

Course Code	Course Title	L	T	P	C
1151BM201	Pathology and Microbiology	2	0	2	3

**a) Course Category**

Program core

**b) Preamble**

To make the student to acquire knowledge on the structural and functional aspects of living organisms and to know the etiology and remedy in treating the pathological diseases

**c) Prerequisite**

Biology for Engineers

**d) Related Courses**

Biochemistry and Anatomy and Human Physiology.

**e) Course Outcomes**

Upon the successful completion of the course, students will be able to:

CO Nos.	Course outcomes	Knowledge Level (Based on Revised Bloom's Taxonomy)
CO1	Analyze structural and functional aspects of living organisms.	K2
CO2	Discuss the importance of public health.	K2
CO3	Explain the function of microscope	K2
CO4	Explain the growth of micro organisms	K2
CO5	Describe methods involved in treating the pathological diseases	K2

## **f) Course content**

<b>UNIT I CELL DEGENERATION, REPAIR AND NEOPLASIA</b>	<b>6</b>
Cell injury and Necrosis, Apoptosis, Intracellular accumulations, Pathological calcification, cellular adaptations of growth and differentiation, Inflammation and Repair including fracture healing, Neoplasia, Classification, Benign and Malignant tumours, carcinogenesis, spread of tumours. Autopsy and biopsy.	
<b>UNIT II FLUID AND HEMODYNAMIC DERRANGEMENTS</b>	<b>6</b>
Edema, normal hemostasis, thrombosis, disseminated intravascular coagulation, embolism, infarction, shock. Hematological disorders-Bleeding disorders, Leukaemias, Lymphomas.	
<b>UNIT III MICROSCOPES</b>	<b>6</b>
Light microscope – bright field, dark field, phase contrast, fluorescence, Electron microscope (TEM & SEM). Preparation of samples for electron microscope. Staining methods – simple, gram staining and AFB staining.	
<b>UNIT IV MICROBIAL CULTURES</b>	<b>6</b>
Morphological features and structural organization of bacteria, growth curve, identification of bacteria , culture media and its types , culture techniques and observation of culture.	
<b>UNIT V IMMUNOLOGY</b>	<b>6</b>
Natural and artificial immunity, opsonization, phagocytosis, inflammation, Immune deficiency syndrome, antibodies and its types, antigen and antibody reactions, immunological techniques: immune diffusion, immuno electrophoresis, RIA and ELISA, monoclonal antibodies. Disease caused by bacteria, fungi, protozoa, virus and helminthes.	
	<b>Total 30 Hrs.</b>

### **LIST OF EXPERIMENTS:**

1. Urine physical and chemical examination (protein, reducing substances, ketones, bilirubin and blood)
2. Basic staining – Hematoxylin and eosin staining.
3. Special stains – cresyl fast Blue (CFV)- Trichrome – oil red O – PAS.
4. Simple stain.
5. Gram stain.
6. Bleeding time and clotting time.
7. Slides of malarial parasites, micro filaria and leishmania donovani.
8. Haematology slides of anemia and leukemia.

**Total 30 Hrs.**

## **h) Learning Resources**

**Text Books**

1. Ramzi S Cotran, Vinay Kumar & Stanley L Robbins, "Pathologic Basis of Diseases", 7th edition, WB Saunders Co. 2005 (Units I & II).
2. Prescott, Harley and Klein, "Microbiology", 5th edition, McGraw Hill, 2002 (Units III,IV & V).

**Reference Books**

1. Underwood JCE: General and Systematic Pathology Churchill Livingstone, 3rd edition, 2000.
2. Anthanarayanan & Panicker, "Microbiology" Orientblackswan, 2005.
3. Dubey RC and Maheswari DK. "A Text Book of Microbiology" Chand & Company Ltd, 2007