Course Specifications

Course Title:	**Lab safety**
Course Code:	**201BIO-2**
Program:	**Biology**
Department:	**Biology**
College:	**College of Arts and Sciences**
Institution:	**Najran University**

Table of Contents

A. Course Identification

1. Credit hours:2
2. Course type **a.** University ☐ College ☐ Department ☒ Others ☐ **b.** Required ☒ Elective ☐
3. Level/year at which this course is offered: III/ 2nd year
4. Pre-requisites for this course (if any)**: non**
5. Co-requisites for this course (if any)**: non**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	30	
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) E-learning	
	Total	30
Other Learning Hours*		
1	**Study**	22
2	**Assignments**	3
3	**Library**	10
4	**Projects/Research Essays/Theses**	5
5	**Others** (specify)**: Office hours**	10
	Total	50

***** 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 is proposed to provide an understanding of the basic safety in chemical laboratories. The student will be exposed to a quantitative interpretation of the fundamentals of accident description, estimation and management as well as general information on the use of personal protection equipment. A main objective of the course is to learn how to apply course knowledge to avoid accidents and how to minimize the risks and to deal with them by following appropriate procedures and precautions methods. The students should be prepared by the end of the course to work safe in the laboratories.

2. Course Main Objective

1. Describe the hazards associated with the chemicals and laboratory equipments
2. Demonstrate accident-prevention activities for safe working environment.
3. Describe the formal and regular training on the proper use of emergency equipment ar procedures that ensure proper disposal of hazardous waste
4. Understand safety Equipment and Emergency Procedures
5. Explain how to work with chemicals and equipment safely.
6. Apply course knowledge to avoid accidents and to minimize the risks in labs

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1	Recognize the hazards associated with the chemicals and laboratory equipments	
1.2	Demonstrate accident-prevention activities for safe working environment.	
1.3	Describe the formal and regular training on the proper use of emergency equipment and procedures that ensure proper disposal of hazardous waste	
2	**Skills :**	
2.1	Explain safety Equipment and Emergency Procedures	
2.2	Explain how to work with chemicals and equipment safely.	
2.3	Apply course knowledge to avoid accidents and to minimize the risks in labs	
3	**Competence:**	
3.1	Work independently and as a team work	
3.2	Manage recourses, time and other members of the group	
3.3	Communicate results of work with others	

C. Course Content

No	List of Topics	Contact Hours
1	Introduction Personal Protection Equipment Eye Protection, Clothing, Gloves	2
2	Laboratory Protocol Laboratory Visitors, , Comportment in the Laboratory, Housekeeping, Cleaning Glassware, Inhaling Harmful Chemicals, Distillations, Extractions, Refrigerators, Disposal of chemicals, General Disposal Guidelines, Unattended Operation of Equipment	2
3	Toxicity with chemicals	4

4	Source of Information-MSDS The Properties of Chemicals	4
5	Working with Chemicals and Apparatus Laboratory Hoods, Precautions for Using Electrical Equipment, Centrifuges	2
6	Working with Chemicals and Apparatus Using Steam, Using High-Pressure Air, Ultraviolet Lamps	2
7	Controlling Temperature Oil and Sand Baths, Cooling Baths and Cold Traps, Dry Ice Cooling Baths and Cold Traps, Cryogenic Liquid Cooling Baths and Cold Traps	2
8	Working with Reduced Pressure Precautions for Using Electrical Equipment	2
9	Safety Equipment and Emergency Procedures Fire Prevention, Dealing with a Fire, Evacuation Procedures, Personal Injuries Involving Fire	2
10	Safety Equipment and Emergency Procedures Chemicals on Skin, Clothing and Eyes Spill Clean-up	2
11	Basics of Biosafety Hierarchy of Controls, Administrative Control, Engineering Control	2
12	Basics of Biosafety Work Practices, Personal Protective Clothing or Equipment, Biosafety Levels (BSL, Biohazardous/Medical Waste	4
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	Know the hazards associated with the chemicals and laboratory equipments	**Lectures**	Final and semester exams
1.2	Demonstrate accident-prevention activities for safe working environment.	**Lectures**	Final and semester exams
1.3	Recognize the formal and regular training on the proper use of emergency equipment and procedures that ensure proper disposal of hazardous waste	**Lectures**	Final and semester exams
2.0	**Skills :**		
2.1	Describe safety Equipment and Emergency Procedures	Student negotiations	Class room activity
2.2	Explain how to work with chemicals and equipment safely.	Student negotiations	Class room activity
1.3	Apply course knowledge to avoid accidents and to minimize the risks in labs	Student negotiations	Class room activity
3.0	**Competence:**		
3.1	Work independently and as a team work	Student negotiations	Class room activity
3.2	Manage recourses, time and other members of the group	Student negotiations	Class room activity
1.3	Communicate results of work with others	Student negotiations	Class room activity

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Theoretical First Exam	7	20%
2	Theoretical Second Exam	12	20%
3	Assays , oral presentations	continuous	10%
4	Theoretical Final Exam	15	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 :

- 10 hours per week as office hours
- Academic advisor 10 hours per week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	- Safety in Chemistry Laboratory, volume 1, Accident Prevention for College and University Student, 7th edition, Amer. Chem. Soc., 2003 - Hazardous Laboratory Chemicals Disposal Guide, Armour A. M., 2nd edition, CRC Press, 1996
Essential References Materials	- Hazards in the Chemical Laboratory, Luxon E. G., 5th edition, London Royal Society of Chemistry, 1992 - Laboratory Manual for Principles of General Chemistry, Bernard J. A., 5th edition, Jon Wiley & Sons,1994
Electronic Materials	http://www.cdc.gov/niosh/database.html - http://www.nfpa.org - http://www.epa.gov
Other Learning Materials	Films related to the course

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) 40 seats/ class room/ 20 seats/lab Computer access with data show and internet
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, Overhead projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Models

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course evaluation	Student	direct
Student-faculty meeting	Faculty, Program Leaders	indirect
Departmental council discussions	Staff members	indirect
Discussion with the group of faculty teaching the same course	Peer Reviewer	indirect
Periodical departmental revisions of each method of teaching	Peer Reviewer	indirect

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	