1. **Basic Information:**

|  |  |
| --- | --- |
| **Program Title** | All programs |
| **Department Offering the Program** | Basic Science and Engineering |
| **Department Responsible for the Course** | Basic Science and Engineering |
| **Course Title** | General Chemistry |
| **Course Code** | CHE 101 |
| **Year/Level** | Level:1 |
| **Specialization** | Major |
| **Authorization Date of Course Specification** | - |

|  |  |  |  |
| --- | --- | --- | --- |
| **Teaching hours** | Lectures | Tutorial | Practical |
| 2 | - | 2 |

1. **Course Aims:**

|  |  |
| --- | --- |
| **No.** | **Aims** |
| 1 | Apply knowledge of mathematics, chemistry to demonstrate knowledge of ontemporary engineering issues |
| 6 | Relate chemical reactions and its characteristics to process industries |

1. **Intended Learning Outcomes (ILO’S):**
2. **Knowledge and understanding:**

|  |  |
| --- | --- |
| **No.** | **Knowledge and understanding** |
| A1 | **Define** concepts and theories of mathematics and chemistry, appropriate to the discipline |
| A13 | **Explain** the fundamentals, basic characteristics and features of general chemistry and their application in chemical process industries, including fertilizers and cements. |
| A16 | **Mention** the general principles of chemical reaction equilibrium and thermodynamics; mass and energy balance. |

1. **Intellectual Skills:**

|  |  |
| --- | --- |
| **No.** | **Intellectual Skills** |
| B1 | **Select** appropriate mathematical and computer-based methods for modeling and analyzing problems |
| B4 | Assess different ideas, views, and knowledge from a range of sources. |

1. **Professional Skills:**

|  |  |
| --- | --- |
| **No.** | **Professional Skills** |
| C5 | **Use** laboratory equipment to design experiments, collect, analyse and interpret results. |

1. **General Skills:**

|  |  |
| --- | --- |
| **No.** | **General Skills** |
| D3 | Communicate effectively |
| D6 | Effectively manage tasks, time, and resources |

**4. Course Contents:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Topics** | Lectures | Tutorial | Practical |
| 1 | Gaseous status | 4 | - | - |
| 2 | Substantial and heat balance in fuel burning operations and chemical operations | 2 | - | - |
| 3 | Properties of solutions | 4 | - | 12 |
| 4 | Dynamic balance in physical and chemical operations | 4 | - | - |
| 5 | Kinetic chemical interactions | 2 | - | 8 |
| 6 | Electrochemistry | 2 | - | - |
| 7 | Introduction to chemical corrosion | 2 | - | - |
| 8 | Water processing | 2 | - | 4 |
| 9 | Building materials | 2 | - | 4 |
| 10 | Pollution and its treatment | 2 | - | - |
| 11 | Selected chemical industries: chemical manures – dyes – polymers – sugar – petrochemicals – semi-conductors – oil, greases and industrial detergents. | 2 | - | - |
|  | **Total** | 28 | - | 28 |

**5. Teaching and learning methods:**

|  |  |
| --- | --- |
| **No.** | **Teaching Methods** |
| 1 | Lectures |
| 2 | Discussion sessions |
| 3 | Information collection from different sources |
| 4 | Research assignment |

**6. Teaching and learning methods for disable students:**

|  |  |  |
| --- | --- | --- |
| **No.** | **Teaching Methods** | **Reason** |
| 1 | Presentation of the course in digital material | Better access any time |
| 2 | Wed communication with students | Better communication with certain cases |
| 3 | Asking small groups to do assignments; each composed of low ,medium and high performance students | Knowledge and skills transfer among different levels of students |

7**. Student evaluation:**

**7.1 Student Evaluation Method**:

|  |  |  |
| --- | --- | --- |
| **No.** | **Evaluation Method** | **ILO’s** |
| 1 | Midterm examination | A1,A16 ,B4 |
| 2 | Semester work | A1, A13, D3,D6 |
| 3 | Practical Examination | C5 |
| 5 | Final term examination | A1, A13, A16 , B1, B4 |

**7.2 Evaluation Schedule:**

|  |  |  |
| --- | --- | --- |
| **No.** | **Evaluation Method** | **Weeks** |
| 1 | Midterm examination | 8th |
| 2 | Semester work | 2nd -7th - 9th |
| 3 | Practical Examination | 14th |
| 4 | Final term examination | 15th |

**7.3 weighting of Evaluation:**

|  |  |  |
| --- | --- | --- |
| **No.** | **evaluation method** | **Weights** |
| 1 | Midterm examination | 10 |
| 2 | Semester work | 20 |
| 3 | Practical Examination | 10 |
| 4 | Final term examination | 60 |

**8. List of References:**

|  |  |
| --- | --- |
| **No.** | **Reference List** |
| 1 | Theodore L. Brown, et al, Chemistry the Central Science, Prentice Hall Int. (Pearson International latest edition), 2009. |
| 2 | Shriver and Atkins', Inorganic Chemistry, Oxford University Press, 2010. |
| 3 | Austin, G.T., Shreve’s Chemical Process Industries, McGraw - Hill Book Co, 5th. Ed., 1984. |

**9. Facilities required for teaching and learning:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Facility** |  | **No.** | **Facility** |
| 1 | Lecture classroom |  | 4 | Data show system |
| 2 | Presenter |  | 5 | Sound system |
| 3 | White board |

**10. Matrix of knowledge and skills of the course:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Topic** | **Aims** | **Knowledge and understanding** | **Intellectual Skills** | **Professional Skills** | **General Skills** |
| 1 | Gaseous status | 1 | A1 | B1 | - | D3,D6 |
| 2 | substantial and heat balance in fuel burning operations and chemical operations | 1 | A13, A16 | B1 | - | D3,D6 |
| 3 | properties of solutions | 1 | A1, A13 | B1 | C5 | D3,D6 |
| 4 | dynamic balance in physical and chemical operations | 1 | A16 | B1 | - | D3,D6 |
| 5 | kinetic chemical interactions | 1,6 | A13, A16 | B1, B4 | C5 | D3,D6 |
| 6 | electrochemistry | 1,6 | A1 | B1, B4 | - | D3,D6 |
| 7 | introduction to chemical corrosion | 1 | A1 | B1, B4 | - | D3,D6 |
| 8 | water processing | 1 | A1,A13 | B1 | C5 | D3,D6 |
| 9 | building materials | 1 | A13 | B1, B4 | C5 | D3,D6 |
| 10 | pollution and its treatment | 6 | A13 | B1, B4 | - | D3,D6 |
| 11 | Selected chemical industries: chemical manures – dyes – polymers – sugar – petrochemicals – semi-conductors – oil, greases and industrial detergents | 1,6 | A13 | B1, B4 | - | D3,D6 |

**Course Coordinator: Dr. Khaled Samir**

**Head of Department: Dr. Khaled Samir**

**Date of Approval: Jan. 2017**