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**Department of Biology**

**College of Science**

**University of Salahaddin**

**Subject: Hematology**

**Course Book – 4**

**Lecturer's name: Lecturer. Peshraw S. Hamadamin**

**Academic Year: 2020/2021**

**Course Book**

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| **1.Course name** | | **Practical Haematology** | |
| **2. Lecturer in charge** | | **Peshraw S. Hamadamin** | |
| **3. Department/ College** | | **Biology department/ college of science** | |
| **4. Contact** | | **E-mail: Peshraw.hamadamin@su.edu.krd.** | |
| **5. Time (in hours) per week** | | **Theory: 0**  **Practical: 16** | |
| **6. Office hours** | | **16 hours per week** | |
| **7. Course code** | |  | |
| **8. Teacher's academic profile** | | B.Sc. of Biology/ Salahaddin University /Biology Department 2006  M.Sc. of Molecular and Cell biology / Sheffield Hallam University 2012  lecturer at Salahaddin University 2013-present. | |
| **9. Keywords** | Hematology, Blood , disorder, platelet | | |
| **10. Course overview:**  Studding of this module is intended to: Understand the process of haemopoiesis and explain the function of the various blood constituents. Explain how certain disease processes may lead to a change in the numbers and morphology of blood cells. Understand the principles of and perform efficiently, a range of routine laboratory tests including; full blood examination (including automated analysis and manual techniques for hemoglobin estimation, hematocrit, leucocyte counts, platelet and reticulocyte counts), and erythrocyte sedimentation rate (ESR). Prepare, examine and report on stained peripheral blood smears (normal and abnormal) to include differential white cell count (DWCC) and assessment of morphology. Understand the significance of the morphological changes in a peripheral blood smear and indicate further investigations useful in establishing a diagnosis. Perform and understand the basis of certain laboratory tests used in the diagnosis and treatment of anemia, leukemia, and other disorders.  Understand normal and abnormal hemostasis, including the blood coagulation and fibrinolytic systems and the role of platelets. Perform relevant laboratory tests used in the diagnosis of patients with hemorrhagic disorders  Explain the inheritance, characteristics and nature of clinically important blood group antigens and antibodies. Understand the principles of, and perform various blood banking techniques including ABO and Rh grouping, compatibility testing  In this course students will study fundamental concepts of hematology and the analysis of laboratory results and their clinical implications. | | | |
| **11. Course objective:**  The course is especially planned for undergraduate students who intend to work in diagnostic laboratories. The goals of this module include :   1. Demonstrate proper procedures for the collection, safe handling, and analysis of biological specimens 2. Describe the principles of some of the most frequently used laboratory tests and their diagnostic significance. 3. Conduct a biomedical laboratory procedure and process, interpret and document the data obtained. 4. Apply appropriate problem solving steps for determining instrument/methodology problems, utilizing instrument manuals, laboratory procedure manuals, and information contained in package inserts 5. Evaluate laboratory test results to determine disease diagnosis | | | |
| **12. Student's obligation**   * Students should attend all lectures and not miss any lecture time. * Electronic devices: All cell phones are to be turned off at the beginning of class and put away. * It is highly advised not to accumulate material until before the examination time. Cramming will definitely weaken the student's ability to understand and retain valuable information. | | | |
| **13. Forms of teaching**   * Data Show Projector * Blackboard * Video * The hard copy of the lectures will be given to the students | | | |
| **14. Assessment scheme**  Breakdown of overall practical assessment and examination  **Grading System:**   * First exam (Practical) : 5% * Second exam(Practical) : 5% * Average of practical Examination: 5 % * Weekly quizzes, activities and attendance 2.5% * Total =7.5 % * Final practical examination 10% Overall practical haematology marks 17.5% | | | |
| **15. Student learning outcome:**  At the end of the course students should be able to   * Demonstrate a working knowledge of the theories and techniques utilized in standard laboratory procedures performed in Hematology * Differentiate various hematological procedures and the use of basic equipment required to working in Clinical Hematology Laboratory * Evaluate test results with normal and abnormal physiologic circumstances * Identify the various components of blood, their functions, and roles in various disease state | | | |
| **16. Course Reading List and References‌:**   1. Colour Atlas of Haematology Practical Microscopic and Clinical Diagnosis by Harald Theml, Heinz Diem, and Torsten Haferlach, 2nd revised edition, 2004, Thieme Stuttgart · New York. 2. Diagnostic Hematology by James A. Ker, 2009, Springer-Verlag London Limited. 3. Hematology, Basic Principles and Practice by Ronald Hoffman, Edward J. Benz, Sanford J. Shattil, Bruce Furie et al., Copyright © 2005, Elsevier Inc. 4. Hematology in Clinical Practice. 2005. Robert S. Hillman, Kenneth A. Ault and Henry M. Rinder. 4th Edition. McGraw-Hill. 5. Basic Medical Laboratory Techniques. 2007. Barbara H. Estridge, Anna P. Reynolds, Norma J. Walters. 5th edition 6. Hematology: Clinical Principles and Applications. 2007. Bernadette F. Rodak, George A. Fritsma, Kathryn Doig. 3ed edition. Elsevier Health Sciences | | | |
| **17. The Topics:** | | | **Date** |
| **Week 1:** Introduction to basic concepts in practical haematology lab.  **Week 2:** Blood Specimen Collection , haematocrit and blood groups  **Week 3:** Determination of Haemoglobin concentration  **Week 4:** ManualRed Blood Cell Counting using Hemocytometer  **Week 5:** ManualWight Blood Cell Counting  **Week 6:** Manual Platelet count and Platelet Indices  **Week 07**: First exam  **Week 08**: Erythrocyte sedimentation rate and RBC indices  **Week 09:** Preparation of the blood smear and differential Leukocyte count  **Week 10**: Reticulocyte count  **Week 11:** clotting Time and Bleeding Time estimation  **Week 12:** Automated haematology analyzer  **Week 13:** Second Exam | | | 12/10/2016  19/10/2016  26/11/2016  2/11/2016  9/11/2016  16/11/ 2016  23/11/2016  30/11/2016  7/12/2016  14/12/2016  21/12/2016  28/12/2016  5/1/2016 |
| **18. Practical Topics (If there is any)** | | |  |
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| **19. Examinations:**  **Examples of Semester Examination**  **Practical Hematology exam**  **Thursday 11 November 2014**  Q1/ Write briefly the aim of using the followings in hematological tests   1. Trisodium citrate in ESR      1. Turk’s solution 2. Pottassium ferricyanide in Hb determination   Q2  A/ Write the name of this tube and mention the errors during this sample collection for estimation Htc  B/What are the suspected layers which are formed after centrifugation of this tube.  Q3 /  C:\Users\MYS\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\Untitled.png  Count WBCs in this large square and calculate the  number of WBC in 1 µl of blood (if you know the sample  is 10 times diluted) and explain the result?  Q4/ Explain why   1. The RBC pipette in some cases is used for WBC count instead of WBC pipette? 2. The error encountered in Hb estimation by SAHLI method may be   up to 15 %? Mention two of sources error  Q5/   1. What are the differences between plasma and serum and how you can get both of them practically? 2. During blood sugar estimation blood collected in Oxalate or EDTA tubes mixed with sodium fluoride. Why?   Q6/   1. Why you are performing ESR? Write the principle of the test? 2. What are the stages of ESR?   Q7/  How many platelet parameters are measured by coulter counter? What is the importance of the solution in manual PLT counting?  Q8    A/ Identify this test and briefly write the principle of it  B/ It's not true to divide PCV value by 3 for obtaining  hemoglobin concentration in patients ? Why  Q9 A/ True or false   1. Polycethemia Vera is overproduction of RBC which is resulted from hypoxia? 2. Hayme’s solution is used for diluting the blood during RBC counting   Q9 A/ Chose the correct answer   1. Which of the following vein is the first choice of vein puncture?   A) Cephalic vein B) Median cubital vein C) Basilic vein  C:\Users\MYS\Desktop\arm_veins.jpg 2- ……..is an anticoagulant which prevent blood clotting by inhibiting thrombin activity  a) Heparin, b) Sodium citrate, c) Salt-EDTA  Q10/  If the number of RBCs in 3 medium squares of hemomacutometer slide was  288 cell, calculate the number of RCB in 1 liter of blood?    Lecturer  Peshraw S.Hamadamin | | | |