Spring 2018

CHEMISTRY 203

INTRODUCTORY CHEMICAL TECHNIQUES (1.3; 2cr.)

Instructor: Prof. Mazen Al-Ghoul
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Office hours: By appointment
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MEETING TIMES

Laboratory Lecture: Tuesday, 12:30-1:20, SLH Biology Department.

Laboratory: Section 1	Wednesday	1:00-4:00 pm	Room 105 Chem.
Section 2	Wednesday	1:00-4:00 pm	Room 107 Chem.
Section 3	Wednesday	1:00-4:00 pm	Room 111 Chem.
Section 4	Wednesday	1:00-4:00 pm	Room 201 Chem.
Section 5	Wednesday	1:00-4:00 pm	Room 205 Chem.
Section 6	Monday	1:00-4:00 pm	Room 201 Chem.
Section 7	Monday	1:00-4:00 pm	Room 205 Chem.
Section 8	Monday	1:00-4:00 pm	Room 111 Chem
Section 9	Thursday	1:00-4:00 pm	Room 111 Chem

RESOURCES AVAILABLE TO STUDENTS

- Laboratory Manual can be downloaded from Moodle.
- Raymond Chang, Chemistry, 10th Edition, McGraw Hill, 2010.
- Zumdahl, Chemistry, 8th Edition, Brooks Cole, 2010.
- Van Loon and Duffy, Environmental Chemistry, 2nd Edition , Oxford University Press, 2005.

SPECIFIC LEARNING OUTCOMES

- Develop basic Chemistry lab skills, and acquire a thorough training on experimental techniques, in both qualitative and quantitative chemical determinations.
- Stress the quantitative aspects of the Chemistry lab. Master the techniques of basic chemical measurements. Learn how to assess the precision of a measurement, and thus report a given measurement to the right degree of precision.
- Learn how to establish the link between theory and experiment. Study basic calculation techniques for the treatment of chemical data, and learn how to draw conclusions and report final results.
- Develop a deep understanding of the philosophy and purpose of performing a given experiment, and subsequently develop a thinking methodology for the design of simple chemical tests and measurements.

- Establish a relation between the performed experiments and the Chemistry in real life applications. Generalize the learned concepts for possible application in problems encountered in everyday life.

STUDENT ASSESSMENT

Student performance is assessed based on the following grading scheme:

Activity	Percentile
Laboratory Reports	**30%**
Pre-Laboratory Assignments	**5%**
Drop Quizzes	**20 %**
Evaluation of Student Conduct	**5 %**
Comprehensive Final Examination	**40 %**

LABORATORY REPORTS: A laboratory report is required for each experiment. Some experiments are performed as a group work, yet every student should submit his/her own report. Reports are due at the end of the current laboratory session. Reports are expected to be neat and attractive in appearance. Report forms will be posted on Moodle. Students must download the form before coming to the lab. They should complete it as the experiment is carried out. Reports should be complete. All appropriate subject matter should be included. The student will demonstrate an adequate understanding of the principles involved in the investigation and comment on his/her findings.

PRE-LABORATORY ASSIGNMNETS: A pre-laboratory assignment is required for each experiment. These assignments are due at the beginning of every lab session. They will be posted on Moodle. Students must download the form and solve the questions neatly before coming to the lab.

DROP QUIZZES & FINAL EXAMINATION: A 10-minute **quiz** will be given at the beginning of the laboratory session on the current experiment. This will be considered as a drop quiz, DQ. Coming late to the laboratory will deprive the student from the quiz and result in a zero grade. No make-up quizzes will be given. Students will sit for a comprehensive **final** exam. They are urged to take this exam on the assigned time. The date of the final exam will be scheduled later.

EVALUATION OF STUDENT CONDUCT: At the end of the semester, each student will be evaluated by his/her laboratory Instructor. The evaluation will be based on the student's conduct and behavior in the laboratory, attendance, punctuality, safety, preparedness and cleanliness in the lab. The Instructor will be observing the student during the laboratory sessions throughout the semester, and will then be able to grade each student's performance.

ABSENSES: Students are expected to attend all laboratory sessions and perform all experiments. Under very special circumstances (only a valid medical reason, certified from the AUB Infirmary to the professor), a make-up experiment could be permitted. Students who miss more than one lab session should automatically withdraw from the course.

CHECK-OUT: Check out will be held during the last week of classes. Details will be

explained at that time. You must check out if you drop the course before the end of the semester. See your TA for instructions. A LBP 15,000 penalty will be assessed for failing to check out in addition to anything lost or broken from the locker.

REQUIEMENTS WHILE IN THE LAB:

In each lab session, you are required to:

1. Have your lab manual and calculator.
2. Come on time, drop quizzes are given at the beginning of each lab session.
3. **Wear a white gown, safety goggles, closed shoes, long pants and gloves.**
4. Bring **soap, detergent, sponge and towel** (paper or cloth).
5. Know the safety rules and regulations, and abide by them.
6. Come prepared to the lab, read the experiment and prepare an outline of the procedure to be followed and answer the assigned pre-lab questions.

At the end of each lab session, you are required to:

1. Hand in your report.
2. Clean any used equipment thoroughly, the bench top, and the sink next to you.
3. Return to the storeroom all items borrowed on that day.
4. Make sure that the water, steam and gas are turned off.
5. Lock your desk.

LAB CONDUCT

1. Eating, drinking, chewing and smoking are strictly forbidden in the lab.
2. All chemicals and water spilled on the benches should be wiped immediately.
3. Side benches should be kept clean at all times, and reagent bottles should be kept closed when not in use.
4. Matches, paper, broken glass and any other solid wastes should be disposed of in the proper waste containers, and not in the sink!
5. ***Organic*** waste and solutions containing ***heavy metal ions*** should be disposed of in special labeled containers do ***not*** pour them in the sink!
6. To prevent contamination of reagent bottles, do ***not*** insert ***any*** droppers or spatulas into them. ***Never*** return unused chemicals (solids or liquids) to the reagent bottle.

LABORATORY SAFETY

Prior to entering the laboratory, students are required to carefully read, understand, and abide by the attached BASIC SAFETY RULES & REGULATIONS and EMERGENCY PROCEDURES (distributed by the **Environmental Health & Safety Center)**. These rules are also found as the first two pages in the laboratory manual.

You are expected to abide strictly by the appropriate dress code:

- White gown (long sleeved, knee length).
- Pants (Skirts, shorts, torn pants, or anything that shows the feet are **not** allowed).
- Safety goggles (provided) and gloves.
- Long hair should be tied back in a bun.
- Shoes that enclose the entire feet. Open-toed shoes, sandals, ballerinas and ballerinas with socks are **not** allowed.

If you do not comply with the safety rules you will be asked to leave the lab and **no** make-up will be allowed.

ACADEMIC INTEGRITY

You are being graded on the work you perform. Dishonesty of any kind will **not** be tolerated in this course. The penalty for any form of academic dishonesty such as cheating on exams and quizzes or copying of reports is a grade of **zero**. Cheating is a violation of the university's academic regulations and is subject to disciplinary action. Please refer to AUB policies and procedures on academic integrity.
http://www.aub.edu.lb/pnp/generaluniversitypolicies/Documents/StudentCodeConduct/StudentCodeConduct.pdf

Environmental Health, Safety and Risk Management

Being Safe is Smart

For a safe practice in laboratories follow these Basic Rules and Regulations:

DO:

1. Wear lab coats (knee-length) and appropriate eye protection (minimum safety goggles).

2. Keep clean work places free of unwanted chemicals, biological specimens, radios, and idle equipment.

3. Keep exits and passageways clear at all times.

4. Become familiar with the locations and operation of safety and emergency facilities such as the fire extinguishers, first aid kit, emergency wash facilities, fire alarm pull stations, telephone, and emergency exits.

5. Wash hands before leaving the laboratory.

6. Leave behind protective clothing (lab coats, gloves, etc.) when leaving the laboratory to eat.

7. Remove contaminated cloths immediately.

8. After leaving the lab, wash before eating, drinking, smoking, or applying cosmetics.

9. Tie or otherwise restrain long hair in a bun when working with chemicals, biohazards, radioisotopes, or moving machinery.

10. Work only with materials when you know their flammability, reactivity, toxicity, safe handling, storage and properly operating emergency procedures.

11. Perform all procedures involving the liberation of volatile materials or aerosols of a toxic or flammable nature in a fume hood.

12. Place sharp objects (syringe needles, broken glass, blades, etc.) in a labeled rigid container before disposal Materials contaminated with bio-hazardous agents should first be autoclaved.

13. Keep wet hands and water away from electrical equipment.

14. Secure your compressed cylinders.

15. Perform a safety check at the end of each experiment - make sure that gas, water, electricity, vacuum lines, air and heaters have been turned off and decontaminate any equipment or work areas which may have been in contact with hazardous materials.

16. Lock laboratory when unoccupied.

17. Store coats, packs, etc., in areas provided, not around the lab bench.

18. Pay strict attention to all instructions before undertaking an experiment. If you do not understand, ask.

19. Clean up apparatus and work areas at the end of the lab period.

20. Set up apparatus so that it is not necessary to reach through the assembly to turn water, gas or electricity off.

21. Assemble apparatus so that control valves and switches will remain accessible if a fire should occur.

22. Be aware of what neighboring laboratory personnel are doing.

DO NOT:

1. Wear open shoes, such as sandals, ballerinas or ballerinas with socks in the lab.

2. Wear shorts, skirts, torn pants and anything that exposes your feet and legs in the lab.

3. Block access to emergency equipment (eyewashes, safety showers and fire extinguishers).

4. Pipette by mouth.

5. Pour water into acid

6. Return unused chemicals to stock bottles.

7. Run, walk in the lab.

8. Carry hazardous chemicals between the lab and storage rooms by hand. Use secondary containers.

9. Place chemicals where they will cause trip hazards, or are liable to cause personal injury. Reagent bottles, empty or full should not be left on the floor.

10. Place chemicals near incompatible substances that may cause them to react.

11. Leave chemicals or experiments unattended.

12. Store food, food containers, drinking glasses in the laboratory.

13. Keep food in refrigerators at the laboratory.

14. Sniff or taste chemicals.

15. Smoke, eat, or drink, food, beverages or tobacco in laboratories.

16. Apply cosmetics or lip-balm in the laboratory.

17. Engage in horseplay or other act or mischief in the lab.

18. Perform unauthorized experiments.

19. Remove chemicals from the lab unless directed otherwise from the instructor/supervisor.

20. Use damaged or broken equipment when handling or experimenting with chemicals.

EHSRM ext. 2360

Environmental Health, Safety and Risk Management

Emergency Procedures

Read carefully, it may save your life!

In Case of Fire

1. **Remain calm** - Do not shout "Fire".
2. **Rescue:** **Rescue** personnel who are in immediate danger. This step is usually performed simultaneously with step 3 "Alarm".
3. **Alarm:** Give the **alarm** - Dial 5555 and inform operator of exact location of fire.
4. **Contain:** Close doors and windows to isolate fire and smoke from rest of the building.
5. **Evacuate:** Evacuate the building using the nearest exit (Do not use elevators). Do not reenter the building until the alarm is silenced and you are told that it is safe to reenter.
6. **Extinguish:** You may fight the fire if you have been trained to do so, your exit is assured and that the alarm has been given.
7. Once the ERT / Beirut Fire Brigade arrive, they will be in charge until they declare the area safe and leave the scene.

Hazardous Materials Emergencies: Chemical, biological and radioactive materials are present in laboratories. If a hazardous material is spilled or released the following precautions or actions are recommended:

If you are unsure about the danger of the material:

1. Do not approach the spill and avoid contact with the material. Avoid breathing gases, fumes or smoke that may be generated. Vapors may be harmful even if there is no odor.
2. If others may be in danger, activate alarm or inform personnel to evacuate the area. Close doors to contain the area of the spill.
3. From a safe location call the EHSRM x 2360 (during working hours) or the protection office **x** 2400 (24 hours/day), describe the nature of the emergency.
4. Stay in a safe area near the vicinity so that you can assist emergency response personnel.

If you are certain that the spill or leak poses no immediate danger or personal injury report it as in 3 above and:

1. Use absorbent material to keep the contamination from spreading or entering drains. Absorbents such as sand, vermiculite, towel papers etc ... may be used.
2. Working from the outside in absorbing the spilled material and using a shovel or dust pan place the spilled material inside a plastic bag or container.
3. EHSRM personnel will advise on further actions.

If the spill is in a lab, shop or chemical storeroom:

1. Evacuate all personnel from the room.
2. Be sure hood/local exhaust is on.
3. If flammable liquids are spilled, disconnect the electricity to sources of ignition.
4. Call EHSRM @ ext. 2360 to request additional assistance if you cannot manage the cleanup yourself.

If the spill is in a corridor or other public passageway:

1. Evacuate all people from the area. Close off area to keep others out.
2. Call the EHSRM at ext. 2360.
3. Call Physical Plant @ ext. 2015 to request to have the air system in the area shut down (to prevent contamination of other areas) and to request additional assistance.

EHSRM ext. 2360

AUB is committed to facilitating a learning environment that is free of all forms of prohibited discrimination. The University's non-discrimination policy and Title IX apply to, and protect, all students, faculty, and staff. Under Title IX, discrimination based on sex and gender, including sexual harassment, is prohibited. If you think you have experienced discrimination or harassment, including sexual misconduct, we encourage you to tell someone promptly. If you speak to a faculty or staff member about an issue such as harassment, sexual violence, or discrimination, the information will be kept as private as possible, however, faculty and designated staff are required to bring it to the attention of the University's Title IX Coordinator. Faculty can refer you to fully confidential resources, and you can find information and contacts at www.aub.edu.lb/titleix. To report an incident, contact the University's Title IX Coordinator Trudi Hodges at 01-350000 ext. 2514, 03-595525, or titleix@aub.edu.lb Confidential reports may be submitted anonymously online through EthicsPoint at www.aub.ethicspoint.com.

If you are pregnant or planning to be pregnant, you should consult with your healthcare provider so you become fully informed of the potential risks and understand the precautions that you should take.