# Department of Liberal Education
## Era University, Lucknow
### Course Outline
### Effective From: 2023-24

| | | | | | |
|---|---|---|---|---|---|
| **Name of the Program** | **B.A. / B.Sc. (LIBERAL EDUCATION)** | | | **Year/ Semester:** | **2nd / 4th** |
| **Course Name** | Molecular biology techniques :Practical training | **Course Code:** | **MB202P** | **Type:** | **Practical** |
| **Credits** | **01** | | | **Total Practical Hours:** | **30 Hours** |
| **Evaluation Spread** | **Internal Continuous Assessment:** | **10 Marks** | | **End Term Exam:** | **15 Marks** |
| **Type of Course** | ○ Compulsory | ● Core | | ○ Creative | ○ Life Skill |
| **Course Objectives** | • This course will give the knowledge of isolating DNA from blood, Plasmid DNA from E.coli .<br>• Through this learner will be able to determine separation of DNA bands through agarose gel electrophoresis. | | | | |

**Course Outcomes (CO):** *After the successful course completion, learners will develop following attributes:*

| **Course Outcome (CO)** | **Attributes** |
|---|---|
| **CO1** | Students will learn about the isolation of DNA from blood and analysis by agarose gel electrophoresis. |
| **CO2** | Students will learn and understand how estimation of DNA using Diphenylamine reagent |
| **CO3** | Students will be able to demonstration polyacrylamide gel electrophoresis (SDS-PAGE) |
| **CO4** | Learner have the ability to learn study the different conformations of plasmid DNA through agarose gel electrophoresis |
| **Pedagogy** | Interactive, discussion-based, student-centered. program outputs. |
| **Internal Evaluation Mode** | Experiment-Writing and Conductance<br>File Maintenance/ Laboratory Record<br>Continuous Attendance and Participation |

| **Practical No.** | **Experiments** | **Contact Hours** | **Mapped CO** |
|---|---|---|---|
| 1. | Isolation of DNA from blood and analysis by agarose gel electrophoresis | 4 | **CO1** |
| 2. | Estimation of DNA using Diphenylamine reagent | 4 | **CO2** |
| 3. | Demonstration polyacrylamide gel electrophoresis (SDS-PAGE) | 6 | **CO3** |
| 4. | Isolation of plasmid DNA from *E.coli* | 8 | **CO4** |

| | | | |
|---|---|---|---|
| 5. | Study the different conformations of plasmid DNA through agarose gel electrophoresis | 8 | **CO4** |

**CO-PO and PSO Mapping**

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | |
| CO2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | |
| CO3 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 1 | 2 | |
| CO4 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | |

***Strongcontribution-3,Averagecontribution-2, Lowcontribution-1,***

**Suggested Readings:**

| | |
|---|---|
| **Reference Books** | 1.Kindt, Goldsby and Osborne. Kuby's Immunology. WH Freeman& Company<br>2.RoittI,Brostoff, J and Male D.Immunology, 6th edition, 2001, Mosby, London.<br>3,Ramesh SR, Immunology. McGraw Hill Publications. |
| **E-Resources** | **1.https://www.youtube.com/watch?v=KSs0SMfERuA&list=PLb8ShsGZfEVb7SSJUus5zp7YmFHiF-YSw**<br><br>**2.https://www.youtube.com/watch?v=SN7PiXDYZno&list=PLb8ShsGZfEVb7SSJUus5zp7YmFHiF-YSw&index=6** |

**Internal Practical Evaluation:**

| Component | Marks |
|---|---|
| **Experiment-Writing and Conductance** | 5 |
| **File Maintenance/ Laboratory Record** | 2 |
| **Continuous Attendance and Participation** | 1 |
| **Viva-Voce** | 2 |
| **Total Marks** | 10 |

**Course created by: Dr.Manaal Zahera**

**Signature:**

**Approved by: Dr. Amita Jain**

**Signature:**