



Philadelphia University
Faculty of Science
Department of Biotechnology and Genetic Engineering
Second Semester, 2009/2010

Course Syllabus

Course Title: Practical General Biology (1)	Course code: 240106
Course Level: 1	Course prerequisite (s) and/or corequisite (s): General Biology (1) - 240101
Lecture Time: Sec.(1): 09:10 – 12:00 (Sun) Sec.(2): 08:10 – 11:00 (Mon)	Credit hours: 1

Academic Staff Specifics

Name	Rank	Office No.	Office Hours	E-mail Address
Maha Qadar	Lecturer	S-1016	11:00 – 12:00 Sun, Tue 11:00 – 02:00 Mon, Wed	mqadan@philadelphia.edu.jo

Course module description:

Includes laboratory safety rules; types and use of microscopes; experiments on detection of carbohydrates, lipids, proteins and DNA. Enzymes and the effect of physical factors; prokaryotic and eukaryotic cells; cell division and genetics.

Course module objectives:

- The course will provide the students with the basic understanding of the fundamental principles of practical biology.
- This course aims to provide the students with the basic fundamentals tools and skills to reinforce the concepts covered in the lectures of the general biology course (240101). It is my hope that this course will help you develop the skills, habits and intellectual practices needed to be a successful independent learner.
- The topics covered in this course will allow the students to better comprehend other practical courses during the following academic years.

The students will be provided with lab sheets for each practical session. The student will maintain a laboratory notebook to record all notes, observations, and information gathered before and during laboratory activities. This notebook must be brought to every laboratory period.

- **Support material (s).**
- **Study guide (s).**
- **Homework and laboratory guide (s).**

Teaching methods:

- You will be given a hand out of the procedures of the lab; Lab reports must be handed in on time.
- The instructor will make introductory remarks that will summarize the important points and highlight what will be done in lab, pointing out possible trouble spots. At times the information in the manual will be amended by, or substituted with, material given by the instructor. Therefore the information given in the introductory remarks is essential and will help you use your lab period more efficiently. Almost all other activities will involve your participation with two other class members in a group.
- The use of Colored Transparent Slides, Power Point presentation, Illustration with models, educational animations, and movies.
- The publisher of the text book, Benjamin Cummings, provide a useful free website, which student can access upon purchase of the text book. This website contains several activities and applications that support the understanding of the biological concepts.

Learning outcomes:

- **Knowledge and understanding**

At the end of this module, student will be able to:

- * Follow and apply the laboratory safety rules during the laboratory time.
- * Describe the characteristics and compounds that make up living things.
- * Discuss how matter and energy are interrelated in photosynthesis and cell respiration.
- * Identify key cell organelles and relate their function to their structure.
- * compare and contrast mitosis and meiosis in terms of their goals and outcomes.
- * Gain knowledge of the anatomical structure and physiological functions of plants tissues and organs.
- * Gain knowledge of the anatomical structures and physiological functions of tissues and organ systems of human.

- **Cognitive skills (thinking and analysis).**

- The Thinking and Meditation about the Great Ability of God in Creation of our body and the biological systems.
- The thinking skills will be developed by encouraging students to conclude answers to different questions that the instructor intends to use during the presentation of the scientific material.
- Improve practical skills in analyzing results obtained during the lab work.
- Improve the ability to work independently and time management.

- **Communication skills (personal and academic).**

- Gain Teamwork skills by getting opportunities to work productively with others
- The students have the option to share their ideas in open discussion and to ask questions during the lab or any other time.
- Students have the opportunity to communicate with others especially professors, while searching answers for home works or through encouraging them to attend different scientific activities that are available in the department.

- **Practical and subject specific skills (Transferable Skills).**

- Improve practical skills such as the ability to work with different types of chemicals, cells, organisms, tools and instruments.

- Improve the ability to observe, collect samples, analyze with different mechanisms, obtain results and analyze information in the laboratory.

Allocation of Marks	
Assessment Instruments	Mark
Mid term exam	30%
Final examination	50%
Reports, Quizzes, Home works, and practical skills.	20%
Total	100%

Expected workload:

Students will get much more out of each experiment if they read the material that will be covered before coming to lab. Students should keep a record of everything they do or see and draw pictures and label them. We will briefly cover the background material but mostly we will ask you to apply, analyze and evaluate what you already should know.

On average you should expect to spend at least (2) hours per week on this module.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Practical General Biology (1)

Week No.	Lab No.	Topic
1	1	<ul style="list-style-type: none"> • Instructions • Laboratory safety rules
2	2	<ul style="list-style-type: none"> • Macromolecules (1)
		<ol style="list-style-type: none"> 1. Carbohydrates <ul style="list-style-type: none"> - Benedict's test for reducing sugars - Iodine test (Lugol's test) for starch 2. Proteins <ul style="list-style-type: none"> - Ninhydrin test for amino acid - Biuret test for polypeptides
3	3	<ul style="list-style-type: none"> • Macromolecules (2)
		<ol style="list-style-type: none"> 1. Lipids <ul style="list-style-type: none"> - Sudan red test for fats - Lipid solubility test 2. Nucleic acids <ul style="list-style-type: none"> - Extraction of DNA
4	4	<ul style="list-style-type: none"> • The Microscope
		<ol style="list-style-type: none"> 1. Types of the microscopes 2. Proper use of a compound light microscopes 3. Parts of a compound light microscope 4. Using a compound light microscope <ul style="list-style-type: none"> - Preparation of a wet mount: <ul style="list-style-type: none"> - The Letter "e" - Pond water - Prepared slides: <ul style="list-style-type: none"> - The <i>Paramecium</i> 5. Parts of a dissecting Microscope 6. Using a dissecting microscope: <ul style="list-style-type: none"> - An insect - A bread mold
5	5	<ul style="list-style-type: none"> • The Cell
		<ol style="list-style-type: none"> 1. Prokaryotic cells <ul style="list-style-type: none"> - Bacteria in yoghurt: <ul style="list-style-type: none"> - <i>Lactobacillus</i>

		<p>2. Eukaryotic cells</p> <ul style="list-style-type: none"> - Animal cells: <ul style="list-style-type: none"> - Human cheek cells - Plant cells: <ul style="list-style-type: none"> - Onion epidermal cells - Potato cells - Cork cells
6	6	<ul style="list-style-type: none"> • Biological Membranes
		<ol style="list-style-type: none"> 1. Diffusion within solutions 2. Diffusion within semi-solid medium 3. Osmosis in plant cells (<i>Elodea</i> leaves) 4. Dialysis
7	7	<ul style="list-style-type: none"> • Mid-term Exam
8	8	<ul style="list-style-type: none"> • Enzymes
		<ol style="list-style-type: none"> 1. Enzyme invertase (sucrase) 2. Enzyme Rennin 3. Enzyme catalase 4. Effect of temperature pretreatment on enzyme activity 5. Effect of pH changes on enzyme activity
9	9	<ul style="list-style-type: none"> • Metabolism
		<ol style="list-style-type: none"> 1. Cellular respiration <ul style="list-style-type: none"> - Aerobic respiration - Fermentation 2. Photosynthesis <ul style="list-style-type: none"> - Light reaction in <i>Elodea</i> - Stomata of Geranium leaf - Chromatography of plant pigments
10	10	<ul style="list-style-type: none"> • The Cell Division
		<ul style="list-style-type: none"> - Mitosis in animal cells - Mitosis in plant cells (Onion root tip) - Meiosis in animal cells
11	11	<ul style="list-style-type: none"> • Genetics
		<ol style="list-style-type: none"> 1. Working with human phenotypes <ul style="list-style-type: none"> - PTC tasting - Tongue-rolling - Thumb-bending - Hair texture - Ear lobes - A-B-O Blood type 2. <i>Drosophila melanogaster</i> genetics

		<ul style="list-style-type: none">- Working with flies- Sexing flies- Observing wild type flies- Examining mutant flies
12	12	Final Exam

Module references

Books

Title: Biology (2008).

Author(s): Neil A. Campbell and Jane B. Reece

Publisher: Benjamin Cumming's Publishing Company, 8th edition.

ISBN:**0-8053-7146-x**

In addition to the above, the students will be provided with handouts by the lecturer.

Students will be expected to give the same attention to these references as given to the Module textbook(s)

1. Karp, G. Cell and Molecular Biology, concepts and Experiments. 2002, 3rd edition, John Wiley publishing company, ISBN 0-471-38913-7.
2. Bruce, A., Bray, D., Hopkins, K., Johnson, A., Lewis, J., Raff, M., Roberts, K., Walter, P. Essential Cell Biology. 2004. Garland Publishing company. ISBN: 0-8153-3480-X.
3. Mader, S. S. 8th edition. Laboratory Manual "inquiry into life". McGraw . Hill companies. Boston. USA. ISBN 0 . 679 . 25183 . 7.
4. Nimri, L. 2006. Laboratory Manual of General Biology. Jordan University of Science and Technology. Irbid, Jordan.
5. Karp, G. Cell and Molecular Biology, concepts and Experiments. 2002, 3rd edition, John Wiley publishing company, ISBN 0-471-38913-7.

Journals

(To be added)

Websites

www.biology.arizona.edu

www.cellsalive.com

www.campbellbiology.com

www.ncbi.nlm.nih.gov