Course Specifications

Course Title:	**Colloid Chemistry and Phase Rule**
Course Code:	**4022146-1**
Program:	**Chemistry and Industrial Chemistry**
Department:	**Chemistry**
College:	**Applied Science**
Institution:	**Umm Al-Qura University**

Table of Contents

A. Course Identification

1. Credit hours:	**1 (theoretical)**
2. Course type	
a.	University ☐ College ☐ Department ☑ Others ☐
b.	Required ☑ Elective ☐
3. Level/year at which this course is offered:	**7th level/4th year**
4. Pre-requisites for this course (if any)**:**	General Chemistry (2)
5. Co-requisites for this course (if any)**:**	**---**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	√	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**	15
2	**Laboratory/Studio**	--
3	**Tutorial**	--
4	**Others** (specify) Exams & Quizzes	6
	Total	**21**
Other Learning Hours*		
1	**Study**	15
2	**Assignments**	10
3	**Library**	--
4	**Projects/Research Essays/Theses**	--
5	**Others** (specify) Exams & Quizzes	20
	Total	**45**

* 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

The course deals with the basic principles of colloid solutions and their properties, types of colloids and their methods of preparation as well as phase rule and different examples.

2. Course Main Objective

By the end of this course the students will be able to describe and explain:

- Fundamental concepts of colloid chemistry
- Types of colloids and their methods of preparation

- Properties of colloids and their applications
- Basics of phase rule and its importance
- Examples of phase rule of mono, di and tri component systems

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	Recognize the differences between colloids, suspension and true solution.	K3
1.2	List the preparation and purification of colloidal solutions.	K1
1.3	Memorize the characteristics of colloidal solutions.	K3
1.4	Mention the most important applications of colloidal solutions.	K1
1.5	Define the phase rule and its classifications.	K3
1.6	Describe the equilibrium curves for different systems.	K3
2	**Skills :**	
2.1	Compare between colloids and suspension and true solution.	S2
2.2	Give concise about the characteristics of colloidal solutions.	S1
2.3	Analyze the relations between different phases of materials.	S1
2.4	Apply the equilibrium curves for different systems.	S2
3	**Competence:**	
3.1	Manage the resources, time and collaborate with members of the group.	C2
3.2	Use the university library and web search engines for collecting information and search about different topics .	C1
3.3	Communicate the results of work to classmate and participation in class or laboratory discussions.	C4
3.4	Communicate with his lecturer and colleagues.	C4
3.5	Use IT and web search engines for collecting information.	C2

C. Course Content

No	List of Topics	Contact Hours
1	Definition of colloids with examples	2
2	Classification of colloids	2
3	Theory of colloid stabilization	2
4	Methods of colloids preparations	2
5	Colloid technology, Colloid properties	2
6	Importance of colloids and its importance	2
7	Definition of phase rule	2
8	First periodical exam	2
9	Physical changes dynamics	2
10	Cielus-Calpyron Equation	2
11	Studying phase rule low	2
12	Phase rule of one component system	2
13	Phase rule of two component system	2
14	Phase rule of three component system	2
15	Second periodical exam	2
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	Recognize the main differences between colloids and suspension and true solution.	Lecture	Quiz
1.2	List the preparation and purifying of colloidal solutions.	Web-based study	Quiz
1.3	Memorize the characteristics of colloidal solutions.	Lecture	Quiz
1.4	Mention the most important applications of colloidal solutions.	Discussion	Exam
1.5	Define the phase rule and its classifications.	Web-based study	Quiz
1.6	Describe the equilibrium curves for different systems.	Discussion	Quiz
2.0	**Skills**		
2.1	Compare between colloids, suspension and true solution.	Discussion	Quiz
2.2	Give concise about the characteristics of colloidal solutions	Lecture	Exam
2.3	Analyze the relations between different phases of materials.	Library visits	Short essays
2.4	Apply the equilibrium curves for different systems	Web-based study	Exam
3.0	**Competence**		
3.1	Manage the resources, time and collaborate with members of the group.	Discussion	Short essays
3.2	Use the university library and web search engines for collecting information and search about different topics .	Lecture	Quiz
3.3	Communicate the results of work to classmate and participation in class or laboratory discussions.	Library visits	Exam
3.4	Communicate with his lecturer and colleagues.	Lecture	Quiz
3.5	Use IT and web search engines for collecting information**.**	Discussion	Quiz

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	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 :

- Weekly office hours for discussion with the students.
- Academic advising for students.
- Availability of Staff members to provide counseling and advice.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• Handbook of Applied Surface and Colloid Chemistry, Vol. 1-2, Holmberg, Krister, John Wiley & Sons, New York, 2002. • PHYSICAL CHEMISTRY IN BRIEF, Josef P. Novak, Stanislav Labık, Ivona Malijevska, Institute of Chemical Technology, Prague, 2005.
Essential References Materials	• Emulsions, Foams, and Suspensions: Fundamentals and Applications, Laurier L. Schramm, WILEY-VCH Verlag GmbH & Co, 2005. • Colloidal Chemistry, A. Goel, Discovery Publishing House, 1st ed., New Delhi, 2006.
Electronic Materials	• http://www.chemweb.com • http://www.sciencedirect.com • http://www.rsc.org • Websites on the internet relevant to the topics of the course
Other Learning Materials	Not required

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Well-equipped lecture halls.
Technology Resources (AV, data show, Smart Board, software, etc.)	Computer and data show.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	No other requirements.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Quality of learning resources	Students	Complete the questionnaire evaluation of the course periodically.
Effectiveness of teaching and assessment.	Program Leaders	Observation of students performing a task.
Extent of achievement of course learning outcomes.	Peer Reviewer	Checking selected exam papers, and student assignments.

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	**Dr. Ahmed Fawzy Saad**
Reference No.	
Date	

Received by: Dr. Ismail Althagafi **Department Head**

Signature: **Date: 20/12/2019**