Specification for Chemistry course

2025/2026

1-Basic information

1.	**Course title**	Chemistry							
2.	**Course code**	CHE.113							
3.	**Department offering the course**	Chemistry							
3.	**Level**	1st year							
4.	**Semester**	Fall semester							
5.	**Number of units/credit hours**	Theoretical	1	Practical	1(2)	Other	0	Total	2(3)
6.	**Course Type**	√ **Obligatory** **Elective**							
7.	**Academic program**	Bachelor of Veterinary Medicine (BVM)							
8.	**University**	Benha University							
9.	**Faculty**	Veterinary medicine							
10.	**Name of course coordinator**	Prof. Dr. WAGDI ELDOGDOG Faculty of science, Benha university							
11.	**Specification Approval Date**	**Faculty council/ 27-8-2025**							
12.	**Course Specification Approval**	**Department council 8/7/2025**							

2-Course overview

- **Course contents written in the program bylaw:**
- Physical chemistry (states of matter, solutions, chemical equilibrium and kinetics. Thermochemistry, electrolytic conduction, application of ionic theory). Organic chemistry (General principles of alkanes, alkenes, alkynes, alcohols, ethers aldehydes and ketones); saturated monocarboxylic acids; monocarboxylic, acid derivatives; amines; mono substituted monocarboxylic acids; carbohydrates; isomerism, aromatic compounds.

3- Intended learning outcomes of the course (ILOs):

	(NARS)		**Course ILOS**	
	Code	**Content**	**Code**	**Content**
			a1	Identify chemical formulae of inorganic and units of some

Knowledge and understanding	2.1	Basic sciences of biology, chemistry, biophysics, genetics, biostatics, computer science and veterinary terminology.		parameters.
			a2	Describe characteristics of different states of the matter and practical elements including trends whithin the periodic table and related theories.
			a3	Define the chemical concepts of inorganic and physical chemistry
			a4	Describe theories of chemical bonding and molecular orbital diagram for diatomic molecules
			a5	State the principles of thermochemistry
			a6	Explain the different types of neutralization reaction in analytical chemistry
			a7	Describe the different units of concentration
			a8	Identify the requirement the primary standard solution
			a9	Describe the different types of indictors in neutralization reaction
			a10	Identify physical and chemical properties of aromatic hydrocarbons " benzene, toluene
			a11	Describe physical and chemical properties of alcohols "methanol, ethanol and glycerol".
			a12	Describe physical and chemical properties of aldehyde and ketones
			a13	Outline physical and chemical

				properties of carboxylic acids "formic acid, acetic acid"
			a14	State physical and chemical properties of aromatic amines "aniline"
			a15	Mention general scheme for identification of simple liquid organic compounds.
Intellectual skills	4.2	Assess and criticize, at the fundamental level, how data are derived.	b1	Differentiate between the different states of the matter, elements and compounds based on the recognition and quantification of the properties
			b2	Solve chemical problems using computational .
			b3	Analyze collected chemical data using some data processing skills.
			b4	Point out different concepts in inorganic and physical chemistry.
			b5	Analyze chemical data to identify the compositions and chemical structures of inorganic and organic compounds.
			b6	Determine the properties of different states of matter (gases, liquids and solids).
			b7	Predict the different shapes of different inorganic materials.
			b8	Analyze collected chemical data using some data processing skills
			b9	point out different concepts of neutralization reaction in analytical chemistry
			b10	Analyze chemical data to determine the concentration of unknown
			b11	Differentiate between the different compounds based on the recognition of the proprieties

			b12	Identify the compositions and chemical structures of organic compounds
			b13	Propose some reaction mechanisms for different chemical processes
Professional and practical skills	3.1	Employ all the gained knowledge and understanding in clinical practice in a skillful pattern.	c1	Determine the chemical formulae and geometrical shapes of organic and inorganic molecules
			c2	Apply the knowledge that the student studied to propose the molecular structures of the molecules.
			c3	Investigate and identify the acidic and basic radicals
			c4	perform standard laboratory procedures in neutralization reaction analytical chemistry
			c5	Assess risk in laboratory work taking into consideration the specific hazards associated with the use of chemical materials as well as the safe and proper operation of the laboratory techniques
			c6	Report observations and measurements of change of color of indicator in neutralization titration to determine the concentration of unknown
			c7	Perform standard laboratory procedures in organic chemistry
			c8	Assess risk in laboratory work taking into consideration the specific hazards associated with the use of chemical materials as well as the safe and proper operation of the laboratory techniques
			c9	Examine the physical and chemical properties of compounds
			c10	Report observations and results of different chemical properties
General and transferabl	5.1	Work under pressure and / or contradictory conditions.	d1	Work under pressure during chemistry lab cession

e skills	5.6	Utilize computer and internet skills	d2	Utilize computer and internet skills, read paper via internet in chemistry

4- Teaching and learning methods					
Lectures	√	**Discussion & seminar**	√	**Practical**	√
Presentation & movies	√	**Problem solving**	√	**Brain storming**	√
Others					

- Course contents:

Week [W]	Lecture Topics					
		Theoretical	Practical topics	Laboratory [practical]	Others	Total
W1	Introduction	**1**	Introduction to neutralization reactions with standardization of hydrochloric acid with sodium carbonate.	**1(2)**	**0**	**2(3)**
W2	Identify chemical formulae of inorganic	**1**	Titration of strong acid with strong base and weak acid with weak base.	**1(2)**	**0**	**2(3)**
W3	Characteristics of different states of the matter 1	**1**	Titration of strong acid with weak base and weak acid with strong base.	**1(2)**	**0**	**2(3)**
W4	Characteristics of different states of the matter 2	**1**	Titration of mix(sodium carbonate and sodium hydroxide)with hydrochloric acid	**1(2)**	**0**	**2(3)**

W5	Characteristics of elements including trends within the periodic table and related theories.	**1**	Titration of mix(sodium carbonate and sodium bicarbonate)with hydrochloric acid	**1(2)**	**0**	**2(3)**
W6	Study the chemical bonding	**1**	Titration of mix (hydrochloric acid and phosphoric acid) with sodium hydroxide.	**1(2)**	**0**	**2(3)**
W7	Semester work (one hour exam)	----------				
W8	State the principles of electrochemistry.	**1**	Titration of mix (acetic acid and phosphoric acid) with sodium hydroxide.	**1(2)**	**0**	**2(3)**
W9	Study the molecular orbital diagram for diatomic molecules.	**2**	Aromatic hydrocarbons	**2(4)**	**0**	**3(5)**
W10	Study the state of matter	**1**	Alcohols	**1(2)**	**0**	**2(3)**
W11	Thermochemistry study	**1**	Aldehydes and ketones	**1(2)**	**0**	**2(3)**
W12	Stoichiometric study.	**1**	Carboxylic acids	**1(2)**	**0**	**2(3)**

W13	Atomic structure	**1**	Aromatic amines	**1(2)**	**0**	**2(3)**
W14	Hybridization	**1**	General scheme for identification of simple liquid organic compounds	**1(2)**	**0**	**2(3)**
W15	Practical exam	- ----------				

5- Assessment timing and grading:

a- Assessment methods (summative and formative)

1. **Formative assessment**: including (weekly quizzes, homework assignments and surveys).
2. **Summative assessment** including (quizzes, class activities, semester work, practical exam, oral exams and final written exams).

b- Assessment schedule and weight

Assessment method	Timing	Grade	Percent
Semester work including one hour exam	7th week	10	10%
Formative assessment	Through semester	------	----------
Practical exam	15th week	30	30%
oral exam	End of semester	10	10%
Written exam	End of semester	50	50%
Total		100	100%

6- Learning resources and supportive facilities:

Learning resources	**Main reference**	**Student handbook**: Lecture notes approved by Chemistry Department
	Essential books (text books)	• Peter Atkin, Loretta Jones, Leroy Laverman, Chemical Principle, Sixth Edition, W.H. Freeman, 2012. • J.D. Lee, Concise Inorganic Chemistry, 5th Edn. Blackwell Science, Australia, 1996. • F.A. Cotton, G. Wilkinson, C.A.Murillo, M. Bochmann, Advanced Inorganic Chemistry, 6th Edn, John Wiley&Sons, Inc., New York, 1999. • N.N. Greenwood, A. EarnShaw, Chemistry of

		Elements,2nd Edn, Butterworth Heinemann, USA 1997.
	Periodicals, Web sites, . . . etc	• Journal of Chemical Education (ACS). • http://www.docbrown.info/page07/appendixtrans11.htm. • www.ekb.eg
	Learning platform	Thinqi
supportive facilities	**Devices & instruments**	1- Data show. 2- Laboratory. 3- White board.

Matrices:

A- Content and ILOs matrix:

Topic	A) Knowledge and understanding	B) Intellectual skills	C) Professional and practical skills	D) General and transferable skills
Introduction	a1	-	-	-
Identify chemical formulae of inorganic	a1	b1, b5,b7	c1,c2,c3	d1,d2
Characteristics of different states of the matter	a2	b1,b2, b5,b9	c1,c2,c3	d1,d2
Characteristics of elements including trends within the periodic table and related theories.	a2,a3	b3,b4,b6	c1,c2,c3	d1,d2

Study the chemical bonding	a4	b3,b4,b5,b6	c1,c2,c3	d1,d2
State the principles of electrochemistry.	a4,a5	b5,b6	c1,c2,c3	d1,d2
Study the molecular orbital diagram for diatomic molecules.	a4,a5	B8,b11	c1,c2,c3	d1,d2
Study the state of matter	a2	B2,b5,b7	c1,c2,c3	d1,d2
Thermochemistry study	a5	b6,b9	c1,c2,c3	d1,d2
Stoichiometric study.	a3,a4,a5	b11,b13	c1,c2,c3	d1,d2
Atomic structure	a4,a5	b1,b2,b3	c1,c2,c3	d1,d2
Hybridization	a5	b5,b6	c1,c2,c3	d1,d2
Introduction to neutralization reactions with standardization of hydrochloric acid with sodium carbonate.	a6,a9	b7,b8, b11	c4,c5,c6	d1,d2
Titration of strong acid with strong base and weak acid with weak base.	a7,a8,a9	b7,b8, b11	c4,c5,c6,c7	d1,d2
Titration of strong acid with weak base and weak acid with strong base.	a7,a8,a9	b9,b10,b11	c8,c9,c10	d1,d2
Titration of mix(sodium carbonate and	a7,a8,a9	b10,b11	c4,c5,c6,c7	d1,d2

sodium hydroxide)with hydrochloric acid				
Titration of mix(sodium carbonate and sodium bicarbonate)with hydrochloric acid	a7,a8,a9	b7,b8, b11	c4,c5,c8,c9,c10	d1,d2
Titration of mix(hydrochloric acid and phosphoric acid)with sodium hydroxide.	a7,a8,a9	b9,b10,b11	c4,c5,c6	d1,d2
Titration of mix(acetic acid and phosphoric acid)with sodium hydroxide.	a7,a8,a9	b7,b8,b9, b11	c4,c5,c6,c7	d1,d2
Aromatic hydrocarbons	a10	b7, b9, b11	c4,c5, c9,c10	d1,d2
Alcohols	a11	b7,b8,b9	c4,c5,c6,c7	d1,d2
Aldehydes and ketones	a12	b9,b10,b11	c4,c5,c8,c9,c10	d1,d2
Carboxylic acids	a13	b7,b8,b9	c4,c5,c6, c10	d1,d2
Aromatic amines	a14	b10,b11	c9,c10	d1,d2
General scheme for identification of simple liquid organic compounds	a15	b7,b8,b9,b10,b12	c4,c5,c9,c10	d1,d2

B- Teaching, learning and assessment methods:

ILOs	Teaching and Learning methods						
	L	P&M	D&S	T	Ps	Bs	R and R

Knowledge and understanding	a1	√	√		√	√		√
	a2	√	√	√	√	√		√
	a3	√	√		√	√		√
	a4	√	√		√	√		√
	a5	√	√	√	√	√		√
	a6	√				√		√
	a7	√						
	a8	√				√		
	a9	√				√		
	a10	√	√			√		√
	a11	√	√			√		√
	a12	√	√					√
	a13	√	√					√
	a14	√	√					√
	a15	√	√					√
Intellectual skills	b1		√		√			
	b2		√		√			
	b3				√			
	b4				√			
	b5				√			
	b6				√			
	b7				√			
	b8	√						
	b9	√						
	b10	√						
	b11	√	√					
	b12	√	√					
	b13	√	√					
Professional and practical skills	c1		√		√			√
	c2		√		√			√
	c3							√
	c4					√		√
	c5					√		√
	c6		√			√		√
	c7		√			√		√
	c8		√					√
	c9		√					√
	c10		√					√
el al sk	d1		√	√	√			

	d2		√		√			

L**: Lecture,** P&M**: Presentations & Movies,** D&S: **Discussions & Seminars** PT**: Practical training,** Ps: **Problem solving,** Bs: **Brain storming**

C- Assessment methods and ILOs matrix::

ILOs		assessment method				
		Formative assessment	Semester work (1 hr exam)	practical	oral	Written
Knowledge and understanding	a1		√	√	√	√
	a2		√	√	√	√
	a3		√	√	√	√
	a4		√	√	√	√
	a5		√	√	√	√
	a6		√	√	√	√
	a7		√	√	√	√
	a8		√	√	√	√
	a9		√	√	√	√
	a10		√	√	√	
	a11		√	√	√	
	a12		√	√	√	
	a13		√	√	√	
	a14		√	√	√	
	a15			√	√	
Intellectual skills	b1	√	√	√	√	√
	b2	√	√	√	√	√
	b3	√	√	√	√	√
	b4	√	√	√	√	√
	b5	√	√	√	√	√
	b6	√	√	√	√	√
	b7	√	√	√	√	
	b8	√		√	√	
	b9	√		√	√	
	b10	√		√	√	
	b11	√		√	√	
	b12	√		√	√	
	b13	√		√	√	√
al and prac	c1		√	√		√
	c2		√	√		

	c3		√	√		
	c4		√	√		
	c5		√	√		
	c6		√	√		
	c7		√	√		
	c8			√		
	c9			√		
	c10		√	√		
General skills	d1	√	√			
	d2	√	√			

Course coordinator: Prof. Dr. WAGDI ELDOGDOG
Head of department Prof. Dr. ALA AMIN
-Program coordinator: Prof. Dr. Mahmoud Abouelroos