



T-104
2022

Course Specification



| | |
|---------------------|---------------------------------------|
| Course Title: | General and Physical Chemistry |
| Course Code: | 201CHEM4 |
| Program: | Bachelor in Chemistry |
| Department: | Chemistry |
| College: | College of Science |
| Institution: | Jazan University (JU) |
| Version: | T104 2022 |
| Last Revision Date: | 31 December 2022 |



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A. General information about the course:

Course Identification

1. Credit hours: 4h

2. Course type

a. University ☐ College ☐ Department ☒ Track ☐ Others ☐

b. Required ☒ Elective ☐

3. Level/year at which this course is offered: Level 3
Year 1

4. Course general Description

| Course Title | Course Number | Contact Hours (CU) | | Credit unit (CU) | Year | Level | Pre-requisite |
|--------------------------------|---------------|--------------------|-------|------------------|------|-------|---------------|
| | | Lec. | Prac. | | | | |
| General and Physical Chemistry | 201CHEM4 | 3 | 2 | 4 | 1 | 3 | 101CHEM4 |

Course objectives: They are to identify the following.

1 - Identification of the laws of thermal chemistry and its various applications.

2 - Identify the types of solutions

3 - Identification of the laws of thermodynamics, and their various functions.

4 - Identify the different forms of energy, and the possibility of turning any of them to other forms.

5 - Identification of chemical contaminants and methods of monitoring, and disposal

Syllabus: A-Theoretical contents

Study Thermochemistry and thermodynamics, Solutions, Chemical kinetics, Redox reactions and Electrochemistry, Acids and bases, Atomic and Molecular Structure, Chemistry and Ecology.

Syllabus: B-Practical contents

Selected experiments in Identification the basic radicals of inorganic salts mixtures.

*See attachment

5. Pre-requirements for this course (if any): 101CHEM

6. Co- requirements for this course (if any): None

7. Course Main Objective(s)

The course is designed to give the students some information about the different chemical items; Thermochemistry, Solutions, Chemical kinetics, Thermodynamics, Redox reactions and Electrochemistry, Atomic and molecular structure, Chemistry and Ecology.





1. Teaching mode (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|----|--|---------------|------------|
| 1. | Traditional classroom | 55 | 100 |
| 2. | E-learning | | |
| 3. | Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning | | |
| 4. | Distance learning | | |

2. Contact Hours (based on the academic semester)

| No | Activity | Contact Hours |
|----|-------------------|---------------|
| 1. | Lectures | 33 |
| 2. | Laboratory/Studio | 22 |
| 3. | Field | |
| 4. | Tutorial | |
| 5. | Others (specify) | |
| | Total | 55 |

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

| Code | Course Learning Outcomes | Code of CLOs aligned with program | Teaching Strategies | Assessment Methods |
|------|---|-----------------------------------|---|-----------------------------------|
| 1.0 | Knowledge and understanding; (Upon completion of the course, student will be able to) | | | |
| 1.1 | Demonstrate an introductory knowledge in solution, chemical kinetics, thermodynamics, oxidation-reduction....,etc . (I) | K(1.1) | lecture / discussion Seminars /presentation | Objective question |
| 1.2 | Describe the essential facts, principles and theories related to thermodynamics, kinetics, solution chemistry,....etc (I) | K(1.2) | lecture / discussion / Seminars /Individual presentation | Essay question |
| 2.0 | Skills: (Upon completion of the course, student will be able to) | | | |
| 2.1 | Demonstrate the knowledge and skills required to solve problems in the kinetic, colligative properties, thermodynamics, thermochemistry ,etc (I) (P) | S(2.1) | lecture / discussion / Seminars /Individual presentation | Solving Problems & chart analysis |



| Code | Course Learning Outcomes | Code of CLOs aligned with program | Teaching Strategies | Assessment Methods |
|------|--|-----------------------------------|---|--|
| 2.2 | Design and carry out scientific experiments as well as accurately record and analyze the results of such experiments. (I) | S(2.2) | Lab work, | Objective question, Essay question, lab report rubric |
| 2.3 | Examine his material and lab safety background to Follow proper procedures and regulations for safe handling and use of chemicals. (I) | S(2.3) | lab demonstrations / hands-on student learning activities | Safety exam |

C. Course Content

| No | List of Topics | Contact Hours |
|-------|--------------------------------------|---------------|
| 1. | Atomic and Molecular structure | 6 |
| 2. | Acids and Bases | 3 |
| 3. | Chemical kinetics | 3 |
| 4. | Redox reactions and Electrochemistry | 3 |
| 5. | Solutions | 6 |
| 6. | Chemistry and Ecology | 3 |
| 7. | Thermochemistry and Thermodynamics | 6 |
| 8. | Revision | 3 |
| 9. | Lab. | 22 |
| Total | | 55 |

D. Students Assessment Activities

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|-------|-------------------------|--------------------------------|--------------------------------------|
| 1. | Quiz | 4 | 5 % |
| 2. | Mid term | 8 | 15 % |
| 3. | Safety EXAM | 13 | 3 % |
| 4. | Laboratory | LAB Sheet | 10-12 |
| 5. | | Quiz in Safety | 9 |
| 6. | | Final practical exam | 10-12 |
| 7. | Final Exam | 12-14 | 50% |
| Total | | | 100 % |

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

| | |
|--------------------------|---|
| Essential References | الكيمياء العامة: المفاهيم الأساسية ، ريموند تشانغ ، العبيكان للنشر ,Raymond, Chang ,General Chemistry: The Essential Concepts 5th Edition 2018, ISBN-13: 978-0073311852 |
| Supportive References | Physical Chemistry ,Peter Atkins, Julio de Paula, Julio DePaula W. H. Freeman, - 2005. - Physical Chemistry, 4th Edition Robert J. Silbey. Robert A. Alberty. Mounji G. Bawendi v. TM. Cambridge, Massachusetts. January 2004 |
| Electronic Materials | Some course contents and materials are posted on Black board sites |
| Other Learning Materials | https://learn.saylor.org/course/CHEM101 https://chem.libretexts.org/Bookshelves/General_Chemistry https://chem.libretexts.org/Special:Search?qid=&fpid=230&fpth=&query=physical+chemistry&type=wiki |

2. Required Facilities and equipment

| Items | Resources |
|---|---|
| facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | Classrooms, laboratories, |
| Technology equipment (Projector, smart board, software) | Smart board, Data show, Black board, internet |
| Other equipment (Depending on the nature of the specialty) | none |

F. Assessment of Course Quality

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---|---------------------------------|--|
| Effectiveness of teaching | Student | Likert-type Survey CES) Indirect |
| Effectiveness of students' assessment | Instructor & Course coordinator | Classroom evaluation (direct & indirect |
| Quality of learning resources | Program coordinator | Indirect |
| The extent to which CLOs have been achieved | Assessment committee | Indirect |
| Other | | |

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

| | |
|-----------------------|---|
| COUNCIL /COMMITTEE | Chemistry Department Council CHEMS2301 |
| REFERENCE NO. | CHEMS230104 |
| DATE | 11/1/2023G – 18/06/1444H |



H. Attachments

1- Practical Work

| Week No. | Experiment Title | Required Chemicals | Required Glass Wear& equipment | Notes |
|-------------------------------------|---|--|--|-------|
| 1st | Group separation of 1st basic radical group | 1st basic radical group salts, reagents. | Conical flask , beakers , tubes , filter papers, holders, heater ,vacuum gas chamber | |
| 2nd | Group separation of 2nd basic radical group | 2nd basic radical group salts, reagents. | Conical flask , beakers , tubes , filter papers, holders, heater ,vacuum gas chamber | |
| 3rd | Group separation of 3rd basic radical group | 3rd basic radical group salts, reagents. | Conical flask , beakers , tubes , filter papers, holders, heater ,vacuum gas chamber | |
| 4th | Group separation of 4th basic radical group | 4th basic radical group salts, reagents. | Conical flask , beakers , tubes , filter papers, holders, heater ,vacuum gas chamber | |
| 5th | Group separation of 5th basic radical group | 5th basic radical group salts, reagents. | Conical flask , beakers , tubes , filter papers, holders, heater ,vacuum gas chamber | |
| 6th | Group separation of 6th basic radical group | 6th basic radical group salts, reagents. | Conical flask , beakers , tubes , filter papers, holders, heater ,vacuum gas chamber | |
| 7 th to 11 th | Identification Of Inorganic Mixtures | All basic radical group salts, reagents. | Conical flask , beakers , tubes , filter papers, holders, heater ,vacuum gas chamber | |

2- Blue Print

| | | | | | | | | |
|---------------------------|--------------------------------|---------------|-----------------|-----------------------------------|-----------------|-------------------------|--------------------------|-----|
| Course Name | General and Physical Chemistry | | | | | | | |
| Course Code | 201CHEM4 | | | | | | | |
| PLOs | K1 | K2 | S1 | S2 | S3 | S4 | V1 | V2 |
| CLOs | 1.1 | 1.2 | 2.1 | 2.2 | 2.3 | 2.4 | 3.1 | 3.2 |
| Marks | 25 | 25 | 20 | 27 | 3 | - | - | - |
| Learning Domain | PLOs | CLOs | Assessment Type | Assessment Tool | No of Questions | Marks of the Assessment | Weight of the Assessment | |
| Knowledge & understanding | K1 | 1.1 (25M) | Quiz | Objective question | 4 | 2 | 2 | |
| | | | Mid term | Objective question | 5 | 5 | 5 | |
| | | | Final Exam | Objective question | 8 | 18 | 18 | |
| | K2 | 1.2 (25M) | Quiz | Objective question | 2 | 2 | 2 | |
| | | | Mid term | Objective question | 5 | 5 | 5 | |
| | | | Final Exam | Objective question | 4 | 18 | 18 | |
| Skills | S1 | 2.1 (20 M) | Quiz | Solving Problems & chart analysis | 2 | 2 | 1 | |
| | | | Mid term | Solving Problems & chart analysis | 2 | 4 | 5 | |
| | | | Final Exam | Solving Problems & chart analysis | 6 | 14 | 14 | |
| | S2 | 2.2 (27 M) | Practical Sheet | Objective question | 10 | 10 | 10 | |
| | | | Lab Report | 10 EXP. | 10 | 7 | 7 | |
| | | | Final Lab Exam | Task | 1 | 10 | 10 | |
| | S3 | 2.3 (3 M) | Safety EXAM | Objective question | 6 | 3 | 3 | |
| TOTAL | | 100 | | | | | | 100 |



