In the Name of God

Hamadan University of Medical Sciences and Health Services
Educational Deputy of the University
Center for Studies and Development of Medical Sciences Education

Theory/Practical Lesson Plan Form

Dear Colleagues,

As the teaching-learning process is one that requires careful planning to achieve its objectives, the preparation of a lesson plan at the beginning of the educational process (as a map and guide for instructors and students) is essential. It serves as one of the main tools for the educational activities of instructors. Therefore, we kindly ask all instructors to pay utmost attention to completing the lesson plan.

Course and Instructor Details (Completing all items in this section is essential)

Course Information

Field	Details
Course Title	Physiology of Blood
Instructor	Dr. Parisa Habibi
Course Coordinator	Dr. Parisa Habibi
Head of Department	Dr. Siamak Shahidi
Credit Hours	Theory: 0.40 units; Practical: 0.10 units
Program & Level	Doctor of Medicine (General) – Professional Doctorate
Teaching Location	Classrooms, School of Medicine

Session-by-Session Syllabus

Session	Topic(s)	Expected Learning Outcomes (Behavioral)	Learning Domain	Teaching Method(s)	Duration	Teaching Aids	Assessment Method(s)
1	Physiology of Red Blood Cells, Anemias, and Polycythemia	1. Describe the components of blood. 2. Explain hematopoiesis and influencing factors. 3. Differentiate serum and plasma. 4. Explain methods for blood volume measurement. 5. Define hematocrit and describe its measurement. 6. State normal RBC count and mean hemoglobin concentration. 7. Identify RBC production sites	Cognitive	Lecture, educational video, Q&A	2 hrs	Video projector, computer, whiteboard, PowerPoint, video clips	Quiz, oral questioning

		across life stages. 8. Describe RBC morpholo gy and formation. 9. Explain role of hypoxia and erythropoi etin. 10. Explain role of vitamin B_{12} and folic acid in RBC production . 11. Describe hemoglobi n structure and types. 12. Explain RBC life cycle. 13. Name iron storage forms in plasma/tis sues. 14. Describe intestinal iron absorption . 15. Explain ATP role in RBCs. 16. Summariz e bilirubin formation. 17. Define anemia and polycythe					

		mia. 18. List types of anemia and explain causes of megaloblastic, aplastic, hereditary spherocytosis, sickle cell, thalassemia, and favism. 19. Explain primary/secondary polycythemia. 20. Describe effects of anemia and polycythemia on the body.					
2	Physiology of White Blood Cells; Blood Groups (ABO, Rh)	1. Name types of WBCs and their origins. 2. Describe general characteristics of WBCs with percentages. 3. Define leukocytosis and leukopenia. 4. Explain chemotaxis and	Cognitive	Lecture, educational video, Q&A	2 hrs	Video projector, computer, whiteboard, PowerPoint, video clips	Quiz, oral questioning

		phagocytosis. 5. Define innate immunity and list its components. 6. Define inflammation and explain WBC role. 7. Describe phagocytosis by neutrophils and macrophages. 8. Explain diapedesis, margination, and opsonization. 9. Describe monocyte–macrophage system. 10. Explain regulation of WBC and macrophage production in inflammation. 11. Describe physiological roles of eosinophils and					

		basophils. 12. Define leukemia and explain systemic effects. 13. Differentiate antigens and antibodies. 14. Define agglutination. 15. Describe ABO blood groups and characteristics. 16. Explain cross-matching test. 17. Explain differences between ABO and Rh systems. 18. List Rh antigens. 19. Differentiate Rh+ and Rh–. 20. Explain clinical importance of Rh system. 21. Describe erythroblastosis					

		fetalis. 22. Explain complications of wrong blood transfusion.					
3	Platelets and Blood Coagulation	1. Define hemostasis and its stages. 2. Explain vascular spasm role. 3. Describe platelet characteristics and role in hemostasis. 4. Describe platelet plug formation. 5. Explain principles of clot formation. 6. Describe intrinsic and extrinsic pathways. 7. Explain anticoagulants and their classes. 8. Describe clot lysis. 9. Explain liver role in coagulation/anticoagulation	Cognitive	Lecture, educational video, Q&A	2 hrs	Video projector, computer, whiteboard, PowerPoint, video clips	Quiz, oral questioning

		factor production . 10. Describe vitamin K role in coagulation. 11. Define thrombocytopenia and its effects. 12. Describe disorders of coagulation (thrombosis, embolism, DIC). 13. List causes of thromboembolic diseases. 14. Explain t-PA role in thrombus treatment. 15. Explain anticoagulant effects of heparin and coumarin drugs. 16. Explain selected coagulation tests (bleeding time, clotting time, prothromb					

		in time). 17. Explain International Normalized Ratio (INR).					
4 (Practical)	Differential White Blood Cell Count (Leukocyte Formula)	Perform leukocyte differential count ("Diff test") with required precautions and report interpretation as a lab report.	Cognitive + Psychomotor	Lecture + lab demonstration	2 hrs	Computer, PowerPoint, video projector, whiteboard	Written quiz, lab report

Grading Scheme

Assessment Type	Assessment Tool	Points
Quiz	Written test	5 points
Project/Presentation	Seminar presentation and oral Q&A	5 points
Midterm Exam	Written electronic test	30 points
Final Exam	Written electronic test	60 points
Other	—	—
Total	—	**100 points**

References

Main

- Guyton & Hall, *Textbook of Medical Physiology*, 2021 Edition (Latest Print)

Supplementary

- Ganong's *Review of Medical Physiology*, latest edition (2021)
- Berne & Levy, *Physiology*, latest edition (2021)