

Planning and Quality Assurance Affairs

Form (A)

Course Specifications

General Information

Course name	Hematology(1)
Course number	AMSL3321
Faculty	
Department	
Course type	Major Needs
Course level	3
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

- 1 - Describe hematopoiesis
- 2 - Describe the basic concepts of cell differentiation and maturation.
- 3 - Compare and contrast each cell line(Erythrocyte, Lymphocyte, Neutrophil, Monocyte, Eosinophil, Megakaryocyte, Basophil, Plasma cell): hematopoietic stem cells, hematopoietic progenitor cells, and maturing cells, including proliferation and differentiation potential, morphology, and population size.
- 4 - Identify the sites of hematopoiesis during embryonic and fetal development as well as in childhood and adulthood.
- 5 - Identify organ/tissue sites in which each hematopoietic cell type differentiates.
- 6 - List and describe the stages of erythrocyte maturation from youngest to most mature cells including hemoglobin synthesis.
- 7 - List the structural components of the cell membrane and correlate poikilocytes with variations in membrane composition.
- 8 - Compare and contrast the following erythrocyte metabolic pathways: Embden-Meyerhof Pathway, Hexose Monophosphate Shunt, Methemoglobin Reductase Pathway, Rapoport-Leubering Shunt
- 9 - Demonstrate an understanding of the intravascular/extravascular hemoglobin degradation process.
- 10 - Explain the function of erythropoietin; include the origin of production, bone marrow effects, and normal values.
- 11 - Explain the role of the spleen in erythrocyte homeostasis.
- 12 - Diagram the quaternary structure of a molecule of hemoglobin identifying the heme ring, globin chains, and iron.
- 13 - List the types of hemoglobin normally found in adults and newborns and give their approximate concentration.
- 14 - Explain how the fine balance of hemoglobin concentration is maintained.
- 15 - Construct a diagram to show the synthesis of a hemoglobin molecule
- 16 - Define and describe significance of the following plasma hemoglobins: Oxyhemoglobin, Reduced hemoglobin, Carboxyhemoglobin, Cyanmethemoglobin
- 17 - Calculate absolute reticulocyte count, corrected reticulocyte count and reticulocyte production index from reticulocyte results, hematocrit, and RBC count. Recall normal values and evaluate results. Correlate clinical significance.
- 18 - Interpret RPI results
- 19 - Describe and identify erythrocyte inclusions including staining characteristics.
- 20 - Given CBC and RPI results, categorize an anemia according to morphologic classification.
- 21 - Compare the morphologic and functional classification of anemia.
- 22 - Define the M:E ratio, and explain what can cause an increase or decrease in it.
- 23 - Differentiate between the various types of anemias studied in the course.

Course Contents

- 1 - Introduction to hematology
- 2 - Hematopoiesis
- 3 - How to identify blood cells and their maturation sequence
- 4 - RBC metabolism
- 5 - RBC membrane
- 6 - The hemoglobin molecule: synthesis, structure, and types
- 7 - The spleen and intravascular and extravascular hemolysis
- 8 - Approach to anemias
- 9 - Microcytic hypochromic anemias: iron deficiency anemia, anemia of chronic disease, sideroblastic anemias, and thalassemias
- 10 - Hemolytic anemias
- 11 - Macrocytic anemias

Teaching and Learning Methods

- | |
|--|
| 1 - Lectures 3 hours weekly
2 - Discussions
3 - Case studies |
|--|

Students Assessment

<u>Assessment Method</u>	<u>TIME</u>	<u>MARKS</u>
First Midterm	After the first month of the semester	25
Second Midterm Exam	After the second month	25
Final Exam	The end of the semester	50

Books and References

Essential books	Essential Haematology. Hoffbrand (2006). 5th edition, Blackwell Science. (ISBN 063-205-1531) Clinical Laboratory Hematology, McKenzie, Shirlyn B. (2004), 3rd Edition, Pearson Education, ISBN 0-13-019996-6. Practical Haematology. Dacie & Lewis (2001). Churchill Livingstone (ISBN 044-306377X)
-----------------	---