



Course Specification

— (Bachelor)

Course Title: **TOXICOLOGY**

Course Code: **PHCL 445**

Program: **Pharmaceutical Sciences**

Department: **Pharmacology**

College: **Pharmacy**

Institution: **Najran University**

Version: **Version-4**

Last Revision Date: **21/08/2024**

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A. General information about the course:

1. Course Identification

1. Credit hours: (3 (2+1))

2. Course type

A. ☐ University ☐ College ☐ Department ☐ Track ☒ Program
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (8th level/ 4th year)

4. Course general Description:

This course provides students with the basic concepts of Toxicology including classification of toxic agents, sources of toxicity, chemical nature of the toxic substances, mechanisms, signs and symptoms of acute and chronic toxicities, concept of selective toxicity and general and specific lines of treatment of toxicity of each toxic substance. Besides understanding the concepts of carcinogenesis, teratogenicity, and drug-induced toxicities. The practical part deals with demonstrating and training students on symptoms, diagnosis, and treatment of different toxicities.

5. Pre-requirements for this course (if any):

Pharmacology-2 (PHCL 443)

6. Co-requisites for this course (if any):

None

7. Course Main Objective(s):

Students after the completion of this course will be:

- Aware of the science of poisons and different classes of Toxicology.
- Conversed with the different types of poisons, their sources, mechanism(s) of toxic action and diagnosis of each type.
- Acquainted with applying distinct lines of treatment of toxicity and antidotal therapy.
- Aware of the concepts of drug-induced toxicity, teratogenicity, carcinogenicity, and abuse.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning	-	-
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 	-	-
4	Distance learning	-	-



3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	-
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Students after the completion of this course will be able to: recognize, selective toxicity, principles of treatment of toxicity and air borne poisons the symptoms and treatment of venom toxicity, heavy metals (lead, mercury, arsenic, copper, and iron) and corrosive toxicities, the symptoms of toxicity and treatment of pesticides toxicity, drug-induced diseases, and different types of drug interactions, carcinogenesis and drug abuse.	K1	Lectures	Written exams
2.0	Skills			
2.1	Summarize the general signs and symptoms of toxicity, how to prevent, diagnose and treat acute and chronic toxicities of air borne poisons, venom, heavy metals and corrosive toxicities.	S1	Lectures Laboratory work Case studies or multimedia instruction	Written exams Practical Exams



Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
2.2	Criticize the mechanism(s), symptoms, and treatment of different pesticides toxicities, besides causes and features of chemical carcinogenesis, teratogenesis drug-induced toxicities and drug abuse.	S2	Lectures Laboratory work Case studies or multimedia instruction	Written exams Practical Exams
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate leadership, skills, in addition to accountability, confidence, and independent thinking to respond to routine or unanticipated circumstances.	V1	Lectures Practice sessions Small group discussion	Observation card
3.2	Professional use of computer in preparing reports, assignments, and oral presentations and to be skilled in the use of electronic library and internet resources for self-directed learning.	V2	Lectures Case studies or multimedia instruction	Presentations (using rubrics)

C. Course Content

No	List of Topics (Theory)	Contact Hours
1.	Introduction to Toxicology	1
2.	General mechanisms of toxic action	1
3.	Selective toxicity	2
4.	General principles for treatment of poisoning	1
5.	Antidotal therapy	1
6.	Air born poisons-1 (carbon monoxide)	1
7.	Air born poisons-2 (cyanide toxicity)	1
8.	Air born poisons-3 (chlorine and kerosene toxicities)	1
9.	Venom toxicity: (General mechanisms, snakes, scorpion)	1
10.	Heavy metal toxicity-1 (Lead)	1





11.	Heavy metal toxicity-2 (Mercury)	1
12.	Heavy metal toxicity-3 (Arsenic, Copper, Iron)	2
13.	Toxicity of corrosives (Mineral acids, Alkalies, Organic acids (Phenol)	2
14.	Pesticide toxicity: (insecticides, rodenticides,)	2
15.	Drug-induced Diseases-1	1
16.	Drug-induced Diseases-2	1
17.	Drug interactions-1	1
18.	Drug interactions-2	1
19.	Chemical Carcinogenesis	2
20.	Chemical Teratogenicity	2
21.	Digitalis toxicity	1
22.	Salicylate toxicity	1
23.	Drug Abuse of CNS depressants	1
24.	Drug Abuse of CNS stimulants	1
Total		30

No	List of Topics (Practical)	Contact Hours
1.	Introduction, Environmental Pollution	2
2.	General lines of treatment of toxicity and antidotal Treatment	2
3.	Carbon Monoxide Poisoning	2
4.	Cyanide Toxicity	2
5.	Methemoglobinemia	2
6.	Lead Toxicity	2
7.	Mercury Toxicity	2
8.	Corrosives	2
9.	Teratogenicity	2
10.	Small group discussion	2
11.	Digitalis Toxicity (clinical case)	2
12.	Salicylate Toxicity (clinical case)	2
13.	Morphine & Heroin Abuse and Toxicity	2
14.	Cocaine & Amphetamine Abuse and Toxicity	2
15.	Revision	2
Total		30



D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz	5 th week	10%
2.	Midterm Exam	8 th week	20 %
3.	Practical Quiz	9 th week	5%
4.	Presentation	14 th Week	10%
5.	Students Observation card	Per semester	5%
6.	Final Practical Exam	16 th week	10%
8.	Final Theoretical Exam	17 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	1. Essentials of Toxicology. Casarett and Doull's. Third edition. 2. B. Katzung. Basic & Clinical Pharmacology. 15 th Edition by B.G. Katzung.
Supportive References	1. Goodman& Gilman: Pharmacological Basis of Therapeutics. 14 th Edition. 2. Katzung-Trevor. Basic & Clinical Pharmacology. 4 th Edition. 3. Rang & Dale's: Pharmacology. 9 th Edition.
Electronic Materials	1. https://www.toxicology.org/about/relevance.asp 2. https://toxedfoundation.org/resources/tox-links/ 3. www.dlaf.nu.edu.sa
Other Learning Materials	1. Microsoft word software. 2. Microsoft PowerPoint software. 3. Microsoft Excel software.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1. Suitable lecture room equipped with data show and internet and sufficient number of seats. 2. Suitable laboratories equipped with health and safety tools, internet, and enough seats. 3. Blackboard collaborative system for e-learning in NU.
Technology equipment (projector, smart board, software)	1. Data show. 2. Computer software listed above. 3. Internet and Wifi- access
Other equipment (depending on the nature of the specialty)	Drug samples lab, samples of different toxins and samples of common antidotes.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Head of departments and students	Direct Indirect (Questionnaires)

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Students assessment	Department Faculty members and department council	Direct Direct
Quality of learning resources	Students Department faculty member	Indirect (Questionnaires) Direct
The extent to which CLOs have been achieved	Students	Questionnaires (Indirect)
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	PHARMACOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	14460217-1071-00001
DATE	21/08/2024

