Second semester 2020-2021 **Date: January 25th, 2021**

COURSE HANDOUT (PART-II)

In addition to part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

Course No. **: BIO F110**
Course Title **: BIOLOGY LABORATORY**
Instructor-in-charge **: Meghana Tare**

Course Description:
Understanding Biological sciences, analysis and estimation of biomolecules, preparation of temporary slides for microscopic analysis, study of cell structure and division, investigation of catalytic activity of enzyme, physiology of plant and animal systems, diversity of living systems.

Scope and Objective of the course:
The major objective of this course is to offer a hands-on experience on fundamental aspects of practical biology. The student would observe and understand various biological phenomena and also be equipped with some simple techniques which form the basis of research in biology. The course has been revised to run parallel to General Biology classes.

Text Book/Manual: Laboratory Manual for Biology, BITS Pilani 2014, revised, 2019.

Reference Book: Simon, E.J. et al: Campbell Essential Biology with Physiology (5th Edition, BITS Pilani custom edition). Noida: Perason India Education Services Pvt. Ltd., 2015

Experiment Plan

Experiment No.	Name of the Experiment	Learning Outcome
Experiment – 1:	**Photosynthesis** Lab: To study **Photosynthesis** in the leaves	Understanding the process of photosynthesis, observing it happen in the lab, importance of different conditions governing photosynthesis.
Experiment-2:	**Transpiration Lab**: Preparation of temporary mount of leaf epidermis to study the structure of stomata and measurement of transpiration rate	Understanding the role of stomata in controlling transpiration in plants. Transpiration rate and factors affecting it.
Experiment – 3:	**Transport Lab:** To study the phenomenon of plasmolysis in onion peel.	Effect of tonicity of a solution on different cell types; osmosis & osmoregulation.
Experiment – 4:	**DNA Lab**: To extract total genomic DNA from cells	Basic knowledge about the genetic material, principle of its isolation.
Experiment – 5:	**Electrophoresis Lab**: Visualizing DNA using gel electrophoresis	Understand characterization of DNA based on molecular weight, using electrophoresis.

Experiment – 6:	**Mitosis Lab**: Measurement of mitotic index and duration of mitosis in the given plant tissue. Observation of various stages of mitosis through permanent slides.	Understanding different phases of cell division, different factors affecting it and preparation of slides to view mitosis in a plant meristematic tissue.
Experiment – 7:	**Protein Lab:** Measurement of total protein content in the given sample by Lowry's method.	Proteins: the building blocks; their role in humans; methods to quantify proteins in different samples.
Experiment – 8:	**Enzyme Lab:** To study the effect of the enzyme lactase on milk	Properties of an enzyme and chromogenic detection methods.
Experiment – 9:	**Physiology Lab**: Measurement of haemoglobin content in the human blood and determination of blood group and Rh status.	Blood group incompatibility, genetics behind blood group inheritance, hemoglobin and its importance; Blood typing.

Evaluation Scheme: Evaluations will be based on laboratory experiments and their manuals and materials provided by the Instuctors.

S. No.	Evaluation component	Duration	Date, time and Venue	Marks & Weightage (%)	Nature of component
1.	Day to Day Evaluation (Attendance+ Performance)	-	Daily Lab	54%	CB+OB
2.	Surprise Quizzes (multiple)	10 minutes	TBA	16%	OB
3.	Comprehensive Exam	TBA	TBA	30%	CB

Notices: Notices will be displayed on Nalanda/Google Classroom.

Make up Policy:

No make ups will be granted for Daily Labs. Genuine cases such as hospitalization, (upon production of the relevant documents as records/ proof) will be considered upon discussion with team for any make ups for the final Exam.

Instructor-in-Charge
BIO F110