

Course Syllabus

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| 1 | Course title | Analytical Chemistry |
| 2 | Course number | 0339211 |
| 3 | Credit hours | 3 Hour |
| | Contact hours (theory, practical) | (3,0) |
| 4 | Prerequisites / corequisites | 0339102 |
| 5 | Program title | Bachelor degree in chemistry |
| 6 | Program code | 0339 |
| 7 | Awarding institution | The University of Jordan |
| 8 | School | Science |
| 9 | Department | Chemistry |
| 10 | Course level | 2nd year |
| 11 | Year of study and semester (s) | Fall, Spring and Summer |
| 12 | Other department(s) involved in teaching the course | N/A |
| 13 | Main teaching language | English |
| 14 | Delivery method | <input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online |
| 15 | Online platforms(s) | <input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others..... |
| 16 | Issuing/Revision Date | March 2023 |

17 Course Coordinator:

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| Name: Mohammed Rasheed Office number: Old Chemistry Building Email: m.rasheed@ju.edu.jo | Contact hours: 11-12 T,T Phone number: 22176 |
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18 Other instructors:

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| Prof. Ramia Albekaeen Dr. Mohammed Amer Dr. Safwan Fraihat |
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19 Course Description:

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| <i>Analytical chemistry is an undergraduate course that covers the following analytical methods and concepts: The nature of analytical chemistry, errors in chemical analysis, chemical equilibria, gravimetric method of analysis, titration methods and complexation titration.</i> |
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20 Course aims and outcomes:

A- Aims:

This course treats chemistry as a quantitative science and seeks to develop a keen observational and analytical insight. The aim of the course is to give the student a solid fundament in analytical chemistry, focusing mainly on classical but still widely used wet chemical methods. Following an introduction to analytical chemistry from a philosophical viewpoint, the fundamentals of the analytical process are discussed with focus on isolation, detection, quantification and identification of analytes. Statistical treatment of experimental errors is taught, with focus on ways of quality assuring measurements. Among the classical methods treated in the course are equilibrium and electrolytes concept, gravimetry, and titrations (precipitation, neutralization and complexometric).

B- Course Learning Outcomes (CLOs): Upon successful completion of this course students will be able to:

B1. Understand the errors that associated with any analysis including types of errors, their effect on the measurements and how to measure them.

B2. Understand the equilibrium types and their effects on the analytical analysis.

B3. Understand the use of classical analytical methods such as gravimetric and titrimetric methods including precipitation, neutralization and complexation titrimetric reactions.

B4. Performing the analytical calculation and selecting a proper analysis method based on analyte type and matrix properties.

| CLO \ PILO | PILO (1) | PILO (2) | PILO (3) | PILO (4) | PILO (5) | PILO (6) |
|------------|----------|----------|----------|----------|----------|----------|
| 1 | X | | | X | | X |
| 2 | | X | | | X | |
| 3 | X | X | | X | | X |
| 4 | | X | X | | X | X |

21. Topic Outline and Schedule:

| Topic | Week | ILOs | Program SOs | ABET SOs | TLA (teaching, learning and Assessment) |
|--|----------------------|------|-------------|----------|---|
| 1- Nature of Analytical Chemistry | 1 st week | B3 | a,b | | Mid and Final Exam |
| 2- Calculations Used in Analytical Chemistry | 2 nd week | B4 | a,b | | |
| 3- Errors in Chemical Analysis | 3 rd week | B1 | a,b,c | | |
| 4- Random Errors in Chemical Analysis | | | | | |
| 5- Statistical Data Treatment and Evaluation | 4 th week | B1 | a,c | | |

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|---|----------------------|---------|-------|--|----------------------------|
| 6- Aqueous Solutions and Chemical Equilibria | 5 th week | B2 & B4 | a,b,c | | Mid and Final Exam |
| 7- Effect of Electrolytes on Chemical Equilibria | 6 th week | B2 & B4 | a,b | | Quiz and Final Exam |
| 8- Solving equilibrium Problems for complex systems | | | | | |
| 9- Gravimetric Methods of Analysis | 7 th week | B3 & B4 | a,c | | |
| 10- Titrimetric methods; Precipitation Titrimetry | 8 th week | B3 & B4 | a,b,c | | |
| 11- Principles of Neutralization Titrations | 9 th week | B3 & B4 | a,b | | |
| Complexation Reactions and Titrations | | | | | |

22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

| Evaluation Activity | Mark | Topic(s) | CLO | Period (Week) | Platform |
|---------------------|------|--------------------------------|-----|------------------|-----------------------------|
| Midterm exam | 30 | Topics covered in chapters 1-6 | 1-3 | Week # 7 | On campus computerized exam |
| Quiz | 20 | Topics covered in chapters 7-9 | 2-4 | Weak1-Weak 10 | On campus computerized exam |
| Final exam | 50 | All Chapters | 1-4 | Final exams week | On campus computerized exam |

23 Course Requirements

N/A

24 Course Policies:

- A- Attendance policies: **All the students should show up on the class time.**
 B- Absences from exams and handing in assignments on time: 5 absence allowed only, make up exam: after the normal exams of around one week.
 C- Health and safety procedures: No phone on during the lecture
 D- Honesty policy regarding cheating, plagiarism, misbehavior: Following the university regulations and rules.
 E- Grading policy: First 30%, Second 30%, and Final 50%
 F- Available university services that support achievement in the course: All available.

25 References:

Recommended books, materials, and media:
 Fundamentals of analytical chemistry by Skoog, West, Holler and Crouch, 9th edition (2004)

26 Additional information:

Safety Procedures should be followed carefully in this lab.

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| Name of Course Coordinator: Dr. Mohammed Rasheed Signature: <i>M. Rasheed</i> Date: 6/3/2022 |
| Head of Curriculum Committee/Department: ----- Signature: ----- |
| Head of Department: ----- Signature:----- |
| Head of Curriculum Committee/Faculty: ----- Signature: ----- |
| Dean: ----- Signature: ----- |