Lakeside View Global Vision

CEGEP JOHN ABBOTT COLLEGE

Introduction to Chemistry

A. General Information:

Program:	Biopharmaceutical Production Technology	Instructor: Dr. Tania Peres Contact: MIO (messaging in Omnivox)
Course Number:	202-1B5-AB	Office hours: Online - to be posted on LEA
Ponderation:	3-2-3	Lectures: M&W 13:00-14:30 (online)
Credits:	2 2/3	Laboratory: Fridays, AME-432
Competency code:	051L	Sect. 1: 8:00 – 10:00
Semester:	Fall 2020	Sect. 2: 10:00 – 12:00

Because much of this course will take place on-line, MIO will be especially important for communication. Please check your MIO regularly. Please use MIO to communicate with the instructor outside of class time.

B. Introduction:

Introduction to Chemistry is required by the Biopharmaceutical Production Technology Program and is normally taken in the first semester. It is specifically designed to fulfill the requirements of the objective **051L**, to monitor bioprocesses.

C. Objective(s):

Statement of the competency: For students to acquire the chemistry tools to monitor bioprocesses (051L). To this end, the student will acquire knowledge and understanding of a number of basic chemical concepts as well as laboratory techniques applicable to biopharmaceuticals.

D. Evaluation Plan:

- Unit Tests (three tests of equal value) 30% (on-site on Sept. 21, Oct. 26, Nov. 25)
- Final Exam 30% (on-site during final exam period)
- Laboratory 20% (on-site and off-site)
- Project 5%
- Quizzes and Assignments 15%

Please Note:

a) If at least one of the three written unit test marks is lower than the final exam mark, the lowest unit test mark will be dropped. The remaining unit tests will then be worth 20% of the final grade and the final exam will then be worth 40% of the final grade. Please note

that this arrangement is NOT available for a student who is assigned a grade of zero on a unit test because of cheating.

b) A minimum of **3 on-site experiments** must be conducted in order to pass the NYB course. Even with a passing course grade, a **temporary incomplete** will be given to students who have not performed 3 on-site experiments.
In case of school closure: make-up labs will be scheduled when the college reopens.
In case of absence due to sickness: make-up labs will be scheduled.
Make-up labs could be scheduled in the evening, weekends, intersession, spring break, etc.

c) To pass the laboratory portion of the course, a minimum of 60% of the total laboratory grade must be obtained. Failing this, a laboratory grade of **zero** will be given and a maximum grade of 55% will be allowed for the course.

d) Notwithstanding other class grades, if a student passes the laboratory portion of the course, a grade of 60% or more on the final exam will guarantee a pass in the course.

e) If an in-class unit test is missed with valid reason(s), the missing mark will be transferred to the final examination (40% final exam and 20% unit tests).

E. Course Content:

The Introduction to Chemistry course will include some very basic ideas concerning atomic and molecular structure and will rely heavily on some well-established patterns revealed in the traditional Periodic Table of the Elements. Simple concepts of chemical bonding will be considered, followed by the system of naming both inorganic and organic compounds that are related to these bonding patterns. Since most reactions of chemical significance occur in solution, the nature of chemical species in aqueous solution will be considered here as well. Solubility of both ionic and non-ionic compounds will be investigated.

The balanced chemical equation, stoichiometry and the mole as a measure of chemical quantity, and the 'IRF Table' as a tool for analyzing chemical systems will be introduced.

Acid/Base reactions will be introduced and titration analyses will be performed in the laboratory. In addition, extraction and purification processes based on acid/base properties of compounds will be performed in the laboratory and the action of buffers will also be introduced.

Structure, nomenclature and functionality of organic compounds as well as polarity, solubility, stability and optical isomerism will be explored as related to drug products and API (active pharmaceutical ingredient). Simple organic compounds may be synthesized and analyzed. Purification and characterization of test compounds will be to prepare the student for the manufacturing laboratory course.

Topics covered include:

Significant figures, scientific notation, mole concept, chemical and physical changes, classification of matter, atomic structure, the periodic table, chemical bonding, chemical nomenclature, chemical

reactions, stoichiometry, solutions, acids & bases, buffers, titrations, organic compounds, solubility, polarity, purification and characterization, chemical analysis

F. Required Texts:

The textbook we will use is *Chemistry 2e, P. Flowers, K. Theopold, R. Langley, W. R. Robinson, OpenStax (Rice Unviersity). It is available ***free of charge*** at https://openstax.org/details/books/chemistry-2e. Click on "get this book" and choose either a PDF file or web view. Only selected portions of this text are used in a one semester course.

G. Bibliography:

The library contains numerous chemistry textbooks. You are always welcome to consult them.

H. Teaching Methods:

The course will be 75 hours, divided into Lecture and Laboratory periods, as follows:

Lectures: 45 hours.

There will be two 1.5-hour periods per week which are the "classroom" periods where we will meet on-line. These periods will consist of the introduction of new material, as well as the opportunity for practice and problem-solving. *Your participation is expected, and grades may be associated with these activities*. In addition, preparation for upcoming laboratory sessions will be discussed during lecture time.

Laboratory Sessions: 30 hours.

There will be one 2-hour laboratory session per week. These sessions will consist of a maximum of 5 on-site experiments, where a minimum of 3 on-site experiments must be conducted in order to pass the course. You will have an on-site lab (at JAC) every second week where you will perform the experiment and collect the data. The other week will be used for data analysis and completion of the lab report. The remaining weeks will consist of at-home laboratory work, at-home experiments and/or workshops. The on-site lab sessions will include practice in the basic techniques of experimental chemistry, experiments designed to verify certain properties of solutions, and experiments that illustrate the properties of some reactions that occur in solution. The chemistry laboratories are equipped with computers interfaced with various instruments and students will be trained in their use. The content of laboratory sessions will also be useful for term tests and final exam preparation.

Laboratory Requirements:

- *Safety glasses must be worn at all times in the laboratory.* Good quality safety glasses are available from the JAC bookstore (about $7) or from most hardware stores. Normal prescription glasses may be worn, but for safety reasons, ***the use of contact lenses is not permitted.***
- A sturdy cotton lab coat or lab apron is required. (about $22 at the JAC bookstore)
- A laboratory manual will be progressively posted on the course Lea website. The student is required to print the material ahead of time, read it, and bring it to the laboratory. Prelab assignments may be included in this material and must be completed prior to the lab.

I. Departmental Policies:

a) Attendance policy: (*Policy 6*) Students are expected to attend all lecture and laboratory sessions. Students are responsible for all assigned work, lecture material and other course related material announced or assigned during class. Attendance for laboratory periods is mandatory. Missing a lab period without a valid reason will result in a grade of zero being assigned to any work assigned during that period.

*However, **please do not come to in-person labs or tests if you are sick or showing any COVID-19 related symptoms.** Be assured that we will arrange make up work or some alternative.*

b) Policy relating to late submission: (*Policy 7*) All assigned work is to be submitted on time. Late submission may be accepted, with or without penalty, at the discretion of individual instructors.

c) Policy dealing with the use of cell phones, laptops and other technology: (*Policy 13*) Use of personal cell phones and/or computers and/or other electronic devices are not permitted in the laboratory unless they are to be used for pedagogical purposes.

Please Note:

1. If you miss an evaluation session or deadline due to illness or other valid reason, you must notify your instructor as soon as possible. A valid medical note is required to prove absence for a medical reason. If a test is missed for a valid reason, then the final exam mark can be used as a basis for a substitute for the missed test mark.

2. A special note concerning the use of chemicals: this course uses chemicals as part of its normal teaching practices. If a student has experienced allergic reactions in the past due to any particular chemical or chemicals he or she must inform the instructor. In the event that an allergic reaction is experienced at the college, the student should report to Campus Security immediately (local 6911, or 9-514-457-6911).

3. Students are expected to behave respectfully towards their classmates and teachers. In case of inappropriate behavior a student will be asked to leave the class or the lab session. If an assessment is planned for this session, a mark of zero will be given in that case.

J. College Policies:

Policy No. 7- IPESA, Institutional Policy on the Evaluation of Student Achievement
http://departments.johnabbott.qc.ca/wp-content/uploads/2017/08/Policy-7-IPESA.pdf

a) Changes to Evaluation Plan in Course Outline (Article 5.3). All changes to evaluation plan in the course outline must have documented unanimous consent from the regularly attending students affected by the change(s) before submission.

b) Evaluation (Article 6)
Teachers should evaluate and enter grades for a sufficient number of assessments in Gradebook in order that the College may advise DEC students of their progress by mid semester as per the ACADEMIC PROCEDURE: Academic Progress by Mid Semester.

c) Religious Holidays (Article 3.2)
Students who wish to miss classes in order to observe religious holidays must inform their teacher of their intent, in writing, within the first two weeks of the semester.

d) Student Rights and Responsibilities (Article 3.2 and Article 3.3)
It is the responsibility of students to keep a copy of all assessed material returned to them and/or all digital work submitted to the teacher for at least four (4) weeks past the grade submission deadline (See current Academic Calendar) in the event that they request a Final Grade Review (Refer to Article 8)
Students have the right to receive graded evaluations, for regular day division courses, within two weeks after the due date or exam/test date, except in extenuating circumstances. A maximum of three (3) weeks may apply in certain circumstances (ex. major essays) if approved by the department and stated on the course outline

e) Cheating and Plagiarism (Article 9)
Cheating and plagiarism are serious infractions against academic integrity which is highly valued at the College; they are unacceptable at John Abbott College. Students are expected to conduct themselves accordingly and must be responsible for all of their actions.
Cheating means any dishonest or deceptive practice relative to examinations, tests, quizzes, lab assignments, research papers or other forms of evaluation tasks. Cheating includes, but is not restricted to, making use of or being in possession of unauthorized material or devices and/or obtaining or providing unauthorized assistance in writing examinations, papers or any other evaluation task and submitting the same work in more than one course without the teacher's permission. It is incumbent upon the department through the teacher to ensure students are forewarned about unauthorized material, devices or practices that are not permitted.
Plagiarism is a form of cheating. It includes copying or paraphrasing (expressing the ideas of someone else in one's own words), of another person's work or the use of another person's work or ideas without acknowledgement of its source. Plagiarism can be from any source including books, magazines, electronic or photographic media or another student's paper or work.

K. Proviso:

- Due to the COVID-19 health crisis, attendance policies may need to be adjusted by your teacher. The normal attendance expectations are outlined below and your teacher will inform you of any modifications as needed. Please note that attendance continues to be extremely important for your learning, but your teacher may need to define it in different terms based on the way your course is delivered during the fall semester.

- Please note that course outlines may be modified if health authorities change the access allowed on-site.

- In addition to LEA, Teams and Moodle, additional software may be used for the submission of essays or projects or for testing. Further details will be provided if applicable.

- Classes on Teams may be recorded by your teacher and subsequently posted on Teams to help for study purposes only. If you do not wish to be part of the recording, please let your teacher know that you wish to not make use of your camera, microphone or chat during recorded segments. Any material produced as part of this course, including, but not limited to, any pre-recorded or live video is protected by copyright, intellectual property rights and image rights, regardless of the medium used. It is strictly forbidden to copy, redistribute, reproduce, republish, store in any way, retransmit or modify this material. Any contravention of these conditions of use may be subject to sanction(s) by John Abbott College.