**Resolution No. - AC/II(22-23).3.RUS7**

# S. P. Mandali's

# Ramnarain Ruia Autonomous College

## (*Affiliated to Mumbai University*)

RUIA COLLEGE
Explore • Experience • Excel

## Syllabus for UG

## Program: F.Y.B.Sc. Life Science

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## Program Code: RUSLSc

## Skill Enhancement Course (SEC)

(As per the guidelines of National Education Policy 2020-
Academic year 2023-24)

(Choice based Credit System)

# Skill Enhancement Course (SEC)

## Course Title: Techniques in Life Science

## Corse Code: RUSSECLSc.E111

## Type of Course: Skill Enhancement Course

## Academic year 2023-24

**COURSE OUTCOMES:**

| COURSE OUTCOME | DESCRIPTION<br>A student completing this course will be able to: |
|---|---|
| **CO 1** | Demonstrate different phases of cell cycle and its importance. |
| **CO 2** | Explain the structure and function of endoplasmic reticulum, Ribosome, lysosomes and evaluate their role in cellular processes. |
| **CO 3** | Compare and contrast different beneficial insects and their role in industry. Explain the importance of different microorganisms in agriculture and the food industry. |
| **CO 4** | Apply theoretical knowledge to practical scenarios, such as conducting experiments like mouth parts of different insects to understand choice of food habits in insects and to develop essential laboratory skills and scientific methodologies. |

# DETAILED SYLLABUS

| Course Code/ Unit | Unit | Course/ Unit Title | Credits/ Hours |
|---|---|---|---|
| **RUSSECLSc.E111** | | **Techniques in Life Science II** | **1 credit / 15 Hours** |
| | **I** | **Cell cycle , cell organelles and beneficial organisms.**<br><br>Cell cycle (G0,G1,G2, M phase)<br><br>**Overview of Cell Organelles**<br>Endoplasmic Reticulum:(Rough and Smooth) Structure (including sarcoplasmic reticulum)<br>Role in protein synthesis (ER- Ribosome complex) and transport (Signal Hypothesis).<br>Ribosomes: Subunits in prokaryotes and eukaryotes (including those within chloroplast and mitochondria); ER-Ribosome complex.<br>Lysosomes:<br>Primary and Secondary lysosomes and their functions Lysosome associated diseases - Tay Sachs , Silicosis. Nucleus<br>Mitochondria<br>Golgi Complex<br><br>**Productive and Beneficial Insects and Microorganisms**<br>**Silkworm** (Biology, nature of produce, uses)<br>**Honey Bees** (Biology, nature of produce, uses) and other beneficial insects.<br>**Types of microorganisms** used in agriculture and food industry. Yeast in baking and brewing industries. | |
| | | | |
| **RUSSECLScP.E111** | | **Practicals Techniques in Life Science II** | **1 credit / 15 Hours** |
| | | **1. Microscopy**<br>**Study of Electron Micrographs of listed below:** Endoplasmic reticulum(Rough and smooth). Golgi complex<br><br>**2. Study of Mouth parts in insect and comparative assessment of mouth parts:** Siphoning Type - eg. Butterfly, Biting and Chewing type- eg | |

| | | | |
|---|---|---|---|
| | | Cockroach (if available)<br><br>**3. Collection of blood group information from family and construction of pedigree charts.**<br><br>**4. Separation techniques:**<br>i. Thin Layer Chromatography<br>ii. Electrophoresis<br><br>**5. Introduction to Applied Entomology - Apiculture , Sericulture.**<br><br>**6. Detection of Dehydrogenase enzyme activity using sprouting grams / beans or muscle (as a study of mitochondrial function)**<br><br>**7. Estimation of Catalase enzyme activity using paper disc rising-time technique (Blood/Plant source).** | |

# Modalities of Assessment

## Skill Enhancement Course - (2 Credit Theory Course for BSc)

**A) Internal Assessment 40% - 10 Marks**
Class Test / Project / Assignment / Presentation

**B) External Examination (Semester End) 60%- 15 Marks**
**Semester End Theory Examination:**

1. Duration – The duration for these examinations shall be of **30 Minutes**.
2. Theory question paper pattern:

**Paper Pattern:**

| Question | Options | Marks | Questions Based on |
|---|---|---|---|
| 1 | Answer any 3 out of 4 (5 marks each) | 15 | Unit 1 |
| | **TOTAL** | **15** | |

**C) Practical Examination Pattern: Total Marks 50**

A. **Internal Examination: 40%- 20 Marks**

| Sr. No. | | Marks |
|---|---|---|
| 1 | Laboratory work, GLP, etiquettes – Continuous assessment | 15 |
| 2 | Journal | 05 |
| | **TOTAL** | **20** |

B. **External Examination: 60%- 30 Marks**

**Semester End Practical Examination:**

| Question | Options | Marks |
|---|---|---|
| 1 | Main question to perform Experimental task / Estimation / Biostatistical analysis | 15 |
| 2 | Identification | 10 |
| 3 | Viva | 05 |
| | **TOTAL** | **30** |

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