

Course Description Form

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| 1. Course Name: | |
| Human biology | |
| 2. Course Code: | |
| SciA108 | |
| 3. Semester / Year: | |
| 2 nd Semester 2023-2024 | |
| 4. Description Preparation Date: | |
| | |
| 5. Available Attendance Forms: | |
| Lectures - laboratories | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 3 / 4 | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Ali Mowafaq Salih | |
| Email: Ali.mowafaq@uoanbar.edu.iq | |
| 8. Course Objectives | |
| Course Objectives 1- Identify the characteristics of the human body. 2- Identify the cells that make up the human body. 3- Knowing the shape, size and composition of cells. 4- Identify the human circulatory system. 5- Study of the human respiratory system and the mechanism of breathing. 6- Study of the human skeletal system. 7- Identify the human nervous system. 8- Identify the human digestive system. 9- Identify the human muscular system 10- Learning Outcomes, Teaching ,Learning and Assessment Methode | |
| 9. Teaching and Learning Strategies | |
| Strategy | 1- Explaining the scientific material to students in detail. 2- Discussion and dialogue about vocabulary related to the topic 3- Using figures and illustrative means to explain the lecture |

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10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|--|---|---|---|
| 12 | 36 | Monthly written and practical exams with reports and a final written and laboratory exam | <p>An introduction to human biology and a historical overview of the scientists who worked in this field</p> <p>Learn about the cells that make up the human body identify the cells that make up the human body in terms of form and function</p> <p>Identify the circulatory system and blood distribution within the body</p> <p>Identify the human respiratory system</p> <p>Study of the skeletal system</p> <p>Learn about the nervous system.</p> <p>Learn about the digestive system.</p> <p>Learn about the human muscular system</p> <p>Identify the internal organs of the human body</p> | Delivering the lecture in person in the classroom using illustration tools such as models and drawings from a blackboard and a projector. | <p>1-Weekly, monthly, daily exams and the end of the year exam.</p> <p>2- Giving the students some group activities and tasks</p> <p>3- Paying attention to daily duties and allocating a percentage of the grade to them</p> |

11. Course Evaluation

1- Distribution of the score out of 50 according to the tasks assigned to the student, such as 1- Participation in the lecture hall 2- Practical evaluation in the laboratory 3- Theoretical and practical monthly tests 4- Reports

12. Learning and Teaching Resources

| | |
|---|------------------------------------|
| Required textbooks (curricular books, if any) | 1-Hamid Ahmed Al-Hajj. 2017, Human |
|---|------------------------------------|

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| | Biology, Dar Al-Maysara for Publishing, Distribution and Printing. 2- Ayesha Mahmoud Zaitoun. 1987, Introduction to Human Biology, 2nd edition - Amman: University of Jordan, Cooperative Printing Workers Association. |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

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|---|---|
| 1. Course Name: | |
| General physics | |
| 2. Course Code: | |
| SciA107 | |
| 3. Semester / Year: | |
| Second/2024 | |
| 4. Description Preparation Date: | |
| 23/1/2024 | |
| 5. Available Attendance Forms: | |
| Classrooms | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 36/3 | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Mohammed Najeeb jasim | |
| Email: mhamad87@uoanbar.edu.iq | |
| 8. Course Objectives | |
| Course Objectives | <ul style="list-style-type: none">Teaching students the basics of the physics of motion of all kinds and the basic laws for interpreting natural phenomena and preparing students on how to explain or interpret these phenomena and their laws |
| 9. Teaching and Learning Strategies | |
| Strategy | Lecture, discussion, and preparing weekly reports |

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|--|---|-----------------------------------|------------------------|
| 1 | 3 | Acquire knowledge in the field of understanding Laws of motion in One dimension with Units used. Measurement and movement at a distance | Measurement and movement at a distance One | Presentation and discussion | Daily and monthly exam |
| 2 | 3 | Acquire knowledge in the field of understanding Laws of motion in One dimension with Units used. Measurement and movement at a distance One | Movement in one dimension | Presentation And discussion | Daily and monthly exam |
| 3 | 3 | Explain the meaning Physics of quantities Vector and quantities Numerical | For vectors and quantities Numerical | Presentation and discussion | Daily and monthly exam |
| 4 | 3 | In expansion Previous topic And gain knowledge In its fields | Vectors and quantities Numerica | Presentation and discussion | Daily and monthly exam |
| 5 | 3 | Laws of motion in Two dimensions with units used. | Laws of motion in Two dimensions with | presentation | Daily and |

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|----|---|--|-----------------|--------------------------------|---------------------------|
| | | | units used. | And discussion | monthly exam |
| 6 | 3 | Derivation of Newton's laws The third with applications | Newton's laws | presentation And discussion | Daily and monthly exam |
| 7 | 3 | Connect Newton's laws By the forces of friction with Solve the examples | Friction forces | presentation And discussion | Daily and monthly exam |
| 8 | 3 | Connect Newton's law | Friction forces | presentation And discussion | Daily and monthly exam |
| 9 | 3 | Know concept of work | Work energy | presentation And discussion | Daily and monthly exam |
| 10 | 3 | Know concept of work | Work energy | presentation And discussion | Daily and monthly exam |

11. Course Evaluation

Grade: 35. Monthly exam: 25. Assignments: 5. Daily exams: 5

12. Learning and Teaching Resources

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|--|---|
| Required textbooks (curricular books, if any) | -Principles of university physics |
| Main references (sources) | Fundamentals of Physics by Friedrich Bosch |
| Recommended books and references (scientific journals, reports...) | Classical Mechanics – A Basic Introduction Michael Cohen |
| Electronic References, Websites | Mechanics principles and applications, Hazem Skaik |

Course Description Form

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|---|---|
| 1. Course Name: General Chemistry - practical | |
| 2. Course Code: | |
| 3. Semester / Year: Season | |
| 4. Description Preparation Date: 17\12\2023 | |
| 5. Available Attendance Forms: weekly | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 26 hours / 13 units | |
| 7. Course administrator's name (mention all, if more than one name) Name: Ahmed Jaber Karakosh Email: ahmad.jaber@uoanbar.edu.iq | |
| 8. Course Objectives | |
| <p>At this stage, the student must become familiar with safety procedures in the laboratory by knowing hazardous materials and rapidly reactive substances such as acids and others and how to deal with them. After that, the student learns about laboratory devices and tools and their methods of operation, then learns about the interactions of various ions of the elements, as well as preparing solutions from solid materials. And the questioner, as well as the knowledge of writing special reports to conduct various experiments.</p> | |
| 9. Teaching and Learning Strategies | |
| Strategy | 1- Cognitive objectives * The student's ability to excel and understand modern practical research methods *The student's knowledge of laboratory equipment, tools, materials, and methods of using them * The student's knowledge of laboratory prevention and safety procedures and |

caution against hazardous materials
 * Know how to use materials to conduct laboratory experiments

2- Skill objectives of the course:
 *The student must have skill in using chemical analysis methods to determine the composition of compounds and the concentration of elements
 * Giving the student the skill of linking the practical and theoretical parts

3- Teaching and learning methods:
 * Lecture and use a presentation in its presentation
 *Using various educational means such as a data show device.
 * Conducting systematic experiments related to general chemistry
 * Asking questions during the lecture

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|--|----------------------------|-------------------|
| 1 | 2 | | General safety directions and instructions in the laboratory | Power point | Written exam |
| 2 | 2 | | Tools and materials used in the laboratory | Power point Interactive | Written exam |
| 3 | 2 | | How to write laboratory reports | Power point | Written exam |
| 4 | 2 | | Copper ion reactions | Power point Interactive | Written exam |
| 5 | 2 | | Preparing solutions of a liquid substance | Power point Interactive | Written exam |
| 6 | 2 | | Preparing solutions of solid matter | Power point Interactive | Written exam |
| 7 | 2 | | First month exam | Power point Interactive | Written exam |
| 8 | 2 | | Determine the concentration of the basic NaOH solution by titrating it with a standard solution of | Power point Interactive | Written exam |

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|----|---|--|--|-------------------------------|--------------|
| | | | acid (HCl) | | |
| 9 | 2 | | Preparation of the neutral complex (Ni(DMG) ₂) PS- dimethylglyoxymeto nicyl | Power point Interactive | Written exam |
| 10 | 2 | | Second month exam | Power point Interactive | Written exam |
| 11 | 2 | | Lead ion reactions | Power point Interactive | Written exam |
| 12 | 2 | | Properties of magnesium metal and magnesium ion interactions | Power point Interactive | |
| 13 | 2 | | Third month exam | Power point Interactive | |
| | | | | | |

11. Course Evaluation

Course evaluation: Course evaluation through student evaluation

1- quiz

2- Short questions during the lecture

3- Monthly exams: two or more exams if possible

4- Final exam

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

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|---|---|
| Required textbooks (curricular books, if any) | Organic chemistry book - Morson Translated 2019 |
| Main references (sources) | Comprehensive book on practical organic chemistry - Written by Professor Dr. Al-Jazi Bint Ibrahim 2007 |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

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|--|---|
| 1. Course Name: Material properties | |
| | |
| 2. Course Code: SciP219 | |
| | |
| 3. Semester / Year: first 2023 – 2024 | |
| | |
| 4. Description Preparation Date: 17 – 4 -2024 | |
| | |
| 5. Available Attendance Forms: Classrooms + electronic class | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 2 hours theory / 2 | |
| | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: eid mohammed monawer Email: eid.mohammed@uoanbar.edu.iq | |
| 8. Course Objectives The aim of this course is to acquaint the student with how to study the internal structure of matter, as well as study the mechanical, thermal, and electrical properties of that material. | |
| Course Objectives | <ul style="list-style-type: none"> • • • |
| 9. Teaching and Learning Strategies | |
| Strategy | <p>Conduct dialogue and discussion in an applied manner relate to the reality of daily life to attract students to a topic</p> <p style="padding-left: 40px;">Lesson without straying from the core of the topic so th</p> <p>the material is flexible and able to be understood and analyse</p> <p style="padding-left: 40px;">- Giving students some group activities and assignments among themselves.</p> |

- Paying attention to daily assignments and tests and allocating a percentage of the grade to them.

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|--|--|--|--|
| 1 | 2 | Conduct dialogue and discussion in an applied | stress and emotion | Teaching and learning methods. | Participation during the lesson. |
| 2 | 2 | manner related to the reality of daily life to attract students on a topic | Classification of stress and strain | Continuous daily and weekly tests. Activities during the lesson. | Providing activities. |
| 3 | 2 | Lesson without straying from the core of the topic so | Types of elastic modulus Stress-strain curve | | Achievement tests are as follows: - A. |
| 4 | 2 | that the material is flexible and able to be understood and analysed. | The relationship between modulus of elasticity and temperature | Directing students to some websites to benefit from them. | Semester exams 50%. End of semester exams |
| 5 | 2 | Electric materials and magnetic | Electrical and magnetic properties of material | Evaluation methods. | |
| 6 | 2 | First month exam | First month exam | Participation during the lesson. | |
| 7 | 2 | Conduct dialogue and discussion in an applied | General properties of semiconductor materials | Providing activities. | |

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|----|---|--|--|---|
| 8 | 2 | Giving students some group activities and assignments among themselves. | Excessive conductivity Optical properties materials | Achievement tests are as follows: - A. Semester exams 50%B. End of semester exams |
| 9 | 2 | straying from the core of the topic the material flexible and able to understand a | | |
| 10 | 2 | analysed. | | |
| 11 | 2 | Define the super conductivity | Super conductivity | |
| 12 | 2 | Second month exam | Second month exam | |

11. Course Evaluation

- Involving students in the lesson, evidence of their commitment and interest.
- Assigning students to prepare reports, and adhering to the deadline specified for them.
 - Conducting monthly achievement tests. (oral, written), expressing commitment With cognitive and skill achievement.

12. Learning and Teaching Resources

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| Required textbooks (curricular books, if any) | Heat and properties of matter / Muhammad Ali Ahmed |
| Main references (sources) | Thermodynamics / Dr. Mohs Abdel Muti Rasoul |

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| Recommended books and references (scientific journals, reports...) | Journal of physics science |
| Electronic References, Websites | www. Physics science. com |

Course Description Form

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|---|---|
| 1. Course Name: | |
| Plant taxonomy | |
| 2. Course Code: | |
| SciB312 | |
| 3. Semester / Year: | |
| 2 st Semester 2023-2024 | |
| 4. Description Preparation Date: | |
| 5 / 2 / 2024 | |
| 5. Available Attendance Forms: | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 30 Hours / 2 Units | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: malath A. Hamed | |
| Email: ag.malath.hamid@uoanbar.edu.iq | |
| 8. Course Objectives | |
| Course Objectives | <ul style="list-style-type: none"> Introducing students to plant taxonomy Learn the basics of plant classification Identify the plant parts used in classification |
| 9. Teaching and Learning Strategies | |
| Strategy | <p>A- A- Knowledge and understanding:</p> <p>B- Studying plant taxonomy helps to gain deep knowledge and understanding about:</p> <p>C- 1. Plant Diversity: Understanding different types of plants and classifying them according to their common and unique characteristics.</p> <p>D- 2. Plant evolution: Understanding the evolutionary history of plants and their genetic and evolutionary relationships.</p> |

- E- 3. Environment and adaptation: The influence of environmental factors on the distribution and adaptation of plants.
- F- 4. Human uses: Uses of plants in medicine, nutrition, agriculture, and other fields.
- G- 5. Preserving biodiversity: The importance of preserving plant diversity and contributing to protecting endangered plants.
- H- 6. Scientific research: Directing scientific research in various fields such as plant genetics and plant biology
- I- C- Teaching and learning methods
- J- Providing students with the basics and lectures related to the subject.
- K- Using Power Point presentation methods to convey information well and clearly to the student.
- L- Urging students to take advantage of Google search engines while asking them to submit scientific reports on the topics given them in the academic subject.

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|-----------------------|--|--|
| 1 | 2 | Plant taxonomy | Plant taxonomy | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 2 | 2 | | Root | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 3 | 2 | | Stems | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 4 | 2 | | Leaves | Lectures, presentations, group | Written exams, oral exams, short exams, and home |

| | | | | | |
|----|---|--|----------------------|--|--|
| | | | | discussions | assignments |
| 5 | 2 | | Leaf Blade | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 6 | 2 | | Leaf Venation | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 7 | 2 | | The Flower | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 8 | 2 | | Perianth | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 9 | 2 | | Androecium | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 10 | 2 | | Gynoecium | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| | | | | | |

11. Course Evaluation

Achievement tests are as follows: - A. Monthly tests 50%

B. End of semester exams 50%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

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| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

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|---|---|
| 1. Course Name: | |
| Plant Physiology | |
| 2. Course Code: | |
| SciB213 | |
| 3. Semester / Year: | |
| 2 st Semester 2023-2024 | |
| 4. Description Preparation Date: | |
| 5 / 2 / 2024 | |
| 5. Available Attendance Forms: | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 30 Hours / 3 Units | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: malath A. Hamed | |
| Email: ag.malath.hamid@uoanbar.edu.iq | |
| 8. Course Objectives | |
| Course Objectives | <p>Introducing students to the cell and its parts</p> <p>Identify the device for transporting water and nutrients within the cell and the structures and theories that explain this process</p> <p>Identify the processes of (transpiration, cellular respiration, and photosynthesis).</p> <p>Know the importance of nutrients and plant hormones</p> <p>Knowing the importance of the work of enzymes and amino acids</p> |
| 9. Teaching and Learning Strategies | |
| Strategy | <p>M-Knowledge and Understanding</p> <ul style="list-style-type: none"> • After completing the course, the student will be able to: - Describe the physiological processes of metabolism, photosynthesis, respiration, and water relations in plants in an appropriate scientific description. |

- Explains basic biological processes, explaining the role of enzymes on plant growth
- It explains some important phenomena related to the physiological processes of plants affected by some surrounding environmental factors in the context of understanding physiological processes such as transpiration and photosynthesis.

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|---|--|--|
| 1 | 2 | Plant Physiology | Introduction to plant physiology Types of living organisms Prokaryotic organisms Eukaryotic organisms Plant cell Animal cell | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 2 | 2 | | Plant cell, its parts and components Stages of plant cell growth Plant cell structure | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 3 | 2 | | Protoplast Cytoplasm Vacuoles | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 4 | 2 | | Water relations of plants Imbibition osmosis | Lectures, presentations, group | Written exams, oral exams, short exams, and home |

| | | | | | |
|----|---|--|--|---|---|
| | | | The plasma | discussions | assignments |
| 5 | 2 | | Plant absorption of water Water transport in plants Plant loss of water | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 6 | 2 | | Blooding Transpiration | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 7 | 2 | | Photosynthesis | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 8 | 2 | | respiration | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 9 | 2 | | Enzymes | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
| 10 | 2 | | Plant nutrition | Lectures, presentations, group discussions | Written exams, oral exams, short exams, and home assignments |
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11. Course Evaluation

Achievement tests are as follows: - A. Monthly tests 50%

B. End of semester exams 50%

12. Learning and Teaching Resources

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|--|--|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | <ul style="list-style-type: none"> ■ اساسيات فسيولوجيا النبات ، 2008 ، حشمت سليمان الدسوقي ■ فسيولوجيا النبات ، 1998 ، عمادالدين وصفي ■ اس العلمية لادارة وإنتاج وتحسين المحاصيل العقلية ، 2018 ، اياد حسن علي و محمد عويد غدير |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

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|---|---|-----------------------------------|---|-------------------------------------|--|--|
| 1. Course Name: | | | | | | |
| Genetics | | | | | | |
| 2. Course Code: | | | | | | |
| Sci4406 | | | | | | |
| 3. Semester / Year: | | | | | | |
| 1 st Semester 2023-2024 | | | | | | |
| 4. Description Preparation Date: | | | | | | |
| 5 / 10 / 2024 | | | | | | |
| 5. Available Attendance Forms: | | | | | | |
| | | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | | |
| 30 Hours / 2 Units | | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | | |
| Name: malath A. Hamed | | | | | | |
| Email: ag.malath.hamid@uoanbar.edu.iq | | | | | | |
| 8. Course Objectives | | | | | | |
| Course Objectives | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Introducing students to genetics.</td></tr> <tr><td>Learn about Mendel's first and second laws.</td></tr> <tr><td>Identify non-Mendelian inheritance.</td></tr> <tr><td>Know the components of the nucleus and DNA</td></tr> <tr><td>Know the importance of crossing over and genetic mutations</td></tr> </table> | Introducing students to genetics. | Learn about Mendel's first and second laws. | Identify non-Mendelian inheritance. | Know the components of the nucleus and DNA | Know the importance of crossing over and genetic mutations |
| Introducing students to genetics. | | | | | | |
| Learn about Mendel's first and second laws. | | | | | | |
| Identify non-Mendelian inheritance. | | | | | | |
| Know the components of the nucleus and DNA | | | | | | |
| Know the importance of crossing over and genetic mutations | | | | | | |
| 9. Teaching and Learning Strategies | | | | | | |
| Strategy | <p>A1. • After completing the course, the student will be able to: - Solve problems related to genetics</p> <p>A2. • Explains the components of DNA and RNA and the difference between them</p> <p>A3. It explains some important phenomena related to genetics, such as linkage, crossing over, and mutations</p> | | | | | |

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10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|--|---|---|
| 1 | 2 | Genetics | Introduction to genetics Branches of genetics The importance of genetics Biology used in genetics | Lectures, presentations, group discussions | Discussions, solving examples and daily tests |
| 2 | 2 | | Division in cells Mitosis Meiosis | Lectures, presentations, group discussions | Discussions, solving examples and daily tests |
| 3 | 2 | | Mendelian inheritance Mendel's first law Some important terms Test cross | Lectures, presentations, group discussions | Discussions, solving examples and daily tests |
| 4 | 2 | | Mendel's second law Post-Mendelian genetics Lethal alleles Multiple alleles | Lectures, presentations, group discussions | Discussions, solving examples and daily tests |
| 5 | 2 | | Genetics inheritance Linked- Sex inheritance Limited –Sex inheritance influenced- Sex | Lectures, presentations, group discussions | Discussions, solving examples and daily tests |
| 6 | 2 | | The chemical basis of genetic material DNA construction RNA construction | Lectures, presentations, group discussions | Discussions, solving examples and daily tests |

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|----|---|--|--|---|---|
| 7 | 2 | | DNA replication Replication Translation Cloning | Lectures, presentations, group discussions | Discussions, solving examples and daily tests |
| 8 | 2 | | Linkage and crossing- over | Lectures, presentations, group discussions | Discussions, solving examples and daily tests |
| 9 | 2 | | Mutations | Lectures, presentations, group discussions | Discussions, solving examples and daily tests |
| 10 | 2 | | Genetic Engineering | Lectures, presentations, group discussions | Discussions, solving examples and daily tests |

11. Course Evaluation

Achievement tests are as follows: - A. Monthly tests 50%

B. End of semester exams 50%

12. Learning and Teaching Resources

| | |
|---|--|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

| | |
|---|---|
| 1. Course Name: Chemistry of represented elements - practical | |
| | |
| 2. Course Code: | |
| | |
| 3. Semester / Year: Season | |
| | |
| 4. Description Preparation Date: 17/4/2024 | |
| | |
| 5. Available Attendance Forms: weekly | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 26 hours / 13 units | |
| | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Ahmed Jaber Karakosh | |
| Email: ahmad.jaber@uoanbar.edu.iq | |
| 8. Course Objectives | |
| <p>8. Course objectives:</p> <p>. The most important goals achieved by this course are for students to be familiar with structure and purpose of the periodic table, and to know the locations of the elements in periodic table, as well as to know the metals, non-metals, and metalloids, and to know many the group elements in the periodic table, their properties, and methods of preparing them.</p> | |
| 9. Teaching and Learning Strategies | |
| Strategy | <p>- 1- Cognitive objectives</p> <p>*The student's ability to excel and understand modern practical research methods</p> <p>* Providing the student with knowledge of the basic principles of the elements of the periodic table, its divisions, the arrangement its elements, and their orbits. This helps him understand the common chemical properties and differences between the elements.</p> <p>*The student must have knowledge in calculating the atomic mas</p> |

and molecular weight of chemical compounds
 *The student must have knowledge of methods for preparing chemical compounds of the elements

2-- The skill objectives of the course
 *The student must have skill in using chemical analysis methods to determine the composition of compounds and the concentration of elements
 * Giving the student the skill of linking the practical and theoretical parts

3- Teaching and learning methods
 * Lecture and use a presentation in its presentation
 *Using various educational means such as a data show device.
 * Conduct systematic experiments related to the chemistry of the represented elements
 * Asking questions during the lecture

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|---|----------------------------|-------------------|
| 1 | 2 | | Periodic Table | Power point | Written exam |
| 2 | 2 | | Group I elements - Preparation of lithium chloride | Power point Interactive | Written exam |
| 3 | 2 | | Preparation of sodium chloride | Power point | Written exam |
| 4 | 2 | | Purification of table salt | Power point Interactive | Written exam |
| | 2 | | | | Written exam |
| 5 | 2 | | Group II elements - alkaline earth elements - magnesium and its compounds and its presence, calcium and its compounds | Power point Interactive | Written exam |

| | | | | | |
|----|---|--|--|----------------------------|--------------|
| 6 | 2 | | Preparation of calcium peroxide | Power point Interactive | Written exam |
| 7 | 2 | | Preparation of barium tartrate | Power point Interactive | Written exam |
| 8 | 2 | | The third group - the dirt group Preparation of barium borate | Power point Interactive | Written exam |
| | 2 | | | | Written exam |
| 9 | 2 | | Preparation of boron oxide | Power point Interactive | Written exam |
| 10 | 2 | | The fourth group is the carbon group Preparation of lead chromate | Power point Interactive | Written exam |
| 11 | 2 | | Properties of magnesium metal and magnesium ion interactions | Power point Interactive | Written exam |
| 12 | 2 | | Preparation of magnesium bromide | Power point Interactive | |
| 13 | 2 | | Estimating water hardness | Power point Interactive | |

11. Course Evaluation

Course evaluation: Course evaluation through student evaluation

1- quiz

2- Short questions during the lecture

3- Monthly exams: two or more exams if possible

4- Final exam

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Book of Chemistry of Representative Elements / by Dr. Mahdi Naji
Al-Zakum / Dar Al-Kutub / Mosul / 1988

| | |
|---|---|
| Main references (sources) | Encyclopedia of Comprehensive Chemistry / Hossam Khalil - Dar Osama - Amman 2009 |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

1. Course Name: Inorganic chemistry - practical

2. Course Code:

3. Semester / Year: Season

4. Description Preparation Date: 10 \ 12 \2023

5. Available Attendance Forms: weekly

6. Number of Credit Hours (Total) / Number of Units (Total) 26 hours / 13 units

7. Course administrator's name (mention all, if more than one name)

Name: Ahmed Jaber Karakosh

Email: ahmad.jaber@uoanbar.edu.iq

8. Course Objectives

The study of inorganic chemistry aims to achieve several important goals, including:

1- Understanding the physical and chemical properties of inorganic compounds by studying the chemical reactions, bonds, and crystal structures of the compounds.

2- Catalyst development: Inorganic chemistry plays a role in developing catalysts that are used in many industrial processes such as the petrochemical industry.

3- Applications in various industries such as the paint industry, adhesives and pharmaceuticals.

9. Teaching and Learning Strategies

- 1- Cognitive objectives

*The student's ability to excel and understand modern practical research methods

* Providing the student with knowledge of the basic principles of the elements the periodic table, its divisions, the arrangement of its elements, and their orbits. This helps him understand the common chemical properties and differences between the elements.

*The student must have knowledge in calculating the atomic mass and molecular weight of chemical compounds

*The student must have knowledge of methods for preparing chemical compounds of the elements

2-- The skill objectives of the course

*The student must have skill in using chemical analysis methods to determine the composition of compounds and the concentration of elements

* Giving the student the skill of linking the practical and theoretical parts

3- Teaching and learning methods

* Lecture and use a presentation in its presentation

*Using various educational means such as a data show device.

* Conducting systematic experiments related to inorganic chemistry

* Asking questions during the lecture

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|---|----------------------------|-------------------|
| 1 | 2 | | Laboratory equipment and tools | Power point | Written exam |
| 2 | 2 | | Preparation of potassium alum | Power point Interactive | Written exam |
| 3 | 2 | | Find the percentage of water in a hydrated compound | Power point | Written exam |
| 4 | 2 | | Magnesium ion interactions | Power point Interactive | Written exam |
| 5 | 2 | | First month exam | | Written exam |
| 6 | 2 | | Calcium ion | Power | Written |

| | | | | | |
|----|---|--|---|----------------------------|--------------|
| | | | interactions | point Interactive | exam |
| 7 | 2 | | Aluminum ion reactions | Power point Interactive | Written exam |
| 8 | 2 | | Silver ion reaction | Power point Interactive | Written exam |
| 8 | 2 | | Second month exam | Power point Interactive | Written exam |
| 9 | 2 | | Oxidation and reduction reactions | Power point Interactive | Written exam |
| 10 | 2 | | Preparation of salts (copper sulphate) | Power point Interactive | Written exam |
| 11 | 2 | | Study of halides (potassium chloride) | Power point Interactive | Written exam |
| 12 | 2 | | | Power point Interactive | |
| 13 | 2 | | Third month exam | Power point Interactive | |

11. Course Evaluation

Course evaluation: Course evaluation through student evaluation

1- quiz

- 2- Short questions during the lecture
- 3- Monthly exams: two or more exams if possible
- 4- Final exam

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

| | |
|--|---|
| Required textbooks (curricular books, if any) | Practical inorganic chemistry book - written by Dr. Ali Ajam 2016 |
| Main references (sources) | Inorganic Chemistry book written by Dr. Issam Girgis 1982 |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

| 1. Course Name: | | | | | |
|--|-----------|---|-----------------------------------|-----------------------------|--|
| Volumetric analytical chemistry | | | | | |
| 2. Course Code: | | | | | |
| SciC233 | | | | | |
| 3. Semester / Year | | | | | |
| the First 2023- 2024 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 17/11/2024 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| presence | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 30 hours | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Sumood Naser Al-Deen Taha Email: Sum20s3005@uoanbar.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives The course aims to familiarize the student with the principles of analytical chemistry and volumetric analysis: <ol style="list-style-type: none"> 1- Introducing the student to the concepts and basics of analytical chemistry 2- Focus on volumetric analysis in quantitative estimation processes through chemical titration. 3- The student will be able to know how to prepare different solutions | | | | | |
| 9. Teaching and Learning Strategies | | | | | |
| <ol style="list-style-type: none"> 1- Lecture method and using the blackboard and data show. 2- 2- Conducting experiments within the curriculum and preparing reports. 3- Providing students with knowledge through homework assignments for academic vocabulary. 4- Improving students' skills by visiting websites to obtain additional knowledge of the academic subject. | | | | | |
| 10. Course Structure | | | | | |
| Week | Hour s | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2 | Introducing the student to chemistry quantitative analytical (volumetric) | Introduction to chemical analysis | Blackboard And data show | Conducting oral and written exams, Homeworks . |

| | | | | | |
|----|---|--|---|-----------------------------|---|
| 2 | 2 | Introducing the student the most important glassware and tools and their uses. | Glass instruments used in volumetric analysis | Blackboard And data show | Conducting oral and written exams, Homeworks |
| 3 | 3 | | | Blackboard And data show | Conducting oral and written exams, Homeworks. |
| 4 | 2 | | | Blackboard And data show | Conducting oral and written exams, Homeworks. |
| 5 | 2 | | | Blackboard And data show | Conducting oral and written exams, Homeworks. |
| 6 | 2 | | First exam - second semester. | | |
| 7 | 2 | Student definition of Solubility | Solubility, dissolution yield Ionic yield, examples and problems | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 8 | 2 | Know the effect of Temperature And the common ion....etc. | Factors Affect portability Solubility the precipitate. | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 9 | 2 | Introducing the student sediment contamination | Precipitate contamination and its effect on accuracy Results, types of pollutants, co-precipitation contamination, Contamination by subsequent sedimentation ,Avoid pollution and treatment Various pollutants. | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 10 | 2 | Introducing the student precipitate washing solutions | Precipitate washing solutions, their effect Onsediments,their | Blackboard And data show | Conducting oral and written exams, Homeworks, and |

| | | | | | |
|----|---|--|---|---------------------------------|--|
| | | | features | | participating in the classroom Provide activities |
| 11 | 2 | Second exam - second Semester | | | |
| 12 | 2 | Introducing the student to Separation methods | Separation methods (separation sedimentation, Separation by distillation, its types, and how to separate). | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 13 | 2 | Introducing the student to the Separation by extraction | Separation by extracting principles Basic, mathematical laws For extraction and extraction techniques | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 14 | 2 | Introducing the student to the Separation By chromatography | Chromatographic separation methods general idea Advantages of chromatographic methods Classification chromatographic methods | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 15 | 2 | Third exam - second Semester | | | |

11. Course Evaluation

Daily preparation, oral or monthly exams and homework

12. Learning and Teaching Resources

| | |
|--|---|
| Required textbooks (curricular books, if any) | General foundations of chemical and gravimetric analysis Dr. Safaa Razouki, Part One. |
| Main references (sources) | 1-Fundamentals of Analytical Chemistry, Douglas Skoog and Donald M. West Eight Edition. 2-Practical applications in instrumental chemical analyses Separation methods - Ismail Khalil Al-Hiti. |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

| | |
|---|--|
| 1. Course Name: Animal physiology | |
| 2. Course Code: SciB303 | |
| 3. Semester / Year: Season First | |
| 4. Description Preparation Date:17/12/2023 | |
| 5. Available Attendance Forms: weekly | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 26 hours / 13 units | |
| 7. Course administrator's name (mention all, if more than one name) Name: Lama Dali Ibrahim Ali Email: lama.dali@uoanbar.edu.iq | |
| 8. Course Objectives | |
| 9. Course objectives: | The course included 12 lectures and three exams to evaluate the students. The science lectures included explanations of laboratory equipment and the most important laboratory safety procedures, as well as methods for collecting samples such as blood, stool, urine, special tubes for each type of analysis, in addition to the most important laboratory analyses such as analysis of hemoglobin and hematocrit ratios, red and white blood cell counts, blood cell sedimentation rate. Detecting the osmotic behavior of red blood cells, in addition to anatomy the frog |
| 10. Teaching and Learning Strategies | |
| Strategy | The course aims to learn about the most important physiological analyzes important the body, methods for collecting samples for the patient, and how to use laboratory equipment related to physiological analyses, in addition to knowing blood pressure methods for measuring it, and what are the most important factors that affect it, as well as how to dissect a frog and see its most important internal parts |

| 11. Course Structure | | | | | |
|----------------------|-------|----------------------------|---|----------------------------|-------------------|
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2 | | Safety procedures in laboratories and laboratory analyses | Power point | Written exam |
| 2 | 2 | | Samples collection methods | Power point Interactive | Written exam |
| 3 | 2 | | Blood group | Power point | Written exam |
| 4 | 2 | | The exam is the first month | Power point Interactive | Written exam |
| | 2 | | Packed Cell Volume | | Written exam |
| 5 | 2 | | red blood cells counts | Power point Interactive | Written exam |
| 6 | 2 | | RBCosmotic Rfragility | Power point Interactive | Written exam |
| 7 | 2 | | Microscopic techniques for studying cells | Power point Interactive | Written exam |
| 8 | 2 | | Second month exam | Power point Interactive | Written exam |
| | 2 | | clotting time | | Written exam |
| 9 | 2 | | bleeding time | Power point Interactive | Written exam |
| 10 | 2 | | Blood pressure measurement | Power point Interactive | Written exam |
| 11 | 2 | | Third month exam | Power point Interactive | Written exam |
| 12 | 2 | | erythrocyte sedimentation rate | Power point Interactive | |
| | | | Frog anatomy | | |

| | | | | |
|----|---|--|---|-------------------------|
| 13 | 2 | | | Power point Interactive |
| | | | Safety procedures in laboratories and laboratory analyses | |

12. Course Evaluation

Course evaluation: Course evaluation through student evaluation

1- quiz

2- Short questions during the lecture

3- Monthly exams: two or more exams if possible

4- Final exam

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

13. Learning and Teaching Resources

| | |
|---|--|
| Required textbooks (curricular books, if any) | .Subhi Omran Shalash, (1990), Practical Animal Physiology, Dar El Nada, Beirut, Lebanon. .2The Scientific Study in Zoology, written by members of the animal teaching staff in Egyptian universities, Dar Al-Maaref, Egypt, 1983 AD. .3Al-Alawji Sabah Nasser, (2007), Science and Sects of Organs, Dar Al-Fikr, Amman, Jordan |
|---|--|

Main references (sources)

Recommended books and references (scientific journals, reports...)

Electronic References, Websites

Course Description Form

| | |
|---|---|
| 1. Course Name: Microbiology | |
| | |
| 2. Course Code: SciB201 | |
| | |
| 3. Semester / Year: Season First | |
| | |
| 4. Description Preparation Date:17/12/2023 | |
| | |
| 5. Available Attendance Forms: weekly | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 26 hours / 13 units | |
| | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Lama Dali Ibrahim Ali | |
| Email: lama.dali@uoanbar.edu.iq | |
| 8. Course Objectives | |
| 8. Course objectives | <p>This course included 12 practical laboratories with three exam for students. The first lecture of the course explained a general introduction to microorganisms and the most important laboratory equipment used to isolate them. After that, touched on the most important step in the field of microbiology, which is sterilization, as it explained the sterilization methods used with the equipment. Then the course included Also, laboratory diagnostic methods such as staining and biochemical tests. After that, we discussed the most important methods for isolating microorganisms from various sources such as water, soil, milk, and canned food. At the end of the course, the students were briefed on the most important infectious diseases caused by microorganisms.....</p> <ul style="list-style-type: none"> • |
| 9. Teaching and Learning Strategies | |
| Strategy | This course aims to provide students with the knowledge of microorganisms and how |

to prepare the most important culture medium also knowledge the methods of culturing microbes on media and the most important biochemical test and used Gram stain to. Knowing the difference between Negative and positive bacteria gram, , as well as how to isolate microorganisms from different sources such as water, canned soil, and milk. This chapter also defines this chapter to The most important fatal diseases in the body that are caused by some microorganisms

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|---|----------------------------|-------------------|
| 1 | 2 | | Introduction to microbiology | Power point | Written exam |
| 2 | 2 | | Sterilization | Power point Interactive | Written exam |
| 3 | 2 | | Culturing media | Power point | Written exam |
| 4 | 2 | | First month exam | Power point Interactive | Written exam |
| | 2 | | Methods of growing microorganisms on culture media | | Written exam |
| 5 | 2 | | Pigmentation | Power point Interactive | Written exam |
| 6 | 2 | | Biochemical I tests | Power point Interactive | Written exam |
| 7 | 2 | | Bacterial examination of water samples | Power point Interactive | Written exam |
| 8 | 2 | | Second month exam | Power point Interactive | Written exam |
| | 2 | | Isolation of bacteria from soil | | Written exam |
| 9 | 2 | | Isolation of bacteria from canned foods | Power point Interactive | Written exam |
| 10 | 2 | | Infectious diseases and communicable microorganisms | Power point Interactive | Written exam |
| 11 | 2 | | Antibiotic resistance | Power | Written |

| | | | | point Interactive | exam |
|----|---|--|--|-------------------------|------|
| 12 | 2 | | | Power point Interactive | |
| 13 | 2 | | | Power point Interactive | |
| | | | | | |

11. Course Evaluation

Course evaluation: Course evaluation through student evaluation

1- quiz

- 2- Short questions during the lecture
- 3- Monthly exams: two or more exams if possible
- 4- Final exam

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

| | |
|--|--|
| Required textbooks (curricular books, if any) | .1Principles of practical microbiology by Assistant Professor Suhaila Jawad Kazem, Department of Soil Sciences and Water Resources, College of Agriculture/University of Basra The Scientific Book of Microbiology / Ramadan Al-Hadithi |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

1. Course Name histology and Embryology

| | |
|---|---|
| 2. Course Code: SciB211 | |
| 3. Semester / Year: Season | |
| 4. Description Preparation Date:17/4/2024 | |
| 5. Available Attendance Forms: weekly | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 26 hours / 13 units | |
| 7. Course administrator's name (mention all, if more than one name) Name: Lama Dali Ibrahim Ali Email: lama.dali@uoanbar.edu.iq | |
| 8. Course Objectives | |
| Course Objectives The study of this course aims to identify the types of tissues in the human body, their locations in the body, and the most important functions they perform. | |
| 9. Teaching and Learning Strategies | |
| Strategy | 1- Cognitive objectives *The student's ability to excel and understand modern practical research methods *Providing the student with knowledge and understanding of the basic principles of histology *Enabling the student to know the most important tissues found in the body and distinguish between their types 2-- The skill objectives of the course *The student should be able to distinguish between the types of tissues present in the body * Giving the student the skill of linking the practical and |

theoretical parts
 3- Teaching and learning methods
 * Lecture and use a presentation in its presentation
 *Using educational slides to learn about the types of tissues present in the body
 * Asking questions during the lecture

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|------------------------------|----------------------------|-------------------|
| 1 | 2 | | Simple epithelial tissue | Power point | Written exam |
| 2 | 2 | | Stratified epithelial tissue | Power point Interactive | Written exam |
| 3 | 2 | | Connective tissue | Power point | Written exam |
| 4 | 2 | | Muscle tissue | Power point Interactive | Written exam |
| 5 | 2 | | Simple epithelial tissue | Power point Interactive | Written exam |
| 6 | 2 | | Stratified epithelial tissue | Power point Interactive | Written exam |
| 7 | 2 | | Nervous tissue | Power point Interactive | Written exam |
| 8 | 2 | | Nervous system | Power point Interactive | Written exam |
| 9 | 2 | | Circulatory system | Power point Interactive | Written exam |
| 10 | 2 | | Lymphatic system | Power point Interactive | Written exam |
| 11 | 2 | | Bone | Power point Interactive | Written exam |
| 12 | 2 | | Cartilage | Power point Interactive | Written exam |

| | | | | | |
|----|---|--|-------|----------------------------|--------------|
| 13 | 2 | | Liver | Power point Interactive | Written exam |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

11. Course Evaluation

Course evaluation: Course evaluation through student evaluation

- 1- quiz
- 2- Short questions during the lecture
- 3- Monthly exams: two or more exams if possible
- 4-Final exam

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

| | |
|--|---|
| Required textbooks (curricular books, if any) | General histology Dr. Muhammad Ali Al-Satli. Ali Hussein, Damascus University, 2010 |
| Main references (sources) | Histology practical part. Prof. Dr. Baidaa Hussein Mutlak, College of Education for Pure Sciences / Ibn Al-Haitham, Biological Sciences Laboratory 2019 |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

| | | | | | |
|---|--------------|--|-----------------------------|------------------------|--------------------------|
| 1. Course Name: | | | | | |
| Soil Chemistry | | | | | |
| 2. Course Code: | | | | | |
| Sci4338 | | | | | |
| 3. Semester / Year: | | | | | |
| 2 nd Semester 2023-2024 | | | | | |
| 4. Description Preparation Date: | | | | | |
| | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Lectures - laboratories | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 3 / 4 | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Ali Mowafaq Salih | | | | | |
| Email: Ali.mowafaq@uoanbar.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | | | | | |
| It aims to explain the principles used in studying the chemical composition of soil. Through this course, the student is introduced to all the chemical properties of soil and how to estimate and calculate them practically and in the field. | | | | | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | | <ul style="list-style-type: none"> 1- Explaining the scientific material to students in detail. 2- Discussion and dialogue about vocabulary related to the topic 3- Using figures and illustrative means to explain the lecture | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| | | | | | |

| | | | | | |
|----|----|--|--|---|---|
| 12 | 36 | Monthly written and practical exams with reports and a final written and laboratory exam | <ul style="list-style-type: none"> 1- Protection from soil chemistry 2- Mineral components of soil 3- Primary and secondary minerals in soil 4- The exam is the first month 5- Strict humus 6- Cation exchange 7- Reactions of acids, bases, oxidation and reduction 8- Soil solution 9- Second month exam 10- Soil intercalation and solid development 11- Soil acidity and alkalinity 12- Third month exam | Delivering the lecture in person in the classroom using illustration tools such as models and drawings from a blackboard and a projector. | <ul style="list-style-type: none"> 1- Weekly, monthly, daily exams and the end of the year exam. 2- Giving the students some group activities and tasks 3- Paying attention to daily duties and allocating a percentage of the grade to them |
|----|----|--|--|---|---|

11. Course Evaluation

1- Distribution of the score out of 50 according to the tasks assigned to the student, such as 1- Participation in the lecture hall 2- Practical evaluation in the laboratory 3- Theoretical and practical monthly tests 4- Reports

12. Learning and Teaching Resources

| | |
|--|--|
| Required textbooks (curricular books, if any) | Principles of Soil Chemistry: Kazem Awad Mashhout, 1985, University of Basra |
| Main references (sources) | Principles of soil science: Abdullah Al-Ani, 1981 |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

| 1. Course Name: oil and petrochemicals | | | | | |
|--|-------|--|-------------------------------|--------------------------------|-------------------|
| 2. Course Code: Sci4335 | | | | | |
| 3. Semester / Year:2023-2024 | | | | | |
| 4. Description Preparation Date:17/4/2024 | | | | | |
| 5. Available Attendance Forms: Daily attendance in the laboratory | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total)60h | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Ghufran Hamed Nail Email: gofran.hamid@uoanbar.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives Students' knowledge of petroleum, which is one of the most important sources in the petrochemical industries | | | | • | |
| | | | | • | |
| | | | | • | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | | Lecture and discussion | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2 | What is petroleum, what are the theories explain the formation of petroleum, what are the compounds? accompanying him. | Crude oil and its derivatives | Lectures Inside laboratory | Oral questions |
| 2 | 2 | Petroleum evaluation | Density and specific gravity | Lectures Inside the laboratory | Oral questions |
| 3 | 2 | Determine the viscosity and viscosity coefficient of petroleum derivatives | Effect of temperature | Lectures Inside the laboratory | Oral questions |
| 4 | 2 | Determines the flash point of petroleum derivatives | Measurement of flash point | Lectures Inside the laboratory | Oral questions |
| 5 | 2 | Measuring the degree of aniline diesel coefficient | To know the | Lectures | Oral questions |

| | | | | | |
|---|---|---|--|--|----------------|
| 6 | 2 | Separating normal paraffins from branched paraffins | aromatic content in the petroleum derivative Decomposition and separation | Inside the laboratory Lectures Inside the laboratory | Oral questions |
| 7 | 2 | Extraction and estimation of the percentage of oil in some plants | Sesame oil extraction | Lectures Inside the laboratory | Oral questions |
| 8 | 2 | Separating white oil from an oil mixture | Separation of petroleum derivatives by fractional distillation | Lectures Inside the laboratory | Oral questions |
| 9 | 2 | finding the percentage of water in petroleum derivatives | Methods for quantitative detection of the presence of water in petroleum derivatives | Lectures Inside the laboratory | Oral questions |

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

| | |
|--|---|
| Required textbooks (curricular books, if any) | Industrial books, including: Chem industries |
| Main references (sources) | Various lectures Crude oil processing operations |
| Recommended books and references (scientific journals, reports...) | Petroleum chemistry |
| Electronic References, Websites | Internet |

Course Description Form

| 1. Course Name: Gravimetric analytical chemistry | | | | | |
|---|-------|--|------------------------------|-----------------------|-------------------|
| 2. Course Code: 2 | | | | | |
| 3. Semester / Year: 2023-2024 | | | | | |
| 4. Description Preparation Date: 17/4/2024 | | | | | |
| 5. Available Attendance Forms: Daily attendance in the laboratory | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 60h | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Ghufuran Hamed Nail Email: gofran.hamid@uoanbar.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives Providing basic information for various topics in wet analysis <ul style="list-style-type: none"> • • • | | | | | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | | Lecture and discussion | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2 | Weight analysis | Gravimetric analysis methods | Inside the laboratory | Oral questions |
| 2 | 2 | Calcium is determined in the form of calcium oxalate | Calcium deposition | Inside the laboratory | Oral questions |
| 3 | 2 | Determination of nickel in the form of dimethylglyoxime | Nickel deposition | Inside the laboratory | Oral questions |
| 4 | 2 | Monthly exam | | | |
| 5 | 2 | Determination of sulphate or barium in the form of barium sulphate | Sulfate determination | Inside the laboratory | Oral questions |
| 6 | 2 | Determination of chloride in the form of silver chloride | Chloride determination | Inside the laboratory | Oral questions |
| 7 | 2 | Monthly exam | | | |

| | | | | | |
|---|---|--|--|-----------------------|----------------|
| 8 | 2 | Estimation of elements using the volatility method | Volatilization method | Inside the laboratory | Oral questions |
| 9 | 2 | Determine the percentage of water of crystallization in barium dichloride crystals | Estimation of water of crystallization | Inside the laboratory | Oral questions |

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

| | |
|--|--|
| Required textbooks (curricular books, if any) | Analytical Chemistry, Part One, General Foundations Quantitative Gravimetric Analysis, Safaa Razouki Al-Mat 1969 |
| Main references (sources) | Analytical Chemistry, Part One, General Foundations Quantitative Gravimetric Analysis, Safaa Razouki Al-Mat 1969 |
| Recommended books and references (scientific journals, reports...) | Fundamentals of Analytical Chemistry, Ismail Al-Hiti |
| Electronic References, Websites | internet |

Course Description Form

| | |
|---|---|
| 1. Course Name: Thermodynamics | |
| | |
| 2. Course Code: SciP224 | |
| | |
| 3. Semester / Year: second 2023 – 2024 | |
| | |
| 4. Description Preparation Date: 17 – 4 -2024 | |
| | |
| 5. Available Attendance Forms: Classrooms + electronic class | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 2 hours theory and 2 hours experimental | |
| | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: eid mohammed monawer | |
| Email: eid.mohammed@uoanbar.edu.iq | |
| 8. Course Objectives : It is for the student to know what heat is and what its importance is, to recognize the positive and negative aspects of heat, to know the effect of heat on matter in all its solid, liquid and gaseous states, to recognize the mathematical relationships that govern the behavior of matter, to link theoretical concepts to practical application by conducting experiments in Laboratory | |
| Course Objectives | <ul style="list-style-type: none"> • • • |
| 9. Teaching and Learning Strategies | |
| Strategy | Conduct dialogue and discussion in an applied manner relate |

to the reality of daily life to attract students to a topic
 Lesson without straying from the core of the topic so that
 the material is flexible and able to be understood and analysed
 - Giving students some group activities and assignments
 among themselves.
 - Paying attention to daily assignments and tests and
 allocating a percentage of the grade to them.

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|----------------------|-----------------|-------------------|
|------|-------|----------------------------|----------------------|-----------------|-------------------|

| | | | | | |
|---|---|---|---|---|--|
| 1 | 2 | Define the heat and temperature | The concept of heat and the difference between it and temperature | Teaching and learning methods. | Participation during the lesson. |
| 2 | 2 | Conduct an experiment in the laboratory | Find the coefficient of longitudinal expansion of a metal rod | Continuous daily and weekly tests. Activities during the lesson. | Providing activities. |
| 3 | 2 | Enumerates the types of shells and knows each type and its difference from the other type | Types of heaters, the advantages and disadvantages of each heater | Directing students to some website to benefit from them. | Achievement tests are as follows: - A. Semester exams 50B. End of semester exams |
| 4 | 2 | Conduct an experiment in the laboratory | Determine the specific heat of a substance | Evaluation methods. | Asking questions |
| 5 | 2 | Enumerate the mechanisms of heat transfer | Heat transfer mechanisms and the difference between them | Participation during the lesson. Providing activities. | Assign a score to the report submitted about the experiment |
| 6 | 2 | The student solves applied examples of the previous topics | Solve applied examples | Achievement tests are as follows: - A. Semester exams 50%B. End of semester exams | Oral questions |
| 7 | 2 | Conduct an experiment in the laboratory | Find the heat capacity | End of semester exams | Asking questions |

| | | | | | |
|----|---|--|---|------------------------|--|
| 8 | 2 | First month exam | First month exam | Lecture and discussion | Submit a report on the experiment and grade it |
| 9 | 2 | Defines gravimetric density and relative density | Weight density and relative density | Lecture and discussion | Oral questions |
| 10 | 2 | The pressure of an ideal gas and its relationship with temperature are described | Ideal gas pressure and temperature | Lecture and discussion | Asking questions |
| 11 | 2 | Known as surface tension | Surface tension and its relationship with temperature | Lecture and discussion | Written exam |
| 12 | 2 | Seond month exam | Seond month exam | Written exam | |

11. Course Evaluation

Involving students in the lesson, evidence of their commitment and interest.

- Assigning students to prepare reports, and adhering to the deadline specified for them.
- Conducting monthly achievement tests. (oral, written), expressing commitment With cognitive and skill achievement.

12. Learning and Teaching Resources

| | |
|--|--|
| Required textbooks (curricular books, if any) | Heat and properties of matter / Muhammad Ali Ahmed |
| Main references (sources) | Thermodynamics / Dr. Mohs |

| | |
|---|--|
| | Abdel Muti Rasoul |
| Recommended books and references (scientific journals, reports...) | Journal of physics science |
| Electronic References, Websites | www. Physics science. com |

Course Description Form

| | |
|---|---|
| 1. Course Name: Modern physics | |
| | |
| 2. Course Code: SciP316 | |
| | |
| 3. Semester / Year: first 2023 – 2024 | |
| | |
| 4. Description Preparation Date: 17 – 4 -2024 | |
| | |
| 5. Available Attendance Forms: Classrooms + electronic class | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 2 hours theory and 3 hours experimental | |
| | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: eid mohammed monawer | |
| Email: eid.mohammed@uoanbar.edu.iq | |
| 8. Course Objectives : The aim of this course is to introduce the student to the theories of special relativity, as well as to know the particle nature of radiation, as well as black body radiation, and how the interaction between matter and radiation occurs. | |
| Course Objectives | <ul style="list-style-type: none"> • • • |
| 9. Teaching and Learning Strategies | |
| Strategy | <p>Conduct dialogue and discussion in an applied manner relate to the reality of daily life to attract students to a topic</p> <p style="padding-left: 40px;">Lesson without straying from the core of the topic so th</p> <p>the material is flexible and able to be understood and analyse</p> <p style="padding-left: 40px;">- Giving students some group activities and assignments</p> |

among themselves.

- Paying attention to daily assignments and tests and allocating a percentage of the grade to them.

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|-------------|--------------|-----------------------------------|-----------------------------|------------------------|--------------------------|
|-------------|--------------|-----------------------------------|-----------------------------|------------------------|--------------------------|

| | | | | | |
|---|---|--|---|---|--|
| 1 | 2 | Knows the meaning of theory Relativity | Special theory relativity | Teaching and learning methods. Continuous daily and weekly tests. | Participation during the lesson. Providing activities. |
| 2 | 2 | Get to know Length contraction And time dilates | Length contraction and time dilation | Activities during the lesson. Directing students to some website to benefit from them. Evaluation methods. | Achievement tests are as follows: - A. Semester exams 50% End of semester exams |
| 3 | 2 | Knowledge of nature Particle radiation | The particle nature of radiation and black body radiation | Participation during the lesson. Providing activities. Achievement tests are as follows: - A. Semester exams 50% End of semester exams | |
| 4 | 2 | Find out how Radiation interaction with Article | Radiation interaction with matter | | |
| 5 | 2 | Derivation of an equation Schrodener and knowledge Wave function | Schrodener wave equation and wave function | | Oral questions |
| 6 | 2 | Get to know Basic principles For the gentle | Basic principles of spectrum | End of semester exams | Asking questions |
| 7 | 2 | First month exam | First month exam | Written exam | |
| 8 | 2 | Find a relationship Rydberg | Hydrogen spectrum and Rydberg correlation | | Oral questions |

| | | | | | |
|----|---|--|------------------------------------|---------------|------------------|
| 9 | 2 | Get to know Spectral series | Spectral series | | Asking questions |
| 10 | 2 | Knowledge of the quantum model of the atom | Quantum model of the hydrogen atom | | Oral questions |
| 11 | 2 | Knowing quantitative numbers | Quantitative numbers | | Oral questions |
| 12 | 2 | Second month exam | Second month exam | Wirrtten exam | |

11. Course Evaluation

Involving students in the lesson, evidence of their commitment and interest.

- Assigning students to prepare reports, and adhering to the deadline specified for them.
- Conducting monthly achievement tests. (oral, written), expressing commitment
With cognitive and skill achievement.

12. Learning and Teaching Resources

| | |
|---|--|
| Required textbooks (curricular books, if any) | Modern Physics/Dr. Ali Ahm Kazem |
| Main references (sources) | Concepts in modern physics/Dr. Mohsen Abboud |
| Recommended books and references (scientific journals, reports...) | Journal of physics science |
| Electronic References, Websites | www. Physics science. com |

Course Description Form

| 1. Course Name: | | | | | |
|--|-------|---|---|--|--|
| Classic mechanic | | | | | |
| 2. Course Code: | | | | | |
| SciP220 | | | | | |
| 3. Semester / Year: | | | | | |
| First semester –2023–2024 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1/9/2023 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Classrooms | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 30/2 | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Mohammed Najeeb jasim Email: mhamad87@uoanbar.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | | | | | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | | Lecture, discussion, and preparing weekly reports | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| | | knowledge in the field of mechanics and its role in building human civilization in general and determining the units of physical quantities related to the subject. | A general lecture on mechanics, its types, and its historical introduction as a course. - Basic units and dimensions - Vector quantities and measurement quantities | Lecture, discussion and preparing weekly reports | Daily and monthly exams and solving examples |
| | | Application of directional and non-directional quantities - Using vector analysis method to extract the resultant for that vector quantity | Acquiring knowledge in the field of vector quantities in two and three dimensions | Lecture, discussion and preparing weekly reports | Monthly exams and solving examples |

| | | | | | |
|--|--|---|---|--|--|
| | | -Vector unit | | | |
| | | Displacement, time and rate of speed - Instantaneous speed and acceleration. - Movement with constant acceleration. Free fall of objects | Gain knowledge in the field of movement in two and three dimensions | Lecture, discussion, preparing weekly reports | Daily and monthly exams and solving examples |
| | | Displacement, velocity and acceleration vectors. - Movement of missiles. Circular motion and relative motion | Understand the concept of movement in two dimensions | Lecture, discussion and preparing weekly reports | Daily and monthly exams and solving examples |
| | | Power . - Newton's first law - Newton's second law - Newton's third law | Gain knowledge of Newton's laws of motion. | Lecture, discussion and preparing weekly reports | Daily and monthly exams and solving examples |
| | | The body is in balance. Body dynamics. And the force of friction. | Gain knowledge and understanding of force of friction | Lecture, discussion and preparing weekly reports | Daily and monthly exams and solving examples |
| | | Dynamics of rotational movement. | Acquire knowledge in the field of work and kinetic energy | discussion, preparing weekly reports | Daily and monthly exams and solving examples |
| | | - - Work. Kinetic energy and the theorem of work and energy Work and energy in the presence of variable force. - Power | Gain knowledge in the field of potential energy and law of conservation of energy | Lecture, discussion and preparing weekly reports | Daily monthly exams solving examples |
| | | Gravitational potential energy Conservative and non-conservative forces. - Power and potential energy | Understand applications of circular motion | Lecture, discussion and preparing weekly reports | Daily monthly exams solving examples |
| | | Problems about circular rotational motion | Understand applications of rotational motion | , discussion, preparing weekly reports | Daily monthly exams solving examples |

11. Course Evaluation

Grade: 50. Monthly exam: 35. Assignments: 5. Daily exams:10

12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curriculum books, if any) | Mechanics for science and engineering students, Dr. Talib Nahi Al-Khafaji |
| Main references (sources) | General Physics I: Classical Mechanics Ph.D. D.G. Simpson |

Course Description Form

| | |
|---|--|
| 1. Course Name: | |
| Physical Chemistry Lab. | |
| 2. Course Code: | |
| SciC234 | |
| 3. Semester / Year: | |
| 1 st / 2023 | |
| 4. Description Preparation Date: | |
| 22-10-2023 | |
| 5. Available Attendance Forms: | |
| attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 30h.r / | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Aws Z. Abdulmajeed Email: awsa.zabin@uoanbar.edu.iq | |
| 8. Course Objectives | |
| Course Objectives | 1- Understanding the theoretical principles: Enhance students' understanding of the theoretical concepts learnt in the Physical Chemistry course through practical application. 2: Acquire the skills needed to accurately conduct physical chemistry experiments, including the preparation of materials and the use of laboratory instruments and devices such as thermometry, electrical conductivity, and pressure measurement. 3- Analyse data: Learn how to collect and analyse experimental data using scientific methods, including plotting results and interpreting mathematical relationships between variables. 4- Hydrodynamics, phase changes and their applications in physical and chemical phenomena such as thermodynamics, chemical kinetics, phase changes and their applications in chemical processes. |

9. Teaching and Learning Strategies

| | |
|----------|--|
| Strategy | <p>1- Providing students with the basics and lectures related to the course</p> <p>2- For the purpose of communicating the information well to the recipient.</p> <p>3- Urging students to take advantage of Google search engines when they are required to submit scientific reports on the course</p> |
|----------|--|

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|--|-----------------------|--|
| 1 | 3 | Physical Chemistry Lab. | Laboratory equipment and instruments | Practical Experiences | Reporting, Participation and Engagement, Compliance and Safety |
| 2 | 3 | Physical Chemistry Lab. | Preparation of liquid and solid solutions | Practical Experiences | Reporting, Participation and Engagement, Compliance and Safety |
| 3 | 3 | Physical Chemistry Lab. | Finding molecular weight by the Dumas method | Practical Experiences | Reporting, Participation and Engagement, Compliance and Safety |
| 4 | 3 | Physical Chemistry Lab. | Calculating the heat capacity of a calorimeter | Practical Experiences | Reporting, Participation and Engagement, Compliance and Safety |
| 5 | 3 | Physical Chemistry Lab. | Copper specific heat samples | Practical Experiences | Reporting, Participation and Engagement, Compliance and Safety |

| | | | | | |
|----|---|----------------------------|--|--------------------------|--|
| | | | | | Safety |
| 6 | 3 | Physical Chemistry Lab. | 1 st Month Exam | | |
| 7 | 3 | Physical Chemistry Lab. | The temperature of the solution | Practical Experiences | Reporting, Participation and Engagement, Compliance and Safety |
| 8 | 3 | Physical Chemistry Lab. | Dilution heat | Practical Experiences | Reporting, Participation and Engagement, Compliance and Safety |
| 9 | 3 | Physical Chemistry Lab. | Reaction temperature of weak acid and a strong base | Practical Experiences | Reporting, Participation and Engagement, Compliance and Safety |
| 10 | 3 | Physical Chemistry Lab. | Calculation of thermodynamic function for the adsorption process | Practical Experiences | Reporting, Participation and Engagement, Compliance and Safety |
| 11 | 3 | Physical Chemistry Lab. | Calculation of thermodynamic function for the adsorption process | Theoretical calculations | Reporting, Participation and Engagement, Compliance and Safety |
| 12 | 3 | Physical Chemistry Lab. | Second Month Exam | | |
| 13 | 3 | Physical Chemistry Lab. | | | |

| | | | | | |
|----|---|----------------------------|--|--|--|
| 14 | 3 | Physical Chemistry Lab. | | | |
| 15 | 3 | Physical Chemistry Lab. | | | |

11. Course Evaluation

Oral exams: 2

Daily paper-based quizzes: 3

Monthly quizzes: 8

Scientific reports: 2

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

Practical Physical Chemistry. Mohamed Magdy Wasel

Fundamentals of Physical Chemistry: Kingdom of Saudi Arabia - General Organisation for Technical Education and Vocational Training

Recommended books and references (scientific journals, reports...)

Practical Physical Chemistry Alexander Findlay

Electronic References, Websites

Course Description Form

| 1. Course Name: Industrial chemistry | | | | | |
|---|-------|----------------------------|---|-----------------|-------------------|
| | | | | | |
| 2. Course Code: Sci4331 | | | | | |
| | | | | | |
| 3. Semester / Year:2023-2024 | | | | | |
| | | | | | |
| 4. Description Preparation Date:11/7/2024 | | | | | |
| | | | | | |
| 5. Available Attendance Forms: Daily attendance in the laboratory | | | | | |
| | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 60h | | | | | |
| | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Ghufuran Hamed Nail | | | | | |
| Email: gofran.hamid@uoanbar.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives Providing basic information for various topics | | | | • | |
| Industrial chemistry | | | | • | |
| | | | | • | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | | Lecture and discussion | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2 | Safety instructions in | Methods of dealing with the laboratory with | Inside the | Oral questions |

| | | | | | |
|---|---|--|--|-----------------------|----------------|
| | | the laboratory | dangerous materials | laboratory | |
| 2 | 2 | Synthesis poly aniline | Prepare a polymer from the aniline monomer | Inside the laboratory | Oral questions |
| 3 | 2 | Chemical fertilizer industry | Preparing chemical fertilizer using ammonia | Inside the laboratory | Oral questions |
| 4 | 2 | Monthly exam | | | |
| 5 | 2 | Aspirin industry | Using Salicylic acid, attending aspirin | Inside the laboratory | |
| 6 | 2 | Preparing soap | Using olive oil and sodium hydroxide | Inside the laboratory | Oral questions |
| 7 | 2 | Preparation of polyesters by linear and cross-linked condensation polymerization methods | Prepare a linear polyester and polyester network Theoretically are only for the lack of materials | Inside the laboratory | Oral questions |
| 8 | 2 | Monthly exam | | | Oral questions |

| | | | | | |
|----|---|--------------------|---------------------------------------|-----------------------|----------------|
| 9 | 2 | Prepare Adhesive | Theoretical for the lack of materials | Inside the laboratory | Oral questions |
| 10 | 2 | Prepare toothpaste | | Inside the laboratory | Oral questions |

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

| | |
|--|---|
| Required textbooks (curricular books, if any) | Industrial chemistry written by Tariq Abdel Jalil Ma and Riyadh Abdel Karim |
| Main references (sources) | an Introduction to Industrial Chemistry, Berlin, Spring 19963rd Edition |
| Recommended books and references (scientific journals, reports...) | Al-Balmara Chemistry- Malcolm B Kazem Gha 1984, - |
| Electronic References, Websites | internet |

Course Description Form

| | |
|---|---|
| 1. Course Name: | |
| Environment and health | |
| 2. Course Code: | |
| | |
| 3. Semester / Year: | |
| Second / 2024 | |
| 4. Description Preparation Date: | |
| 2024-4-22 | |
| 5. Available Attendance Forms: | |
| attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 30h.r / | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Aws Z. Abdulmajeed | |
| Email: awsa.zabin@uoanbar.edu.iq | |
| 8. Course Objectives | |
| Course Objectives | Providing knowledge and awareness of the relationship between health and the environment, understanding the effects of the environment on public health and promoting environmental awareness, teaching environmental health aims to make students aware of the importance of maintaining a clean and healthy environment. Students are encouraged to take action to preserve the environment, minimise pollution and promote sustainable environmental practices. It also aims to encourage students to make healthy decisions and take action to preserve their health and the health of the environment. |
| 9. Teaching and Learning Strategies | |

| | |
|----------|---|
| Strategy | <p>1- Providing students with the basics and lectures related to the course</p> <p>2- Using multiple methods in presenting the material, including Power Point to communicate the information well to the recipient.</p> <p>3- Urge students to utilise Google search engines when asked to submit scientific reports on the course</p> |
|----------|---|

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|--|------------------------|-------------------|
| 1 | 2 | Environment and health | The concept of public health | Brainstorming | Oral tests |
| 2 | 2 | Environment and health | Areas of health education | Discussion | Oral tests |
| 3 | 2 | Environment and health | Methods and techniques of health education | Discussion and lecture | Paper tests |
| 4 | 2 | Environment and health | School health | Lecture Discussion | Oral tests |
| 5 | 2 | Environment and health | Nutrients (Carbohydrates) | Brainstorming | Paper tests |
| 6 | 2 | Environment and health | Nutrients (proteins and fats) | Brainstorming | Paper tests |

| | | | | | |
|----|---|------------------------|---|-----------------------------|-------------|
| 7 | 2 | Environment and health | Nutrients (salts and vitamins) | Brainstorming | Paper tests |
| 8 | 2 | Environment and health | First Month Exam | | |
| 9 | 2 | Environment and health | Some malnutrition diseases (obesity) | Presentations Discussion | Oral tests |
| 10 | 2 | Environment and health | Some malnutrition diseases (anaemia) | Presentations Discussion | Oral tests |
| 11 | 2 | Environment and health | First Aid and Home Pharmacy | Lecture Discussion | Paper tests |
| 12 | 2 | Environment and health | Vaccines | Brainstorming Lecture | Oral tests |
| 13 | 2 | Environment and health | Some diseases that affect children | Presentation Discussion | Oral tests |
| 14 | 2 | Environment and health | Some harmful habits (smoking and alcohol) | Group discussion | Oral tests |
| 15 | 2 | Environment and health | Second Month Exam | | |

11. Course Evaluation

Oral exams: 15

Daily paper-based quizzes: 15

Monthly quizzes: 50

Scientific reports: 20

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

The chemistry of the environment: Dr Hassan Siddiq

Environmental Chemistry : Translated
Dr Hatem Al Najdi

Recommended books and references
(scientific journals, reports...)

Alchemy of Life. Dr Tarek Younis

Medical Biochemistry. Dr Youssef Barakat

Electronic References, Websites

Course Description Form

1. Course Name: Solid State physics

2. Course Code: SciP323

3. Semester / Year: second 2023 – 2024

4. Description Preparation Date: 17 – 4 -2024

5. Available Attendance Forms: Classrooms + electronic class

6. Number of Credit Hours (Total) / Number of Units (Total) 2 hours theory / 2

7. Course administrator's name (mention all, if more than one name)

Name: eid mohammed monawer

Email: eid.mohammed@uoanbar.edu.iq

8. Course Objectives The aim of this course is to introduce the student to the solid state of matter and the internal changes that occur to matter in the cubic crystal system and the hexagonal system, as well as to know the crystalline distortions and defects that occur in matter.

Course Objectives

-
-

•

9. Teaching and Learning Strategies

| | |
|-----------------|---|
| Strategy | <p>Conduct dialogue and discussion in an applied manner relate to the reality of daily life to attract students to a topic</p> <p>Lesson without straying from the core of the topic so that the material is flexible and able to be understood and analysed</p> <ul style="list-style-type: none"> - Giving students some group activities and assignments among themselves. - Paying attention to daily assignments and tests and allocating a percentage of the grade to them. |
|-----------------|---|

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|---|--|---|---|
| 1 | 2 | Conduct dialogue and discussion in applied manner | the crystal structure Types of solids | Teaching and learning methods. | Participation during the lesson. |
| 2 | 2 | ner related to the reality of daily life to attract students to a to Lesson without straying from the core of the topic so that the material is flexible and able to be | Types of crystal lattice | Continuous daily and weekly tests. Activities during the lesson. Directing students to some website to benefit from | Providing activities. Achievement tests are as follows: - A. |

| | | | | | |
|----|---|---|--|--|-----------------------|
| | | understood and analysed. | | them. | Semester exams 50% |
| 3 | 2 | Giving students some group activities and assignments among themselves. | The grid has two dimension Paraffic lattices | Evaluation methods. Participation during the lesson. Providing activities. | End of semester exams |
| 4 | 2 | First month exam | Cubic crystal system Primary Weigner-Zeitl cell | Achievement tests are as follows: - A. Semester exams 50% | |
| 5 | 2 | Conduct dialogue and discussion in applied man | | End of semester exams | |
| 6 | 2 | | First month exam | | |
| 7 | 2 | Giving students some group activities and | Symmetry in crystal Symmetry elements | | |
| 8 | 2 | | Installation of contiguous stacking | | |
| 9 | 2 | Second month exam | Miller's indices Find Miller's coefficients | | |
| 10 | 2 | | Directions of crystal | | |

| | | | | | |
|----|---|--|-------------------|--|--|
| 11 | 2 | | planes | | |
| 12 | 2 | | Second month exam | | |
| 13 | 2 | | | | |

11. Course Evaluation

Involving students in the lesson, evidence of their commitment and interest.

- Assigning students to prepare reports, and adhering to the deadline specified for them.
- Conducting monthly achievement tests. (oral, written), expressing commitment
With cognitive and skill achievement.

12. Learning and Teaching Resources

| | |
|--|--|
| Required textbooks (curricular books, if any) | Solid state physics / Dr. Support Gabriel |
| Main references (sources) | Solid Physics / Dr. Ali Mohs Abboud |
| Recommended books and references (scientific journals, reports...) | Journal of physics science |
| Electronic References, Websites | www. Physics science. com |

Course Description Form

| | |
|---|--|
| 1. Course Name: | Gravimetric analytical chemistry |
| 2. Course Code: | SciC238 |
| 3. Semester / Year | the second 2023- 2024 |
| 4. Description Preparation Date: | 17/4/2024 |
| 5. Available Attendance Forms: | Daily attendance in the classroom |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | 30 hours |
| 7. Course administrator's name (mention all, if more than one name) | Name: Sumood Naser Al-Deen Taha Email: Sum20s3005@uoanbar.edu.iq |
| 8. Course Objectives | Course Objectives 1- The student learns the basics of analytical chemistry, especially learning about gravimetric analysis. 2- Introducing the student to the classification of weight analysis methods. 3- Introduce the student to the steps of weight analysis. 4- Study of the chemical composition of the precipitate and calculations in quantitative gravime analysis. 5- Identify the types of precipitants. 6- Identifying solubility. |

- 7- Study the factors affecting the solubility of sediments.
- 8- Study of sediment pollution, methods of pollution, and how to avoid and treat it.
- 9- Identifying washing solutions, their types, and the conditions that must be met in washing solutions.
- 10- Study separation methods.
- 11- Identify methods of separation by extraction.
- 12- Study of separation by paper chromatography, thin layer chromatography, gas chromatography, and ion exchange separation methods.

9. Teaching and Learning Strategies

- 5- Lecture method and using the blackboard and data show.
- 6- Dialogue and discussion of analytical chemistry topics that require thinking and analysis.
- 7- Providing students with knowledge through homework assignments for academic vocabulary.
- 8- Improving students' skills by visiting websites to obtain additional knowledge of the academic subject.
- 9- Urging students to visit the library to obtain academic knowledge related to academic vocabulary.

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|--|---|-----------------------------|---|
| 1 | 2 | Introducing the student to chemistry Weight analysis | Introduction to weight analysis And basic principles. | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 2 | 2 | Introducing the student the classification of weight analysis methods. | Gravimetric Analysis methods (dissolution and volatilization method, isolation, | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |

| | | | | | |
|---|---|---|---|---------------------------------|---|
| | | | sedimentation). | | |
| 3 | 3 | Introduce the student to steps of weight analysis | Steps in gravimetric analysis: Weigh Sample, sample dissolution, sedimentation Form, digest the precipitate, Filtration, washing sediment, burning sediment, weighing | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 4 | 2 | Identify the chemical composition of the precipitate, know the weight factor, and find the amount of the component to be estimated And his percentage | Study of chemical composition For failure and account in analysis Gravimetric quantification. | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 5 | 2 | Introducing the student To organic and inorganic precipitants. | Organic and inorganic precipitants, their types, and the characteristics they must have In good sediment | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 6 | 2 | | First exam - second semester. | | |
| 7 | 2 | Student definition of solubility | Solubility, dissolution yield Ionic yield, examples | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide |

| | | | and problems | | activities |
|----|---|---|--|---------------------------------|---|
| 8 | 2 | Know the effect of Temperature And the common ion....etc. | Factors Affect portability Solubility the precipitate. | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 9 | 2 | Introducing the student sediment contamination | Precipitate contamination and its effect on accuracy Results, types of pollutants, co-precipitation contamination, Contamination by subsequent sedimentation ,Avoid pollution and treatment Various pollutants. | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 10 | 2 | Introducing the student precipitate washing solutions | Precipitate washing solutions, their effect Onsediments,their features | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 11 | 2 | Second exam - second semester | | | |
| 12 | 2 | Introducing the student to Separation methods | Separationmethods (separation sedimentation, Separation by distillation, its types, a how to separate). | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |

| | | | | | |
|----|---|--|---|---|--|
| 13 | 2 | Introducing the student to the Separation by extraction | Separation by extracting principles Basic, mathematical laws For extraction and extraction techniques | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 14 | 2 | Introducing the student to the Separation By chromatography | Chromatographic separation methods general idea Advantages of chromatographic methods Classification chromatographic methods | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 15 | 2 | Third exam - second semester | | | |

11. Course Evaluation

Daily preparation, oral or monthly exams and homework

12. Learning and Teaching Resources

| | |
|--|---|
| Required textbooks (curricular books, if any) | General foundations of chemical and gravimetric analysis Dr. Safaa Razouki, Part One. |
| Main references (sources) | 1-Fundamentals of Analytical Chemistry, Douglas Skoog and Donald M. West Eight Edition. 2-Practical applications in instrumental chemical analyses Separation methods - Ismail Khalil Al-Hiti. |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

1. Course Name:

Chemistry of Identical Elements

2. Course Code:

SciC240

3. Semester / Year:

the second / 2023- 2024

4. Description Preparation Date:

18 /4/2024

5. Available Attendance Forms:

Daily attendance in classrooms

6. Number of Credit Hours (Total) / Number of Units (Total)

30 hours

7. Course administrator's name (mention all, if more than one name)

Name: Sumood Naser Al-Deen Taha

Email: Sum20s3005@uoanbar.edu.iq

8. Course Objectives

1- Identifying the elements represented by their location in the periodic table – studying the general and periodic properties of the main elements (periodic size, ionization energies, electronic affinity, electronegativity).

2- Study of hydrogen – its existence and characteristics – its interactions – hydrogen isotopes – its production in industry and its uses.

3- Identifying hydrides and their types – their structure – hydrides of group I elements.

4- Study of alkaline elements – general characteristics – preparation – existence.

5- Identifying the alkaline earth elements – their general characteristics – their preparation – their existence.

6- Study of compounds of group II elements (halides – oxides – hydroxides – carbonates).

7- Identifying the elements of the third group (electronic arrangement – their preparation characteristics).

8- Study of the fourth group of elements: carbon and silicon (existence – characteristics preparation).

9- Study of the elements of the fifth group: electronic structure – metallic and non-metallic properties – nitrogen, its preparation and compounds – phosphorus, its types and compounds.

10- Study of the sixth group of elements: the characteristics of the elements, their existence, and methods of preparing them – their most important compounds.

11- Study of the group of halogens: introduction – their existence – methods of preparation – their most important compounds.

12- Identifying the elements of the eighth group VIII: the group of inert or rare gases: general characteristics – their compounds – and their uses

1- Teaching and Learning Strategies

- 1- Using available teaching methods such as the blackboard and data show.
- 2- Improving students' skills by visiting websites to obtain additional knowledge of academic subject.
- 3- Providing students with knowledge through homework assignments for academic vocabulary.
- 4 - Urging students to visit the library to obtain academic knowledge related to academi

vocabulary.

5 - Developing students' ability to acquire knowledge through dialogue and group Discussion.

2- Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|---|--|-----------------|-------------------|
| 1 | 2 | Introducing students chemistry Representative elements | The elements represented their location in the table Periodic - study of general properties And the periodicity of the main elements (size periodic, ionization energies, Electronegativity, electronegativity) | | |
| 2 | 2 | Introducing students to chemistry Hydrogen | Hydrogen - its existence and characteristics - Its reactions - isotopes - production in Industry and its uses. | | |

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|----|---|--|---|--|--|
| 3 | 2 | Study of types of hydrides | Hydrides and their types - their composition Hydrides are group I elements. | | |
| 4 | 2 | Definition of students With alkaline elements | Alkaline elements - characteristics Public - its preparation - existence | | |
| 5 | 2 | First month exam | | | |
| 6 | 2 | Introducing students to the elements Alkaline earth | Alkaline earth elements - composition Chemical- its properties - its existence -Its compounds and methods of preparation. | | |
| 7 | 2 | Study the elements of the Group Third | Elements of the third group - composition Chemical - its properties - its existence -Its compounds and methods of preparation. | | |
| 8 | 2 | Study of the elements of the P sector Elements of the fourth group | Elements of the fourth group Chemical composition General properties - its component | | |
| 9 | 2 | Study the chemistry of an element Silicon | Silicon - its presence - its preparation His Compounds | | |
| 10 | 2 | Second month exam | | | |

| | | | | | |
|----|---|--|---|--|--|
| 11 | 2 | Study the elements of the Group Fifth | Elements of the fifth group chemical composition General properties - its components | | |
| 12 | 2 | Study elements Sector P (elements Sixth group) | Sixth group elements chemical composition Its compounds -properties preparation - Its uses | | |
| 13 | 2 | Study of halogen elements (Seventh group) | Elements of the seventh group chemical composition Its compounds -properties preparation -Its uses | | |
| 14 | 2 | Introducing the student to a group Noble (inert) gases | Elements of the eighth group chemical composition Its compounds - properties preparation - Its uses | | |
| 15 | 2 | Third month exam | | | |

3- Course Evaluation

Daily preparation, oral and monthly exams, Homework, and presenting activities

4- Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

Inorganic Chemistry (Chemistry of Representative Elements) by Dr. Mahdi Naji Zakum.
Inorganic Chemistry, Mosul, Dr. Issam Girgis. University

| | |
|---|-------------------------------------|
| | Mosul, Mosul, 1st edition, 1982 AD. |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | Wikipedia |

Course Description Form

| | |
|--|---------------------------|
| 1. Course Name: Practical Biochemistry | |
| | |
| 2. Course Code: | |
| | |
| 3. Semester / Year: Season | |
| | |
| 4. Description Preparation Date: 17/4/2024 | |
| | |
| 5. Available Attendance Forms: weekly | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 26 hours / 13 units | |
| | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Ahmed Jaber Karakosh | |
| Email: ahmad.jaber@uoanbar.edu.iq | |
| 8. Course Objectives | |
| Providing students with awareness of the importance of biochemistry in our daily lives and its impact on society, as well as understanding the structure and functions of important biomolecules. This course covers a variety of topics related to biochemistry, including sugars, fats, and amino acids. | |
| 9. Teaching and Learning Strategies | |
| Strategy | - 1- Cognitive objectives |

*The student's ability to excel and understand modern practical research methods

*The student must have knowledge of the most important biochemistry topics such as sugars, fats, amino acids, and enzymes

**The student must have knowledge of the characteristics of the compounds being studied (such as fats, amino acids, and enzymes), their importance, classifications, and their impact on our daily lives

*The student should have knowledge of the types of compounds, their existence, the reactions they involve, and the most important laboratory reagents that indicate their different types.

2- The skill objectives of the course

*The student must have skill in using chemical analysis methods to determine the composition of compounds and the concentration of elements

* Giving the student the skill of linking the practical and theoretical parts

3- Teaching and learning methods

* Lecture and use a presentation in its presentation

*Using various educational means such as a data show device.

* Conduct systematic experiments related to the chemistry of the represented elements

* Asking questions during the lecture

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|--|----------------------------|-------------------|
| 1 | 2 | | Introduction to sugars | Power point | Written exam |
| 2 | 2 | | Statements of pentasaccharides | Power point Interactive | Written exam |
| 3 | 2 | | Uranic acids | Power point | Written exam |
| 4 | 2 | | Polysaccharides and their disclosures | Power point Interactive | Written exam |
| | 2 | | | | Written exam |
| 5 | 2 | | First month exam | Power point Interactive | Written exam |
| 6 | 2 | | Fats | Power point Interactive | Written exam |
| 7 | 2 | | Fatty acids | Power point Interactive | Written exam |
| 8 | 2 | | Acrolein detection | Power point Interactive | Written exam |
| | 2 | | Second month exam | | Written exam |
| 9 | 2 | | amino acids | Power point Interactive | Written exam |
| 10 | 2 | | Reactions of sulfur amino acids | Power point Interactive | Written exam |
| 11 | 2 | | Detection of amino acids (ninhydrin reaction) | Power point Interactive | Written exam |
| 12 | 2 | | Peptides | Power point Interactive | |
| | | | Third month exam | | |

| | | | | |
|----|---|--|--|-------------------------|
| 13 | 2 | | | Power point Interactive |
| | | | | |

11. Course Evaluation

Course evaluation: Course evaluation through student evaluation

1- quiz

2- Short questions during the lecture

3- Monthly exams: two or more exams if possible

4- Final exam

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | Basics of biochemistry - Dr. Sami Al-Muzaffar (2009) Dar Al Masirah |
| Main references (sources) | *Introduction to Biochemistry - Dr. Khawla Ahmed (2019) University of Al Mosul * Fundamentals of Biochemistry book - Dr. Abdel Moneim Mohamed The Lefty (2011) |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

1. Course Name: Organic Chemistry

2. Course Code: sciC239

3. Semester / Year: Season First

4. Description Preparation Date 17/12/2023

5. Available Attendance Forms: weekly

6. Number of Credit Hours (Total) / Number of Units (Total) 26 hours / 13 units

7. Course administrator's name (mention all, if more than one name)

Name: neda taghlib abdukkareem abdulwahab

Email: neda.taghalab@uoanbar.edu.iq

8. Course Objectives

Cours
objectives:

The course included 12 lectures and three tests to evaluate students. The scientific lectures included an explanation of laboratory equipment and the most important laboratory safety procedures, in addition to learning about the method of preparing aspirin, preparing beta-naphthyl acetate, preparing para-iodoaniline, preparing para-nitroaniline, preparing para-nitro astenide, and detecting the carbonyl group.

| | |
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9. Teaching and Learning Strategies

| | |
|-----------------|--|
| Strategy | <p>This course aims to study the most important chemical reactions, identify the method and mechanism of aspirin reaction, study the preparation of beta naphthyl acetate study the mechanism of its preparation. Preparation of para-iodoaniline halogenation of the benzene ring by electrophilic substitution and preparation of para-nitroaniline to identify the method of acylation reaction and preparation of p-nitroaniline to identify the method of nitration reaction and preparation of p-nitroaniline to identify the method of hydrolysis reaction and detection of carbonyl group using iodoform detection, which is a method of halogenation of basic medium.</p> |
|-----------------|--|

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|--|----------------------------|-------------------|
| 1 | 2 | | Safety procedures in laboratories and laboratory analyses | Power point | Written exam |
| 2 | 2 | | Preparation and study of the mechanism of aspirin reaction | Power point Interactive | Written exam |

| | | | | | |
|----|---|--|--|----------------------------|--------------|
| 3 | 2 | | Preparation and study of the reaction mechanism of beta-naphthyl acetate | Power point | Written exam |
| 4 | 2 | | The exam is the first month | Power point Interactive | Written exam |
| 5 | 2 | | Preparation and study of the reaction mechanism of para-nitroaniline. | Power point Interactive | Written exam |
| 6 | 2 | | Preparation of acetanilide | Power point Interactive | Written exam |
| 7 | 2 | | Mechanical study of preparation of acetanilide | Power point Interactive | Written exam |
| 8 | 2 | | Second month exam | Power point Interactive | Written exam |
| 9 | 2 | | Preparation of para-nitroaniline reaction by hydrolysis method | Power point Interactive | Written exam |
| 10 | 2 | | Study of the mechanism of the reaction of para-nitroaniline by hydrolysis | Power point Interactive | Written exam |
| 11 | 2 | | Third month exam | Power point Interactive | Written exam |
| 12 | 2 | | Preparation of iodoform and study of the effect of adding it to different samples of aldehydes and | Power point Interactive | |

| | | | | |
|----|---|--|--|-------------------------|
| | | | ketones | |
| 13 | 2 | | Study of the reaction mechanism in the detection of the methyl carbonyl group in the basic environment | Power point Interactive |

11. Course Evaluation

Course evaluation: Course evaluation through student evaluation

1-Quiz

2- Short questions during the lecture

3- Monthly exams: two or more exams if possible

4- Final exam

Achievement tests are as follows:- A. Monthly tests 15%

B. End of semester exams 15%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

1- Mahasin Youssef Sharaf, (2001) Organic Chemistry, Dar Al-Maysara for Publishing and Distribution, Amman, Jordan.

2-Written by Professor Dee Bradley and Jesbriggs and translated by Omar Hamad Shihab Al-Obaidi, (2013) Organic Chemistry, Exact Science Experiments, Teaching and Learning Materials / A Guide for Learners, Dar Al-Safa for Publishing and Distribution, Amman,

| | |
|---|--------|
| | Jordan |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

| | |
|---|--|
| 1. Course Name: Organic Chemistry | |
| | |
| 2. Course Code: SciC239 | |
| | |
| 3. Semester / Year: Season second | |
| | |
| 4. Description Preparation Date:2024/5/1 | |
| | |
| 5. Available Attendance Forms: weekly | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 26 hours / 13 units | |
| | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: neda taghlib abdukkareem abdulwahab | |
| Email: neda.taghalab@uoanbar.edu.iq | |
| 8. Course Objectives | |
| Course objectives: | The course included 12 lectures and three tests to evaluate students. The scientific lecture included an explanation of laboratory equipment, the most important laboratory safety procedures, learning how to measure the melting point and the boiling point, learning how to purify liquid organic compounds and their types, preparing meta-nitrobenzoic acid amides, detecting double bonds using the Bayer test, detecting aldehydes and ketones, methods of distinguishing between aldehydes and ketones, detecting the presence of carboxyl group, and detecting alcohols. |
| 9. Teaching and Learning Strategies | |

| | |
|-----------------|--|
| Strategy | This course aims to study the most important chemical reactions, identify the general safety guidelines and instructions in the laboratory, some devices, glassware and how to use them, measure the boiling point and the factors affecting it, methods of purifying liquid organic compounds, preparing meta-nitrobenzoic acid, detecting the double bond using the Bayer test and detecting aldehydes and ketones, and how to distinguish between aldehydes and ketones, detecting the presence of the carboxyl group, and detecting alcohols using the Lucas test. |
|-----------------|--|

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|-------------|--------------|-----------------------------------|---|----------------------------|--------------------------|
| 1 | 2 | | Safety procedures in laboratories and laboratory analyses | Power point | Written exam |
| 2 | 2 | | Measuring the melting point and the factors affecting it | Power point Interactive | Written exam |

| | | | | | |
|----|---|--|--|----------------------------|--------------|
| 3 | 2 | | Measuring the boiling point and studying the factors affecting it | Power point | Written exam |
| 4 | 2 | | The exam is the first month | Power point Interactive | Written exam |
| 5 | 2 | | Study the purification of liquid organic compounds and identify the types of distillation techniques | | Written exam |
| 6 | 2 | | Preparing meta-nitrobenzoic acid and benzamide and studying their reaction mechanisms | Power point Interactive | Written exam |
| 7 | 2 | | Double bond detection using Bayer detection | Power point Interactive | Written exam |
| 8 | 2 | | Detection of aldehydes and ketones | Power point Interactive | Written exam |
| 9 | 2 | | Second month exam | Power point Interactive | Written exam |
| 10 | 2 | | Distinguishing reagents between aldehydes and ketones | | Written exam |
| 11 | 2 | | Detection of carboxyl group | Power point Interactive | Written exam |
| 12 | 2 | | Detection of alcohols using Lucas reagent | Power point Interactive | Written exam |
| 13 | 2 | | Third month exam | Power point Interactive | Written exam |

11. Course Evaluation

Course evaluation: Course evaluation through student evaluation

1- Quiz

2- Short questions during the lecture

3- Monthly exams: two or more exams if possible

4- Final exam

Achievement tests are as follows:- A. Monthly tests 15%

B. End of semester exams 15%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

1- Mahasin Youssef Sharaf, (2001) Organic Chemistry, Dar Al-Maysara for Publishing and Distribution, Amman, Jordan.

2-Written by Professor Dee Bradley and Jesbriggs and translated by Omar Hamad Shihab Al-Obaidi, (2013) Organic Chemistry, Exact Science Experiments, Teaching and Learning Materials / A Guide for Learners, Dar Al-Safa for Publishing and Distribution, Amman, Jordan

Main references (sources)

Recommended books and references (scientific journals, reports...)

| | |
|---------------------------------|--|
| Electronic References, Websites | |
|---------------------------------|--|

Course Description Form

| 1. Course Name: Coordination Chemistry | | | | | |
|---|-------|----------------------------|--|---|-------------------|
| | | | | | |
| 2. Course Code: Sci4329 | | | | | |
| | | | | | |
| 3. Semester / Year:2023-2024 | | | | | |
| | | | | | |
| 4. Description Preparation Date:11/7/2024 | | | | | |
| | | | | | |
| 5. Available Attendance Forms: Daily attendance in the laboratory | | | | | |
| | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 60h | | | | | |
| | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Ghufran Hamed Nail | | | | | |
| Email: gofran.hamid@uoanbar.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives Providing basic information for various topics | | | | <ul style="list-style-type: none"> • • • | |
| Coordination Chemistry | | | | | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | | Lecture and discussion | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2 | Safety Instructions | Methods of dealing with materials in the | inside the laboratory | Oral questions |

| | | | | | |
|---|---|--|---|-----------------------|----------------|
| 2 | 2 | Introduction to Coordination Chemistry | laboratory Introduction to Coordination chemistry and metandras | Inside the laboratory | Oral questions |
| 3 | 2 | Prepare the complex $[\text{Ni}(\text{NH}_3)_6]\text{Cl}_2$ | Using the nickel chloride, the complex was prepared Using a water copper sulfate | Inside the laboratory | Oral questions |
| 4 | 2 | Prepare the complex $[\text{Cu}(\text{NH}_3)_4]\text{SO}_4 \cdot \text{H}_2\text{O}$ | | Inside the laboratory | Oral questions |
| 5 | 2 | Monthly exam | Using the nickel chloride, the complex was prepared | Inside the laboratory | |
| 6 | 2 | Prepare the complex $\text{Ni}(\text{DMG})_2$ | Using Dai Chromate potassium with oxalic acid attends the complex | Inside the | Oral questions |

| | | | | | |
|---|---|---|--|---|----------------|
| 7 | 2 | Prepare the complex $K[Cr(C_2O_4)_2(H_2O)_2] \cdot 2H_2O$ | <p>Theoretios are only for the lack of materials</p> <p>A water copper sulfate attends the theoretical complex only due to the lack of materials</p> | <p>laboratory</p> <p>Inside the laboratory</p> <p>Inside the laboratory</p> | Oral questions |
| 8 | 2 | Prepare the complex $K_2[Cu(C_2O_4)_2] \cdot 2H_2O$ | From $CoCl_2 \cdot 6H_2O$, a waterproof chloride nh_4cl attended the complex | | Oral questions |
| 9 | 2 | Monthly exam | | Inside the laboratory | Oral questions |
| | | Prepare the complex $[Co(NH_3)_5SO_3]Cl$ | | | Oral questions |

| | | | | | |
|----|---|--|--|--|--|
| 10 | 2 | | | | |
|----|---|--|--|--|--|

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

| | |
|--|--|
| Required textbooks (curricular books, if any) | Palmer, W.G. ; Experimental Inorganic Chemistry (1970) |
| Main references (sources) | Noman Saad El -Din, Dr. Nazir Arian Milad, Karim Abdul Amir Al -Obaid, Dr. Abdul -Fahad Hudhayah, Dr. Kazem Al -Ubaidi, Dr. Souad Al -Nour, Latic Chemistry (Transitional Elements and Harmonic Principles) First Edition, College Science Press / Baghdad University 1980 |
| Recommended books and references (scientific journals, reports...) | Dr. Hamdallah Al -Hodli, Dr. Manar Fayyad Inorganic Chemistry, Part Two, Publications of Jordan Arabic Language Academy, First Edition (1983). Translator from Huhee J.E |
| Electronic References, Websites | internet |

Course Description Form

| 1. Course Name: organic chemistry | | | | | |
|---|-------|-----------------------------------|--|-------------------|--|
| | | | | | |
| 2. Course Code: Sci4330 | | | | | |
| | | | | | |
| 3. Semester / Year:2023-2024 | | | | | |
| | | | | | |
| 4. Description Preparation Date:11/7/2024 | | | | | |
| | | | | | |
| 5. Available Attendance Forms: Daily attendance in the laboratory | | | | | |
| | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 60h | | | | | |
| | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Ghufuran Hamed Nail | | | | | |
| Email: gofran.hamid@uoanbar.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives Providing basic information for various topics in an organic chemistry | | | | | <ul style="list-style-type: none"> • • • |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | | Lecture and discussion | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2 | Purification of organic compounds | Methods for purifying organic vehicles | Inside laboratory | Oral questions |

| | | | | | |
|----|---|--|---|-----------------------|-----------------------|
| 2 | 2 | Measurement of melting point | Learn to measure the degree of melting material | Inside the laboratory | Oral questions |
| 3 | 2 | Boiling point | Learn to measure the degree of boiling alkanes detection tests | Inside the laboratory | Oral questions |
| 4 | 2 | Preparation and detection of alkanes | | Inside the laboratory | Oral questions |
| 5 | 2 | First month exam | | | |
| 6 | 2 | Detection and preparation of alcohols | Reveal a number of alcohols using detection methods | Inside the laboratory | Oral questions |
| 7 | | | Detection of aldehyde and ketone using detection methods | Inside the laboratory | |
| 8 | 2 | Detection Of aldehyde and Ketone | detection of carboxylic acids | Inside the laboratory | Oral questions |
| 9 | 2 | preparation and Detection carboxylic acids | detection of the phenols in different reagents | Inside the laboratory | Oral questions |
| 10 | 2 | Detection of phenols - their | Detecting the amines using the | | Inside the laboratory |

| | | | | | |
|----|---|--|--|-----------------------|-----------------------|
| 11 | 2 | preparation Preparation and detection of amines and amide | reagents Second month exam | Inside the laboratory | Inside the laboratory |
| 12 | 2 | second month exam | Detection of aromatic vehicles in the reagents | Inside the laboratory | |
| 13 | 2 | Reactions and detection of aromatic compounds | Ethar has been detected using reagents | Inside the laboratory | Inside the laboratory |
| 14 | 2 | Preparation and detection of ethers | | | Inside the laboratory |

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

| | |
|--|--|
| Required textbooks (curricular books, if any) | The foundations of organic chemistry. W Ghaleb Muhammad - Walid Muhammad Al -S First Edition (2008) / Dar Al -Kutub Al -Watar - Benghazi - Labya |
| Main references (sources) | The basics of organic chemistry. Mohar Magdy Wasel, Al -Azhar University - A Republic of Egypt |
| Recommended books and references (scientific journals, reports...) | Lectures in organic chemistry |

| | |
|---------------------------------|----------|
| Electronic References, Websites | internet |
|---------------------------------|----------|

Course Description Form

| | |
|---|--|
| 1. Course Name: Organic Chemistry | |
| | |
| 2. Course Code: SciC239 | |
| | |
| 3. Semester / Year: Season First | |
| | |
| 4. Description Preparation Date:2023/12/17 | |
| | |
| 5. Available Attendance Forms: weekly | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) 26 hours / 13 units | |
| | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: neda taghlib abdul Kareem abdulwahab | |
| Email: neda.taghalab@uoanbar.edu.iq | |
| 8. Course Objectives | |
| 9. Course objectives: | The course included 12 lectures and three tests to evaluate students. The scientific lectures included an explanation of laboratory equipment and the most important laboratory safety procedures, as well as learning about Toulou's reagent and... Haloform detector Identifying alcohols and their types and using the Lucas reagent to distinguish between types of alcohols Study of one of the hydrazine derivatives And detection of carboxylic acids |
| 10. Teaching and Learning Strategies | |

| | |
|-----------------|---|
| Strategy | <p>This course aims to study the most important chemical studies, identify carboxylic acids and their types, study one of the hydrazine derivatives, which is dinitrophenylhydrazine, and its effect on aldehydes and ketones, the method of preparing the Lucas reagent and its effect on the types of alcohols, how to use the haloform reagent in detecting the methyl carbonyl group, and how to convert acetyl groups to Carboxyl groups, preparing Toulin's reagent, and studying its effect on aldehydes and ketones</p> |
|-----------------|---|

11. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------|--|--|-------------------|
| 1 | 2 | | Safety procedures in laboratories and laboratory analyses | Power point and Laboratory experiments | Written exam |
| 2 | 2 | | Identify caroxylic acids and their types | Power point and Laboratory experiments | Written exam |
| 3 | 2 | | Conduct an experiment to detect the carboxyl group using samples of different chemical compounds | Power point and Laboratory experiments | Written exam |
| 4 | 2 | | The exam is the first month | Power point and Laboratory experiments | Written exam |
| 5 | 2 | | Conducting an | Power point and Laboratory | Written exam |

| | | | | | |
|----|---|--|--|--|--------------|
| | | | experiment using dinitrophenylhydrazine and how its presence affects aldehydes and ketones in the laboratory. | experiments | |
| 6 | 2 | | Preparing Lucas reagent in the laboratory and studying the reaction mechanism | Power point and Laboratory experiments | Written exam |
| 7 | 2 | | Identifying alcohols and their types and studying the reaction mechanism of sn1 and sn2 | Power point and Laboratory experiments | Written exam |
| 8 | 2 | | Second month exam | Power point and Laboratory experiments | Written exam |
| 9 | 2 | | Conduct an experiment to distinguish between the three types of alcohols in the laboratory using the Lucas reagent | Power point and Laboratory experiments | Written exam |
| 10 | 2 | | Detection of carbonyl | Power point and Laboratory experiments | Written exam |

| | | | | | |
|----|---|--|--|--|--------------|
| | | | group on samples of different chemicals using iodoform | | |
| 11 | 2 | | Third month exam | Power point Interactive | Written exam |
| 12 | 2 | | Laboratory preparation of Tollen's reagent | Power point and Laboratory experiments | |
| 13 | 2 | | Study of the effect of Toulain's reagent on samples of aldehydes and ketones | Power point and Laboratory experiments | |
| | | | Safety procedures laboratories and laboratory analys | | |

12. Course Evaluation

Course evaluation: Course evaluation through student evaluation

1-Quiz

2- Short questions during the lecture

3- Monthly exams: two or more exams if possible

4- Final exam

Achievement tests are as follows:- A. Monthly tests 15%

B. End of semester exams 15%

13. Learning and Teaching Resources

Required textbooks (curricular books, if any)

1- Mahasin Youssef Sharaf, (2001) Organic Chemistry, Dar Al-Maysara for Publishing and Distribution, Amman, Jordan.

| | |
|---|--|
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

| 1. Course Name: | | | | | |
|--|-------|---|--|--|--|
| Electromagnetism | | | | | |
| 2. Course Code: | | | | | |
| Sci4417 | | | | | |
| 3. Semester / Year:2023 -2024 | | | | | |
| First semester 2023-2024 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 2023/9/1 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Classrooms | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 30/2 | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Mohammed Najeeb jasim Email: mhamad87@uoanbar.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | | | | | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | | Lecture, discussion, and preparing weekly reports | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1 | 2 | the student should know the foundations of electromagnetism and the electromagnetic field | Magnetic and electric fields | Lecture, discussion and preparing weekly reports | Daily monthly exams solving examples |
| 2 | 2 | Know the concept of Faraday's law and its applications in electromagnetism | Faraday's law of electromagnetic induction | Lecture, discussion and preparing weekly reports | Daily monthly exams solving examples |
| 3 | 2 | Know the concept of Lenz's law | Lenz's law | Lecture, discussion | Daily |

| | | | | | |
|----|---|--|--|--|--|
| | | Lenz's law and applications electromagnetism | and application | and prepar weekly reports | monthly exams solving examples |
| 4 | 2 | Know the concept electromotive force & how it is generated conductors | | Lecture, discussion, preparing weekly repo | Daily monthly exams solving examples |
| 5 | 2 | Understanding h an electric genera works | The driving fo generated in a mov conductor | Lecture, discussion, preparing weekly repo | Daily monthly exams solving examples |
| 6 | 2 | Acquire the concept opposing torques & eddy currents electrical devices & how to overcome th | The electric genera its working princi and the feedback fo in the generator | Lecture, discussion, preparing weekly repo | Daily monthly exams solving examples |
| 7 | 2 | ing how an electrical transformer works Knowledge applications Maxwell's equations | Counter torque Eddy currents | Lecture, discussion, and prepar weekly rep | Daily monthly exams solving examples |
| 8 | 2 | ating energy electromagnetic waves | Transformers and power transmission Caswell's equations | Lecture, discussion, and prepar weekly rep | Daily monthly exams solving examples |
| 9 | 2 | ow the types modulation and h waves are modula to be transmitted o long distances | Light as electromagnetic wave | Lecture, discussion, and prepar weekly rep | Daily monthly exams solving examples |
| 10 | 2 | ledge of w applications communications & televisions | Wave inclus and its types | Lecture, discussion, preparing weekly repor | Daily monthly exams solving examples |

11. Course Evaluation

Grade: 50. Monthly exam: 35. Assignments: 5. Daily exams:10

12. Learning and Teaching Resources

Required textbooks

Electricity and magnetism -
Muhammad bin Ali Ahmed

Main references (sources)

Physics Principles and Applications - Douglas
Giancoli

| | |
|----------------------------------|--|
| Recommended books and references | Basic Electrical Engineering - I.Mekenzie sm |
| | |

Course Description Form

| | |
|--|--|
| 13. Course Name: | Instrumental analysis |
| 14. Course Code: | Scic428 |
| 15. Semester / Year | the First 2023- 2024 |
| 16. Description Preparation Date: | 10/11/2024 |
| 17. Available Attendance Forms: | presence |
| 18. Number of Credit Hours (Total) / Number of Units (Total) | 30 hours |
| 19. Course administrator's name (mention all, if more than one name) | Name: Sumood Naser Al-Deen Taha Email: Sum20s3005@uoanbar.edu.iq |
| 20. Course Objectives | Course Objectives 1- Teaching the student the scientific concept of the foundations of instrumental analysis, what are the most important methods used in automated analysis, how to use advanced automated laboratory equipment to complete analyses, the basis of the work of these devices, and their most important components, Application areas. 2- Teaching and educating students on all the necessary and necessary information related to the subject of automatic analysis, which qualifies them To work and research in all fields of analytical chemistry. |

21. Teaching and Learning Strategies

- 10- Lecture method and using the blackboard and data show.
- 11- Conducting experiments within the curriculum and preparing reports.
- 12- Providing students with knowledge through homework assignments for academic vocabulary.
- 13- Improving students' skills by visiting websites to obtain additional knowledge of the academic subject.

22. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|--|---|-----------------------------|---|
| 1 | 2 | Introducing the student to the most important precautions and safety procedures in the laboratory | Security and safety guidelines In the chemistry laboratory | Blackboard data show | Conducting oral and written exams, Homeworks . |
| 2 | 2 | Introducing the student to the concept of Instrumental analysis methods and their advantages and disadvantages | Introduction Instrumental analysis | Blackboard And data show | Conducting oral and written exams, Homeworks |
| 3 | 3 | Definition of the most important ways of expressing concentrations. | Methods of expressing concentrations | Blackboard And data show | Conducting oral and written exams, Homeworks. |
| 4 | 2 | Introducing students to the types of absorption and the factors on which it depends, and explaining the phenomenon of emission | Absorption and emission electromagnetic radiation | Blackboard And data show | Conducting oral and written exams, Homeworks. |

| | | | | | |
|----|---|--|--------------------------------------|-----------------------------|---|
| | | | | | |
| 5 | 2 | Clarifying the Beer-Lambert concept and deviations from law. | Beer-Lambert law | Blackboard And data show | Conducting oral and written exams, Homeworks. |
| 6 | 2 | First exam - second semester | Spectroscopic devices | | |
| 7 | 2 | Identify the components of spectral devices and their basis. | Spectroscopic devices | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 8 | 2 | Identify devices parts | Fluorescence phosphorescence devices | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 9 | 2 | Learn about atomic absorption methods and identify component parts of the atomic absorption spectrometer | Atomic absorption spectrometry | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 10 | 2 | Second exam - first semester | | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |

| | | | | | |
|----|---|---|--|-----------------------------|---|
| 11 | 2 | Identify the measurement of maximum wavelength of absorption (λ_{max}) for potassium permanganate solution | Experiment: Determine maximum absorption wavelength (λ_{max}) of a solution potassium permanganate | Blackboard And data show | |
| 12 | 2 | Application of the law estimate potassium permanganate KMnO_4 using a spectrophotometer | Experiment: Explaining the Beer-Lambert law | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 13 | 2 | Identify the parts of the device and its applications | Infrared spectrometer | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 14 | 2 | review | | Blackboard And data show | Conducting oral and written exams, Homeworks, and participating in the classroom Provide activities |
| 15 | 2 | Third exam - second semester | | | |

23. Course Evaluation

Daily preparation, oral or monthly exams and homework

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)

.

| | |
|--|---|
| Main references (sources) | - Instrumental analysis in analytical chemistry: Muayad Qasim Al-Abaji . - Instrumental analysis: D. Abdul Hamid Mohsen Al-Haidari |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

Course Description Form

| | |
|--------------------------|--|
| 25. | Course Name: |
| | Sustainable Development |
| 26. | Course Code: |
| | |
| 27. | Semester / Year: |
| | Second semester / Third year |
| 28. | Description Preparation Date: |
| | 7 / 3 / 2024 |
| 29. | Available Attendance Forms: |
| | Attendance + Electronic class |
| 30. | Number of Credit Hours (Total) / Number of Units (Total) |
| | 30 / 30 |
| 31. | Course administrator's name (mention all, if more than one name) |
| | Name: Zayd Abdul-Jabbar Abdullah Email: eng.zayd132@uoanbar.edu.iq |
| 32. | Course Objectives |
| Course Objectives | <ul style="list-style-type: none">• Highlighting the role of education and learning in achieving goals, ambitions and common pursuit.• Encouraging the improvement of the quality of education and its requirements.• Enabling students to rely on themselves and take responsibility; To achieve the requirement of lifelong learning.• Providing students with social and emotional skills to develop themselves.• Contributing to crystallizing and forming new visions regarding the changes and shape of the world.• Making a radical change in the content of education, its results, educational methods, and way of thinking, which is reflected in |

behavior and actions.

33. Teaching and Learning Strategies

| | |
|-----------------|---|
| Strategy | <ul style="list-style-type: none"> a. Adopting an approach that education is the key factor in promoting values, behavior and lifestyles for a sustainable future. b. Explaining the concept of sustainable development to students in detail. c. Students' participation in solving issues related to sustainable development topics. d. Discussion and dialogue on vocabulary related to sustainable development topics. e. Place environmental and sustainability issues at the heart of the learning process and help learners better understand the world in which they live. |
|-----------------|---|

34. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|-----------------|-------|---|-------------------------|--------------------|----------------------------|
| 1 st | 2 | The concept of sustainable development and its most important definitions | Sustainable Development | Classroom lectures | discussions and oral exams |
| 2 nd | 2 | Reasons for setting sustainable development goals | Sustainable Development | Classroom lectures | discussions and oral exams |
| 3 rd | 2 | Characteristics of sustainable development and its continuity | Sustainable Development | Classroom lectures | discussions and oral exams |
| 4 th | 2 | The philosophy of sustainable development and its historical evolution | Sustainable Development | Classroom lectures | discussions and oral exams |
| 5 th | 2 | The requirements of sustainable development and its most important elements | Sustainable Development | Classroom lectures | discussions and oral exams |
| 6 th | 2 | Dimensions of sustainable development and its most important areas | Sustainable Development | Classroom lectures | discussions and oral exams |
| 7 th | 2 | Sustainable development trends for local communities | Sustainable | Classroom | discussions and |

| | | | | | |
|------------------|---|---|-------------------------|--------------------|----------------------------|
| | | and factors influencing them | Development | lectures | oral exams |
| 8 th | 2 | Preparing written exam questions | First month exam | theoretical | monthly exam |
| 9 th | 2 | Pillars of sustainable development and indicators for achieving them | Sustainable Development | Classroom lectures | discussions and oral exams |
| 10 th | 2 | The role of sustainable development in achieving goals and confronting problems | Sustainable Development | Classroom lectures | discussions and oral exams |
| 11 th | 2 | Sustainable development goals and principles | Sustainable Development | Classroom lectures | discussions and oral exams |
| 12 th | 2 | Sustainable cities and local communities | Sustainable Development | Classroom lectures | discussions and oral exams |
| 13 th | 2 | Iraq's vision for sustainable development goals 2030 | Sustainable Development | Classroom lectures | discussions and oral exams |
| 14 th | 2 | The international community's vision for the sustainable development goals | Sustainable Development | Classroom lectures | discussions and oral exams |
| 15 th | 2 | Preparing written exam questions | Second month exam | theoretical | monthly exam |

35. Course Evaluation

| Daily preparation | Reports | Monthly Exams | Final Exam | Total |
|-------------------|---------|---------------|------------|-------|
| 5 | 5 | 40 | 50 | 100 |

36. Learning and Teaching Resources

| | |
|---|--|
| Required textbooks (curricular books, if any) | <p>Sustainable development in Arab countries between theory and practice.</p> <p>Written by Dr. Qadri Muhammad Al-Tahir / 2014</p> |
|---|--|

| | |
|--|---|
| Main references (sources) | Sustainable development - its concept - dimensions - indicators Mr. Dr. Medhat Abu Al-Nasr/Dr. Yasmine Medhat Mohamed / 2017 |
| Recommended books and references (scientific journals, reports...) | The reports of the United Nations and scientific journals that specialize in studying sustainable development in various fields. |
| Electronic References, Websites | Iraqi, Arab and international websites related to sustainable development. |

Course Description Form

| | |
|-------------------------|---|
| 37. | Course Name: |
| | English |
| 38. | Course Code: |
| | |
| 39. | Semester / Year: |
| | Second semester / First year |
| 40. | Description Preparation Date: |
| | 7 / 3 / 2024 |
| 41. | Available Attendance Forms: |
| | Attendance + Electronic class |
| 42. | Number of Credit Hours (Total) / Number of Units (Total) |
| | 30 / 30 |
| 43. | Course administrator's name (mention all, if more than one name) |
| | Name: Zayd Abdul-Jabbar Abdullah Email: eng.zayd132@uoanbar.edu.iq |
| 44. | Course Objectives |
| Course Objective | <ul style="list-style-type: none">• Understand and use the English language as a means of communication and learning in their specializations.• Understanding the reading material and creating a link between its various components.• Using colloquial English in their daily lives• Write a sentence that is sound and correct in structure and meaning.• Graduating cadres with a high degree of education, qualification and excellence. |
| 45. | Teaching and Learning Strategies |

| | |
|-----------------|--|
| Strategy | <ul style="list-style-type: none"> • Understanding the target language’s meaning and structure, in addition to being proficient in its pronunciation. • Developing basic linguistic competencies that enable dealing with vocabulary at the introductory level • Developing understanding and the ability to use conversational language in daily life • Writing a simple, grammatically sound sentence that the student will use to describe people or express a desire or point of view...etc... • Using sentences with simple grammatical structures in certain contexts • Understanding simple read texts and comparing them live. |
|-----------------|--|

46. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|----------------------------------|-------------------------|----------------------------------|----------------------------|
| 1 | 2 | An introduction to English | Unit One – Introduction | Lectures inside the classroom | Discussions and oral exams |
| 2 | 2 | Learning the names of contraries | Unit Two – Contraries | Lectures inside the classroom | Discussions and oral exams |
| 3 | 2 | Learning the names of jobs | Unit Three – Jobs | Lectures inside the classroom | Discussions and oral exams |
| 4 | 2 | Learning the ways of Possessive | Unit Four – Possessive | Lectures inside the classroom | Discussions and oral exams |
| 5 | 2 | Learning the names of | Unit Five – Sports | Lectures inside the classroom | Discussions and oral exams |
| 6 | 2 | Learning the names of sports | Unit Six – The Time | Lectures inside the classroom | Discussions and oral exams |
| 7 | 2 | Exercises on previous topics | First month exam | Preparing written exam questions | Monthly exam |
| 8 | 2 | Learning the ways of questions | Unit Seven – Questions | Lectures inside the classroom | Discussions and oral exams |
| 9 | 2 | Learning the names of Rooms and | Unit Eight – Rooms and | Theoretical | Monthly exam |

| | | | | | |
|------------------|---|--|------------------------------------|-------------------------------|----------------------------|
| | | Furniture | Furniture | | |
| 10 | 2 | Learning the ways of Saying Years | Unit Nine – Saying Years | Lectures inside the classroom | Discussions and oral exams |
| 11 | 2 | Learning roles of Past Simple | Unit Ten – Past Simple | Lectures inside the classroom | Discussions and oral exams |
| 12 | 2 | Learning deference between can / can't | Unit eleven – can / can't | Lectures inside the classroom | Discussions and oral exams |
| 13 | 2 | Learning deference between some / any | Unit Twelve – some / any | Lectures inside the classroom | Discussions and oral exams |
| 14 th | 2 | Learning the names of Colors and Clothes | Unit Thirteen – Colors and Clothes | Classroom lectures | discussions and oral exams |
| 15 th | 2 | Preparing written exam questions | Second month exam | theoretical | monthly exam |

47. Course Evaluation

| Daily preparation | Reports | Monthly Exams | Final Exam | Total |
|-------------------|---------|---------------|------------|-------|
| 5 | 5 | 40 | 50 | 100 |

48. Learning and Teaching Resources

| | |
|--|--|
| Required textbooks (curricular books, any) | <i>Beginners - New Headway Plus- student's book + workbook by John and Liz Soar</i> |
| Main references (sources) | <i>Learn the English language in a simple way</i> By Taher Al-Bayati |

| | |
|--|---|
| Recommended books and references (scientific journals, reports...) | <ul style="list-style-type: none">• https://learnenglish.britishcouncil.org/english-grammar-reference/present-simple• https://www.englishpage.com/verbpage/presentcontinuous.html• https://www.ef.com/wwen/english-resources/english-grammar/present-perfect/ |
| Electronic References, Websites | Iraqi, Arab and international websites related to English. |

Course Description Form

| | | |
|-------------------------|---|-------------------------------|
| 49. | Course Name: | English -2- |
| 50. | Course Code: | UOAa203 |
| 51. | Semester / Year: | First semester / Second year |
| 52. | Description Preparation Date: | 3 / 11 / 2023 |
| 53. | Available Attendance Forms: | Attendance + Electronic class |
| 54. | Number of Credit Hours (Total) / Number of Units (Total) | 30 / 30 |
| 55. | Course administrator's name (mention all, if more than one name) | |
| | Name: Zayd Abdul-Jabbar Abdullah | |
| | Email: eng.zayd132@uoanbar.edu.iq | |
| 56. | Course Objectives | |
| Course Objective | <ul style="list-style-type: none"> • Understand and use the English language as a means of communication and learning in their specializations. • Understanding the reading material and creating a link between its various components. • Using colloquial English in their daily lives • Write a sentence that is sound and correct in structure and meaning. • Graduating cadres with a high degree of education, qualification and excellence. | |
| 57. | Teaching and Learning Strategies | |
| Strategy | <ul style="list-style-type: none"> • Understanding the target language's meaning and structure, in addition to being proficient in its pronunciation. | |

- Developing basic linguistic competencies that enable dealing with vocabulary at the introductory level
- Developing understanding and the ability to use conversational language in daily life
- Writing a simple, grammatically sound sentence that the student will use to describe people or express a desire or point of view...etc...
- Using sentences with simple grammatical structures in certain contexts
- Understanding simple read texts and comparing them live.

58. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|------|-------|-------------------------------------|------------------------------------|----------------------------------|----------------------------|
| 1 | 2 | An introduction to tenses | Unit One – tenses | Lectures inside the classroom | Discussions and oral exams |
| 2 | 2 | Learning the present tenses | Unit Two – present tenses | Lectures inside the classroom | Discussions and oral exams |
| 3 | 2 | Learning the past tenses | Unit Three – past tenses | Lectures inside the classroom | Discussions and oral exams |
| 4 | 2 | Learning the expressing of quantity | Unit Four – expressing of quantity | Lectures inside the classroom | Discussions and oral exams |
| 5 | 2 | Learning the verb patterns | Unit Five – verb patterns | Lectures inside the classroom | Discussions and oral exams |
| 6 | 2 | Learning the what ... like? | Unit Six – what ... like? | Lectures inside the classroom | Discussions and oral exams |
| 7 | 2 | Exercises on previous topics | First month exam | Preparing written exam questions | Monthly exam |
| 8 | 2 | Learning the present perfect tense | Unit Seven – present perfect | Lectures inside the classroom | Discussions and oral exams |
| 9 | 2 | Learning roles of | Unit Eight – | Theoretical | Monthly exam |

| | | | | | |
|------------------|---|---|--|-------------------------------|----------------------------|
| | | have to | have to | | |
| 10 | 2 | Learning the roles of time clauses | Unit Nine – time clauses | Lectures inside the classroom | Discussions and oral exams |
| 11 | 2 | Learning roles of the passive voice | Unit Ten – the passive | Lectures inside the classroom | Discussions and oral exams |
| 12 | 2 | Learning roles of the second conditional | Unit eleven – second conditional | Lectures inside the classroom | Discussions and oral exams |
| 13 | 2 | Learning present perfect continuous tense | Unit Twelve – present perfect continuous | Lectures inside the classroom | Discussions and oral exams |
| 14 th | 2 | Preparing oral exam questions | Oral exam | Classroom lectures | discussions and oral exams |
| 15 th | 2 | Preparing written exam questions | Second month exam | theoretical | monthly exam |

59. Course Evaluation

| Daily preparation | Oral | Monthly Exams | Final Exam | Total |
|-------------------|------|---------------|------------|-------|
| 5 | 5 | 40 | 50 | 100 |

60. Learning and Teaching Resources

| | |
|--|---|
| Required textbooks (curricular books, any) | <i>Pre-intermediate - New Headway Plus- student's book + workbook by John and Liz Soar</i> |
| Main references (sources) | <i>Learn the English language in a simple way</i> By Tahir Al-Bayati |

| | |
|--|---|
| Recommended books and references (scientific journals, reports...) | <ul style="list-style-type: none">• https://learnenglish.britishcouncil.org/english-grammar-reference/present-simple• https://www.englishpage.com/verbpage/presentcontinuous.html• https://www.ef.com/wwen/english-resources/english-grammar/present-perfect/ |
| Electronic References, Websites | Iraqi, Arab and international websites related to English. |