BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
INSTRUCTION DIVISION
SECOND SEMESTER 2015-2016

Date: 12/01/2016

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 G523**
Course Title : **Molecular Parasitology & Vector Biology**
Instructor-in-charge : **VISHAL SAXENA**
Co-Instructor : **Lalita Gupta**

1. **Course Description:** The course explores in detail the biology of various parasitic diseases and their transmission in human and animal population by vectors (carriers). This course will give insight to the students into some frontier areas in molecular aspects of parasite and vector biology, modes of infection, life cycles of parasite and vector, host - parasite interactions, infectivity pattern, mechanisms of drug resistance and immune evasion, methods of diagnosis, prophylaxis, treatments to parasitic diseases and vector control measures.

2. **Scope and Objective of the Course**: This course is ideal for students willing to gain additional training prior to embarking on a research career in medical or molecular biology of parasites and their corresponding vectors, their immunology and host-pathogen interactions. The course also helps enhance knowledge of students who foresee their future career in medical sciences and related administrative services.

3. **Text Book (**TB**):**
   TB1: Cox, F. E. G., "Modern Parasitology", 2nd Edition, Blackwell Science, 2004.
   TB2: Clements, A.N., "The Biology of Mosquitoes", Vol. 1, 2, 3, Cambridge Uni Press 2012

4. **Reference Books:**
   R1: Bogitsh, B.J., Carter, C.E., Oeltmann, T.N., "Human Parasitology", Elsevier, 3rd Ed., 2005.
   R2: Thomas C. Cheng. General Parasitology, Elsevier, IInd Ed., 2010.

5. **Course Plan:**

Lecture No.	Learning Objectives	Topics to be covered	Ref. Chap./ Sec.# (Book)
1 – 3	Parasites & their vectors	Introduction and Classification of various disease causing parasites and their transmission vectors	TB1: 1, 2, 3; Ref. Material
4 – 8	Biology of protozoan and helminthes parasites	Life cycles of *Plasmodium, Leishmania, Trypanosoma,* Nematodes and their mode of infection. Life cycle and mode of infection of *Dengue*. Physiology and nutrition of parasites. Diseases progressions and its signs and symptoms.	TB1: 1, 2; Ref. Material
9 – 13	Biology of various vectors	Life cycles of Mosquitoes (*Anopheles*, *Aedes* & *Culex*) Tsetse fly, Sandfly. Indigenous flora of	TB1: 3, TB2: 46

		the vector & its effect on pathogen development and transmission	
14 – 19	Host – parasite interactions	Molecular biology of host – parasite interactions Host immune response to protozoan and helminthes parasites and viruses – antigenic variations, parasitic diseases and virulence, and immuno-pathology	TB2: 41, R2:1, 2; Review articles
20 – 25	Vector immunity to parasites & virus	Cellular and Humoral responses, Alteration of vertebrate host immune response by Vector molecules, manipulation of vectorial capacity	TB1: 8; TB2: 42, 46; Lecture notes
26 – 28	Methods of diagnostics and research	Identification of parasites, clinical and molecular diagnostics, Techniques used for study of host-parasite interactions, molecular research techniques.	Review articles and Lecture notes
29 – 36	Parasite chemotherapy and vector control	Drugs against various parasitic diseases, their modes of action and limitations, drug resistance, vaccinations; vector control measures, health education; discovery and development of new drugs	TB1: 9, 10
37 – 40	Advances in parasite and vector biology research	Parasite Genomics, advances in parasite genome databases, systems biology, techniques to parasite and vector in-vitro and in-vivo studies.	Research and Review Articles

Additional references will be given from time to time. The course has Lab components which will be planned as per time and chemical availability.

6. Evaluation Scheme:

Component	Duration	Wtg. (%)	Date & Time	Remarks
Mid-term test	90 minutes	30	16/3 4:00- 5:30 PM	Closed Book
Quizzes	Variable	10		Closed Book
Seminar	"	10		-
Assignment	"	10		-
Comp. Exam.	3 hrs.	40	9/5 AN	Partly CB & OB

7. **Chamber Consultation Hours:** To be announced in the class.
8. **Notice:** Notices for tests will be displayed on Biological Sciences Notice Board. Quizzes will be unannounced.
9. **Makeup Policy:** Makeups for quizzes, seminar or assignment will not be granted. Make-ups for Tests will be granted only in case of severe medical urgency or hospitalization.

Instructor-in-charge
BIO G523