mLAC
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Excellence in Education
Since 1972

Maharani Lakshmi Ammanni College for Women **Autonomous**

Affiliated to Bangalore University
Re-accredited by NAAC with "A" grade, Recognised by UGC
under Section 2(f) and 12(b) of the UGC Act 1956
Conferred the Status of 'College with Potential for Excellence' by UGC

MAHARANI LAKSHMI AMMANNI COLLEGE, AUTONOMOUS

SYLLABUS

FOR

STAR PRACTICALS - BASIC LEVEL

(LIFE SCIENCES)

UNDER STAR COLLEGE SCHEME

FUNDED BY

सत्यमेव जयते
Department
of Biotechnology
Govt. of India

DBT, GoI

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Maharani Lakshmi Ammanni College
for Women, Autonomous
Science Post, Bangalore - 560 012.

Overview of the program

Star program for undergraduate Science programs is an initiative of DBT, Government of india to strengthen the Basic Sciences. As mentioned by DBT, GoI, Star College Scheme is a pan India Scheme that envisages a Star College in every district of the country, DBT in collaboration with State Government will identify colleges that can be considered for support under this Scheme.

The main Objective of the program is

To strengthen the academic and physical infrastructure for achieving excellence in teaching and training.

- To enhance the quality of the learning and teaching process to stimulate original thinking through 'hands-on' exposure to experimental work and participation in summer schools.
- To promote networking and strengthen ties with neighbouring institutions and other laboratories.
- To conduct specialized training programmes for faculty improvement for optimizing technical capabilities.
- To increase capabilities of core instrumentation resources by procuring new equipment and upgrading of existing facilities.
- To provide access and exposure to students to research laboratories and industries in the country.
- To help in devising standard curricula and Standard Operating Procedures (SOP's) / kits for practicals.
- To provide better library facility to students and teachers.

Aim

Envisaging the objective "To help in devising standard curricula and Standard Operating Procedures (SOP's) / kits for practical's", mLAC has compiled the practical's conducted under the star college program/ scheme for life Sciences and Physical Sciences and will be offered as the value-added Programs to students.

Outcome

- The program will enhance the hands-on skill ability of the students, enabling them understand in deep the practical knowledge of various process in sciences.
- Inculcating research ambience into conventional learning environment
- Understand the multidisciplinary aspects of subjects
- Learn and imbibe applied aspects in life and physical sciences.

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- Understand importance of Interdisciplinary learning and emphasize on based learning

Beneficiaries:

- The program will be offered to I year students of Department of life Sciences
- The program will be offered twice in an academic year

Course Plan:

Course Plan			
	Hours/week	**Total duration**	**Total hours**
No theory/week	**2hr**	**2 months**	**18**
No. of Practical sessions/week	**2hrs X 2 practicals/week= 4 hrs**	**2 months**	**32**
		Total	**40 hrs**

Scheme of evaluation:

Scheme of evaluation		
	Marks	**Mode**
Theory	**35**	**Written**
Practicals	**50**	**Hands-on**
Internal Marks	**15**	**Continuous evaluation**
	Total	**100 marks**

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Content of Syllabus- Theory

Sl. No	Contents	Duration in hours
1.	**Biochemistry**: Introduction to blood and its components, Clinical importance of serum, Plasma and blood cells. **Lipids**- Properties, types and clinical importance. Antioxidants- types, source, significance and applications.	2hrs
2.	**Biotechnology**: Cellular organelles Cell aging, cell death. mutations, overview of molecular basis of mutations Microbial techniques and its applications.	2hrs
3	**Botany:** Microscopes use and maintenance, Micrometry and its application. Algaes, phytoplanktons and zooplanktons- Introduction, importance and application.	2hrs
4	**Chemistry**: Zero order reactions- examples and applications. Equivalent weight, pka, pH, rate constant- Introduction and application. Chemical Synthesis of components- methods, examples and application.	2hrs
5	**Microbiology**- Good Lab practices, waste management- types and uses of microbes.	2hrs
6.	**Zoology**: RBC- properties and significance. Soil and its properties, soil analysis and its application. Water analysis and its application.	2hrs

Content of Syllabus- Practical:

Sl. No	Title of the Experiments
	Experiments in Biochemistry
1.	Determination of viscosity and density of blood and serum.
2.	Lipid profile- Triglycerides and cholesterol.
3.	Estimation of serum electrolytes.
4.	Surfactant properties of oils.
5.	Determination of surfactant properties of lipids.
6.	Estimation of phenolic content of green tea and commercial tea.

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7.	Determination of oxalates in Spinach by gravimetric titrations.
8.	Estimation of Acid content of soft drinks by pH metric titrations
	Experiments in Biotechnology
1.	UV induced mutation &Cell viability assay by dye exclusion method
2.	Activity on finger printing technique- a part of crime detection
3.	Evaluation of Antiseptics and disinfectant as an effective antimicrobial agent.
4.	Identification of oxygen requirement by bacteria by cultivation on Fluid thioglycolate medium
5.	Activity on finger printing technique- a part of crime detection
6.	Isolation of chloroplast from spinach leaves
7.	Isolation & screening of cellulase producing bacteria from cow dung
8.	Membrane filtration technique for bacteriological examination of water
9.	Staining of mitochondria in human cheek epithelial cells
10.	Study of human Mendelian traits- A survey of inheritance pattern in family.
	Experiments in Botany
1.	Methods to measure the size of plant cells under Microscope Identification of algae from water sample of Sankey Tank.
2.	Determination of ionic accumulation (Chlorine) in plant cells.
3.	Isolation of plant-based bacteria from milk & Qualitative study of commercial milk.
4.	Identification of phytoplanktons from water sample of various sources.
5.	Maceration and Study of cell measurement using micrometry.
Sl. no	**Experiments in Chemistry**
1.	Study of rate constant of a zero – order reaction (Iodination of acetone) by volumetric method.
2.	Determination of equivalent weight of copper by oxide.
3.	Estimation of Cuprous oxide by Raschig's method.
4.	Preparation of m-nitro aniline from acetanilide.

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5.	Determination of pKa of a weak acid using pH meter.
6.	Isolation of Casein from different samples of milk.
	Experiments in Microbiology
1.	Waste disposal mechanisms in microbiology laboratory
2.	Cleaning and handling of glassware in microbiology laboratory.
3.	Morphological examination of dry seeds for seed health.
	Experiments in Zoology
1.	Estimation of Haemoglobin in human blood using Haemoglobinometer.
2.	Soil Analysis- pH, Turbidity, total dissolved salts, dissolved oxygen, salinity, Temperature & Conductivity.
3.	Statistical analysis to determine population density in a given quadrant.
4.	To calculate gene frequency in Mendelian population

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