

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	Renal and Body Fluid Physiology
Instructor	Dr. Mohammad Zarei
Course Coordinator	Dr. Mohammad Zarei
Head of Department	Dr. Siamak Shahidi
Credit Hours	Theory: 0.71 units; Practical: 0.12 units
Program & Level	Doctor of Medicine (General) – Professional Doctorate

Teaching Location	Classrooms, School of Medicine
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Session-by-Session Syllabus

Session	Topic(s)	Expected Learning Outcomes (Behavioral)	Learning Domain	Teaching Method(s)	Duration	Teaching Aids	Assessment Method(s)
1	Body Fluid Compartments	1. Identify intracellular and extracellular fluids. 2. Describe components of intracellular and extracellular fluids. 3. Explain measurement of fluid volumes in different body compartments.	Cognitive	Lecture	90 min	Slides, markers, whiteboard	Q&A
2	Functional Anatomy of the Kidneys and Urine Formation	1. List kidney functions. 2. Describe kidney anatomy and physiology. 3. Explain urine formation physiology.	Cognitive	Lecture	90 min	Slides, markers, whiteboard	Q&A
3	Glomerular Filtration	1. Explain glomerular filtration. 2. State determinants of GFR. 3. Explain GFR regulation.	Cognitive	Lecture	90 min	Slides, markers, whiteboard	Q&A
4	Tubular Reabsorption	1. Describe tubular reabsorption, its pathways and mechanisms. 2. Explain reabsorption of substances in different	Cognitive	Lecture	90 min	Slides, markers, whiteboard	Q&A, quiz

		nephron segments. 3 . Describe regulation of tubular reabsorption.					
5	Tubular Secretion	1. Describe tubular secretion, its pathways and mechanisms. 2. Explain secretion of substances in different nephron segments. 3 . Describe regulation of tubular secretion.	Cognitive	Lecture	90 min	Slides, markers, whiteboard	Q&A
6	Urine Concentration and Dilution	1. Explain formation of dilute urine. 2. Explain formation of concentrated urine. 3. Describe regulation of extracellular fluid osmolarity.	Cognitive	Lecture	90 min	Slides, markers, whiteboard	Q&A
7	Renal Regulation of Potassium, Phosphate, and Magnesium	1. Explain renal control of potassium excretion and extracellular potassium concentration. 2. Explain renal control of calcium excretion and extracellular calcium concentration. 3. Explain renal control of magnesium	Cognitive	Lecture	90 min	Slides, markers, whiteboard	Q&A

		excretion and extracellular magnesium concentration. 4. Describe coordination of renal mechanisms for extracellular fluid regulation.					
8	Renal Acid–Base Regulation	1. State definitions and concepts of acids and bases. 2. List and explain mechanisms of acid–base regulation in the body. 3. Describe renal regulation of acid–base balance. 4. Explain renal correction of acidosis and alkalosis.	Cognitive	Lecture	90 min	Slides, markers, whiteboard	Q&A, quiz

Grading Scheme

Assessment Type	Assessment Tool	Points (%)
Quiz & Q&A	Oral Q&A, short-answer and fill-in-the-blank questions	10%
Project/Presentation	—	—
Midterm Exam	—	—
Final Exam	Short-answer and multiple-choice questions	90%
Other	—	—
Total	—	100%

References

Main:

1. Guyton & Hall, *Textbook of Medical Physiology*, 2021 Edition (Latest Print)
2. Ganong's *Review of Medical Physiology*, latest edition (2021)

3. Berne & Levy, *Physiology*, latest edition (2021)
