

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

- Course Title: Circulatory Physiology
- Instructor: Dr. Siamak Shahidi
- Course Coordinator: Dr. Siamak Shahidi
- Head of Department: Dr. Siamak Shahidi
- Credit Hours: Theory: 1.1 units; Practical: 0.1 units
- Program & Level: Doctor of Medicine (General) – Professional Doctorate
- Teaching Location: Classroom 5, 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	Mechanical and Pumping Activity of the Heart	1. Explain the role of the atria in the mechanical activity of the heart. 2. Describe the stages of ventricular filling and ejection. 3. Explain volume and pressure changes during the cardiac cycle. 4. State cardiac output and its main determinants. 5. Describe types of cardiac work. 6. Explain sources of cardiac energy supply.	Cognitive	Lecture, Q&A	2 hours	Computer, PowerPoint, video projector, whiteboard	Oral or written questions
2	Cardiac Valves, Heart Sounds, and Regulation	1. Describe types of cardiac valves and their functions. 2. State	Cognitive	Lecture, Q&A	2 hours	Computer, PowerPoint, video projector,	Oral questions

	of Pump Function	characteristics and causes of normal heart sounds. 3. Relate mechanical heart activity to heart sounds. 4. Describe some abnormal heart sounds and their features. 5. Explain graphical analysis of ventricular action during the cardiac cycle. 6. Describe mechanisms regulating cardiac pump function.				whiteboard	
3	Functional Components of the Circulatory System and Hemodynamics Principles	1. State physical characteristics of circulation. 2. Describe functional parts of the circulatory system. 3. Provide values of key circulatory parameters. 4. Explain	Cognitive	Lecture, Q&A	2 hours	Computer, PowerPoint, video projector, whiteboard	Oral questions

		basic principles of circulatory function. 5. Describe types of blood flow and factors affecting them. 6. Define blood pressure and vascular resistance.					
4	Functional Properties of Arterial and Venous Systems	1. Explain vascular compliance and capacitance and their differences . 2. Describe arterial pulse waves and factors that affect them. 3. Explain methods for measuring arterial blood pressure. 4. State characteristics and functions of veins. 5. Explain the basis of central venous pressure and its	Cognitive	Lecture, Q&A	2 hours	Computer, PowerPoint, video projector , whiteboard	Oral questions

		determinants.					
5	Capillary Circulation Physiology and the Lymphatic System	<p>1. Describe capillary wall structure.</p> <p>2. Explain types of capillary membrane pores and their roles.</p> <p>3. State characteristics of cerebral, hepatic, and renal capillary walls.</p> <p>4. Explain changes in capillary blood flow.</p> <p>5. Describe mechanisms of transcapillary exchange.</p> <p>6. List solid structures in the interstitial space.</p> <p>7. Explain Starling forces and their effects on fluid distribution between interstitium and capillaries.</p> <p>8. Describe lymph</p>	Cognitive	Lecture, Q&A	2 hours	Computer, PowerPoint, video projector, whiteboard	Oral questions

		composition, volume, and factors affecting lymph formation.					
6	Mechanisms Regulating Tissue Blood Flow	1. Explain the role and importance of tissue blood flow control. 2. Describe general mechanisms for regulating tissue blood flow. 3. Explain methods for determining arterial blood pressure. 4. Describe mechanisms and specific features of blood flow regulation in organs such as skeletal muscle, skin, brain, lung, fetus/newborn, and heart.	Cognitive	Lecture, Q&A	2 hours	Computer, PowerPoint, video projector, whiteboard	Oral questions
7	Regional Blood Flow and Its Regulation	1. Explain blood flow and its regulation in skeletal muscle,	Cognitive	Lecture, Q&A	2 hours	Computer, PowerPoint, video projector	Oral or written questions

		coronary circulation, lungs, skin, fetus and newborn.				, whiteboard	
8	General Mechanisms of Arterial Blood Pressure Control	1. Explain main determinants of arterial blood pressure. 2. State the importance of blood pressure control. 3. Describe short-term mechanisms for arterial pressure control. 4. Describe intermediate-term mechanisms for arterial pressure regulation.	Cognitive	Lecture, Q&A	2 hours	Computer, PowerPoint, video projector, whiteboard	Oral or written questions
9	Role of the Kidneys in Blood Pressure Regulation	1. Explain long-term mechanisms of arterial blood pressure regulation.	Cognitive	Lecture, Q&A	2 hours	Computer, PowerPoint, video projector, whiteboard	Oral or written questions
10	Overview of Heart Failure and Circulatory Shock	1. State cardiac output and pathological factors that increase or decrease it. 2. Define	Cognitive	Lecture, Q&A	2 hours	Computer, PowerPoint, video projector, whiteboard	Oral or written questions

		heart failure, list main causes, signs, and general therapeutic approaches . 3. Define circulatory shock, its main causes, stages, and types.					
11	Radial Pulse and Auscultation of Heart Sounds (Practical)	1. Locate and palpate the radial artery pulse and measure heart rate. 2. Auscultate first and second heart sounds at appropriate chest locations using a stethoscope.	Psychomotor	Lecture and practical — palpation and auscultation practice	2 hours	Computer, PowerPoint, video projector, whiteboard, practical equipment	Written quiz and student lab report
12	Measurement of Arterial Blood Pressure (Practical)	1. Measure arterial blood pressure by palpation method. 2. Measure arterial blood pressure by auscultatory method.	Psychomotor	Lecture and practical — blood pressure measurement	2 hours	Computer, PowerPoint, video projector, whiteboard, practical equipment	Written quiz and student lab report

Grading Scheme

- Quiz (written questions): 5%

- Classroom participation (answers and Q&A across all sessions): 5%
- Final Exam (multiple-choice and descriptive questions): 90%
- Total: 100%

References

- Guyton & Hall, Textbook of Medical Physiology, latest 2021 edition, and course lecture notes
- Ganong's Review of Medical Physiology, latest edition 2021
- Berne & Levy Physiology, latest edition 2021