

PHARMACOLOGY,
TOXICOLOGY &
BIOCHEMISTRY
DEPARTMENT

Courses of Pharmacology, Toxicology and Biochemistry

Department

No.	Course Title	Course Code
1	Anatomy and Histology	PHL 111
2	Medical Terminology	PHL 122
3	Physiology	PHL 123
4	Pharmaceutical Biostatistics	PHL 214
5	Pharmacology I	PHL 315
6	Pharmacology II	PHL 326
7	Pharmacology III	PHL 417
8	Toxicology	PHL 518
9	Biochemistry I	PBC 211
10	Biochemistry II	PBC 222
11	Clinical Biochemistry	PBC 323
12	Molecular Biology	PBC 414

Elective Courses:

No.	Course Title	Course Code
1	Drug Evaluation and Bioassay	PHL 605
2	Substance Abuse	PHL 606
3	Clinical Toxicology	PHL 607
4	Clinical Nutrition	PBC 608

Anatomy & Histology (PHL 111)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Pharmacology, Toxicology and Biochemistry
Academic year:	2014/2015
Approval Date:	October 2014

A. Basic Information

Course Title: Anatomy & Histology	Course Code: PHL 111		
Prerequisites: ---			
Students' Level/Semester:	First Level/ First Semester		
Credit hours:	2 (1+1)		
Actual teaching hours per week:			
Lectures: 1/week	Practical: 2/week	Tutorial: N/A	Total: 3/week

B. Professional Information

1. Overall Aim of Course

The histology course aims to teach the students the basic histological structure of different cells and tissues of human body, in addition makes a correlation between function and structure of various tissues and their clinical significance.

The anatomy course introduces the anatomy of the human body including the human skeleton (bones – joints & cartilage - muscles) and the various human body systems; digestive, respiratory, cardiovascular, urinary and nervous systems.

2. Intended Learning Outcomes (ILOs)

By the end of the course, the student should be able to:

a- Knowledge and Understanding:

- a.1** Describe the ultra-structure of the human cell.
- a.2** Mention the functions of each structure of human cell.
- a.3** Describe the normal histological structure of different cells and tissues of human body.
- a.4** Mention the functions of different cells and tissues of human body.
- a.5** Describe the advanced histological structure of cardiovascular, lymphatic systems in relation to function.
- a.6** State the advanced histological structures of respiratory, digestive and endocrine systems in relation to function.

Course Specifications

- a.7 Recognize the advanced histological structures of urinary, male and female genital systems in relation to function.
- a.8 Describe the basic principles of structure of the different tissues, organs and systems of the human body.
- a.9 Describe basic structure of the different systems of the body and its correlation to its functions.
- a.10 Outline the clinical applications of the given anatomical facts.
- a.11 Recognize organelles structure.
- a.12 Recognize the structure of different tissue cells.

b- Intellectual Skills:

- b.1 Correlate cell organelles structure with functions.
- b.2 Differentiate between different types of the basic tissues.
- b.3 Distinguish tissue subtypes.
- b.4 Correlate advanced histological structure of cardiovascular, lymphatic and related clinical conditions.
- b.5 Differentiate between parts of respiratory and digestive systems.
- b.6 Distinguish cytogenetics applications and methods.
- b.7 Compare the different anatomical structure of organs in the human body
- b.8 Compare anatomical structures of the different body systems.

c- Professional and Practical Skills:

- c.1 Identify the ultrastructure of the different components of cell.
- c.2 Identify the different types of tissues and organs
- c.3 Identify the different surface markings.
- c.4 Interpret some of the clinical findings and its correlations to the anatomical & histological facts known.

d- General and Transferable Skills:

- d.1 Update their knowledge of histology & Anatomy by using recent references.
- d.2 Apply good communication skills and presentational techniques including the ability to organize lectures and labs.
- d.3 Use the sources of biomedical information to remain current with advances in knowledge and practice.
- d.4 Interact effectively with colleagues and mentors.

3. Contents

Teaching Weeks	Topic	No. of hours	Lecture	Practical
One	Introduction & Cytology	3	1	1
	Anatomical positions and terms		1	
Two	Cytology & Epithelial Tissue	3	1	1
	Human Skeleton		1	
Three	Connective Tissue proper	3	1	1
	Types of bones & joints		1	
Four	Blood & Skin + First Midterm Exam	3	0.5 + 0.5	1
	Types of cartilage		1	
Five	Muscular Tissue	3	1	1
	Muscular System		1	
Six	Nervous Tissue	3	1	1
	Nervous system		1	
Seven	Cardiovascular system – Histology	3	1	1
	Cardiovascular System- Anatomy		1	
Eight	Second Midterm exam			
Nine	Lymphatic System - Histology	3	1	1
	Lymphatic System - Anatomy		1	
Ten	Respiratory System - Histology	3	1	1

Course Specifications

	Respiratory system - Anatomy		1	
Eleven	Digestive Glands & endocrine glands	3	1	1
	Digestive system – Anatomy		1	
Twelve	Urinary system Anatomy & histology	3	1	1
	Practical Exam		1	
Thirteen	Genital system - Histology	2	1	0
	Genital system - Anatomy		1	
Total No. of hours		35	24	11
Fourteen	University Requirement Exams			
Fifteen	Final Exams			
Sixteen				

4. Teaching and Learning Methods

- 4.1 Power point lectures.
- 4.2 White board illustrations
- 4.3 Power point practical slides.
- 4.4 Open discussion.
- 4.5 Human system model.
- 4.6 Office hours.
- 4.7 Assignments.

5. Student Assessment Methods

- 5.1. Written exams to assess knowledge & understanding.
- 5.2. Practical exam to assess practical skills
- 5.3. Assignment to assess general transferable skills
- 5.4. Class work (including assignments) to assess intellectual skills

Assessment Schedule

- Assessment 1: First midterm Week Four
 Assessment 2: Class Work (Assignment) Week Seven
 Assessment 3: Second Midterm Week Eight

Assessment 4: Practical exam	Week Twelve
Assessment 5 Final written exam	Week 15/16

Weighting of Assessments

First Mid-term Examination	5%
Second Mid-Term Examination	15%
Final-Term Examination	40%
Practical Examination	30%
Class Work (assignments)	10%
Total	100%

6. List of References

6.1. Course Notes

Anatomy & Histology handouts uploaded on Moodle.
Practical Notes

6.2. Essential Books (Text Books)

- a. Anthony L. Mescher ,Basic Histology : Text and Atlas 13th edition, 2013.
- b. Richard L. Drake ,Gray's anatomy for students, 2nd edition , 2009.
- c. Ann M. R. Agur & Arthur F. Dalley: Grant’s Atlas of anatomy, 13th edition, 2013.

6.3. Recommended Books

- a) Richard S Snell ,Clinical anatomy by regions,9th edition 2012
- b) Chummy S.Sinnatamby ,Last Anatomy: Regional and applied, 12 edition, 2011
- c) Barbara Young, Wheater's functional histology, 6th edition, 2014

6.4. Periodicals, Websites,etc

<http://www.Lumen.com>
[http:// www. Blue Histology.com](http://www.BlueHistology.com)

7. Facilities Required for Teaching and Learning

Smart board, projector setup, lecture rooms
Library furnished with textbooks
White board and required colored drawing pens.
Human system model

Course Coordinators:

Dr. Salwa Saad, Dr. Hoda Hussein

Head of Department: Prof. Dr. Maha El Sawalhy

Course Coordinator: October 2014

Medical Terminology (PHL 122)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	(Pharmacology, Toxicology and Biochemistry)
Academic year:	2014/2015
Approval Date:	September 2014

A. Basic Information

Course Title: Medical Terminology	Course Code: PHL 122
Prerequisites: N/A	
Students' Level/Semester:	First Level/ Second Semester
Credit hours:	1 (1+0)
Actual teaching hours per week:	
Lectures: 1 hr/week	Practical: N/A Tutorial: N/A Total: 1 hr/week

B. Professional Information

1. Overall Aim of Course

The course scope covers the language used by medical health care professionals and students. A medical word consists of some or all of the following elements: word root, combining form, suffix, and prefix. How to combine these elements, and whether all or some of them are present in a medical word, determine the meaning of a word.

2. Intended Learning Outcomes (ILOs)

By the end of the course, the student should be able to:

a- Knowledge and Understanding:

- a1.** Recognize different components of a medical word.
- a2.** Identify the most commonly used prefixes and their meanings.
- a3.** Identify the most commonly used suffixes and their meanings
- a4.** Mention the prefixes, suffixes and medical terms used to describe GIT system
- a5.** List the prefixes, suffixes and medical terms used to describe respiratory system
- a6.** Name the prefixes, suffixes and medical terms used to describe cardiovascular system
- a7.** Recognize the prefixes, suffixes and medical terms used to describe blood and lymph system
- a8.** Identify the prefixes, suffixes and medical terms used to describe central nervous system

b- Intellectual Skills:

- b1.** Categorize medical terms into different body systems.
- b2.** Correlate medical terms with pathological, diagnostic and symptomatic meanings
- b3.** Use medical words to express specific meanings.
- b4.** Solve problems in a case-based or vignette module.

c- Professional and Practical Skills:

- c1.** Integrate previously acquired knowledge of English linguistics with newly acquired concepts of biological sciences.
- c2.** Express pharmaceutical knowledge in correct medical terms
- c3.** Use gained knowledge to interpret medical reports.

d- General and Transferable Skills:

- d1.** Work effectively within a team frame.
- d2.** Use different resources to enhance self-learning skills.
- d3.** Communicate with others using proper medical language and expressions.

3. Contents:

Week	Topic	No. of hours	Lecture
One	Course Outline Parts of Medical Terms	1	1
Two	Suffixes	1	1
Three	Prefixes	1	1

Four	Digestive System + First Midterm exam	1	1
Five	Digestive System (Cont.)	1	1
Six	Respiratory System	1	1
Seven	Cardiovascular System	1	1
Eight	Second Midterm Exam		
Nine	Cardiovascular System (Cont.)	1	1
Ten	Central Nervous System	1	1
Eleven	Central Nervous System	1	1
Twelve	Blood, Lymph, and Immune Sys	1	1
Thirteen	Musculoskeletal System	1	1
Total no. of hours		12	12
Fourteen	University Requirement Exams		
Fifteen	Final Exams		
Sixteen			

4. Teaching and Learning Methods

- 4.1. Lectures
- 4.2. Power point presentations
- 4.3. Assignments
- 4.4. Office hours

5. Student Assessment Methods

- 5.1.** Written exams to assess knowledge & understanding as well as intellectual and professional skills.
- 5.2.** Class work and Assignments to assess all types of skills including general and transferrable skills.

Assessment Schedule

Assessment 1 Midterm-1 Exam	Week 4
Assessment 2 Midterm-2 Exam	Week 8
Assessment 3 Final Exam	Week 15/16
Assessment 4 Class Work (including Assignments)	(During the semester)

Weighting of Assessments

First midterm examination	10%
Second Mid-Term Examination	20%
Final-Term Examination	40%
Class Work (including Assignments	30%
Total	100

6. List of References

6.1. Course Notes

Handouts of power point presentation given to students by instructors and uploaded on Moodle.

6.2. Essential Books (Text Books)

Medical Terminology Systems, A Body Systems Approach, 7th Edition, 2012

6.3. Recommended Books

Medical Terminology for Health Professionals, Rice, 8th Edition, 2014

6.4. Periodicals, Websites,etc

<http://www.merriam-webster.com/>

7. Facilities Required for Teaching and Learning

Computer and Data Show

Course Specifications

White board
Lecture halls
White board
Meeting rooms for office hours
Library furnished with books

Course Coordinator: Dr. Suzan Mohamed

Head of Department: Prof. Dr. Maha El Sawalhy

Department Approval Date: October 2014

Course Specifications

Physiology (PHL 123)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Pharmacology, Toxicology and Biochemistry
Academic year:	2014/2015
Approval Date:	October 2014

A. Basic Information

Course Title: Physiology	Course Code: PHL 123		
Prerequisites: --			
Students' Level/Semester:	First Level/ Second Semester		
Credit hours:	3(3+0)		
Actual teaching hours per week:			
Lectures: 3 hr/week	Practical: N/A	Tutorial: N/A	Total: 3 hr/week

B. Professional Information

1. Overall Aim of Course

This course allows the student to:

- Acquire an appropriate functional background of cells, tissues & systems.
- Integrate physiological data & mechanisms with the ongoing basic sciences: anatomy, histology, biochemistry and clinical applications.
- Explore in detail the functions of the blood components and autonomic, endocrine, renal, gastric, CNS and cardiovascular systems as well as their integration to achieve homeostasis.
- Develop the basic scientific research skills as well as effective communication and team work attitudes.

2. Intended Learning Outcomes (ILOs)

By the end of the course the student should be able to:

a- Knowledge and Understanding:

- a1. Classify the functional organization of sympathetic and parasympathetic nervous systems on different systems of the body and receptors for action.
- a2. Recognize classification of drugs acting on autonomic nervous system.
- a3. Explain the functions of different components of blood.

Course Specifications

- a4. Recognize plasma proteins, factors needed for formation of RBC, types of anemia and hemostasis process with its abnormalities.
- a5. Describe the properties of cardiac muscle (action potential of ventricular muscle, contraction, rhythm and conduction), cardiac output.
- a6. Memorize the functional anatomy of the kidney, physiology of glomerular filtration and reabsorption of different substance by renal tubules.
- a7. Describe the function of some endocrine glands and their action on different system of the body.
- a8. Classify the function of nervous system on the base of Reflex Arc, types of pain sensation, mechanism of Referred Pain with examples and causes of Headache.
- a9. Describe the anatomical parts of stomach, function of each part, mechanism of gastric secretion, mucosal barrier, causes of peptic ulcers and recent drugs used in treatment of peptic ulcers.
- a10. Identify the principle of measurement of arterial blood pressure with physiological variations.
- a11. Recognize principles of blood transfusion.

b- Intellectual Skills:

- b1. Distinguish a physiological from a pathological condition.
- b2. Compare measured values of blood pressure to normal levels.
- b3. Integrate physiology with other basic and clinical sciences.
- b4. Select proper blood group for blood transfusion.
- b5. Detect abnormality in hormonal levels.

c- Professional and Practical Skills:

- c1. Measure arterial blood pressure.
- c2. Detect clinical manifestation of abnormal hormonal levels.
- c3. Apply gained knowledge in precautions during blood transfusion.

General and Transferable Skills:

- d1. Present clearly and effectively a scientific topic
- d2. Present physiological data in a graphical form.
- d3. Communicate effectively with others.

3. Contents

Teaching Weeks	Topic	No. of hours	Lecture
One	Blood	3	2
			1
Two	Blood (cont.)	3	2
			1
Three	Blood (cont.)	3	2
			1
Four	Autonomic nervous system	3	2
	First midterm exam		1
Five	Autonomic nervous system	3	2
	Gastro intestinal tract		1
Six	Autonomic nervous system	3	2
	Gastro intestinal tract		1
Seven	Kidney	3	2
	Arterial blood pressure		1
Eight	Second Midterm exam		
Nine	Kidney	3	2
	Arterial blood pressure		1
Ten	Endocrine	3	2
	Sheet exam		1
Eleven	Cardio vascular system	3	2
			1
Twelve	Cardio vascular system	3	2
	Sensory		1
Thirteen	Cardio vascular system	3	2
	Sensory		1
Total No. of hours		36	36
Fourteen	University requirements Exams		

Course Specifications

Fifteen	Final Exams		
Sixteen			

4. Teaching and Learning Methods

- 4.1 –Lectures.
- 4.2- Group Discussion.
- 4.3 -Data Analysis.
- 4.4 -Active learning: blood pressure measurements .

5-Student Assessment Methods

- 5.1. Discussions to assess knowledge and understanding.
- 5.2. Written exams + sheets to assess knowledge and understanding as well as intellectual skills.
- 5.3. Group discussion to assess general and transferrable skills.
- 5.4. Interacting with students by different means to assess professional skills.

Assessment Schedule

Assessment 1	Written exams	Week (4, 8, 15/16)
Assessment 2	Sheet (Quiz)	Week 10
Assessment 3	Class Work (Discussions + Participation + Quiz) (During the semester)	

Weighting of Assessments

First midterm examination	10%
Second Mid-Term Examination	20%
Final-Term Examination	40%
Class Work (Discussions + participation + Quiz)	30%
Total	100%

6.List of References

6.1 Course Notes

Handouts of power point presentations uploaded on Moodle.

6.2 Essential Books (Text Books)

John E. Hall , Guyton and hall textbook of Medical physiology 12th edition, 2010.

6.3 Recommended Books

Kim E. Barrett, Ganong's review of medical Physiology , 24 th edition, 2012.

6.2 Periodicals, Websites,etc

www.Wikipedia.com

7. Facilities Required for Teaching and Learning

- Lecture halls: provided by the faculty.
- Computers and data show.
- White board and necessary colored pens.
- Library furnished with textbooks.
- Meeting rooms for office hours.

Course Coordinator: Prof. Dr. Heba Shawky

Head of Department : Prof.Dr. Maha El Sawalhy

Department Approval Date: October 2014

Pharmaceutical Biostatistics (PHL 214)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Pharmacology, Toxicology and Biochemistry
Academic year:	-----
Approval Date:	October 2014

A. Basic Information

Course Title: Pharmaceutical Biostatistics	Course Code: PHL 214
Prerequisites: Medical Terminology (PHL 122)	
Students' Level/Semester:	Second Level/ third Semester
Credit hours:	1 (1+0)
Actual teaching hours per week:	
Lectures: 1 hr/week	Practical: N/A Tutorial: N/A Total: 1 hr/week

B. Professional Information

1. Overall Aim of Course

At the end of the course the candidate will be able to identify the basic concepts of Biostatistics and data analysis.

2. Intended Learning Outcomes (ILOs)

By the end of the course, the student should be able to:

a- Knowledge and Understanding:

- a1. Recognize basic concepts of Biostatistics and data analysis.
- a2. Identify the types of data and the data collection process.
- a3. Recognize the meaning of data.
- a4. Outline the measures of central tendency such as the mean, the mode and the median.
- a5. Identify the measures of dispersion such as the range, the variance and the standard deviation.
- a6. Describe the concepts of probability, normal distribution and population parameters.
- a7. Discuss the concept of hypothesis testing in a parametric and a non-parametric setting.

b- Intellectual Skills:

- b1.** Interpret dispersion of data and normal distribution curve.
- b2.** Select types of samples to a certain sampling technique.
- b3.** Interpret the meaning of different data presentation types.

b4. Predict role of Biostatistics in medical research.

c- Professional and Practical Skills:

- c1. Apply methods of graphical presentation.
- c2. Use results of applied statistics to make informed decisions.
- c3. Choose between various experimental models to select the best one used for biological assay.
- c4. Design experiments in the lab and field within proper scientific basis.

d- General and Transferable Skills:

- d1. Use computer to analyze data effectively.
- d2. Work effectively in a team.
- d3. Use different resources to act as a life-long, self-directed learner.
- d4. Value precision and correctness.

3. Contents:

Teaching Weeks	Topic	No. of hours	Lecture
One	Introduction to Biostatistics	1	1
Two	Strategies to understanding the meaning of data (descriptive statistics)	1	1
Three	Measures of central tendency (mean, median, mode)	1	1
Four	Measures of dispersion (range, variance and standard deviation) + First midterm Exam	1	0.5 + 0.5
Five	Inferential statistics	1	1
Six	Probability	1	1
Seven	Normal distribution	1	1
Eight	Second Midterm exam		
Nine	Population parameters	1	1
Ten	Hypothesis testing (one sample t test, student t test, ANOVA)	1	1

Eleven	Non parametric hypothesis testing (rank sum test)	1	1
Twelve	Non parametric hypothesis testing (sign test)	1	1
Thirteen	Revision	1	1
Total No. of hours		12	12
Fourteen	University requirement Exams		
Fifteen	Final Exams of Faculty		
Sixteen			

4. Teaching and Learning Methods

- 4.1. Power point based lecture.
- 4.2. Data show and computers in lectures
- 4.3. Interactive teaching supported by actual examples from local and international origin.
- 4.4. Encouragement of searching and retrieving information in the form of assignments.
- 4.5. Office hours.

5. Student Assessment Methods

- 5.1. Written exams to assess knowledge and understanding as well as intellectual and professional skills.
- 5.2. Assignments to assess general and transferrable skills.
- 5.3. Class Work (Participation) to assess all types of skills.

Assessment Schedule

Assessment 1	First Midterm Exam	Week 4
Assessment 2	2nd Midterm Exam	Week 8
Assessment 3	Final Exam	Week 15/16
Assessment 4	Class Work (Participation & Assignments) (During the semester)	

Weighting of Assessments

First mid-term Examination	10 %
Second Mid-term Examination	20 %
Final-term Examination	40 %
Class Work (Participation & Assignments)	30 %
<hr/>	
Total	100 %

6. List of References

6.1. Course Notes

Handout of power point presentations uploaded on Moodle.

6.2. Essential Books (Text Books)

Biostatistics, Basic concepts and methodology for the health sciences, 10th Edition, Wiley. 2014

6.3. Recommended Books

Biostatistics: The Bare Essentials, People's Medical Publishing House - USA, Ltd.; 4th edition (May 30, 2014)

6.4. Periodicals, Websites,etc

www.Pubmed.org

www.Scimedirect.com

www.GoogleScholar.com

7. Facilities Required for Teaching and Learning

- Data show.

Course Specifications

- White Board + Markers.
- Interactive board.
- Meeting rooms for office hours

Course Coordinator: Dr. Yousra Abdel-Mottaleb

Head of Department: Prof. Dr. Maha El Sawalhy

Department Approval Date October 2014

Pharmacology-I(PHL 315)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Pharmacology, Toxicology and Biochemistry
Academic year:	-----
Approval Date:	October 2014

A. Basic Information

Course Title: Pharmacology-I	Course Code: PHL 315		
Prerequisites: Physiology (PHL 123)			
Students' Level/Semester: Third level/Fifth semester			
Credit hours: 3 (2+1)			
Actual teaching hours per week:			
Lectures: 2 hr/week	Practical: 2 hr/week	Tutorial: N/A	Total: 4 hr/week

B. Professional Information

1. Overall Aim of Course

The course starts with basic introduction about Molecular Drug Action explaining drugs' specificity. This is followed by establishing understanding of the international Pharmacologic concepts and terms (agonists, antagonists, efficacy as well as the pharmacokinetics of the drugs).

The second part of the course involves basic Pharmacology of the Autonomic Nervous System (ANS), including both Adrenergic and Cholinergic NS. In the third part, pharmacology of autacoids will be covered.

2. Intended Learning Outcomes (ILOs)

By the end of the course, the student should be able to:

a- Knowledge and Understanding:

- a1.** Recognize different types of molecular targets for drugs.
- a2.** Identify the main Four Classes of Receptors, their structure & operation.
- a3.** Identify the different types of cholinergic agonists both direct-acting and indirect-acting agonists.
- a4.** Recognize the different types of cholinergic antagonists including muscarinic antagonists, neuromuscular blockers and ganglionic blockers.
- a5.** List the actions, uses and adverse effects of each group

Course Specifications

- a6. Categorize adrenergic receptors and their agonists and antagonists that are commonly used for the treatment of many visceral diseases
- a7. Correlate pharmacological actions of adrenergic agonists/antagonists with possible therapeutic uses and adverse effects.
- a8. Identify different types of autacoids, mechanism of action and uses.

b- Intellectual Skills:

- b1. Categorize autonomic receptors and their agonists and antagonists that are commonly used for the treatment of many visceral diseases.
- b2. Discriminate among major drug classes by their mechanism(s) of action at molecular, cellular and organ levels.
- b3. Relate the beneficial effects of different pharmacological classes in the respective cardiovascular disease.
- b4. Correlate significant toxicities, drug interactions with specific observable and major adverse effects.
- b5. Evaluate indications, rationale for clinical use and risks of commonly prescribed drugs.

c- Professional and Practical Skills:

- c1. Integrate previously acquired knowledge of physiology and pathophysiology of a specific organ with newly acquired concepts of pharmacology for reaching appropriate therapeutic decisions.
- c2. Assess the simulated response of the blood pressure to the effect of ions or drugs (sympathomimetics, parasympathomimetics) using virtual Dog BP Laboratory
- c3. Apply cognitive skills needed to evaluate disease case-based scenarios and to select an appropriate pharmacological solution to these situations using case studies.
- c4. Apply the gained knowledge of the mechanistic aspects of pharmacology with the rational and successful therapeutic selection in a case-based or clinical vignette module.
- c5. Select drug classes or specific drugs according to population considerations.

d- General and Transferable Skills:

- d1. Work effectively within a team frame.
- d2. Suggest appropriate solutions in a case-based or vignette module
- d3. Develop self-learning capacitance skills to enhance independent thinking
- d4. Use different resources to encourage knowledge management skills.

3. Contents

Teaching Weeks	Topic	Total No. of hours	Lecture	Practical
One	Introduction to pharmacology (historical overview, general knowledge, prelude to pharmacokinetics)	4	2	
	Introduction to experimental pharmacology			2
Two	- Pharmacokinetics (absorption, distribution, metabolism, elimination)	4	2	
	Drug administration scheme, central nervous system acting drugs (Sc injection of strychnine and chloral hydrate)			2
Three	Pharmacodynamics(receptor families, agonists, antagonists, drug efficacy and potency)	4	2	
	Autonomic nervous system acting drugs (IP injection of atropine and pilocarpine in mice)			2
Four	- Drug side effects, adverse reaction, interaction, toxicity, hypersensitivity, Pharmacogenetics, precautions, contraindications + First Midterm Exam	4	2	
	IP injection of caffeine in mice			2
Five	Introduction to autonomic pharmacology	4	2	
	Sc injection of nicotine in frogs			2
Six	- Cholinergic Agonists	4	2	
	Eye drops + First practical exam			2
Seven	Cholinergic Antagonists	4	2	
	Effects of drugs on BP			2
Eight	Second Midterm exam			

Course Specifications

Nine	Adrenergic Agonists	4	2	
	Adrenergic depressants			
	Dose response relationship			2
Ten	Adrenergic Agonists	4	2	
	Revision			
Eleven	Neuromuscular blockers	4	2	
	Autacoids			
	Second Practical exam			2
Twelve	autacoids		2	
	Second Practical exam			2
Thirteen	Revision		2	
Total No. of hours		46	24	22
Fourteen	University requirement Exams			
Fifteen	Final Exams			
Sixteen				

4. Teaching and Learning Methods

- 4.1. Lectures
- 4.2. Wet laboratories using experimental animals (Chymograph, glassware)
- 4.3. Virtual laboratories
- 4.4. Presentation.
- 4.5. Office hours

5. Student Assessment Methods

- 5.1. Written exams to assess understanding & knowledge as well as intellectual skills.
- 5.2. Practical exams to assess professional and practical skills
- 5.3. Oral exam to assess all types of skills and mainly general and transferrable skills
- 5.4. Class work to assess all types of skills.

Assessment Schedule

- Assessment 1 Midterm-1 Exam Week 4
- Assessment 2 Midterm-2 Exam Week 8
- Assessment 3 Practical exam-1 Week 6
- Assessment 4 Practical exam-2 Week 11, 12
- Assessment 5 Final Exam Week 15/16
- Assessment 6 Oral exam Week 15/16
- Assessment 7 Class Work (During the semester)

Weighting of Assessments

First mid-Term Examination	5%
Second mid -term examination	15%
Final-Term Examination	30%
Oral Examination	10%
Practical Examination	30%
Class Work	10%
Total	100%

5. List of References

6.1. Course Notes

- Handouts of power point presentations uploaded on Moodle.
- Practical notes given to each student.

6.2. Essential Books (Textbooks)

Richard Finkel, Lippincott's Illustrated Reviews – Pharmacology, 5th edition, 2011

6.3. Recommended Books

- Harold Kalant, Principles of Medical Pharmacology, 7th edition, 2006
- Laurence L. Brunton, Bruce A. Chabner, Goodman and Gilman's the pharmacological basis of therapeutics, 12th edition, 2011
- Bertram G Katzung, Susan B Masters, Anthony J. Trevor Basic & Clinical Pharmacology, 12th edition, 2012

6.4. Periodicals, Websites,etc

<http://www.cvphysiology.com/Intro.htm>

www.aspetjournal.org

6. Facilities Required for Teaching and Learning

Computer and Data Show

Experimental laboratory animals

White board, Projector, computer,

Course Coordinator: Prof. Dr. Samira Saleh

Head of Department: Prof. Dr. Maha El Sawalhy

Department Approval Date: October 2014

Pharmacology-II (PHL 326)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	(Pharmacology, Toxicology & Biochemistry)
Academic year:	-----
Approval Date:	October 2014

A. Basic Information

Course Title: Pharmacology-II	Course Code: PHL 326	
Prerequisites: Pharmacology I (PHL 315)		
Students' Level/Semester: Third level / Sixth semester		
Credit hours: 4 (3+1)		
Actual teaching hours per week:		
Lectures: 3 hr/week	Practical: 2 hr/week	Tutorial: N/A
Total: 5 hr/week		

B. Professional Information

1. Overall Aim of Course

- a. To provide the basic knowledge about commonly used groups of drugs affecting different body systems and their implications in therapy of disease and health promotion.
- b. To enable students to understand the safe use of drugs, as regards adverse effects, contraindications, and drug interactions.
- c. To enable students to predict the risk/benefit ratio as a base to initiate, discontinue or avoid drug administration.

2. Intended Learning Outcomes (ILOs)

By the end of the course, the student should be able to:

a- Knowledge and Understanding:

- a1. Describe the mechanism of action of drugs with regard pathophysiology of common diseases and explain the rational basis for proper choice of drugs in treating them
- a2. Explain cardiovascular drugs for hypertension, angina pectoris, heart failure and arrhythmia.
- a3. Explain Central nervous system drugs for Depression, Psychosis, Parkinson's disease, neurodegenerative diseases and epilepsy .
- a4. Recognize the relative risks and benefits of options of commonly used drugs and their uses and their side effects.

- a5. Determine the best drug of choice for each disease explained.
- a6. Discuss any contraindication of drugs with certain diseases and any drug interaction may happen.
- a7. Identify the role of antiplatelet and anticoagulant drugs in the treatment of heart diseases.
- a8. Explain the anti-inflammatory drugs interaction with the drugs of cardiovascular diseases .
- a9. Identify drugs used for the treatment of emergency conditions
- a10. Explain the therapeutic dose of the drugs and the side effects which may appear when we overdose

b- Intellectual Skills:

- b1. Select the best drugs to be used in variable medical conditions.
- b2. Evaluate effect of medication on patients.
- b3. Evaluate drug interaction and risk-benefit ratio.

c- Professional and Practical Skills:

- c1. Record a comprehensive drug history of the patient
- c2. Predict drug adverse reactions
- c3. Analyze the effect of drugs on experimental animal tissues

d- General and Transferable Skills:

- d1. Communicate effectively with others.
- d2. Interpret the basic drug information to the patient and his family.
- d3. Use different resources to be a life-long learner.
- d4. Counsel patients to have them oriented with his drug prescription and the doses of the day.

3. Contents

Teaching Weeks	Topic	No. of hours	Lecture	Practical
One	Cardiovascular drugs: Hypertension	5	3	
	Introduction			2
Two	Cardiovascular drugs: Hypertension and Angina Pectoris	5	3	
	Dose-response using rectus abdominus muscle in mice			2
Three	Cardiovascular drugs: Angina	5	3	

	Pectoris and Arrhythmia			
	Dose-response using rectus abdominus muscle in mice			2
Four	Cardiovascular drugs: Heart failure + First Midterm Exam	5	2.5 + 0.5	
	Dose-response using rectus abdominus muscle in mice			2
Five	CNS drugs: antidepressants	5	3	
	Dose-response using rectus abdominus muscle in mice			2
Six	CNS drugs: Antipsychotics and anxiolytics	5	3	
	Dose-response using rectus abdominus muscle in mice			2
Seven	CNS drugs: Neurodegenerative diseases	5	3	
	Dose-response using rectus abdominus muscle in mice			2
Eight	Second Mid-term Exam			
Nine	CNS drugs: CNS stimulants and Epilepsy	5	3	
	Dose-response using rectus abdominus muscle in mice			2
Ten	CNS drugs: CNS stimulants and Epilepsy (Cont.)	5	3	
	Dose-response using rectus abdominus muscle in mice			2
Eleven	Anti-inflammatory drugs (1)	5	3	
	Revision			2
Twelve	Anti-inflammatory drugs (2)	5	3	
	Final Practical exam			2
Thirteen	Revision	3	3	
Total No. of hours		58	36	22
Fourteen	University Requirements Exams			
Fifteen	Final Exams			

Sixteen				
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4. Teaching and Learning Methods

- 4.1. Power point based lecture
- 4.2. Interactive teaching supported by actual examples from local and international origin
- 4.3. Encouragement of searching, retrieving and analyzing information in the form of assignments
- 4.4. Practical sessions

5. Student Assessment Methods

- 5.1. Written exams to assess knowledge and understanding as well as intellectual skills.
- 5.2. Practical exam to assess professional and practical skills.
- 5.3. Oral exam to assess all types of skills and mainly general and transferrable skills.
- 5.4. Class Work (Participation) to assess all types of skills.

Assessment Schedule

Assessment 1	First Midterm Exam	Week 4
Assessment 2	Second Midterm exam	Week 8
Assessment 3	Practical exam	Week 12
Assessment 4	Final written exam	Week 15/16
Assessment 5	Oral exam	Week 15/16
Assessment 6	Class Work	(During the semester)

Weighting of Assessments

1 st Mid Term Examination	5 %
2 nd Mid-Term Examination	15 %
Final-Term Examination	30 %
Oral Examination	10 %
Practical Examination	30%
Class Work	10%
Total	100%

6. List of References

6.1. Course Notes

Handout of slides of power point presentations uploaded to Moodle.

6.2. Essential Books

Richard Finkel, Lippincott's Illustrated Reviews – Pharmacology, 5th edition, 2011

6.3. Recommended Books

- Humphrey Rang ,Maureen Dale, Rang and Dale's Pharmacology, 7th edition,2012
- Laurence L. Brunton, Bruce A. Chabner ,Goodman and Gileman's the pharmacological basis of therapeutics, 12 th edition ,2011

6.4. Periodicals, websites,.....etc.:

Periodicals

- British journal of Pharmacology
- Biochemical Pharmacology journal

Websites:

- PubMed.org,
- Science Direct
- Google Scholar

7. Facilities Required for Teaching and Learning

- White board.
- Projector.
- Computer.
- Experimental animals.
- Different equipment in labs.
- Personal computer available for each staff member,
- Library furnished with textbooks.

Course Coordinator: Dr. Yousra Abdel-Mottaleb

Head of Department: Prof. Dr Maha El Sawalhy

Department Approval Date: October 2014

Toxicology (PHL 518)

Program(s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Pharmacology, Toxicology and Biochemistry
Academic year:	-----
Approval Date:	October 2014

A. Basic Information

Course Title: Toxicology	Course Code: PHL518		
Prerequisites: Pharmacology-II (PHL 326)			
Students' Level/Semester:	Fifth Level /Ninth Semester		
Credit hours:	4 (3+1)		
Actual teaching hours per week:			
Lectures: 3 hr/week	Practical: 2 hr/week	Tutorial: N/A	Total: 5
hr/week			

B. Professional Information

1. Overall Aim of Course

Following the completion of the course, the student should have the knowledge and skills that enables him/her to be aware of the basic concepts of toxicology; history, mechanisms of toxicity, factors affecting toxicity, different types of intoxication and different toxic episodes; accidental, suicidal, homicidal and non-accidental poisoning. The course combines an accessible and engaging approach with coverage of essential introductory concepts providing a solid grounding in basic and medical toxicology. The course also covers the specific effect sofa wide range of toxic chemicals, gases, corrosives, metal poisoning, hydro carbons, alcohols, asphyxiates and pesticides as well as the basic principles of forensic toxicology. Many of the sub-disciplines will be provided such as plant and animal poisons, food toxicology, environmental toxicology with its multi facets of air, water and soil pollution. It also includes the study of congenital mal formation and syndromes caused by toxic agents during pregnancy.

2. Intended Learning Outcomes (ILOs)

By the end of this course, students should be able to:

a- Knowledge and Understanding:

- a1. Define the principles of medical, health and environmental sciences.
- a2. Recognize factors affecting toxicity, ways of exposure of toxic agents.
- a3. Outline general mechanisms of toxicity and how different chemicals are taken up, processed, eliminated from the body and management.
- a4. Define the most toxic agents and mechanisms behind the effects.
- a5. Describe the bio-effects of various toxic chemicals on the environment and the current pollution problems.
- a6. Distinguish plant and animal toxins, the underlying mechanisms of toxicity and management.
- a7. List contra-indications, drug interactions, adverse effects and other properties of different drugs from various origins.
- a8. State the causes and management of food toxicity.
- a9. Recognize the different pesticides, their mechanisms of toxicity and management.
- a10. Recognize safe drugs during pregnancy.
- a11. Identify congenital malformations caused by toxic agents and drugs during pregnancy.
- a12. Express chromosomal aberrations causing teratogenic syndromes.
- a13. Describe the basic principles of forensic toxicology, post-mortem examination and analysis of toxic agents.

b- Intellectual Skills:

- b1. Identify factors affecting toxicity.
- b2. Discriminate between different toxicities and syndromes.
- b3. Estimate the role of the forensic chemist with regard to the medico-legal aspects.
- b4. Select different antidotes for different toxic agents.

c- Professional and Practical Skills:

- c1. Detect mechanisms of action of all toxins confirmed or suspected in all cases in the daily case log.
- c2. Relate toxic mechanisms at a cellular/molecular level, and their overall effect on each body system.
- c3. Assess toxicity of various xenobiotics.
- c4. Apply this knowledge to how specific antidotes and treatments will effectively work to improve patient outcomes.
- c5. Apply medical ethics, etiquette, duties, rights, medical negligence and legal responsibilities of the pharmacists towards patients, profession, society, state and humanity at large.
- c6. Prepare report in medico-legal cases/situations.
- c7. Apply safety measures in practice.

d- General and Transferable Skills:

- d1. Use different sources of biomedical information to remain current with advances in knowledge and practice.
- d2. Collect information and data search from different sources.
- d3. Participate actively in a team.
- d4. Apply self-learning to develop profession continuously.
- d5. Communicate effectively with his colleagues and mentors.
- d6. Express thoughts and ideas effectively.

3. Contents

Teaching Weeks	Topic	No. of hours	Lecture	Practical
One	General introduction	5	3	
	Introduction, lab animal handling			2
Two	General principles of toxicology	5	3	
	CNS drugs			2
Three	CNS drugs	5	3	
	CNS drugs			2
Four	Paracetamol & Salicylates + First Midterm Exam	5	3	
	CNS drugs			2
Five	Toxic effects of solvents & vapors	5	3	
	Hemolytic agents			2
Six	Toxic effects of pesticides	5	3	
	Hemolytic agents			2
Seven	Corrosive poisons & hydrocarbons	5	3	
	Irritants & corrosives			2
Eight	Second Midterm exam			
Nine	Teratogenicity	5	3	
	Irritants & corrosives			2
Ten	Toxic effects of heavy metals	5	3	
	Case studies			2
Eleven	Food, plant & animal toxicity	5	3	
	Practical Exam			2
Twelve	Pollution & ecotoxicology	3	3	
Thirteen	Forensic toxicology	3	3	
Total No. of hours		56	36	20
Fourteen	University requirements Exams			
Fifteen	Final Exams			
Sixteen				

4. Teaching and Learning Methods

- 4.1. Power point based lecture
- 4.2. Interactive teaching supported by actual examples from local and international origin
- 4.3. Encouragement of searching and retrieving information in the form of assignments
- 4.4. Practical sessions

5. Student Assessment Methods

- 5.1. Written exams to assess knowledge and understanding as well as intellectual skills.
- 5.2. Practical exam to assess professional and practical skills.
- 5.3. Oral exam to assess all types of skills and mainly general and transferrable skills.
- 5.4. Class Work (Researches and oral presentations) to assess all types of skills

Assessment Schedule

Assessment 1	1 st Mid-term exam	Week 4
Assessment 2	2 nd Mid-term Exam	Week 8
Assessment 3	Class Work (Research & presentation)	each lab
Assessment 4	Practical Exam	Week 11
Assessment 5	Final Written Exam	Week 15/16
Assessment 6	Oral exam	Week 15/16

Weighting of Assessments

1 st Mid-Term Examination	5 %
2 nd Mid-Term Examination	15 %
Final-Term Examination	30 %
Oral Examination	10 %
Practical Examination	30 %
Class Work (Research & presentation)	10 %

Total **100 %**

6. List of References

6.1. Course Notes

Handout of slides of power point presentations uploaded on Moodle.
Practical notes given to each student.

6.2. Essential Books (Text Books)

Casarett & Doull's: Essentials of Toxicology, 2nd edition, McGraw Hill,
2010.

ISBN 978-0-07-174274-0

6.3. Recommended Books

Casarett & Doull's Toxicology, The Basic Science of Poisons, 8th edition,
2013,

ISBN 978-0-07-176923-5

6.4. Periodicals, Websites,etc

www.pubmed.org

www.toxicology.org

<http://toxsci.oxfordjournals.org/>

www.nature.com

7. Facilities Required for Teaching and Learning

Data show, White board, white board markers, laboratory equipment, laboratory animals.

Course Coordinator:-----

Head of Department

Prof. Dr./ Maha El Sawalhy

Department Approval Date: October 2014

Drug Evaluation and Bioassay (PHL 605)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Pharmacology, Toxicology & Biochemistry
Academic year:	-----
Approval Date:	October 2014

A. Basic Information

Course Title: Drug Evaluation and Bioassay	Course Code: PHL 605
Prerequisites: Pharmacology-II (PHL 326)	
Students' Level/Semester:	Elective
Credit hours:	2 (2+0)
Actual teaching hours per week:	
Lectures: 2 hr/week	Practical: N/A Tutorial: N/A Total: 2 hr/week

B. Professional Information

1. Overall Aim of Course

At the end of the course the candidate will be able to identify the basic concepts of the biological assay. The course covers different techniques applied for screening and standardization of drugs belonging to different pharmacological categories.

2. Intended Learning Outcomes (ILOs)

By the end of the course, the student should be able to:

a- Knowledge and Understanding:

- a1. Recognize the basis of biological assay.
- a2. Identify ways of drug development.
- a3. Select experimental animals to estimate the potency of drugs and for biological standardization.
- a4. Outline screening of different drug groups.
- a5. Discuss the role of hormones in the regulation of biological activities.
- a6. Recognize knowledge about which drug should be monitored.

b- Intellectual Skills:

- b.1. Classify different pharmacologically acting substances.
- b.2. Relate the importance of screening procedures to the discovery of new pharmacological agents.
- b.3. Outline the main steps in screening and biological standardization of different hormonal-like substances based on their physiological function or toxic effects.
- b.4. Compare the potency of the test and standard preparations used in bioassay procedures based on the statistical results.

Course Specifications

b.5. Analyze critically the data derived from laboratory and clinical observations and measurements.

Professional and Practical Skills:

- c1. Discriminate between various experimental models to select the best one used for biological assay.
- c2. Design complete experimental protocols for biological standardization of different compounds, beginning from problem-recognition to evaluation of results and findings.
- c3. Develop a critical attitude in clinical evaluation and prescription auditing.

c- General and Transferable Skills:

- d1. Develop strong analytical skills.
- d2. Work effectively within a team.
- d3. Use different resources to enhance life-long, self-directed working.
- d4. Value precision and correctness.

3. Contents:

Teaching Weeks	Topic	No. of hours	Lecture
One	Methods used to minimize variability in biological assay – Blind screening	2	2
Two	Screening and bioassay of autonomic acting drugs	2	2
Three	Screening and bioassay of skeletal muscle relaxants	2	2
Four	Screening and bioassay of autacoid and anti-inflammatory drugs + First Midterm Exam	2	2
Fifth	Screening and bioassay of cardiac glycosides	2	2

Course Specifications

Six	Screening and bioassay of anti-arrhythmic drugs	2	2
Seventh	Screening and bioassay of antihypertensive drugs	2	2
Eight	Second Midterm exam		
Nine	Screening and bioassay of neuroleptic and anxiolytic drugs	2	2
Ten	Screening and bioassay of anticonvulsants and hypnotics	2	2
Eleven	Screening and bioassay of insulin and sex hormones	2	2
Twelve	Screening and bioassay of thyroid, parathyroid hormones, cortisone, ADH pituitary hormones	2	2
Thirteen	Revision	2	2
Total No. of hours		24	24
Fourteen	University requirements Exams		
Fifteen	Final Exams		
Sixteen	Final Exams		

4. Teaching and Learning Methods

- 4.1. Power point based lectures.
- 4.2. Interactive teaching supported by actual examples from local and international origin.
- 4.3. Encouragement of searching and retrieving information in the form of assignments.

5. Student Assessment Methods

- 5.1. Written exams to assess knowledge and understanding and intellectual skills as well as professional skills.
- 5.2. Class Work (Participation) to assess all types of skills including general and transferrable skills.

Assessment Schedule

Assessment 1	First Midterm Exam	Week 4
Assessment 2	Second Midterm Exam	Week 8
Assessment 3	Final Exam	Week 15/16
Assessment 4	Class Work (Participation)	(During the semester)

Weighting of Assessments

First Midterm Examination	10%
Second Mid-term Examination	20%
Final-term Examination	40 %
Class Work (Participation)	30 %
<hr/>	
Total	100 %

6. List of References

6.1. Course Notes

Handout of slides of power point presentations uploaded on Moodle.

6.2. Essential Books (Text Books)

Bioassay technique for drug development, Atta-ur-Rahman, Choudhary and Thomsen, W.J (2001), Hardwood medical publishers.

6.3. Recommended Books

- a. Drug discovery and evaluation: Pharmacologic assays, Vogel and Vogel (1997), Springer.
- b. Qualitative and quantitative evaluation of drugs and hormones, 2003, Alexandria Univ. press.

6.4. Periodicals, Websites,etc

www. Pubmed.org

www.Scimedirect.com

www. Googlescholar.com

7. Facilities Required for Teaching and Learning

- Data show.
- White Board + Markers.
- Interactive board.

Course Coordinator:-

Head of Department: Prof. Dr. Maha El Sawalhy

Department Approval Date: October 2014

Substance Abuse (PHL 606)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Pharmacology, Toxicology and Biochemistry
Academic year:	-----
Approval Date:	October 2014

A. Basic Information

Course Title: Substance Abuse	Course Code: PHL 606
Prerequisites: Toxicology (PHL 518)	
Students' Level/Semester:	Elective
Credit hours:	2 (2+0)
Actual teaching hours per week:	
Lectures: 2 hr/week	Practical: N/A Tutorial: N/A Total: 2 hr/week

B. Professional Information

1. Overall Aim of Course

Following completion of the course, the student will have a good knowledge of a variety of abused drugs and substances. The student learns the neurochemical basis of drug dependence. The psychoactive effects of CNS depressant drugs such as opioids, sedative hypnotics (barbiturates, benzodiazepines), alcohol, cannabinoids as well as psychostimulant drugs such as caffeine, cocaine and amphetamines which are discussed in details in the current course. Besides, inhalants, hallucinogens and designer drugs are also an integral part of the curriculum. Recent trends in the management of the aforementioned drug classes are also provided.

2. Intended Learning Outcomes (ILOs)

By the end of the course, student should be able to:

a- Knowledge and Understanding:

- a.1. Recognize the basic neurochemistry behind drug dependence.
- a.2. Differentiate between physical and psychological dependence.
- a.3. Identify the psychoactive effects of CNS depressant drugs such as opioids, sedative hypnotics, alcohol & cannabinoids.
- a.4. Identify the psychoactive effects of CNS stimulant drugs such as caffeine, cocaine and amphetamines.
- a.5. Recognize the recent trends in the management of dependence.
- a.6. List the effects of inhalants, hallucinogens & designer drugs.
- a.7. Recognize the different abused stuff in the Egyptian habitat.

b- Intellectual skills:

- b.1. Identify the most common features of drug dependence particularly amongst youth.
- b.2. Detect the best solution for addiction problems.
- b.3. Identify the merits and demerits of various therapeutic interventions for dependence.

c- Professional and practical skills:

- c.1. Assess various addiction problems.
- c.2. Solve problems associated with substance abuse effectively.
- c.3. Counsel patients on reasonable use of drugs and social health dangers of drug abuse and misuse.

d- General and transferable skills:

- d.1. Work effectively within a team during questionnaire assessment.
- d.2. Set up targets and work-plans to fulfill these targets within deadlines.
- d.3. Develop self-learning skills.
- d.4. Communicate effectively with patients and other health professionals.

3. Contents

Teaching Weeks	Topic	No. of hours	Lecture
One	Neurochemistry of brain in health and addiction	2	2
Two	Opioid dependence	2	2
Three	Sedative hypnotics: Barbiturate abuse	2	2
Four	Sedative hypnotics: Benzodiazepines abuse + First Midterm Exam	2	2
Five	Alcohol abuse	2	2
Six	Cannabinoids	2	2
Seven	Psychostimulants: Cocaine abuse	2	2
Eight	Second Midterm exam		
Nine	Psychostimulants: Amphetamines abuse	2	2
Ten	Tobacco smoking and addiction	2	2
Eleven	Designer drugs	2	2
Twelve	Inhalants	2	2
Thirteen	Hallucinogens	2	2
Total No. of hours		24	24
Fourteen	University requirements Exams		
Fifteen	Final Exams		
Sixteen			

4. Teaching and Learning Methods

- 4.1. Power point based lecture
- 4.2 Interactive teaching supported by actual examples from local and international origin
- 4.3 Encouragement of searching and retrieving information in the form of assignments

5. Student Assessment Methods

- 5.1. Written exams to assess knowledge and understanding skills as well as intellectual and professional skills.
- 5.2 Class Work (Participation and Assignments) to assess all types of skills including the general and transferrable skills.

Assessment Schedule

Assessment 1	First Midterm exam	Week 4
Assessment 2	Second Midterm exam	Week 8
Assessment 4	Final written exam	Week 15/16
Assessment 5	Class Work	(During the semester)

Weighting of Assessments

1 st Mid-Term Examination	10 %
2 nd Mid-Term Examination	20 %
Final-Term Examination	40 %
Class Work (Participation & Assignments)	30 %
Total	100 %

6. List of References

6.1. Course Notes

Handout of slides of power point presentations uploaded on Moodle.

6.2. Essential Books (Text Books)

JH Lowinson, Substance abuse::A Comprehensive textbook,
Lippincott Williams and Wilkins, 5th edition, 2011.

6.3. Recommended Books

Marc Galanter & Herbert D. Kleber, Textbook of Substance Abuse
Treatment, 3rd Edition, American Psychiatric Publishing, 2004.

6.4. Periodicals, Websites,etc

- www.emedicine.com <http://www.medconsult.com>
<http://www.freemedicalbooks.com>
<http://www.freemedicaljournals.com>

7. Facilities Required for Teaching and Learning

Lecture halls, Personal computer
available for each staff member,
Data show, White board, white
board markers.

Course Coordinator:-

Head of Department: Prof.Dr./ Maha El Sawalhy

Department Approval Date: October 2014

Clinical Toxicology (PHL 607)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Department of Pharmacology and Toxicology and Biochemistry
Academic year:	-----
Approval Date:	October 2014

A. Basic Information

Course Title: Clinical Toxicology	Course Code: (PHL 607)
Prerequisites: Toxicology PHL 518	
Students' Level/Semester:	Elective
Credit hours:	2(2+0)
Actual teaching hours per week:	
Lectures: 2 hr/week	Practical: N/A
	Tutorial: N/A
	Total: 2
	hr/week

B. Professional Information

1. Overall Aim of Course

Following the completion of this course the student should have a solid foundation in clinical toxicological concepts and principles including the proper diagnosis and management of poisoning from drugs usually used for therapeutic purposes as well as chemical wastes with no medical purposes, in addition to food, plant and animal poisons, household products and drugs of abuse.

2. Intended Learning Outcomes (ILOs)

By the end of this course the student should be able to:

a- Knowledge and Understanding:

- a1. Describe the steps of clinical assessment of poisoning (physical signs: odor, skin, temperature, blood pressure, and eye).
- a2. Recognize the various poison management protocols (airway, breathing, circulation, and altered mental status)
- a3. Outline the general and specific methods for approach of a poisoned patient in normal and critical situations (decontamination, enhanced removal, disposition)
- a4. Outline the toxicity and management of typical drugs present in the medical cabinet
- a5 .Recognize the toxicity of food, plant and animal poisons
- a6. Identify the health hazards of household cleaning products

a7. Describe the maladaptive pattern of use of drugs that alter the behavior and management of the poisoned patient.

b- Intellectual Skills:

b1. Construct integrated approaches to analyze and interpret complex and contradictory scientific information autonomously to solve special problems in clinical toxicology.

b2. Evaluate his own and others' work accurately.

b3. Plan for innovative and creative performance in the field of clinical toxicology.

b4. Relate the ethical constraints and risks associated with the subject and the ability to relate these to own experience.

b5. Manage the toxicity of food, plant and animal poisons

c- Professional and Practical Skills:

c1. Construct appropriate management strategies both diagnostic and therapeutic for patients with acute and chronic toxicity.

c2. Resolve problems independently to react effectively to unusual and unexpected toxicological situations.

c3. Communicate effectively with professional and academic staff in the clinical toxicology field.

c4. Conduct a study or research to develop his skills.

d- General and Transferable Skills:

d1. Utilize information (from electronic database and other resources), for solving problems and making decisions that are relevant to care for poisoned patients.

d2. Apply gained knowledge to be a life-long self-directed learning to catch up the scientific evolution.

d3. Counsel patients and their families.

d4. Work in a team in different professional situations.

d5. Develop good presentation skills.

d6. Criticize his work and other's effectively.

3. Contents

Teaching Weeks	Topic	No. of hours	Lecture
One	Poison clinical assessment	2	2
Two	Poison clinical assessment (2)	2	2
Three	Poison management	2	2
Four	Poison management + First Midterm Exam	2	2
Five	Toxidromes	2	2
Six	Toxidromes	2	2
Seven	Medicinal cabinet	2	2
Eight	Medicinal cabinet + Second Midterm exam	2	2
Nine	Food poisons	2	2
Ten	Plant and animal poisons	2	2
Eleven	Household cleaning products	2	2
Twelve	Drug dependence	2	2
Thirteen	Case studies	2	2
Total No. of hours		26	26
Fourteen	University requirements Exams	26	26
Fifteen	Final Exams of Faculty		
Sixteen			

4. Teaching and Learning Methods

- 4.1. Power point lectures.
- 4.2. White board illustrations.
- 4.3. Open discussion.
- 4.4. Case studies

5. Student Assessment Methods

5.1. Written exams to assess all types of skills.

5.2. Class Work (Assignments) to assess general and transferable skills.

Assessment Schedule

Assessment 1	1 st Mid-term.....	Week ...4
Assessment 2	2 nd Mid-term	Week ...8
Assessment 3	Class work (assignments)... ..during the semester	
Assessment 4	Final term exam	Week ...15/16

Weighting of Assessments

1 st Mid-term Examination	10%
2 nd Mid-Term Examination	20%
Final-Term Examination	40%
Semester Work (assignments)	30%
Total	100%

6. List of References

6.1. Course Notes

Handouts given to students by instructors and uploaded on Moodle.

6.2. Essential Books (Text Books)

Lewis Goldfrank, Goldfrank's Manual of Toxicologic emergencies, 1st edition 2007

6.3. Recommended Books

Alisonl, Jones,PaulI, Dargan ,Churchill's Pocketbook of Toxicology,1st edition 2001

6.4. Periodicals, Websites,etc

www.medlib.med.utah.edu/webpath/
www.dundee.ac.uk/facmedden/bmsc

7. Facilities Required for Teaching and Learning

Computer and projector (data show)

White board and required colored drawing pens.

Course Coordinator: -

Head of Department: Prof.Dr. Maha El Sawalhy

Department Approval Date: October 2014

Biochemistry-I (PBC 211)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Pharmacology, Toxicology and Biochemistry
Academic year:	-----
Approval Date:	October 2014

A. Basic Information

Course Title: Biochemistry-I	Course Code: PBC 211
Prerequisites: Physiology PHL 123	
Students' Level/Semester:	Second Level/ Third Semester
Credit hours:	3 (2+1)
Actual teaching hours per week:	
Lectures: 2 hr/week	Practical: 2 hr/week
	Tutorial: N/A
	Total: 4
	hr/week

B. Professional Information

1. Overall Aim of Course

This course introduces the concepts of cellular biology including the outlines, different functions of different cell components, different transport mechanisms through the plasma membrane as well as the basic concepts and fundamentals of biochemistry. The course covers the physical and chemical properties of different biomolecules; carbohydrates, lipids, proteins, and nucleic acid and their functions, enzyme mechanism and controlling enzyme activity, biochemistry of hemoglobin and the basic principles of molecular biology. The laboratory application to study the physical and chemical properties of different biochemical molecules and the enzyme activity are included.

2. Intended Learning Outcomes (ILOs)

By the end of the course, the student should be able to:

a- Knowledge and Understanding:

- a1. Recognize structure and nomenclature of enzymes.
- a2. Outline the kinetic properties of enzymes.
- a3. Outline the process of enzyme regulation.
- a4. Recognize the diagnostic role of enzymes.
- a5. Identify the structure of amino acids, and proteins
- a6. Outline the process of protein denaturation.
- a7. Identify the concept of bioenergetics and oxidative phosphorylation.

Course Specifications

- a8. Recognize the concept of free energy change, ATP as energy carrier, and electron transport chain.
- a9. Recognize different concepts of molecular biology; DNA and RNA.
- a10. Identify the concepts of DNA repair, condensation, replication, and gene expression.
- a11. Outline the processes of RNA synthesis, transcription, translation, protein biosynthesis, and mutation.

b- Intellectual Skills:

- b1. Apply the above knowledge in analyzing different states of health and disease.
- b2. Compare the utility of subsystems within the biological systems mentioned above.
- b3. Point out the biochemical triggers and anomalies that are related to enzymes.
- b4. Compare various structures of the cell, DNA, RNA, and oxidative stress.
- b5. Point out the biochemical triggers and anomalies that are related to proteins.

c- Professional and Practical Skills:

- c1. Assess the differential methods and appraise the principles of testing and quantitation of biological samples.
- c2. Predict the presence/absence of proteins.
- c3. Detect the concentration of proteins in blood samples.
- c4. Identify specificity and sensitivity of enzymes, and enzymes in biological materials.
- c5. Assess enzyme activity through chromic period measurement.
- c6. Interpret the effect of changing physical conditions (pH, substrate/ enzymes concentrations, temp., and activators/inhibitors).
- c7. Interpret laboratory data in a scientific way.
- c8. Predict a disease situation based on critical differential diagnosis and results obtained from laboratory analysis done.
- c9. Use various types of equipment for analysis in laboratory accurately.

d- General and Transferable Skills:

- d1. Work effectively in a team and taskforce coordinated efforts.
- d2. Use different means of getting independent/critical opinions on definitive problems.
- d3. Argue about ways of calculating and expressing concentrations of biological materials.
- d4. Explain different ways of examination and assessments.
- d5. Collect information using web resources.
- d6. Present topics/data in a professional manner applying level (I) presentation skills.

3. Contents

Teaching Weeks	Topic	No. of hours	Lecture	Practical
One	Introduction to the course: topics, objectives, grading and assessments. Amino acids and protein chemistry/ Enzymology.	4	2	
	Qualitative analysis of protein.			2
Two	Amino acids and protein chemistry/ Enzymology.	4	2	
	Denaturation of proteins. Conjugated proteins			2
Three	Amino acids and protein chemistry/ Enzymology.	4	2	
	Quantitative determination of total plasma proteins			2
Four	Amino acids and protein chemistry/Enzymology	4	2	
	Enzymology			1½
	First Midterm Exam			½
Five	Amino acids and protein chemistry/Enzymology	4	2	
	Kinetic properties of enzymes + (First lab sheet)			2
Six	Nucleic acid / Enzymology.	4	2	
	Kinetic properties of enzymes			2
Seven	Nucleic acid / Biological oxidation.	4	2	
	Blood			2
Eight	Second Midterm exam			
Nine	Nucleic acid / Biological oxidation (1).	4	2	

Course Specifications

	Gastric Juice			2
Ten	Nucleic acid / Biological oxidation (2).	4	2	
	Practical exam + Second practical sheet			
Eleven	Nucleic acid / Biological oxidation (3).	4	2	
	Practical exam+ Second practical sheet			
Twelve	Nucleic acid / Biological oxidation (4).	2	2	
Thirteen	Revision	2	2	
Total No. of hours		44	(12*2) 24	(2*10) 20
Fourteen	University Elective Final Exams			
Fifteen	Final Exams			
Sixteen				

4. Teaching and Learning Methods

- 4.1. Data show and computer in lectures.
- 4.2. Laboratory sessions
- 4.3. Office hours
- 4.4. Research and power point presentations
- 4.5. Assignments.
- 4.6. Demonstrations

5. Student Assessment Methods

- 5.1. Written exams to assess knowledge and understanding as well as intellectual skills.
- 5.2. Oral exam to assess all types of skills and mainly general and transferrable skills.

Course Specifications

- 5.3. Practical exam to assess professional and practical skills.
- 5.4. Class work (Lab performance/ participation in lectures) to assess all types of skills.
- 5.5. Assignments and presentation to assess general and transferrable skills.

Assessment Schedule

Assessment 1	First midterm	Week	4
Assessment 2	Second midterm exam	Week	8
Assessment 3	First Practical quiz	Week	5
Assessment 4	Second Practical quiz	Week	10 &11
Assessment 5	Practical Exam	Week	10 &11
Assessment 6	Final Exam	Week	15/16
Assessment 7	Oral Exam	Week	15/16
Assessment 8	Class Work	(During the semester)	

Weighting of Assessments

-First Midterm Examination	5%
-Second midterm Examination:	15 %
-Practical Examination:	30%
• Practical Experiment	15%
• First practical sheet	5%
• Second practical sheet	5%
• Presentations	5%
-Class Work:	10%
-Final-Written Examination:	30 %
-Oral Examination:	10%
Total	100%

6. List of References

6.1. Course Notes

Staff lectures handouts are uploaded to the Moodle.
Lab manual is given to each student.

6.2. Essential Books (Text Books)

- Lippincott's Illustrated Reviews: Biochemistry, 6th edition 2013.
Authors: Pamela C. Champe, Richard A. Harvey, and Denise R. Ferrier
Publisher: Lippincott Williams & Wilkins. (Given to each student)

6.3. Recommended Books

- Harper's Biochemistry, Harper's illustrated Biochemistry 2012,

Authors: Robert K. Murray, Daryl K. Granner, Peter A. Mayes, and Victor W. Radwel. Publisher: Appelton & Lange.

6.4. Periodicals & Websites

1. Journal of Biological Chemistry
2. Biochemical Journal
3. www.PubMed.com
4. www.medline.com
5. <http://pdfdatabase.com/index.php?q=medical+biochemistry+lectur>
6. <http://www.indstate.edu/thcme/mwking/lectures09.html>
7. <http://www.biosolutions.info/search/label/biochemistry>
8. <http://themedicalbiochemistrypage.org/>

7. Facilities Required for Teaching and Learning

- Lecture halls.
- Laboratories.
- Personal Computer (available for each staff member).
- Computer equipped with projector and internet connection available for the usual lectures and Labs.
- Meeting rooms for office hours.
- White board.
- Books.
- Audio-lectures.
- Library furnished with textbooks.
- Chemicals
- Different laboratory equipment
 - 1- Centrifuges.
 - 2- Colorimeters.
 - 3- Glassware.
 - 4- Water baths.
 - 5- Wide, air-conditioned, well-lighted laboratories with suitable no. of benches.

Course Coordinator:

Head of Department:

Prof. Dr. Maha El-Sawalhi

Department Approval Date:

October 2014

Biochemistry-II (PBC 222)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Pharmacology, Toxicology and Biochemistry
Academic year:	-----
Approval Date:	October 2014

A. Basic Information

Course Title: Biochemistry-II	Course Code: PBC 222		
Prerequisites: Biochemistry-I (PBC 211)			
Students' Level/Semester:	Second Level/ Fourth Semester		
Credit hours:	4 (3 +1)		
Actual teaching hours per week:			
Lectures: 3 hr/week	Practical: 2 hr/week	Tutorial: N/A	Total: 5
hr/week			

B. Professional Information

1. Overall Aim of Course

The course covers the macromolecular pathways, interconversion and integration of carbohydrates (glucose oxidation, citric acid cycle, gluconeogenesis, glycogen metabolism, hexose monophosphate shunt, fructose and galactose metabolism), lipids(Fatty acid metabolism), proteins and nucleic acid (amino acid metabolism, disposal of nitrogen; urea cycle) in well feed and fasting states. The laboratory biochemical measurements of different enzymes involved in different metabolic pathways enable the student to analyze and interpret the different biochemical data and ensure that their clinical significances is covered .

2. Intended Learning Outcomes (ILOs)

By the end of the course, the student should be able:

a- Knowledge and Understanding:

- a.1. Identify the metabolism of basic macromolecules as carbohydrates, lipids and proteins.
- a.2. Outline major oxidative pathways of glucose including; glycolysis, Krebs's cycle,
- a.3. Recognize HMP shunt, gluconeogenesis and glycogen metabolism including synthesis and breakdown.
- a.4. Outline galactose metabolism, fructose metabolism, and uronic acid pathway.
- a.5. Recognize the chemistry of lipids metabolism.
- a.6. Describe Cholesterol synthesis.
- a.7. Describe fatty acid synthesis.
- a.8. Outline β oxidation of fatty acids, ketogenesis, and ketolysis.

- a.9. Identify Ecosanoids.
- a.10. List different types of lipoproteins, their formation and functions.
- a.11. Explain Amino acids metabolism.
- a.12. Outline urea cycle, glucose-alanine cycle.
- a.13. Recognize genetic defects associated with abnormalities in amino acids metabolism.
- a.14. Outline the synthesis of catecholamines, serotonin, histamine, Nitric oxide and glutathione.
- a.15. Explain various biochemical reactions and their impact and uses.
- a.16. Summarize biological mechanisms and their sites.

b- Intellectual Skills:

- b.1. Infer the process of energy production from different macromolecules.
- b.2. Relate different biochemical pathways with the crucial role of enzymes and cofactors in their driving and regulating.
- b.3. Infer pathway sites that, when defective, and interpreted into clinical disorders.
- b.4. Compare inputs and outputs of diverse metabolic pathways and their sites of overlap and inter-conversion.
- b.5. Relate metabolites to energy, and metabolite concentrations to disease states.
- b.6. Interpret readings of laboratory results into diagnosis of conditions related to the metabolism of macromolecules.

c- Professional and Practical Skills:

- c.1. Estimate levels of key diagnostic molecules in biological fluids.
- c.2. Estimate the levels of glucose in the blood.
- c.3. Evaluate the levels of lipids in blood samples.
- c.4. Test liver and kidney functions in blood samples.
- c.5. Analyze urine sample
- c.6. Apply the differential methods and principles of testing and quantitation of biological samples.
- c.7. Illustrate laboratory data in a scientific way
- c.8. Predict a disease situation based on critical differential diagnosis.

d- General and Transferable Skills:

- d.1. Argue about ways of calculating and expressing concentrations of different biological molecules in biological materials.
- d.2. Work effectively within a team.
- d.3. Use optimal means of getting independent/critical opinions on definitive problems.
- d.4. Present topics/data in a professional manner.
- d5. Suggest different ways of examination and assessments
- d6. Collect information using web resources.

using various analysis equipment and in undergoing laboratory analysis.

3. Contents

Teaching Weeks	Topic	No. of hours	Lecture	Practical
One	Introduction to the course, assessment, topics, objectives. Carbohydrate metabolism+ lipid chemistry and metabolism	5	3	
	Determination of blood glucose level			2
Two	Carbohydrate metabolism+ lipid chemistry and metabolism	5	3	
	Plasma lipids and lipoproteins (Triglycerides)			2
Three	Carbohydrate metabolism+ lipid chemistry and metabolism	5	3	
	Plasma lipids and lipoproteins (Total Cholesterol)			2
Four	Carbohydrate metabolism+ lipid chemistry and metabolism	5	3	
	Test for evaluation of liver function(Bilirubin)			1½
	+ First Midterm Exam			½
Five	Carbohydrate metabolism+ lipid chemistry and metabolism	5	3	
	Test for evaluation of liver function (ALT &AST) First practical sheet			2
Six	Carbohydrate metabolism+ lipid chemistry and metabolism	5	3	
	Determination of serum creatinine			2
Seven	Lipid chemistry & metabolism	5	3	
	Determination of serum urea			2

Eight	Second Midterm exam			
Nine	Amino acid anabolism+ lipid chemistry and metabolism	5	3	
	Determination of pathological constituents of urine+ Second practical sheet			2
Ten	Amino acid catabolism+ lipid chemistry and metabolism	5	3	
	Practical Exam + Second Practical Sheet			2
Eleven	Urea cycle and the metabolism of some nitrogenous compounds + lipid chemistry and metabolism	5	3	
	Practical Exam + Second Practical Sheet			2
Twelve	Urea cycle and the metabolism of some nitrogenous compounds + lipid chemistry and metabolism	3	3	
				0
Thirteen	Revision	3	3	
				0
Total No. of hours		56	36	20
Fourteen	University Elective Final Exams			
Fifteen	Final Exams			
Sixteen	Final Exams			

4. Teaching and Learning Methods

- 4.1. Data show and computer in lectures.
- 4.2. Laboratory sessions
- 4.3. Office hours
- 4.4. Research and presentation
- 4.5. Data Analysis.
- 4.6. Assignments.
- 4.7. Power point presentations.
- 4.8. Research and presentation
- 4.9. Demonstrations

5. Student Assessment Methods

- 5.1. Written exams to assess the student's understanding and comprehension as well as intellectual skills.
- 5.2. Oral exam to assess the communication skills.
- 5.3. Practical exam to assess the students' practical skills in the field of Biochemistry.
- 5.4. Class work (Lab performance/ participation in lectures) to assess all types of skills.
- 5.5. Assignments/presentations and poster to assess general and transferrable skills.

Assessment Schedule

Assessment 1	First Midterm	Week	4
Assessment 2	Second Midterm	Week	8
Assessment 3	First Practical quiz	Week	5
Assessment 4	Second Practical quiz	Week	10 &11
Assessment 5	Practical Exam	Week	10 &11
Assessment 6	Final Exam	Week	15/16
Assessment 7	Oral Exam	Week	15/16
Assessment 8	Class Work (Lab performance/ participation in lectures) (During the semester)		
Assessment 9	Assignments/presentations/poster (During the semester)		

Weighting of Assessments

- First Midterm Examination	5%
- Second Midterm Examination:	15 %
-Final-Term Examination:	30 %
-Oral Examination	10%
-Practical Examination:	30%
- First practical sheet	5%
- Second practical sheet	5%
- Practical Exam	15%
- Poster	5%
-Class Work	10%
Total	100%

6. List of References

6.1. Course Notes

Staff lectures handouts are uploaded to the Moodle.

Lab manual is given to each student.

6.2. Essential Books (Text Books)

- Lippincott's Illustrated Reviews: Biochemistry, 6th edition 2013.
Authors: Pamela C. Champe, Richard A. Harvey, and Denise R. Ferrier
Publisher: Lippincott Williams & Wilkins. (Given to each student)

6.3. Recommended Books

- Harper's Biochemistry, Harper's illustrated Biochemistry 2012,
Authors: Robert K. Murray, Daryl K. Granner, Peter A. Mayes, and
Victor W. Radwel. Publisher: Appelton & Lange.

6.4. Periodicals, Websites,etc

1. Journal of Biological Chemistry
2. Biochemical Journal
3. www.PubMed.com
4. www.medline.com
5. <http://www.una.edu/faculty/aecrews/Biochemistry/LectureNotes.htm>
6. <http://pdfdatabase.com/index.php?q=medical+biochemistry+lectures>
7. <http://www.biosolutions.info/search/label/biochemistry>

7. Facilities Required for Teaching and Learning

- Lecture halls.
- Laboratories.
- Personal Computer (available for each staff member).
- Computer equipped with projector and internet connection available for the usual lectures and Labs.
- Meeting rooms for office hours.
- White board.
- Books.
- Audio-lectures.
- Library furnished with textbooks.
- Chemicals
- Different laboratory equipment
 - 1- Centrifuges.
 - 2- Colorimeters.
 - 3- Glassware.
 - 4- Water baths.
 - 5- Wide, air-conditioned, well-lighted laboratories with suitable no. of benches.

Course Coordinator:

Head of Department:
Prof. Dr. Maha El-Sawalhi

Department Approval Date:
October 2014

Clinical Biochemistry (PBC 323)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Pharmacology, Toxicology and Biochemistry
Academic year:	-----
Approval Date:	October 2014

A. Basic Information

Course Title: Clinical Biochemistry	Course Code: PBC 323
Prerequisites: PBC 222 (Biochemistry-II)	
Students' Level/Semester:	Third Level/ Sixth Semester
Credit hours:	4 (3+1)
Actual teaching hours per week:	
Lectures: 3 hr/week	Practical: 2 hr/week
	Tutorial: N/A
	Total: 5
	hr/week

B. Professional Information

1. Overall Aim of Course

The course emphasizes the clinical aspects and applications of Biochemistry through identifying the clinical disorders posed by genetic/hereditary diseases and/or related to metabolism, and production of carbohydrates, lipids , proteins , hormones and nucleic acids and providing precise diagnostic means and markers for specific disease situation. The course enables the student to analyze and interpret the different biochemical data and their clinical correlations with respect to the pathophysiological relevance.

2. Intended Learning Outcomes (ILOs)

By the end of the course, the student should be able to:

a- Knowledge and Understanding:

- a.1. Identify clinical disorders relating to metabolism,.
- a.2. Identify disorders related to carbohydrates, lipids, proteins, hormones and porphyrin.
- a.3. Recognize the definition and the bases of clinical enzymology.
- a.4. Discuss the bases of endocrinology and disorders related to endocrine related abnormalities.
- a.5. List the functions and disorders related to the liver on clinical bases.
- a.6. Mention the functions and disorders related to the kidney on clinical bases.
- a.7. Describe the functions and disorders of iron and porphyrin metabolism on clinical bases .

Course Specifications

- a.8.** Define the function and disorders of mineral metabolism (ex. Calcium , phosphate & magnesium).
- a.9.** Recognize the relation between metabolic disorders and pathophysiological events in the context of disease conditions.
- a.10.** Identify the basis and mechanisms posed by genetic/hereditary diseases related to systemic disease.
- a.11.** Define the principles and most relevant biochemical tools in diagnosis and distinction among closely related diseases.

b- Intellectual Skills:

- b.1** Apply previously studied disciplines; like pathology, physiology, biochemistry, and pharmacology in analyzing different states of health and diseases (using case study scenarios).
- b.2.** Infer essential concepts and modalities commonly used to define and diagnose a biochemical metabolic disease.
- b.3.** Develop appropriate plans for using biochemical assays to rationally diagnose a disease.
- b.4.** Evaluate laboratory results towards diagnosis of a disease.

c- Professional and Practical Skills:

- c.1.** Appraise the differential methods and the principles of testing and quantitation of biological samples.
- c.2.** Detect levels of glucose, ALT, AST, and creatinine in the blood.
- c.3.** Appraise the principles of testing and quantifying the key diagnostic molecules in biological fluids.
- c.4.** Interpret laboratory data in a scientific way.
- c.5.** Predict the diagnosis, disease progression and prognosis (severity and consequences) of a disease situation based on assaying laboratory data of specific markers

d- General and Transferable Skills:

- d.1.** Argue about ways of calculating and expressing concentrations of biological materials
- d.2.** Work effectively within a team.
- d.3.** Use optimal ways of getting independent/critical opinions on definitive problems.
- d.4.** Present topics/data in a professional manner.
- d.5.** Collect information using web resources.

3.Contents

Teaching Weeks	Topic	No. of hours	Lecture	Practical
One	Introduction to the course, assessment, topics, objectives. Carbohydrate disorders	5	3	
	Laboratory diagnosis of glucose abnormalities			2
Two	Lipids and cardiovascular disorder	5	3	
	Clinical cases on glucose.			2
Three	Amino acids and protein metabolism disorders	5	3	
	Lipids levels and lipoproteins			2
Four	Clinical enzymology/Liver Function	5	3	
	Clinical cases on lipids.			1½
	First Midterm Exam			½
Five	Porphyrim metabolism	5	3	
	First Practical Exam			2
Six	Disorders of iron and Porphyrim metabolism	5	3	
	Evaluation of liver function			2
Seven	Disorders of mineral metabolism	5	3	
	Clinical cases on liver disease.			2
Eight	Second Midterm exam			
Nine	Renal Function	5	3	
	Evaluation of kidney function/clinical cases on kidney functions.			2
Ten	Disorders of pituitary gland	5	3	
	Clinical cases on Endocrine disorders.			2
Eleven	Disorders of adrenal cortex/ thyroid gland	5	3	
	Clinical cases on Endocrine disorders.			2

Course Specifications

Twelve	Tumor markers	5	3	
	Second Practical Exam			2
Thirteen	Revision	3	3	
Total No. of hours		58	36	22
Fourteen	University electives Exams			
Fifteen	Final Exams			
Sixteen				

4. Teaching and Learning Methods

- 4.1 Data show and computer in lectures. \
- 4.2 Tutorials, Problem-based learning.
- 4.3 Case study.
- 4.4 Data Analysis.
- 4.5 Problem solving.
- 4.6 Assignments.
- 4.7 Power point presentations.
- 4.8 Self-learning by discussion of projects prepared by students.
- 4.9 Office hours.
- 4.10 Research and presentation.

5. Student Assessment Methods

- 5.1. Written exams to assess the student's understanding and comprehension as well as intellectual skills.
- 5.2. Oral exam to assess the all types of skills and mainly general and transferrable skills.
- 5.3. Practical exam (including presentations, flyers and posters) to assess the students' professional and practical skills in the field of Biochemistry via problem-based learning & case study scenarios as well as general and transferrable skills.
- 5.4. Class work (Lab performance/ participation in lectures) to assess all types of skills.

Course Specifications

Assessment Schedule

Assessment 1: First midterm	Week 4
Assessment 2: Second midterm exam	Week 8
Assessment 3: First Practical exam	Week 5
Assessment 4: Second practical exam	Week 12
Assessment 5: Final written Exam	Week 15/116
Assessment 6: Oral Exam	Week 15/116
Assessment 7: Class Work	(During the semester)

Weighting of Assessments

-First Mid-Term Examination	5%
-Second Mid-Term Examination	15%
-Practical Examination	30%
• 1 st Exam	12%
• 2 nd Exam	12%
• Presentation, Flyers or Posters	6%
-Class Work	10%
-Final-Term Examination	30%
-Oral Examination	10%
Total	100%

6. List of References

6.1. Course Notes

Staff lectures handouts are uploaded to the Moodle.
Practical note (Lab Manual) is given to each student.

6.2. Essential Books (Text Books)

- Lectures notes on clinical biochemistry: Geoffrey Beckett, Simon W. Walker, Peter Rae, and Peter Ashby. Publisher: Wiley; 8th edition (June 24, 2008). (Given to each student)

6.3. Recommended Books:

- Tietz Fundamentals of Clinical Chemistry. Carl A. Burtis , Edward R. Ashwood MD David E. Bruns MD . Publisher: Saunders; 6 th edition 2008.

Course Specifications

- Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. Carl A. Burtis, Edward R. Ashwood, David E. Bruns, 5 th edition, 2013. Elsevier.

6.4. Periodicals, Websites,etc

- Clinical Biochemistry Journal
- Journal of Clinical Biochemistry and Nutrition
- <http://www.Clinical Chemistry.net>
- <http://www.pathology.med.umich.edu/handbook/>
- <http://www.aacc.org/Pages/default.aspx>
- <http://www.labexplorer.com/chemistry.htm>

7. Facilities Required for Teaching and Learning

- Lecture halls.
- Laboratories (for tutorials, case study teaching).
- Personal Computer (available for each staff member).
- Computer equipped with projector and internet connection available for the usual lectures and Labs.
- Meeting rooms for office hours.
- White board.
- Books.
- Audio-lectures.
- Library furnished with textbooks

Course Coordinator: -

Head of Department:

Prof. Dr. Maha El-Sawalhi

Department Approval Date:

October 2014

Molecular Biology (PBC 414)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Pharmacology, Toxicology and Biochemistry
Academic year:	-----
Approval Date:	October 2014

A. Basic Information

Course Title: Molecular Biology	Course Code: PBC 414
Prerequisites: Biochemistry-II (PBC 222)	
Students' Level/Semester:	Fourth Level/ Seventh Semester
Credit hours:	2 (1+1)
Actual teaching hours per week:	
Lectures: 1hr/week	Practical: 2 hr/week
	Tutorial: N/A
	Total: 3
hr/week	

B. Professional Information

1. Overall Aim of Course

This course demonstrates an understanding of genome organization in prokaryotes and eukaryotes, outlines the recent advances in approaching gene discovery through, explaining gene expression, regulation, and molecular biology techniques. In addition to, cancer development, progression mechanisms (carcinogenesis and apoptosis) and different models of cell division and cell cycle control are illustrated. The course emphasis new approaches using molecular biology to understand gene manipulation in diagnosing and controlling different diseases.

2. Intended Learning Outcomes (ILOs)

By the end of the course, the student should be able to:

a- Knowledge and Understanding:

- a1. Identify the genome of different organisms.
- a2. Outline the process of gene discovery.
- a3. Recognize recent advances in approaching gene discovery.
- a4. Identify the process of gene expression.
- a5. Outline the key elements and processes involved in gene regulation.

b- Intellectual Skills:

- b1. Differentiate the genome of prokaryotes and eukaryotes.
- b2. Relate the process of gene expression and regulation to various diseases.
- b3. Interpret alteration and mutations in human genome.

c- Professional and Practical Skills:

- c1. Comment on a range of advanced molecular biology techniques.
- c2. Assess the impact of bioinformatics on molecular biology particularly in respect to recent advances in biology and medicine.
- c3. Design approaches to using molecular biology to undertake gene discovery and manipulation.

d- . General and Transferable Skills:

- d1. Work effectively in a team and taskforce coordinated efforts.
- d2. Use optimal means of getting independent/critical opinions on definitive problems.
- d3. Argue about ways of calculating and expressing concentrations of biological materials.
- d4. Explain different ways of examination and assessments.
- d5. Collect information using web resources.

3. Contents

Teaching Weeks	Topic	No. of hours	Lecture	Practical
One	Review of genome organization	3	1	
	Introduction			2
Two	Gene discovery	3	1	
	Discussion and video shows of uses of genetics and molecular biology			2
Three	Gene expression	3	1	
	Discussion on check points for gene regulation			2
Four	Gene expression	3	1	
	Discussion of gene extraction			1½
	First Midterm Exam			½
Five	Gene regulation	3	1	
	DNA extraction lab			2
Six	Mutation, Recombination and Repair and cancer	3	1	
	Discussion of separation of proteins according to molecular weight			2
Seven	Mutation, Recombination and Repair and cancer	3	1	

	Demo on electrophoresis			2
Eight	Second Midterm Exam			
Nine	Developmental molecular biology	3	1	
	Techniques used in molecular biology (Western blot/ ELISA/PCR)			2
Ten	Advanced technologies in Molecular Biology	3	1	
	ELISA demo			2
Eleven	Systems Biology/ Advanced technologies in Molecular Biology (1)	3	1	
	Practical exam			2
Twelve	Systems Biology/ Advanced technologies in Molecular Biology (2)	1	1	
				0
Thirteen	Revision		1	
				0
Total No. of hours		32	(1*12) 12	(2*10)= 20
Fourteen	University electives Exams			
Fifteen	Final Exams			
Sixteen				

4. Teaching and Learning Methods

- Data show and computer in lectures
- Laboratory sessions
- Demonstrations.
 - Assignments.

- Demonstration videos.
- Data Analysis
- Tutorials.
- Self-learning by discussion of projects prepared by students.
- Office hours.
- Research and Power point presentations.

5. Student Assessment Methods

- Written exams to assess the student's understanding and comprehension as well as intellectual skills.
- Practical exam to assess professional and practical skills.
 - Class Work (Lab performance/ participation in lectures/ assignments & presentations) to assess the general and transferrable skills.

Assessment Schedule

Assessment 1	First midterm	Week 4
Assessment 2	Second midterm	Week 8
Assessment 3	Practical Exam	Week 11
Assessment 4	Final written Exam	Week 15/16
Assessment 5	Class Work (Lab performance/ participation in lectures/ assignments & presentations)	(During the semester)

Weighting of Assessments

-First Mid-Term Examination	5 %
-Second Mid-Term Examination	15 %
-Final-Term Examination	40%
-Practical Examination	30%
-Class Work	10%
Total	100%

6. List of References

6.1. Course Notes

Staff lectures handouts are uploaded to the Moodle..
Practical note (Lab Manual) is given to each student

6.2. Essential Books (Text Books)

- Cell and Molecular Biology, Lippincott's illustrated reviews. 2010 Authors: Nalini Chandar , Susan Viselli.

- James D. Watson, Tania A. Baker, Stephen P. Bell, "Molecular Biology of the Gene". 7th Edition 2014. Published and/or distributed in conjunction with Pearson.

6.3. Recommended Books

- Karp, G. Cell and Molecular Biology: Concepts and Experiments, 7th edn, 2014, John Wiley, & Sons.

6.4. Periodicals, Websites,etc

- Journal of Biological Chemistry
- www.PubMed.com
- www.medline.com
- www.indstate.edu/thcme/mwking/lectures09.html
- www.biosolutions.info/search/label/biochemistry
- 5thmedicalbiochemistrypage.org/

7. Facilities Required for Teaching and Learning

- Lecture halls.
- Personal Computer (available for each staff member).
- Computer equipped with projector and internet connection available for the usual lectures and Labs.
- Meeting rooms for office hours.
- White board.
- Books.
- Audio-lectures.
- Library furnished with textbooks.
- Different laboratory equipment
 - Centrifuges.
 - Colorimeters.
 - Glassware.
 - Water baths.
 - Eelectrophoresis.
 - Conventional PCR
 - Wide, air-conditioned, well-lighted laboratories with suitable no. of benches.

Course Coordinator: -

Head of Department:

Prof. Dr. Maha El-Sawalhi

Department Approval Date:

October 2014

Clinical Nutrition (PBC 608)

Program (s) on which the course is given:	Bachelor of Pharmacy
Department offering the program:	All Faculty Departments
Department offering the course:	Pharmacology, Toxicology and Biochemistry
Academic year:	-----
Approval Date:	October 2014

A. Basic Information

Course Title: Clinical Nutrition	Course Code: PBC 608
Prerequisites: Biochemistry-II (PBC 222)	
Students' Level/Semester:	Elective
Credit hours:	2 (2+0)
Actual teaching hours per week:	
Lectures: 2 hr/week	Practical: N/A Tutorial: N/A Total: 2 hr/week

B. Professional Information

1. Overall Aim of Course

The course introduces students to basic concepts of clinical nutrition including detailed information about micro and macronutrients, types of healthy and unhealthy food, drug-nutrient interactions, and essential medical nutrition in particular disease conditions, ex. Cancer; diabetes ; obesity , fatty liver etc.. It also emphasizes the practical application of the current principles of nutrition & diet therapy in the prevention & management of different disease states.

2. Intended Learning Outcomes (ILOs)

By the end of the course, the student should be able to:

a- Knowledge and Understanding:

- a1. Identify types of macro- and micronutrients
- a2. Identify the basics of energy requirements, and types of healthy and unhealthy food.
- a3. Recognize possible food-drug interactions in order to avoid any undesirable effects.
- a4. Recognize recent Medical Nutrition Therapy (MNT) for Diabetes Mellitus.
- a5. Identify the relationship of excessive or low nutrients intakes to the development of disease (CV, renal disease).
- a6. Recognize the goals of nutritional care for patients with certain disease (DM, infection,)

b- Intellectual Skills:

- b1. Detect needs for macro- and micronutrients across the human age.
- b2. Dominate concepts of human body weight standards.
- b3. Outline disorders and risk of nutrient deficiency.
- b4. Appraise the role and needs of nutrients in common metabolic, cardiovascular, and CNS disorders.
- b5. Outline the controlling factors and associated disorders of obesity.
- b6. Infer the potential, mechanisms and risk of nutrient interactions with medicines.

c- Professional and Practical Skills:

- c1. Estimate potential risk for definitive diseases in light of nutrient availability.
- c2. Assess the differential needs of vitamins/nutrients in health and disease.
- c3. Interpret nutritional needs in a scientific way
- c4. Predict a disease situation based on nutritional deficiency and needs.

d- General and Transferable Skills:

- d1. Interact effectively when working in a group.
- d2. Present topics/data in a professional manner.
- d3. Apply optimal means of getting independent/critical opinions on definitive problems.
- d4. Predict rules and tactics of developing teamwork coordinated efforts.
- d5. Use professional, efficient and prompt means to get reliable data on nutrition

3. Contents

Teaching Weeks	Topic	No. of hours	Lecture
One	Introduction to the course, assessment, topics, objectives	2	2
	The Role of nutrients in the human body.		
Two	Energy needs: Assessment and requirements. Diets and therapy: Nutritional assessment and standards.	2	2
Three	Role of diets in management of weight control and obesity	2	2

Four	Drug- Nutrient interaction. +	2	1½
	First Midterm Exam		½
Five	Recent Medical Nutrition Therapy (MNT) for Diabetes Mellitus.	2	2
Six	Role of diets in management of cardiovascular diseases	2	2
Seven	Role of diets in management of nervous system disorders.	2	2
Eight	Second Midterm Exam		
Nine	Role of diets in management of gastrointestinal tract disorders	2	2
Ten	Role of diets in management of renal diseases	2	2
Eleven	Role of diets in management of renal diseases.	2	2
Twelve	Nutrition and Cancer.	2	2
Thirteen	Revision	2	2
Total No. of hours		24	24
Fourteen	University Elective Final Exams		
Fifteen	Final Exams		
Sixteen			

4. Teaching and Learning Methods

- 4.1. Data show and computer in lectures.
- 4.2. Office hours
- 4.3. Research and power point presentations
- 4.4. Assignments

4.5. Self-learning by discussion of projects prepared by students.

5. Student Assessment Methods

5.1. Written exams to assess the student's knowledge and understanding as well as intellectual and professional skills.

5.2. Class Work (Assignments/ presentations/ participation in lectures & group discussion) to assess the students' analysis and appraise his ability to conduct & present a research, thus assessing the general and transferrable skills.

Assessment Schedule

Assessment 1 Written exams ... **Week 4, 8,15/16.**

Assessment 2 Class Work (Assignments / presentations / participation in lectures& group discussion) **During the semester**

Weighting of Assessments

-First Mid-Term Examination	10%
-Second Mid-term Examination	20%
-Final Examination	40 %
-Class Work	30%
Total	100%

6. List of References

6.1. Course Notes

Staff lectures handouts are uploaded to the Moodle.

Lab manual is given to each student.

6.2. Essential Books (Text Books)

- Lippincott's Illustrated Reviews: Biochemistry, 6th edition 2013.
Authors: Pamela C. Champe, Richard A. Harvey, and Denise R. Ferrier
Publisher: Lippincott Williams & Wilkins. (Given to each student)

6.3. Recommended Books

- Clinical Nutrition in Practice: Editors: Nikolaos Katsilambros , Charilaos Dimosthenopoulos , Meropi D. Kontogianni , Evangelia Manglara, Kalliopi-Anna Poulia. Publisher:Wiley- Blackwell, 2010.

6.4. Periodicals, Websites,etc

- Journal of Nutrition.
- The Journal of Nutritional Biochemistry.

-www. Pubmed.com
-www.medline.com

7. Facilities Required for Teaching and Learning

- Lecture halls.
- Laboratories.
- Personal Computer (available for each staff member).
- Computer equipped with projector and internet connection available for the usual lectures and Labs.
- Meeting rooms for office hours.
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