BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
Pilani Campus
AUGS/ AGSR Division

SECOND SEMESTER 2020-21
Course Handout (Part II)

Date: January 15, 2021

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

Course No. : **BIO F411**
Course Title : **LABORATORY**
Instructor-in-Charge : **Dr. Meghana Tare**
Instructors : **Prof. Jitendra Panwar, Dr. B. Vani**
Student Instructors : **Vikas, Sonia, Mamta, Diksha, Aakanksha**

1. Course Description:
Specially designed laboratory course aims to impart practical training in different areas of biology. Experiments related to areas like Cell and Tissue culture, Genetics, Cell Biology, Developmental Biology, Plant and Animal Physiology, Ecology, Biophysics, Immunology etc. will be done to acquaint students with the practical aspects of these courses.

2. Scope and Objective of the Course:
Familiarize students with the experimental techniques in major areas of biology.

3. Text Book: Write-ups will be made available (online) for each experiment.

4. Course Plan:

Exp. No.	Area	Experiment	Learning Outcome
1.	Cell Biology	Membrane permeability of a beet root	Understanding of material uptake and release by cells
2.	Cell Biology	Basic handling of cells	
3.	Cell Biology	DAPI staining and cell counting	
4.	Integrated Biology	Phylogeny analysis	Understanding evolutionary analysis
5.	Biological Chemistry	Differential NH_4SO_4 fractionation of plant extract and Bradford protein assay	Understanding protein estimation
6.	Ecology & Envtl. Science	Study of quantitative characteristics in plant communities/ Population growth kinetics	Learning statistical analysis in population and
7.	Ecology & Envtl. Science	To calculate analysis of variance (ANOVA)	
9.	Bioinformatics	Functional and structural aspects of protein sequences	Knowing basic bioinformatics
10.	Genetics	Bacterial conjugation	Learning genetic manipulation effects
11.	Genetics	Mutational studies using *Drosophila*	
12.	Genetics	Understanding gene/genome structure	
13.	Plant Physiology	Induction of callus using plant growth regulators	Understanding functions of PGRs and stress physiology
14.	Plant Physiology	Quantification of oxido-reductase enzymes	
15.	Plant Physiology	Quantification of stress responsive proteins	
16.	Plant Physiology	Isolation of thylakoid membrane and analyzing its function	

17.	Animal Physiology	Histological analysis of human tissue	Understating animal tissue systems
18.	Biophysics	Protein folding kinetics using spectrometer	Understanding protein folding kinetics
19.	R-DNA Technology	Restriction fragment length polymorphism (RFLP)	Learning restriction mapping
20.	Immunology	Rocket immune-electrophoresis assay	Learning Ag-Ab reactions
21.	Immunology	Dot ELISA	
22.	Dev. Biology	Study of morphogenetic movement in chick	Knowing chick development stages

Note: 1. Out of this list, a minimum of 17 experiments will be conducted in the semester.
2. Order and execution of the experiments may also be subject to change as per the availability of the consumables.

5. Guide to attend the online course:

- Do not sit idle during online demonstrations, you can be asked questions in between to assure participation.
- For each experiment being demonstrated, you should note down:
  (a) Objective of the experiment.
  (b) Theory/ Principle on which the experiment is based.
  (c) Steps in experimental procedure (Methodology)
  (d) Results including all observations
  (e) Precautions

6. Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Remarks
Quizzes (surprise)	10 min.	10		
Mid Semester Exam			As per schedule	
Viva		20		
Mid Sem. Quiz	30 min.	20		Close Book
End Semester Exam			As per schedule	
Viva		20		
Comprehensive Exam	1 hour	30		Close Book

7. Chamber Consultation Hours: By appointment over emails.

8. Notice: Notice will be sent by email.

9. Make-up Policy: No make-up for surprise quizzes. For other components, make-up decisions will be made on a case-by-case basis and only genuine cases as determined by the Departmental team will be considered.

Note: It shall be the responsibility of the individual student to be regular in attending lectures as per the schedule.

Instructor-in-Charge
BIO F411