**Course Code: MLE404** **Course Title: Hematology and Transfusion medicine**

**Number of Credits: 3T + 2P = 5**

**Effective from AY: 2022 -2023**

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| **Prerequisite for the Course:** | Basic knowledge of blood components and their applications | |
| **Objectives:** | • To get acquainted to blood collection and analyses of blood.<br>• To learn various components of blood<br>• Understanding importance of blood donation and learn grouping systems. | |
| **Content:** | **Module 1: Hematology–Blood composition and Hemolytic disorders**<br>Blood: composition, haemopoesis, RBC'S- structure function, synthesis: Hemoglobin- structure, function, abnormal haemoglobin, reticulocytes, blood indices, peripheral blood smear, parasites in blood. Hemolytic disorders: investigations, screening tests, sickling, osmotic fragility, Heinz bodies, G-6-P-D screening, Hb electrophoresis, Hb-F estimation. Applied pathology, lab diagnosis of anemia, lab diagnosis and CSF picture in diff types of meningitis, lab diagnosis of hemorrhages disorders, lab diagnosis and LFT findings in diff types of jaundice, lab diagnosis | 15hrs |
| | **Module 2: WBCs and Platelets** White blood corpuscles: Description, morphology, leucocyte counts, leucopenia, leukocytosis, leukemia, leukemoid reaction, absolute count, differential count, bone marrow iron staining, special stains for leukemias. Platelet structure and function: Bleeding disorders and investigations, coagulation process and theory, disorders. Flow cytometry and application. | 15hrs |
| | **Module 3: Transfusion medicine** Blood groups: ABO and sub groups, antigen and antibodies, Rh blood grouping, other blood group systems, compatibility testing, antihuman globulin test. Blood transfusion: Selection of blood donors, blood transfusion procedures, Complications of blood transfusion, Blood component therapy, organization and administration of blood bank, blood safety. Equipments for blood component separation in blood bank, refrigerated centrifuge, plasma expresser ,refrigerated water bath, laminar air flow bench etc.<br>Administrations and medico legal aspects, accreditation of lab. | 15hrs |
| | **Practical Module:**<br>• Use and care of microscopes, study of improved Neubaur chamber<br>• Anticoagulants and blood collection<br>• Haemoglobinometry: Sahli's method, Cyanmethemoglobin method.colori meter / spectrophotometer , principles part workings<br>• Coagulometer<br>• Haemoglogin electrophoresis, agar gel, CAM, HPLC, capillary | 30 hrs x 2 |

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| | electrophoresis etc.<br>• Hematology analyser , 3 part/5 part differential counters ( cell counter, semi automated, fully automated)<br>• Haemocytometry: Erythrocyte count ,RBC pipette<br>• Haemocytometry: Total WBC count, WBC pipette<br>• Blood smear preparations: Staining, differential WBC count<br>• Peripheral blood smear examination and morphological abnormalities<br>• Hemolytic work-up osmotic fragility test, Heinz bodies, sickling, G-6-P-D estimation, Hb-electrophoresis, Hb-F estimation.<br>• Reticulocyte count- absolute eosinophil count<br>• E.S.R, P.C.V, Blood indices (02 Practicals)<br>• Platelet count, BT, CT, CRT<br>• Prothrombin time, A.P.P.T, FDP estimation<br>• Bone marrow examination- staining of smear, special stains- PAS, Sudan black, Myeloperoxidase<br>• ABO grouping and Rh typing.<br>• Demonstration of Coombs test and compatibility testing. | |
| **Pedagogy:** | Lectures/tutorials/assignments/ Presentations/Practicals/ demonstrations. | |
| **Learning Outcome:** | By the end of this course, students will be able to<br>1. Explain the composition of blood and changes in Hemolytic disorders.<br>2. Describe the structure and functions of WBCs and explain the tests associated with detection of Hemolytic disorders.<br>3. Perform various hemocytometric procedures.<br>4. Perform various hematological tests for disease detection. | |
| **References** | 1. Rao GH, Eastlund T and Jagannath L(2006).Handbook Of Blood Banking & Transfusion Medicine. Jaypee Medical Publishers, New Delhi.<br>2. A.B. Dutta (2006) :Blood Banking and Transfusion, Satish Kumar Jain for CBS Publishers, New Delhi.<br>3. Rudmann SV(2005).Textbook of Blood Banking and Transfusion Medicine. Second Edition. Elsevier Saunders Publication.<br>4. Bharadwaj K(2015). Transfusion Update. Indian Society of Blood Transfusion and Immunohaematology. Jaypee Medical Publishers, New Delhi.<br>REFERENCE BOOKS FOR PRACTICAL:<br>1. Mukherjee KL (2017) Volume II:Medical Laboratory Technology, Tata McGraw-Hll Publishing Company Ltd. New Delhi.<br>2. Kamat G(2011). Practical manual of Hematology. Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi. | |