

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 cannot achieve its objectives without planning, it is essential to develop a lesson plan at the beginning of the educational process (as a roadmap and guide for instructors and students). Therefore, it is requested that esteemed instructors exercise utmost care in completing the lesson plan.

Course and Instructor Details (Completion of all items in this section is mandatory)

- **Course Title:** Medical Biochemistry of the Kidney
- **Instructor Name:** Dr. Gholamreza Shafiei
- **Course Coordinator:** Dr. Gholamreza Shafiei
- **Department Head:** Dr. Iraj Khodadadi
- **Type and Credit Hours:** Theoretical 0.2 credits , Practical credits
- **Field and Level of Student Study:** Bachelor's in Laboratory Sciences.....
- **Teaching Location:** Classroom 5, Paramedical Department.....

Session	Title	Learning Objectives	Domain of Learning	Teaching Method	Duration	Teaching Aids	Evaluation Method
Session 1:	Buffer - Acid-Base Regulation and Their Disorders	<ol style="list-style-type: none"> 1. The learner will identify types of blood gases. 2. The learner will recognize the tissues involved in blood gas regulation. 3. The learner will understand the Henderson-Hasselbalch equation. 4. The learner will know the definitions of acid, base, and buffer. 5. The learner will understand types of acidosis and alkalosis. 6. The learner will recognize respiratory compensation and metabolic compensation. 7. The learner will identify the anion gap phenomenon. 8. The learner will understand clinical and metabolic manifestations of acidosis disorders. 9. The learner will understand clinical and metabolic manifestations of alkalosis disorders. 	Cognitive	Memorization, Lecture, Q&A	90-100 minutes	Computer with internet access, data projector, display screen, flash drive, Microsoft Office software (PowerPoint and Word), whiteboard, markers	Class assessment through questions, final exam

		10. The learner will know how to treat acidosis disorders.					
Session 2:	Electrolytes	<ol style="list-style-type: none"> 1. The learner will identify types of electrolytes. 2. The learner will be able to recognize the mechanisms of action of various electrolytes. 3. The learner will be able to identify disorders and diseases related to various electrolytes. 4. The learner will understand the effects of cations. 5. The learner will understand the effects of anions. 6. The learner will know the definition of trace elements. 7. The learner will understand the effects of trace elements. 8. The learner will be able to identify disorders and diseases related to trace elements. 9. The learner will be able to identify disorders and diseases related to non-trace elements. 10. The learner will be able to explain the genetic effects on electrolyte changes. 11. The learner will be able to explain the effects of nutrition and acquired factors 	Cognitive	Memorization, Lecture, Q&A	90-100 minutes	Computer with internet access, data projector, display screen, flash drive, Microsoft Office software (PowerPoint and Word), whiteboard, markers	Class assessment through questions, final exam

		<p>on electrolyte changes.</p> <p>12. The learner will be able to suggest prevention and treatment methods for disorders and diseases related to various electrolytes.</p> <p>13. The learner will be able to suggest prevention and treatment methods for disorders and diseases related to trace elements.</p>					
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Notes:

- Each session is designed to last approximately 90-100 minutes.
- The teaching methods primarily include lectures, question and answer sessions, and in some cases, flipped classroom techniques.
- Evaluation is conducted through class assessments and final exams.

Grading Scheme

Type of Evaluation	Evaluation Tool	Score out of Total
Quiz	Oral Exam	1
Project Presentation	Class Seminar	1
Midterm Exam	Written Exam	
Final Exam	Multiple Choice Exam	18
Other	-	-
Total		20

Reference

1. **Principles of Biochemistry** by Leninger, David Nelson, Michael Cox. Translated by: Dr. Mohammad Hossein Asrar, Dr. Parsa Ghavam, Zahra Mohammadi. Published by Arjomand Publications. 7th edition, 2017 AD (1397 SH).
2. **Harper's Biochemistry** by Victor Rodwell. Translated by: Parvin Pasalar. Published by Andisheh Rafieh. 3rd edition, published in 1400 SH.