**Vice Chancellor for Education, Ahvaz University of Medical Sciences**
**Center for Studies and Development of Medical Sciences Education**

**Course Title:** Practical Biochemistry
**Field and Degree Level:** Medicine - Professional Doctorate
**Faculty:** Medicine
**Course Code:** 1121407
**Academic Year:** 1404-1405 (2025-2026)
**Prerequisite:** Molecular-Cell Biochemistry
**Number of Credits:** 1
**Academic Semester:** Second, First and Second Term
**Credit Breakdown:** 1 Practical Credit
**Teaching Group:**

**Class Day and Time:** Saturday to Wednesday, 14:00 - 18:00
**Responsible Instructor:** Dr. Salehipour
**Email:**
**Office Days:** Every day from 8:00 to 14:00

**Overall Course Objectives:**
By the end of this course, the student should be familiar with the importance of knowing laboratory equipment and tools, observing safety protocols when working with them, methods for identifying and titrating acids, bases, and buffers, various chromatography techniques, qualitative identification methods for proteins and carbohydrates in biological fluids, complete urinalysis, the principles of working with a spectrophotometer and its use for measuring biochemical analytes in biological fluids, and methods for measuring blood glucose, urea, uric acid, and cholesterol. Additionally, students should become familiar with methods for extracting DNA from various samples.

**Specific Objectives:**

1. Familiarization with various types of laboratory equipment and tools, how to use them, and observing safety precautions.
2. Identification and titration of acids, bases, and buffers, plotting their titration curves, and familiarization with different chromatography methods.
3. Familiarization with various qualitative identification methods for proteins and carbohydrates in biological fluids.
4. Familiarization with the physicochemical and microscopic properties of urine, performing complete urinalysis, and understanding the importance of this test in diagnosing kidney function.
5. Familiarization with the components and principles of operating a spectrophotometer and how to use it to measure biochemical analytes in biological fluids.
6. Familiarization with methods for measuring blood glucose, urea, uric acid, and cholesterol concentrations using spectrophotometry, and interpreting and relating them to associated diseases.
7. Familiarization with various DNA extraction methods, storage conditions, and determining their concentration and purity from different samples.

**Course Description:**
Students will become familiar with various laboratory methods for measuring the most important biochemical analytes in biological fluids. This will help deepen their understanding of topics from Molecular-Cell Biochemistry and the

Biochemistry discipline courses, and to some extent, help them interpret laboratory results in clinical settings and understand the importance and role of the biochemistry laboratory in diagnosing the cause and basis of diseases.

| Session | Main Topics (Concepts to be Taught) | Learner Activities | Teaching Method | Instructor Name |
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| **First** | Introduction to Laboratory Equipment and Safety | Punctual and full-time attendance and performing practical steps for using equipment | Interactive Lecture (Q&A during teaching), Encouraging students for more participation | Dr. Hashemnia |
| **Second** | Identification and Titration of Acids, Bases, Buffers | Punctual and full-time attendance, performing all experimental steps, writing lab report, plotting titration curve, and concluding | Interactive Lecture (Q&A during teaching), Encouraging students for more participation | Dr. Salehipour |
| **Third** | Chromatography of Amino Acids | Punctual and full-time attendance, performing all experimental steps, writing lab report, determining Rf value, and concluding | Interactive Lecture (Q&A during teaching), Encouraging students for more participation | Dr. Igder |
| **Fourth** | Qualitative Identification of Proteins | Punctual and full-time attendance, performing all experimental steps, writing lab report, identifying proteins, and concluding | Interactive Lecture (Q&A during teaching), Encouraging students for more participation | Dr. Mohammadzadeh |

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| **Fifth** | Qualitative Identification of Carbohydrates | Punctual and full-time attendance, performing all experimental steps, writing lab report, identifying unknown sugars, and concluding | Interactive Lecture (Q&A during teaching), Encouraging students for more participation | Dr. Baba Ahmadi |
| **Sixth** | Complete Urinalysis | Punctual and full-time attendance, performing all experimental steps, writing lab report, identifying proteinuria, hematuria, etc. | Interactive Lecture (Q&A during teaching), Encouraging students for more participation | Dr. Rashidi |
| **Seventh** | Principles of Spectrophotometer Operation | Punctual and full-time attendance, performing all experimental steps, writing lab report, plotting standard creatinine curve, and concluding | Interactive Lecture (Q&A during teaching), Encouraging students for more participation | Dr. Mohammadzadeh |
| **Eighth** | Measurement of Blood Glucose Concentration | Punctual and full-time attendance, performing all experimental steps, writing lab report, determining blood glucose concentration, and concluding | Interactive Lecture (Q&A during teaching), Encouraging students for more participation | Dr. Rashidi |

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| **Ninth** | Measurement of Blood Urea Concentration | Punctual and full-time attendance, performing all experimental steps, writing lab report, determining blood urea concentration, and concluding | Interactive Lecture (Q&A during teaching), Encouraging students for more participation | Dr. Baba Ahmadi |
| **Tenth** | Measurement of Serum Uric Acid Concentration | Punctual and full-time attendance, performing all experimental steps, writing lab report, determining serum uric acid concentration, and concluding | Interactive Lecture (Q&A during teaching), Encouraging students for more participation | Dr. Ghasemian |
| **Eleventh** | Measurement of Serum Cholesterol Concentration | Punctual and full-time attendance, performing all experimental steps, writing lab report, determining serum cholesterol concentration, and concluding | Interactive Lecture (Q&A during teaching), Encouraging students for more participation | Dr. Faridi |
| **Twelfth** | DNA Extraction | Punctual and full-time attendance, performing all experimental steps, writing lab report, determining DNA concentration, and concluding | Interactive Lecture (Q&A during teaching), Encouraging students for more participation | Dr. Salehipour |

**Student Assignments:**

Write a lab report for each educational session.

**Course Evaluation Method:**
Assignment Score: 40%
Midterm Exam Score: 30%
Final Exam Score: 30%

**Main Course Resources Approved by the Ministry:**

Laboratory Manual for Biochemistry, prepared and authored by the Biochemistry Group of Jundishapur University, Ahvaz.