Basic Data
(1) Course Title: General Chemistry I
(2) Course Code No.: 111ch
(3) Credit Hours: Six credit hours
   Lectures: 4 credit hours
   laboratory: 2 credit hour
   Total hours: 6 credit hours

The course is designed to help student-teachers achieve the following goals:
• Use of SI units and conversion factors in problem solving.
• Express results of calculations in terms of significant figures.
• Explain the properties of different states of matter.
• Understand principles underlying first law of thermodynamic and its applications in thermo chemistry.
• Explain the concepts underlying atomic structure, electronic configuration, periodic properties, and chemical bonding.
• Identify the properties of solutions and relevant applications.

By the end of this course, student teachers are expected to achieve the following objectives:
(2) نواتج التعلم المستهدفة:

A-1. Identify the different states and properties of matter.
A-2. Explain the relationship between electronic configuration of elements and their periodic properties and chemical reactivity.
A-3. Apply principles of colligate properties.
A-4. Describe the liquid state properties.
A-5. Describe the dependence of VP of liquids on T.
A-6. Describe the electronic configuration.
A-7. Describe molecular geometry based on hybridization.
A-8. Apply gas laws to solve problems concerning gas behavior.

B-1. Relate the concepts of chemistry to contemporary, historical, technological, and societal issues; in particular, relate concepts of chemistry to current controversies, such as those around energy uses and medical research, as well as other issues.
B-2. Demonstrate competence in the practice of teaching as defined within the Entry-Level Standards.
B-3. Predict chemical properties and chemical bonding.
B-4. Use phase diagrams to deduce colligative properties of solutions.
B-5. Derive laws based on colligative properties.

C-1. Perform chemical calculations.
C-2. Perform thermo chemical calculations.
C-3. Acquire basic lab skills; identify inorganic anions and cations, titrations and chemical calculations.
C-4. Calculate them chemical characteristics of different chemical reactions using thermo.
C-5. Sketch phase diagrams of H2O aqueous solutions.
C-6. Perform chemical calculations using chemical formulas and equations.
C-7. Acquire familiarity with industrial, medical and biological applications of analytical chemistry.
C-8. Locate resources, design and conduct inquiry-based open-ended investigations in chemistry, interpret findings, communicate results, and make judgments based on evidence.
C-9. Demonstrate competence in the practice of teaching through investigative experiences and by demonstrating the application of the scientific process and assessing student learning through multiple processes.

D-1. Apply chemistry knowledge in his life.
D-2. Thinking scientifically.
D-3. Construct new knowledge for themselves through research, reading and discussion, and reflect in an informed way on the role of science in human affairs.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>First</td>
<td><strong>Units of measurements</strong>: Chemical formulas. Chemical reactions.</td>
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<tr>
<td>Second</td>
<td>• Chemical calculations based on chemical reactions.</td>
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<tr>
<td>Third</td>
<td>• <strong>The Gaseous State</strong>: gas laws, kinetic theory of gases, real gases, critical phenomena.</td>
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<tr>
<td>Fourth</td>
<td>• <strong>Thermochemistry</strong>: first law, internal energy, enthalpy, heat capacity, Hess's law, bond and lattice energy.</td>
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<tr>
<td>Fifth</td>
<td><strong>The liquid and solid state</strong>: intermolecular forces, vapor pressure of liquids, diffusion.</td>
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<td>Sixth</td>
<td>• viscosity, and surface tension of liquids, types of amorphous and crystalline solids.</td>
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<tr>
<td>Seventh</td>
<td>• lattice and unit cells, structure and bonding in metals, semi- and superconductivity.</td>
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<tr>
<td>Eighth</td>
<td>• <strong>Solution</strong>: Types of solutions concentration units, effects of temperature and pressure on solubility, colligative properties.</td>
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<tr>
<td>Ninth</td>
<td><strong>Electronic structure of the atom</strong>: Planck and quantum theory, Photoelectric Effect, Bohr theory</td>
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<tr>
<td>Tenth</td>
<td>• helsenb… uncertainty principle, Schrödinger and wave equation of matter in quantitative terms, quantum numbers, atomic orbital, the electronic configuration of the atom, the periodic table and periodic properties Molecular Structure ionic bonds.</td>
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<tr>
<td>Eleventh</td>
<td><strong>Chemical Bonding</strong>: Covalent bonding, polarity and electronegativity, lewis structure and the valence bond theory.</td>
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<tr>
<td>Twelfth</td>
<td>• hybridization, valence shell electron pair repulsion VSEPR,</td>
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<tr>
<td>Thirteenth</td>
<td>• molecular orbital theory.</td>
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- **Laboratory**: quantitative analysis of simple inorganic anions and cations. Titration and chemical calculations.

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Activities, tasks and assignments:

- Solve and discusses problem sets.
- Submission and class presentation of term papers.
- Visit to pertinent chemical plants and sites.
- Computer aided and web based assignment.
- Molecular modeling to elucidate chemical bonding, atomic, molecular, and crystal structure.

Assessment and Evaluation tools:

- Final exam
- Hourly and midterm exams.
- Oral assessment.
- Assessment of term paper, reports and group discussions.
- Quizzes
- Evaluation of performance in the lab, group projects and reports.

Summative Evaluation table

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Score</th>
<th>Weight</th>
<th>التقييم</th>
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</thead>
<tbody>
<tr>
<td>Final exam</td>
<td></td>
<td></td>
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<tr>
<td>Fifteenth Week</td>
<td></td>
<td></td>
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<tr>
<td>تقييم</td>
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<td></td>
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<tr>
<td>1. Final written exam</td>
<td>170</td>
<td>170</td>
<td>1. امتحان نهاية الفصل الدراسي</td>
</tr>
<tr>
<td>2. Final oral exam</td>
<td>50</td>
<td>50</td>
<td>2. الامتحان العملي</td>
</tr>
<tr>
<td>3. Assignments</td>
<td>30</td>
<td>30</td>
<td>3. أعمال السنة</td>
</tr>
<tr>
<td>Total</td>
<td>250</td>
<td>250</td>
<td>المجموع</td>
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Note: The evaluation table includes the weightage and scores for each assessment item, as well as the final total for each category.
References:

Students' Textbooks


Periodicals and websites

Journal of Chemical Information and Modeling
Journal of Chemical Education (JCE)
Supplementary material
Chemical reviews.
Condensed matter, materials, surfaces, interfaces & biophysical.

Resources

- References
- Chemistry library
- Textbooks
- Handouts and problem sets.
- Electronic, web, and multimedia based resources.
- Lab work.

Course coordinator:

- منسق المقرر: د. محمد عبد النطيف

Head of the Department:

- رئيس القسم: أ/ مدحت شاكر

Date

- التـاريخ: 11/5/2005م
رؤية الكلية: انطلاقاً من رؤية جامعة الإسكندرية تسعى كلية التربية لدعمها إلى تحقيق الجودة والحصول على الاعتماد الأكاديمي لتحقيق مكانة متميزة بين كليات التربية على المستوى القومي والعالمي (مجلس الكلية، 8 مارس 2009).

رسالة الكلية: إعداد المعلمين والكوادر المؤهلة القادرة على تطوير النظم التعليمية والإدارية بالتعليم العام والفنى، والباحثين القادرين على تطوير...