

**Course Title : Physiology, Genetics and Molecular Biology**  
**Course No. : Zool. 302**  
**Nature of Course : Practical**  
 (One practical period is of three hours)

**Full Marks: 50**  
**Pass Marks: 20**  
**Year: III**

Units	Sub-units	Detail description of the sub-units	No. of Practical Periods	Remarks
<b>Physiology Practical</b>	Detection of carbohydrate	Mollisch's test, Barfoed's test, Benedict's test, Fehling's test, Iodine test	5	Swarup, Pathak & Arora.
	Detection of protein	Protein precipitation, Ninhydrin test, Xanthoproteic test, Biuret test	4	Swarup, Pathak & Arora
	Detection of Lipids	Solubility test, Reaction with Sudan IV, Saponification test, Salkowski's test	4	Swarup, Pathak & Arora
	Effect of temperature, pH and on enzymatic action of amylase on starch	Influence of temperature, pH and on enzymatic action of amylase on starch	3	Swarup, Pathak & Arora
	Estimation of haemoglobin	Estimation of haemoglobin by haemometer	1	
	Blood grouping	Determination of blood groups using anti A and B serum	1	
	RBC and WBC counting	Counting of RBC in the blood by Haemocytometer	2	
		Counting of WBC in the blood by Haemocytometer	2	
	Detection of sugar, urea and protein in urine	Detection of sugar-Benedict's test	1	
		Detection of urea-Efferveswcnce/Urease test	1	
	Detection of protein-Heller's Nitric Acid ring test	1	Swarup, Pathak & Arora	

	Study of the models and embryological slides of different stages of Chick	Study of the models/embryological slides of different stages of cleavage, blastulation, gastrulation etc	2	
<b>Molecular Biology Practical</b>	Study of the cytological slides: Cell division (Mitosis and Meiosis).	Mitotic cell division	1	
		Meiotic cell division	1	
	Study of Lampbrush chromosome of any animal	Lampbrush chromosome preparations from any animal	2	
	Study of the human genetic traits (ear lobe, colour of eye, etc.).	Study of the human genetic traits (ear lobe, colour of eye, etc.).	4	
	Extraction and quantification of DNA.	Extraction of DNA	1	Sambrook and Russel; <a href="http://www.protocol-online.org">http://www.protocol-online.org</a>
		Quantification of DNA by UV spectrophotometer	1	
Separation of DNA by Agarose gel electrophoresis		1		
Preparation of short community/family based survey report on human genetic traits	Survey and prepare reports on human genetic traits		Throughout the session and submit report	
<b>Practical record</b>		Each student should prepare a practical record based on their study		Throughout the session

**Books:**

Arora, M.P. Genetic Engineering. Himalaya Publishing House, India.

Swarup, H., Pathak,, C.S. and Arora, S. Laboratory Techniques in Modern Biology. Himalayan Publishers.

Verma, P.S. and Agrawal, V.K. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Co., New Delhi.

Sambrook, J. and Russel, D.W. Molecular cloning, A labortory manual, Cold Spring Harbor laboratory press, New York.