

A. GENERAL INFORMATION:

1. Program name:	Biopharmaceutical Production Technology
2. Course title:	Introduction to Chemistry
3. Course and section number(s):	202-IB5-AB
4. Ponderation (weekly class – lab/fieldwork – homework hours):	3-2-3
5. Credits:	2 ² / ₃
6. Competency statement and code:	For students to acquire the chemistry tools to monitor bioprocesses (051L).
7. Prerequisite:	None
8. Semester:	Fall 2022
9. Teacher name(s), (pronouns if desired):	
10. Office number, phone extension (email address optional):	
11. Teacher's availability:	

B. INTRODUCTION:

Land Acknowledgement: *At John Abbott College we acknowledge that we are on unceded Indigenous lands of the traditional territory of both the Kanien'kehá:ka, "Mohawk," and the Anishinabeg, "Algonquin," peoples.*

We are grateful for the opportunity to gather here and we thank the many generations of people who have taken care of this land and these waters. Tiohtiá:ke, Montreal, is historically known as a gathering place for diverse First Nations; thus, we recognize and deeply appreciate the historic and ongoing Indigenous connections to and presence on these lands and waters. We also recognize the contributions Métis, Inuit, and other Indigenous peoples have made in shaping and strengthening our communities.*

Together, as a diverse college community, we commit to building a sincere relationship with Indigenous peoples based on respect, dignity, trust, and cooperation, in the process of advancing truth and reconciliation

Course summary: 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.

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.

Role and place of the course: 202-1B5-05 is normally taken in the program's first semester, although it may be done in a subsequent semester.

The Program Approach and the Exit Profile: This course is part of the Biopharmaceutical Production Technology Program.

C. COURSE OBJECTIVES:

Objectives: To acquire knowledge and understanding of a number of basic chemical concepts as well as laboratory techniques applicable to biopharmaceuticals.

D. EVALUATION PLAN (include all components of the evaluation and their weights – IPESA Article 6):

Evaluation type:	%	Tentative date:	√ if part of final evaluation
Unit test 1	10	Week 5-6	
Unit test 2	10	Week 10-11	
Unit test 3	10	Week 14-15	
Final exam	30	Mid-December	√
Laboratories	20	Almost weekly	√
Project	5	November-December	√
Quizzes and/or assignments	15	Almost weekly	
Total value:	100%		

Please Note:

- a) A student may drop the lowest unit test mark, if it is lower than the final exam mark, so that the remaining unit tests are worth 20% of the final grade, and the final exam is worth 40% of the final grade. This is not available for a student assigned a grade of zero on a unit test because of cheating.
- b) 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.
- c) 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. COURSE CONTENT:

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, emulsification and polymerization.

F. REQUIRED TEXTBOOKS/MATERIALS, COURSE COSTS IN ADDITION TO TEXTS:

Item:	Estimated cost (\$):
Flowers, P., K. Theopold, R. Langley, W. R. Robinson, <i>Chemistry 2e</i> , OpenStax (Rice University). Freely available at https://openstax.org/details/books/chemistry-2e .	Free (digital copy)
Safety glasses (available from the JAC bookstore or from most hardware stores). Normal prescription glasses may be worn.	\$10
Cotton lab coat (available from the JAC Bookstore, or may be available second hand- see JAC portal)	\$25

G. BIBLIOGRAPHY

Not applicable

H. INSTRUCTIONAL METHODS:

Methods used in teaching the course:
The course will be 75 hours, divided into lecture (classroom) and laboratory periods, as follows: Lectures: 45 hours Two 1.5-hour sessions per week consisting of the introduction of new material, usually accompanied by the working of sample problems. In addition, preparation for upcoming laboratory sessions will be discussed during lecture time. Laboratory Sessions: 30 hours. One 2-hour period per week. The laboratory sessions will demonstrate the basic techniques of experimental chemistry, demonstrate certain properties of solutions, and illustrate 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.

I. PROGRAM, DEPARTMENTAL/DISCIPLINE, AND COURSE/SECTION POLICIES:

Policy:	Description:
Department attendance policy (Policy 6).	<p>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.</p> <p><i>However, please do not come to campus if you are showing any COVID-19-related symptoms unless you have tested negative. Be assured that we will arrange make up work or some alternative.</i></p>
Policy to ensure that issues relating to late submission, or resubmission, of work to be dealt with in an equitable manner (Policy 7).	<p>All assigned work is to be submitted on time. Late submission may be accepted, with or without penalty, at the discretion of individual instructors.</p>
Policy dealing with the expectations of classroom behaviour, including use of cell phones, laptops and other technology (Policy 13).	<p>Use of personal electronic devices is permitted in the classroom or laboratory with teacher's permission.</p>
Other expectations.	<ol style="list-style-type: none"> 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 behaviour 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:

Topic:	Resource:
Student rights and responsibilities (articles 3.2 and 3.3)	Policy 7:IPESA - Institutional Policy on the Evaluation of Student Achievement (version: June 12, 2019)
Changes to evaluation plan in the course outline (article 5.3)	
Religious holidays (articles 3.2.13 and 4.1)	
Cheating and plagiarism (articles 9.1 and 9.2)	
Cheating and plagiarism academic procedure and other resources	Academic Integrity: Cheating and Plagiarism Procedure (version: October 22, 2021) <ul style="list-style-type: none"> • You need to log into Omnivox to access the above document • For PowerPoint on cheating and plagiarism refer to the JAC Portal: My JAC Communities / Academic Council / Curriculum Validation Committee (CVC) / Course Outlines – Reference Documents / Academic Integrity • For link to interactive tutorial on how to cite sources correctly: http://citeit.ccdmd.qc.ca
Code of conduct	Policy 13: Policy on Student Conduct and Discipline Procedures (version: September 21, 2021)

K. PROVISIO:

- Attendance: Due to the ongoing pandemic health issues, attendance policies may need to be adjusted by your teacher. The normal attendance expectations are outlined above (Section I) 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 semester.
- Please note that course outlines may be modified if health authorities change the access allowed on-site. This includes the possibility of changing between in-person and online formats.
- 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.

