are requested to kindly attend the meeting.

Agenda of the meeting:

i) Introduction of Add-on course on "Techniques in Biochemistry" for PG Sem-IV Students from the session 2022-2023

HOD

## DEPARTMENT OF BIOCHEMISTRY

Resolution of the departmental meeting held on 29.08.22

### A) Teacher present:

1. Dr. Dibyendu Raj 29/08/22
2. Dr. Kakali Sinha Roy 29/08/22
3. Nimesha Sen Banerjee 29.8.22
4. Dr. Subhasini Banerjee 29/08/22

### B) Minutes of the meeting

1. In the Departmental meeting dated 17.02.2022 the teachers of the UG Department of Biochemistry unanimously decided that:
  - a. The UG Sem-II Honours students would be offered a 30-hour Add-on Course on "Clinical Diagnostic Technique" in Collaboration with IQAC, Vivekananda College.
  - b. Another 30-hour Add-on course on "Techniques in Biochemistry" will be offered to UG Sem-III students from the Session 2022-2023.
2. It was also decided in the meeting that Dr. Kakali Sinha Roy, Department of Biochemistry would be the Course Coordinator for the Add-On Course on "Clinical Diagnostic Technique" for the Academic session 2021-2022 and Dr. Dibyendu Raj, H.O.D would be the Course Coordinator for the Add-On Course on "Techniques in Biochemistry"
3. The Course structure of the course on "Clinical Diagnostic Technique" would be submitted by Dr. Kakali Sinha Roy and was accepted by all teachers of the department.
4. The Course structure of the course on "Techniques in Biochemistry" would be submitted by Dr. Dibyendu Raj and was accepted by all teachers of the department.
5. Certificates would be given to each student at the successful completion of the Course.

[ADD ON COURSE]

**CERTIFICATE COURSE ON TECHNIQUES IN BIOCHEMISTRY**

**FOR 2022-23**

3 Hrs./Week  
Max. Time: 3Hrs.  
Max. Marks: 50  
Internal Assessment: 10  
Total Marks: 60

**SECTION – A**

- **Introduction to Biological Research**
- Definition and significance of research in biology, Historical context and landmark studies, Overview of contemporary research areas in biology, Ethical considerations in biological research.
- **Formulating Research Questions and Hypotheses**
- Developing clear and testable research questions, constructing hypotheses in biological research, Significance of hypotheses in experimental design.
- **Data Collection Methods in Biology: A basic conceptual Approach**
- Measurement and Analysis in Biology, Quantitative and qualitative data in biology, Statistical analysis in biological research, Data interpretation and visualization techniques.
- Research Proposal and Project Presentation, Developing a research proposal in biology, Effective presentation skills for scientific research, Peer review and constructive feedback

**SECTION -B**

- **Protein purification techniques:** Protein Isolation- Methods of solubilization of proteins from their cellular and extra cellular locations- cytosolic, integral and peripheral membrane protein. Brief outline of the use of simple grinding methods, homogenization, ultrasonication, French press and centrifugation, sedimentation coefficient, stabilization of proteins during purification.
- **Solubility of Proteins based on Protein Purification-** Salting in and salting out (Ammonium sulphate fractionation), solvent fractionation, Isoelectric precipitation), lyophilization, Dialysis, Ultrafiltration (Principle and application), Ultracentrifugation
- **Chromatographic techniques and analysis:** partition coefficient, phase systems, liquid and gas chromatography, performance parameters: retention, resolution, basis of peak broadening, peak symmetry, Principle, Application, Advantages and Disadvantages, limitation for different modes of chromatography- Partition Chromatography (Paper Chromatography, hydrophobic interaction/ reverse phase chromatography), Adsorption Chromatography; Thin Layer Chromatography, Gel filtration chromatography, affinity

chromatography, Ion-exchange chromatography, Demonstration of High Performance Liquid Chromatography (HPLC), brief concept of FPLC.

- **Electrophoresis Techniques:** Principle and application of different types of Gel Electrophoresis (PAGE- horizontal and vertical, SDS-PAGE and molecular weight determination, Isoelectric Focusing (IEF) and 2-D gel electrophoresis.
- **Determination of purity,** specific activity, extinction coefficient of enzymes / proteins. Mass Spectrometry (Principle and application only).

#### LABORATORY

3 Hrs./Week

Max. Time: 3 Hrs.

Max. Marks: 40

1. Determination of Molecular weight of protein from SDS-PAGE (kit based)
2. Column chromatography (size exclusion) by teaching kit (Determination of Void volume)
3. Genomic DNA and Plasmid DNA isolation from bacterial cells.
4. Agarose gel electrophoresis.
5. Determination of unknown protein concentration by Folin-Lowry method.
6. PCR and ELISA techniques (demonstration only)

#### BOOKS RECOMMENDED

1. Biological instrumentation and methodology by Dr. P.K. Bajpai
2. Techniques and methods in Biology by K.L. Ghatak
3. Experimental procedures in Life Sciences by S. Rajan and R. Selvi Christy
4. Methodology of Biological Science by R. Bakappa
5. Principles and techniques of Biochemistry and Molecular Biology by Wilson and Walker
6. Tools and techniques in Biological Science by Dev, Vats and Chaturvedi
7. A Book on Biological techniques by Pawar and Desai

**Vivekananda College**  
**Department of Biochemistry**  
**Add on Course Title: Techniques in Biochemistry**  
**Syllabus distribution**

Course	30 Hours	Faculty
Introduction to Biological Research	2	KR
Formulating Research Questions and Hypotheses	2	DR
Data Collection Methods in Biology: A basic conceptual Approach	4	DR
Protein purification techniques	2	DR
Solubility of Proteins based on Protein Purification	2	NS
Chromatographic techniques and analysis	2	NS
Electrophoresis Techniques	2	NS
Determination of purity	2	NS
Mass Spectrometry	2	SB
<b>LABORATORY SKILL</b>		
Determination of Molecular weight of protein from SDS-PAGE (kit based)	1	DR
Column chromatography (size exclusion) by teaching kit (Determination of Void volume)	2	SB
Genomic DNA isolation from bacterial cells	2	DR
Plasmid DNA isolation from bacterial cells	2	NS
Agarose gel electrophoresis.	1	DR
Determination of unknown protein concentration by Folin-Lowry method.	1	KR
PCR and ELISA techniques (demonstration only)	1	DR