



Course Specifications

Course Title:	Specialized English Language for Chemistry
Course Code:	31021227
Program:	Bachelor of Science in Chemistry
Department:	Chemistry Department
College:	Faculty of Science
Institution:	Albaha University

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A. Course Identification

1. Credit hours: 2 credit hours			
2. Course type			
a.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/>
b.	Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	Others <input type="checkbox"/>
3. Level/year at which this course is offered: 2 nd year/ 3 rd level			
4. Pre-requisites for this course (if any): English Language (2)(11030219)			
5. Co-requisites for this course (if any): None			

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	30
Other Learning Hours*		
1	Study	30
2	Assignments	15
3	Library	15
4	Projects/Research Essays/Theses	
5	Others(specify) (Worksheets)	6
	Total	66

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

English for Science has been designed for academic oriented students to provide language skills practice needed for effective participation in basic science course. It covers the key vocabulary, structure and usage which can be come across in academic textbooks, articles and lectures. In this course emphasis is placed on developing technical writing skills. Technical and science reading skills, science vocabulary, and oral presentations on science topics are also covered. Using English to hypothesize, reading skills, vocabulary building, finding main Ideas and note taking, and writing skills The topics are related to chemistry-biology-physics and mathematics. Topics include classification, comparing, cause and effect (color, light and sound), definition (energy), Hypothesizing : motion and gravity ... etc.

2. Course Main Objective

English for Science has been designed to develop the English Language skills of students pursuing degrees in chemistry. Moreover, to meet the specific needs of students' academic courses as well as those who want to specialize or work in any of the fields of science. It covers the key vocabulary, structure and usage which can be come across in academic textbooks, articles and lectures. It can be very useful for students who want to take part in any of the student exchange programs, or after graduating are interested in bilingual teaching. In this course emphasis is placed on developing technical writing skills. Technical and science reading skills, science vocabulary, and oral presentations on science topics are also covered. The topics are related to chemistry.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Define, understand and know the terms and vocabularies used in classification, comparing, cause and effect, and others used in sciences with particular concentration to chemistry.	1-1
1.2	Recognize and use vocabularies properly in sentences and texts.	1-2
1.3	Use of passive voice and active voice, comparing, cause and effect in proper tenses and structure of the sentences.	1-3
1...		
2	Skills :	
2.1	Reading, writing, speaking and understanding texts in chemistry and related sciences.	2-1
2.2	Understand, interpret and evaluate different texts that they may encounter in their daily and professional life.	2-2
2...	Apply grammar principles and construct the correct sentence.	2-3
3	Competences	
3.1	Demonstrate reading and writing skills relevant to chemistry and related sciences. Moreover, use English in class and communicate with staff members and classmates with clear expressions.	3-1
3.2	Use the English language learning strategies effectively and develop their English language skills continuously	3-2
3.3	Understand, interpret and evaluate different texts that they may encounter in their daily, academic and professional life.	3-3
	.	

C. Course Content

No	List of Topics	Contact Hours
1	Chapter 1 : Classifying: The composition of matter Sentence Patterns, the passive voice, Reading Skills, Vocabulary building and writing skills.	6
2	Chapter 2: Comparing : The element Using English to compare, Sentence Patterns and creating comparisons, Reading Skills Vocabulary building and writing skills	6
3	Chapter 3: Cause and Effect: color, light and sound Using English to show Cause and Effect:, Sentence Patterns, subordination Reading Skills, Vocabulary in context and vocabulary building and writing skills.	6
4	Chapter 4: Hypothesizing : motion and gravity Using English to hypothesize, reading skills, vocabulary building, finding main Ideas and note taking, and writing skills	6
5	Chapter 5 : Energy Using English to define, reading skills, vocabulary building, scanning, finding main Ideas and note taking, and writing skills	6
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Define, understand and know the terms and vocabularies used in classification, comparing, cause and effect, and others used in sciences with particular concentration to chemistry.	<ul style="list-style-type: none"> Lectures Debate and discussion Assignments (Co-operative & Individual assignments). Working in small groups. 	<ul style="list-style-type: none"> Continuous evaluation through interaction, and presentation of assignments. Evaluation of assignments. Quiz1 & Quiz2. Midterm exam. Final written exams.
1.2	Recognize and use vocabularies properly in sentences and texts.	<ul style="list-style-type: none"> Lectures Discussion and dialogue. solving exercises. assignments *work sheets 	<ul style="list-style-type: none"> Assessment evaluation Tests (periodic tests - mid-semester - final exam).
1.3	Use of passive voice and active voice, comparing, cause and effect in proper tenses and structure of the sentences.	<ul style="list-style-type: none"> Lectures * Discussion and dialogue. * Solve exercises in the book * assignments 	<ul style="list-style-type: none"> Tests (periodic tests - mid-semester - final exam). Assessment of assignments
...			
2.0	Skills		
2.1	Reading, writing, speaking and understanding texts in chemistry and related sciences.	<ul style="list-style-type: none"> Lectures Dialogue and discussion. Solving vocabulary exercises and building vocabulary 	<ul style="list-style-type: none"> Tests (periodic tests - mid-semester - final Exam). Assessment of assignments.
2.2	Understand, interpret and evaluate different texts that they may encounter in their daily and professional life.	<ul style="list-style-type: none"> Lectures Exercises assignments 	<ul style="list-style-type: none"> * exams Solving assignments and exercises
2.3	Apply grammar principles and	Lectures	* exams

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	construct the correct sentence.	<ul style="list-style-type: none"> Exercises assignments 	<ul style="list-style-type: none"> Solving assignments and exercises
Competence			
3.1	Demonstrate reading and writing skills relevant to chemistry and related sciences. Moreover, use English in class and communicate with staff members and classmates with clear expressions.	*Exams, worksheets and Assignments <ul style="list-style-type: none"> Reading training in the classroom individually. *Practicing writing in class and assignments.	Exams and Assignments. <ul style="list-style-type: none"> Evaluation of reading skills and development. Reading tests
3.2	Use the English language learning strategies effectively and develop their English language skills continuously		
...	Understand, interpret and evaluate different texts that they may encounter in their daily, academic and professional life.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Exam 1	5	10%
2	Assignment 1	6	5%
3	Mid-term Exam	9	20%
4	Assignment 2	11	5%
5	Reading test	12	10%
6	Final exam	End of semester	50%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- The presence of faculty members minimum 4 hours/week to provide advice, academic advice and academic guidance to the student in need.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	English for Science. By: Fran Zimmerman; Prentice Hall Regents. ISBM: 0-13-282179-6
Essential References Materials	1- M. Charmas, English for Students of Chemistry. Wydawnictwo UMCS, Lublin 2008. 2- M. Robinson, F. Stoller, M. Constanza-Robinson, J. K. Jones, "Write Like a Chemist", Oxford University Press 2008

Electronic Materials	
Other Learning Materials	https://www.fluentu.com/blog/english/english-for-science#/ http://www.wata.cc/forums/showthread.php?20690-English-for-Science https://www.nature.com/scitable/ebooks/english-communication-for-scientists

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> Lecture room with tables and/or movable chairs for student group work. Modern classrooms equipped with modern teaching techniques and various projectors.
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board and data show
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching strategies and course satisfaction.	Student	Students feedback/ survey
Verifying Standards of Student Achievement	Independent member teaching staff	Check marking and assessment methods. Analyzing results of students.
Evaluation of Teaching, course contents and learning resources.	By the Department/ or external reviewer	direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	



Course Specifications

Course Title:	Organic Chemistry 1
Course Code:	31021225
Program:	Bachelor of Science in Chemistry
Department:	Chemistry
College:	Faculty of Science
Institution:	Albaha University

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A. Course Identification

1. Credit hours: 4 credit hrs. (3T + 1P)			
2. Course type			
a.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	
3. Level/year at which this course is offered: Level 3/ Second year			
4. Pre-requisites for this course (if any): General Chemistry 1 (31020104)			
5. Co-requisites for this course (if any): none			

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	45
2	Laboratory/Studio	30
3	Tutorial	
4	Others (specify)	
	Total	75
Other Learning Hours*		
1	Study	45
2	Assignments	15
3	Library	15
4	Projects/Research Essays/Theses	
5	Others(specify)	
	Total	75

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Lectures: This course is designed to give a broad overview of aliphatic hydrocarbons, with respect to, nomenclature, synthesis and reactions of alkanes, alkenes, alkynes, alkyl halides, alcohols, phenols and Ethers and epoxides. The course encompasses: introduction to Organic Chemistry, Bonding in organic compounds; isomerism; hybridization, bond cleavage, free radical, nucleophile and electrophile, inductive and resonance effects, Types of reactions in organic chemistry, Stereochemistry chemistry, .

Labs: The labs will provide student with an opportunity to identify and study commonly alkanes, alkenes, alcohols and phenols. Emphasis will be placed on the Precautions and safety rules and the safety in the chemical laboratory. The laboratory will include determination of melting and boiling points of organic compounds, crystallization, distillation, separation of organic compounds.

2. Course Main Objective

The objectives of this course are to:

- 1- Introduce students to the basic concepts of Organic Chemistry and bonding in organic chemistry;
- 2- Expose students to the knowledge of classification of organic compounds, properties, structure and types of reactions.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Define the general concepts, terms, common and IUPAC nomenclature of hydrocarbons, most known functional groups, molecular structures and their physical properties.	1.1
1.2	Explain the stereochemistry, general preparation methods and their chemical reactions.	1.2
1.3	Recall the chemical transformation between these compounds	1.3
1..		
2	Skills :	
2.1	Apply his chemical knowledge in solving the chemical problems.	2.1
2.2	Use different chemical ways in preparing the organic molecules and investigate their chemical properties.	2.2
2.3	Conduct laboratory experiments by using different techniques and effective communication to identify the chemical compounds.	2.4
3	Competence:	
3.1	Bear self-learning responsibility and decision-making.	3.1
3.2	Write reports and use various techniques to collect and analyze information and presenting it to others.	3.3

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to the course. Bonding in organic compounds; isomerism; hybridization (sp^3 , sp^2 , sp); bond cleavage, free radical, nucleophile and electrophile.	6

	Inductive and resonance effects. Functional groups of organic families.	
2	Types of reactions in organic chemistry: addition, substitution and elimination. Alkanes: Nomenclature, structure, properties source, preparation and reactions.	6
3	Alicyclic compounds: Nomenclature of mono and polycyclic compounds, preparation, reactions and Conformations of cycloalkanes.	4.5
	Exam 1	1
4	Stereochemistry: chiral compounds, enantiomers, diastereoisomers, racemic mixture, R/S system and optical activity.	4.5
5	Alkenes and cycloalkenes: Nomenclature, structure, properties, preparation and reactions.	3
6	Alkynes: Nomenclature, structure, properties, preparation and reactions.	3
	Mid Term Exam	1
7	Alkyl halides: Nomenclature, structure, properties, preparation and reactions. SN ¹ , SN ² , E ¹ and E ² Reactions.	6
8	Alcohols: Nomenclature, structure, properties, preparation and reactions. Ethers and epoxides: Nomenclature, structure, properties, preparation and reactions.	6
	Exam 2	1
9	Phenols: nomenclature, properties, preparation and reactions.	3
	Final Exam	2

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Define the general concepts, terms, common and IUPAC nomenclature of hydrocarbons, most known functional groups, molecular structures and their physical properties.	<ul style="list-style-type: none"> • Lectures • Debate and discussion • Working in small groups • Individual and group assignments 	<ul style="list-style-type: none"> • Quizzes • Midterm exam. • Assignments evaluation *Final written exams.
1.2	Explain the stereochemistry, general preparation methods and their chemical reactions.		
1.3	Recall the chemical transformation between these compounds		
1..			
2.0	Skills		
2.1	Apply his chemical knowledge in solving the chemical problems.	<ul style="list-style-type: none"> • Lectures • Debate and discussion • Working in small groups • Individual and group assignments • Laboratory 	<ul style="list-style-type: none"> • Quizzes • Midterm exam. • Assignments evaluation *Final written exams. *laboratory reports
2.2	Use different chemical ways in preparing the organic molecules and investigate their chemical properties.		
2.3			
	Conduct laboratory experiments by		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	using different techniques and effective communication to identify the chemical compounds.	sessions <ul style="list-style-type: none"> Individual and Group work 	Final lab exam
3.0	Competence		
3.1	Bear self-learning responsibility and decision-making.	<ul style="list-style-type: none"> Team work Small groups and the distribution of roles. PowerPoint presentation. Writing reports 	Oral discussion Report evaluation
3.2	Write reports and use various techniques to collect and analyze information and presenting it to others.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	5	5
2	Midterm Exam	9	10
3	Quiz2	13	5
4	Assignments and Activities	During Semester	10
5	Final Practical Exam	16	10
6	Lab Reports	During Semester	10
7	Final Exam	17	50

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- The presence of faculty members to provide advice, academic advice and academic guidance to the student in need within the six hours a week available to all students.
- Arrange extra hours gifted students or Program for students who default in scholastic achievement.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Hornback, Joseph, <i>Organic Chemistry: Student Solutions Manual [book]</i> , NY:Thompson Brook/Cole, 2005, 507pp, ISBN 0534397107
Essential References Materials	Klein, David R. “ <i>Organic Chemistry as a Second Language</i> , 2 nd ed. ISBN 978-0-470-12929-6 {English edition}
Electronic Materials	<ul style="list-style-type: none"> https://chemistry.tutorvista.com/organic-chemistry/aliphatic-hydrocarbon.html https://chem.libretexts.org/LibreTexts/Athabasca_University/Chemistry_360%3A_Organic_Chemistry_II/Chapter_17%3A_Alcohols_and_Phenols https://chem.libretexts.org/Core/Organic_Chemistry/Alkyl_Ha

	<p>lides</p> <ul style="list-style-type: none"> • https://www.khanacademy.org/science/organic-chemistry/stereochemistry-topic • http://amrita.olabs.edu.in/?sub=73&brch=8&sim=141&cnt=2 • https://www.youtube.com/watch?v=iOAG93aqPKs • https://www.youtube.com/watch?v=p8F5Duo8g68 • https://www.youtube.com/watch?v=mAZqGzFbGQE • https://www.youtube.com/watch?v=-S3DHdP-gXU
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> • Classrooms equipped with smart board and display screen for (40) students • Practical labs provided with glass wares, reagents, melting point apparatus and different equipment for (20-25) students.
Technology Resources (AV, data show, Smart Board, software, etc.)	Provision of computers for students training to be used in research on scientific topics that serve the course.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> • TLC gars. • Glass tubes. • A sensitive balance Chemicals

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching strategies.	Students	Direct Students feedback/survey
Course contents and Learning resources	Students, Faculty and external reviewer.	Direct
Verifying Standards of Student Achievement	Independent member teaching staff	Direct, check marking and assessment methods. Analyzing results of students.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	



Course Specifications

Course Title:	Inorganic Chemistry I
Course Code:	31021223
Program:	Bachelor of Science in Chemistry
Department:	Chemistry
College:	Faculty of Science
Institution:	Albaha University

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F. Learning Resources and Facilities.....	6
1.Learning Resources	6
2. Facilities Required.....	7
G. Course Quality Evaluation	7
H. Specification Approval Data	7

A. Course Identification

1. Credit hours: 4 credits			
2. Course type			
a.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	
3. Level/year at which this course is offered: 3 rd level /2 nd year			
4. Pre-requisites for this course (if any): General Chemistry I (31021104)			
5. Co-requisites for this course (if any): None			

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	45
2	Laboratory/Studio	30
3	Tutorial	
4	Others (specify)	
	Total	75
Other Learning Hours*		
1	Study	60
2	Assignments	15
3	Library	15
4	Projects/Research Essays/Theses	15
5	Others (specify): web search	
	Total	105

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

This course provides students with an introduction to inorganic chemistry. Classification of elements, modern periodic table and periodic trends in properties of elements atomic and ionic radii, ionization energy, electron affinity, electronegativity, valence, oxidation states and chemical reactivity. Course includes electronic structure of elements, bonding theories, chemical forces, acids and bases, redox chemistry, solids, and chemical reactions. Chemistry of main group elements (s- & P-block elements), properties and reactions of main group elements. A two-hour laboratory in which basic Inorganic chemistry laboratory procedures and techniques are presented, including identification of anions and cations (Qualitative analysis).

2. Course Main Objective

- 1- Knowledge of basic concepts and principles of inorganic chemistry.
- 2- To introduce the students to classification of elements, periodic table and periodic trends.
- 3- To introduce the students into chemical formulas, name inorganic compounds, and demonstrate a knowledge of basic atomic theory.
- 4- To introduce Students to basic atomic theory, general concepts of atomic structure and bonding.
- 5- Provide the students with knowledge of the chemical and physical properties of main group elements.
- 6- To provide students with laboratory work and perform qualitative analysis.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Define the periodic trends and concepts related to main group elements.	1-1
1.2	Recall symbols, formulas, chemical equations for reactions of s-block and p-block elements.	1-2
1.3	Explain and interpret chemical and physical properties of main group elements, and theories of bonding and chemical forces.	1-3
1...		
2	Skills :	
2.1	Applying critical thinking in explaining the behavior of main group elements and their compounds.	2-2
2.2	Conduct laboratory experiments and qualitative analysis by using different techniques and effective communication	2-4
2.3		
3	Competence:	
3.1	Cooperate with his colleagues in teamwork and actively collaborate within one team in solving chemical problems related to main group elements.	3-1
3.2	Bear self-learning responsibility and decision-making	3-2
3.3	Write the lab reports from results obtained from using practical techniques.	3-3
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to inorganic chemistry, Origin of the elements and atomic structure, Bohr's atomic model.	3
2	Nomenclature of Inorganic Compounds	3
3	Overview of the modern periodic Table, classification of elements, periodic properties and periodic trends in properties of elements (Periodic Trends: atomic and ionic radii, ionization energy, electron affinity, electronegativity, valence, oxidation states, acid base properties and chemical reactivity.	6
4	Molecular structure and bonding: Ionic Bond, ionic compounds, lattice energy of ionic crystals. Covalent bond: Lewis structures,	6
5	Valence Bond Theory, Molecular Orbital theory. isoelectric series in covalent compounds.	6
...	Chemical forces: Types of chemical forces, internuclear distances and atomic radii, hydrogen bonding, effect of chemical forces.	3
	* Midterm exam	
	Chemistry of Main group elements : s-block elements, Alkali metals, alkaline earth metals	6
	Hydrogen: Isotopes of hydrogen, properties of hydrogen, hydrides, water and hydrogen bonding, biological aspects of hydrogen bonding.	3
	Chemistry of main group elements: p-block elements	9
	* Final exam	
Total		45

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Define the periodic trends and concepts related to main group elements.	* Lectures * Discussion questions during class * Assignments	* Short quizzes * Mid-term exam * Final exam * Individual assignments
1.2	Recall symbols, formulas, chemical equations for reactions of s-block and p-block elements.		
1.3	Explain and interpret chemical and physical properties of main group elements, and theories of bonding and chemical forces.		
2.0	Skills		
2.1	Applying critical thinking in explaining the behavior of main group elements and their compounds.	* Lectures * Discussion questions during class * Assignments	* Short quizzes * Mid-term exam * Final exam * Individual and group assignments
2.2	Conduct laboratory experiments and qualitative analysis by using different		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.3	techniques and effective communication		
3.0	Competence		
3.1	Cooperate with his colleagues in teamwork and actively collaborate within one team in solving chemical problems related to main group elements.	* Lecture preparation * Discussions * solving problems	Monitoring individual behavior during the class and group work.
3.2	Bear self-learning responsibility and decision-making		
3.3	Write the lab reports from results obtained from using practical techniques.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	5	5%
2	Mid-term exam	9	10%
3	Quiz 2	13	5%
4	Lab report	During semester	10%
5	Assignments	During semester	10%
6	Lab final	16	10%
7	Final Exam	17	50%
8			

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Recommend faculty have 2 hours per week office hours available for student appointments.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1- Inorganic chemistry by Shriver & Atkins, 5 th Edition: W. H. Feeman and Company 2- Inorganic Chemistry, Principles of structure and reactivity, 4 th edition. J.E.Huheey and others.
Essential References Materials	Inorganic Chemistry (4 th edition); Catherine E. Housecroft and Alan G. Sharpe. Pearson (2012).

Electronic Materials	None
Other Learning Materials	None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	* Lecture room with tables and/or movable chairs for student group work * Laboratory for experimentation
Technology Resources (AV, data show, Smart Board, software, etc.)	* Smart Board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Glassware, chemicals and ordinary laboratory equipment for practical part

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching strategies.	Students	Direct Students feedback/survey
Course contents and Learning resources	Students, Faculty and external reviewer.	Direct
Verifying Standards of Student Achievement	Independent member teaching staff	Direct, check marking and assessment methods. Analyzing results of students.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	



Course Specifications

Course Title:	General Chemistry 2
Course Code:	31021221
Program:	Bachelor of Science in Chemistry
Department:	Chemistry
College:	Faculty of Science
Institution:	Albaha University

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A. Course Identification

1. Credit hours: 4 credit hrs. (3 T + 1 P)			
2. Course type			
a.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/>
b.	Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	Others <input type="checkbox"/>
3. Level/year at which this course is offered: Third Level, Second Year			
4. Pre-requisites for this course (if any): General Chemistry I (31021104)			
5. Co-requisites for this course (if any): None			

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	45
2	Laboratory/Studio	30
3	Tutorial	
4	Others (specify)	
	Total	75
Other Learning Hours*		
1	Study	45
2	Assignments	15
3	Library	15
4	Projects/Research Essays/Theses	
5	Others (specify)	
	Total	75

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

This course is the second course in the General Chemistry sequence that when combined with the first semester provides a thorough foundation of chemical principles. This course is appropriate both as an introductory course for chemistry and other science majors as well as an introductory and terminal course for non-science majors who desire a basic foundation in chemical principles. In this course the students will learn the fundamental nature of chemicals and chemical systems and becoming familiar with the language symbols, and rules of chemistry. **Emphasize will be more on equilibrium principles, kinetics, thermodynamics and electrochemistry.**

2. Course Main Objective

The main objective of this course is to provide students with a solid background in general chemistry which is a base for advanced chemistry courses.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Define basic concepts of chemical equilibrium, chemical kinetics, properties and types of solutions, different states of matter and Le Chatelier's Principle.	1.1
1.2	State the basic laws and principles of thermodynamics, kinetics and electrochemistry, like Le Chatelier's Principle, rate law, Arrhenius law, Nernst law, collision theory, and nuclear chemistry principles, standard electrode and cell potential.	1.2
1.3	Explain the principle effect on chemical reactions.	1.3
1...		
2	Skills :	
2.1	Use law and principles like Le Chatelier's Principle, rate law, Nernst equation and different quantities related to kinetics, chemical equilibrium and thermodynamics.	2.1
2.2	Apply thermodynamics principles, kinetic laws and equilibrium to different reactions.	2.2
2.3	Illustrate and demonstrate the experiments of Kinetics, electrochemistry and thermodynamics concepts.	2.3
2...		
3	Competence:	
3.1	Work effectively in groups and exercise leadership when appropriate.	3.1
3.2	Write reports and use various techniques to collect and analyze information.	3.3
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Chemical Equilibria: Dynamic equilibrium, equilibrium constant	3/2

2	Chemical Equilibria: Predicting the direction of reactions, calculating equilibrium concentrations	3/2
3	Chemical Equilibria: Le Chalelier's Principle Exam 1	3/2
4	Acid-Base Equilibria: Acid and base ionization constants, calculating concentrations and pH, hydrolysis	3
5	Acid-Base Equilibria: Buffers, Titrations	3
6	Solubility Equilibria: Solubility product constant, common-ion effect, precipitation calculations	3/2
7	Solubility Equilibria: Effect of pH and complex-ion formation Exam 2	3/2
8	Kinetics: Reaction rates, Rate law	3
9	Kinetics: Integrated Rate law, Half-life	3
10	Kinetics: Collision Theory, Reaction mechanisms, catalysts	3
11	Thermodynamics: First Law, Second Law	3
12	Thermodynamics; Free energy and spontaneity, free energy and equilibrium constants	3
13	Electrochemistry: Half-reactions, balancing redox reactions, voltaic cells	3/2
14	Electrochemistry: Electromotive force, Standard Electrode Potentials	3/2
15	Electrochemistry: Free energy and equilibrium constants form emfs	3
16	Electrochemistry: Nernst Equation	3/2
17	Electrochemistry: Electrolytic cells and batteries	3
18	Nuclear chemistry: Radioactivity, stability, types of radioactive decay, Particle accelerators, detection methods, rates of decay, energy of nuclear reactions	3
19	Optional: Description inorganic, or intro to organic, or polymers	3
Total		

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Define basic concepts of chemical equilibrium, chemical kinetics ,properties and types of solutions, different stats of matter and Le Chalelier's Principle.	Lectures PowerPoint presentation Debate and discussion. Assignments (Co-operative & Individual assignments).	quizzes assigned textbook problems; Responses to in-class questions asked by instructor. students group work Mid-term and Final exam
1.2	State the basic laws and principles of thermodynamics, kinetics and electrochemistry, like Le Chalelier's Principle, rate law, Arrhenius law, Nernst law, collision theory, and nuclear chemistry principles, standard electrode and cell potential.		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.3	Explain the principle effect on chemical reactions.		
2.0	Skills		
2.1	Use law and principles like Le Chalelier's Principle, rate law, Nernst equation and different quantities related to kinetics, chemical equilibrium and thermodynamics.	<ul style="list-style-type: none"> * Lectures * Discussion questions during class * Assignments 	<ul style="list-style-type: none"> * Short quizzes * Mid-term exam * Final exam * Individual and group assignments
2.2	Apply thermodynamics principles, kinetic laws and equilibrium to different reactions.	<ul style="list-style-type: none"> • Lectures • Scientific movies and animated life cycles. • Debate and discussion. • Assignments (Co-operative & Individual assignments). • Cooperative Learning • Working in small groups Individual & group research 	<ul style="list-style-type: none"> • Continuous evaluation through interaction during work in the laboratory. • Presentation of summaries and reports during experimentation. • Evaluation of assignments. • Lab reports. • Midterm exam. Final practical exam
2.3	Illustrate and demonstrate the experiments of Kinetics, electrochemistry and thermodynamics concepts.	Laboratory experimentation	Lab reports Lab final exam
3.0	Competence		
3.1	Work effectively in groups and exercise leadership when appropriate.	<ul style="list-style-type: none"> *The classroom strategy of student-teacher and student-student discussions and group Work. *problem-solving encourages the development of these skills. 	<ul style="list-style-type: none"> * Participation and interaction with peers during class. *Monitoring individual behavior during the class and group work.
3.2	Write reports and use various techniques to collect and analyze information.	<ul style="list-style-type: none"> • Working in small groups Individual & group assignments 	<ul style="list-style-type: none"> • Evaluation of individual & group works. Observation Card

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	5	5%
2	Midterm Written Theoretical Exam	9	10%
3	Quiz2	13	5%

#	Assessment task*	Week Due	Percentage of Total Assessment Score
4	Activities & Attendance	During Semester	10%
5	Final Practical Exam	16	10%
6	Lab Reports	During semester	10%
7	Final Exam	17	50%
8			

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:. (include amount of time teaching staff are expected to be available each week)

- The presence of faculty members to provide advice, academic advice and academic guidance to the student in need within the six hours a week available to all students.
- Arrange extra hours gifted students or Program for students who default in scholastic achievement.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	General Chemistry Enhanced by Ebbing and Gammon 9th Edition Houghton Mifflin (this is probably the best written and most easily read book on the market)
Essential References Materials	General Chemistry: Principles and Structure; by: James E. Brady; 5 th edition, Wiley (2000). ISBN-13: 978-0471528746 - Recommended Books and Reference Material (Journals, Reports, etc) (Attach List) Foundations of Chemistry: Applying POGIL Principles. <i>D. Hanson; Pacific Crest: Lisle IL, 2007.</i> Chemistry: A Guided Inquiry. <i>R. Moog and J. Farrell; John Wiley & Sons: New York, 2008</i>
Electronic Materials	The “Media Enhanced Edition” of the Ebbing & Gammon text contains visualizations, tutorials, and video lessons for students. Online tutoring is also available as well as practice tests. The Enhanced version of the text is recommended.
Other Learning Materials	None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> • Classrooms equipped with smart board and display screen for (40) students • Practical labs provided with glassware, chemicals and different equipment for (20-25) students.
Technology Resources (AV, data show, Smart Board, software, etc.)	Provision of computers for students training to be used in research on scientific topics that serve the course.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> • Glass wares. • A sensitive balance and melting point equipment and other lab instruments. • Chemicals.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching strategies.	Students	Direct Students feedback/survey
Course contents and Learning resources	Students, Faculty and external reviewer.	Direct
Verifying Standards of Student Achievement	Independent member teaching staff	Direct, check marking and assessment methods. Analyzing results of students.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	



Course Specifications

Course Title:	Principle Statistics and Probability
Course Code:	31041221
Program:	Bachelor Degree in Chemistry
Department:	Chemistry
College:	Faculty of Science in Al -Baha
Institution:	Al - Baha University

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2. Facilities Required		5
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H. Specification Approval Data	6	

A. Course Identification

1. Credit hours: 3 hours (lecture)			
2. Course type			
a.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	
3. Level/year at which this course is offered: 3th Level: / 2th year:			
4. Pre-requisites for this course (if any): Non			
5. Co-requisites for this course (if any): Non Non			

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	80%
2	Blended	√	10%
3	E-learning	√	5%
4	Correspondence		
5	Other		5%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	60
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	60
Other Learning Hours*		
1	Study	90
2	Assignments	45
3	Library	45
4	Projects/Research Essays/Theses	-----
5	Others(specify)	
	Total	180

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

This course introduces the basic concepts of statistics in chemistry, with a focus on both univariate (single-variable) and bivariate (two-variable) data in chemistry. The course starts with an introduction to statistics terms and then moves on to organization and display of data. Analysis of univariate data by way of measures of central tendency (such as the mean or average), dispersion (such as the variance), and asymmetry ("skewness") is presented next, followed by an introduction to probability theory in chemistry.

2. Course Main Objective

- Learn statistics terms
- Learn the organization and display of data in chemistry.
- Learn measures of central tendency, dispersion and skewness and its application.
- Learn basic concepts of statistical analysis that use univariate (single-variable) and vicariate (two-variable) data in chemistry
- Learn the basics of probability theory in chemistry.

3. Course Learning Outcomes

CLOs		Aligned PLOs
Knowledge		
	Define the related basic scientific facts, concepts, principles and techniques in statistics and probability theory	K1
	Recognize the relevant theories and their applications in basic mathematics.	K2
	Recall Condition Correlation and Regression, probability use Bayes Theorem	K3
Skills		
	Apply statistical tools for simple data analysis, scientific models and tools effectively	S1
	Discuss the results of statistical measures	S1
	Evaluate probability of events using different rules	S3
	Solve problems using a range of formats and approaches in basic science	S3
	Present the data graphically	S4
Competence		
	Use the internet to write reports about basic statistical principles	C1
	Work effectively in groups and exercise leadership when appropriate.	C3
	Present information clearly in both written and oral form.	C2
	Communicates effectively in oral and written form in educational situations related to the subjects of the course.	C1

C. Course Content

No	List of Topics	Contact Hours
1	Definition and general view of statistics	4
2	Measures of central tendency (Mean, Median, Mode) of the simple data and the frequency distribution	8
3	Measures of dispersion (The Range – The Variance and the standard deviation - Coefficient of variation) of the simple data and the frequency distribution	8
4	Moments and Measure of Skewness and Kurtosis	4
5	Correlation measures, Simple Linear regression	8
6	Sample space and Events Counting Techniques (Fundamental basics, Addition Rule – Multi-placation Rule- Permutation and Combinations)	8
7	Definition of the probability and its applications	8
8	Conditional probability - Independence of events and Bayes theorem and its applications	8
Total		

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Define the related basic scientific facts, concepts, principles and techniques in statistics and probability theory	<ul style="list-style-type: none"> • Lectures • Debate and discussion • Assignments (Co-operative & Individual assignments). • Working in small groups 	<ul style="list-style-type: none"> • Continuous evaluation through interaction, and presentation of summaries and reports during lectures. • Evaluation of assignments. • Quiz1 & Quiz2. • Midterm exam. • Final written exams.
1.2	Recognize the relevant theories and their applications in basic mathematics.	<ul style="list-style-type: none"> • Lectures • PowerPoint presentation • Debate and discussion. • Assignments (Co-operative & Individual assignments). • Cooperative Learning • Working in small groups • Individual & group research 	<ul style="list-style-type: none"> • Continuous evaluation through interaction, and presentation of summaries and reports during lectures. • Evaluation of assignments. • Quiz1 & Quiz2. • Midterm exam. • Final written exam.
1.3	Recall Condition Correlation and Regression, probability use Bayes Theorem	<ul style="list-style-type: none"> • Lectures • PowerPoint presentation • Debate and discussion. • Assignments (Co-operative & Individual assignments). • Cooperative Learning • Working in small groups • Individual & group research 	<ul style="list-style-type: none"> • Continuous evaluation through interaction, and presentation of summaries and reports during lectures. • Evaluation of assignments. • Quiz1 & Quiz2. • Midterm exam. • Final written exam
2.0	Skills		
2.1	Apply statistical tools for simple data analysis, scientific models and tools effectively	<ul style="list-style-type: none"> • Lectures • Debate and discussion. 	<ul style="list-style-type: none"> • Continuous evaluation through interaction, and presentation of

		<ul style="list-style-type: none"> • Assignments (Co-operative & Individual assignments). • Cooperative Learning • Working in small groups Individual & group research 	summaries and reports during lectures. <ul style="list-style-type: none"> • Quiz1 & Quiz2. • Midterm exam. • Final written exam. Evaluation of assignments
2.2	Solve problems using a range of formats and approaches in basic science	<ul style="list-style-type: none"> • Lectures • Debate and discussion. • Assignments (Co-operative & Individual assignments). • Cooperative Learning • Working in small groups Individual & group research 	<ul style="list-style-type: none"> • Continuous evaluation through interaction, and presentation of summaries and reports during lectures. • Evaluation of assignments. • Quiz1 & Quiz2. • Midterm exam. Final written exam.
2.3	Evaluate probability of events using different rules	<ul style="list-style-type: none"> • Lectures • PowerPoint presentation • Debate and discussion. • Assignments (Co-operative & Individual assignments). • Cooperative Learning • Working in small groups Individual & group research 	<ul style="list-style-type: none"> • Continuous evaluation through interaction, and presentation of summaries and reports during lectures. • Evaluation of assignments. • Quiz1 & Quiz2. • Midterm exam. Final written exams.
3.0	Competence		
3.1	Use the internet to write reports about basic statistical principles	Team work- Assignments-student presentation-reporting- Scientific media Co-operative & Individual assignments. Cooperative Learning.	<ul style="list-style-type: none"> • Evaluation of individual & group works. Observation Card
3.2	Work effectively in groups and exercise leadership when appropriate.	<ul style="list-style-type: none"> • Working in small groups Group research	Evaluation of individual & group works.
3.3	Present information clearly in both written and oral form.	<ul style="list-style-type: none"> • small groups and the distribution of roles. • PowerPoint presentation. Writing reports	Oral discussion Report evaluation

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework & Classwork Assignments	During the Semester	10%
2	The First Mid-Term Examination (Written Test)	The 7th Week	20%
3	The Second Mid-Term Examination (Written Test)	The 12th Week	20%
4	The Final Examination (Written Test)	The 16-17 th Week	50%
	Total		100

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Follow-up by the head of the department.
- Define 8 office hours per week for each member of the faculty who resides in his office.
- Define 2 hours weekly as Academic guidance for each faculty member for guiding a group of students academically.
- Give guidance so encouraging in assessing the performance of a teacher.
- Creating the means to make the teacher benefit of his time during his stay in office.
- Non-scientific services to assist the teacher to attend office hours.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<p>1-Lectures notes.</p> <p>2-Chapters from different text books.</p> <p>3-Bluman, A. G., "Elementary Statistics a Step by Step Approach", 6th Edition, McGraw-Hill, (2006).</p> <p>4- Larson, R. C. and Farber, E. , " Elementary Statistics: Picturing the World", 3rd Edition, Prentice Hall, (2006).</p>
Essential References Materials	<p>Lecture</p> <ul style="list-style-type: none"> ● Larson & Farber, "Elementary Statistics: Picturing the World", 3rd Edition (2006)
Electronic Materials	<ul style="list-style-type: none"> ● https://www.youtube.com/watch?v=fpxaZ9Pv2HM&list=PL9fwy3NUQKwZKOpj354PRgwYPWWgxchnI ● https://en.wikipedia.org/wiki/Abstract_algebra ● https://www.youtube.com/watch?v=4gVA64K1AwY&list=PLp5QO1iuiUkN7KGvBPXUX5gE04fiw5G18 ● https://www.extension.harvard.edu/open-learning-initiative/abstract-algebra
Other Learning Materials	<ul style="list-style-type: none"> ● Microsoft Excel 2007 – 2010 ● Minitab <p>SPSS.</p>

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms equipped with smart board and display screen for (40) students
Technology Resources (AV, data show, Smart Board, software, etc.)	Provision of computers for students training to be used in research on scientific topics that serve the course.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	-----

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Extent of achievement of course learning outcomes	The teacher using an excel program that measure CLO's	Direct
Quality of learning resources	Students and Program Leaders	Direct
Effectiveness of teaching	Students	Indirect (Questionnaires)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods(Direct, Indirect)

H. Specification Approval Data

Council / Committee	1- Prof. Dr./ Ahmed Hamed Abd Ellah 2- Dr./ 3- Dr./
Reference No.	
Date	