

CHEM 3305A

Advanced Analytical Chemistry Laboratory

Fall-Winter 2022-2023

Instructor:	Dr. Edward Lai Office: Steacie 230 E-mail: edward.lai@carleton.ca
Office hours:	Email to arrange a Zoom meeting
Teaching assistant:	Christian Rosales (ChristianRosales@cmail.carleton.ca) - office hours by appointment
Lab:	Steacie 305 Friday 8:35-12:25 p.m.
Lab supervisor:	Graham Galway (graham.galway@carleton.ca) – office hours during each lab
Schedule:	Posted on Brightspace
Manual:	Available on Brightspace
General notes by TAs:	Available on Brightspace. Students are advised to read them before starting lab work on each experiment.
Error analysis handout:	Available on Brightspace. Students are advised to read it before starting to write their first report.
COVID-19:	These practical labs will be conducted in line with all University Policies on COVID-19. Please see the University COVID-19 website for full details. See the COVID-19 section below for more details.

Experiments:

1. Determination of Phenols in Water
2. Determination of PCB organic compounds in a Sediment Sample
3. Determination of Atrazine by Immunoassay
4. Determination of Aldehydes in Indoor Air
5. Determination of Arsenate in Beer
6. Determination of Atrazine and Simazine in Water
7. Determination of Selenium in Pharmaceutical Products

Students are scheduled to complete 5 (out of the seven) experiments. For each experiment, you will be required to complete the lab work, show acceptable data precision, write up all experimental results, and submit a report either Short or Formal.

Reports:

Reports should be submitted 2 weeks after each experiment is finished. All reports should be submitted electronically on Brightspace to the TA. Please ensure that your name, student number and lab section appear in the file name you upload.

Formal reports are typically shorter than 10 pages (1.5-line spacing) plus figures, tables and calibration curves. The introduction need not be longer than 1 page, and 2-3 pages of theory are good enough. Students should not copy any information from the lab manual. You may focus on experimental, data, calculations, results, discussion, and conclusion. A high mark will go to a report that is rich in discussion, organized in presentation, correct in calculations, logical in writing, and polished in style. More guidelines on the mark breakdown for CHEM 3305 formal reports are posted on Brightspace. Collaborating on formal reports is strictly disallowed. You must complete the work by yourself. If you need help, please see your TA or Dr. Lai.

Short reports are typically less than 7 pages (1.5-line spacing) plus figures, tables and calibration curves. Introduction, theory, and experimental sections are not required. More guidelines on the mark breakdown for CHEM 3305 short reports are also posted on Brightspace. Short reports may be submitted as lab partners.

Note that plagiarism is easy to detect and temptation must be resisted.

Scenarios:

All students in CHEM 3305 will complete the Scenarios assignment. The scenarios will consist of two parts, a written report graded by the TA and a presentation conducted before the class and graded by the teaching team. Each group will be provided with a scenario that will require the development of an experimental approach to answer the question or solve the problem presented. Each group will write a report that outlines their plan of action for solving the presented problem or question. The report must include but is not limited to the following: concepts, sampling requirements (sampling locations, types of samples, and sample preparation etc.), the experiment design and the rationale, and any related theory to support the experimental design. The report should be no longer than 5 pages (1.5-line spacing). The report will be submitted to the TA in December, graded and returned in January and presentations will be in a scheduled lab period in February/March. The oral presentations will use PowerPoint slides of the experimental design followed by a group discussion with the teaching team on the rationale for the experimental design and any related theory.

Rideau River Water Project:

All students in CHEM 3305 will participate in a project that will involve testing water samples collected from the Rideau River. These samples will be analysed by employing the methods used in experiments 1, 2, 3, 5, and 7 as well as a method for total organic carbon. Each group within a section will also collect sediment samples from the Rideau River and perform analyses on them throughout the year. The entire class will aggregate the individual group results and prepare a final report and a presentation. The report will include all raw data (i.e. chromatograms, etc.), sample calculations, individual and aggregated results with appropriate uncertainty statistics, and a full discussion. The presentation will be 30 minutes, which will occur during the scheduled lab period towards the end of the winter term. The presentation should cover the methods employed and the results obtained. All students in the class are expected to participate in the presentation.

Grading Scheme:

2 individual formal reports (Exp. 1/6 or Exp. 3)	30%
3 team/individual short reports	25%
Scenarios	
Scenarios written report (graded by TA)	5%
Scenarios presentation (graded by instructor)	10%
Laboratory skills and techniques	
TA evaluation	10%
Instructor evaluation	5%
Lab supervisor evaluation	5%
Rideau River Project	10%

COVID-19

All members of the Carleton community are required to follow COVID-19 prevention measures and all mandatory public health requirements (e.g. wearing a mask, physical distancing, hand hygiene, respiratory and cough etiquette) and [mandatory self-screening](#) prior to coming to campus daily.

If you feel ill or exhibit COVID-19 symptoms while on campus or in class, please leave campus immediately, self-isolate, and complete the mandatory [symptom reporting tool](#). For purposes of contact tracing, attendance will be taken in all classes and labs. Participants can check in using posted QR codes through the cuScreen platform where provided. Students who do not have a smartphone will be required to complete a paper process as indicated on the [COVID-19 website](#).

All members of the Carleton community are required to follow guidelines regarding safe movement and seating on campus (e.g. directional arrows, designated entrances and exits, designated seats that maintain physical distancing). In order to avoid congestion, allow all previous occupants to fully vacate a classroom before entering. No food or drinks are permitted in any classrooms or labs.

For the most recent information about Carleton's COVID-19 response and required measures, please see the [University's COVID-19 webpage](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact covidinfo@carleton.ca

Please note that failure to comply with University policies and mandatory public health requirements, and endangering the safety of others are considered misconduct under the [Student Rights and Responsibilities Policy](#). Failure to comply with Carleton's COVID-19 procedures may lead to supplementary action involving Campus Safety and/or Student Affairs

Academic Accommodation for Students with Disabilities:

Carleton University is strongly committed to providing access and accommodation for all individuals with identified and duly assessed disabilities. The University has a Senate-approved policy on Academic Accommodation that forms part of its Human Rights Policy. This policy should be consulted for further information and is available at the front of this Calendar and online at: www.carleton.ca/equity. The policy promotes efforts to accommodate students with disabilities so that they will have the opportunity to meet learning objectives and be fairly evaluated in their performance. In no case, however, does academic accommodation negotiate away, lower, or remove the academic standards and learning objectives of any course or program, rule, regulation, or policy at the University.

The Paul Menton Centre for Students with Disabilities (www.carleton.ca/pmc/) is the designated unit at the University for assisting the Carleton community in integrating persons with disabilities into all aspects of Carleton's academic and community life. The Paul Menton Centre provides assessment of academic accommodation, advises students on strategies to open a dialogue with instructors and acts as consultant, facilitator, coordinator and advocate in this area for all members of the University community.

The Paul Menton Centre provides individualized support services, based on appropriate and up to date documentation, to persons who are deaf or hard of hearing, with learning disabilities, attention deficit disorder (ADD), visual impairments, head injuries, physical disabilities including mobility impairments, or who have psychiatric, other medical or non-visible disabilities. Students are responsible for applying for special services by making an appointment with the appropriate coordinator at the Paul Menton Centre. All requests will be considered on the basis of individual need. Students are advised to come to the Centre early in the term to discuss service requests.

Examination accommodations for all tests and examinations (in-class, CUTV, or formally scheduled) must be arranged by specific deadline dates. Please consult the Paul Menton Centre for a list of deadlines for all examinations. Accommodation requests not made prior to the specified deadlines will not be fulfilled. Students with disabilities requiring academic accommodations in this course must register with the Paul Menton Centre for Students with Disabilities for a formal evaluation of disability-related needs. Registered PMC students are required to contact the PMC, 613-520-6608, every term to ensure that I receive your Letter of Accommodation, no later than two weeks before the first assignment is due or the first in-class test/midterm requiring accommodations. If you only require accommodations for your formally scheduled exam(s) in this course, please submit your request for accommodations to PMC by the deadlines published on the PMC website.

Academic Accommodation for Students with Religious Obligations:

Carleton University accommodates students who, due to religious obligation, must miss an examination, test, assignment deadline, laboratory, or other compulsory event. The University has a Senate-approved policy on religious accommodation that forms part of its Human Rights Policy, available at: www.carleton.ca/equity. Students requesting academic accommodation on the basis of religious observance should make a formal, written request to their instructors for alternate dates and/or means of satisfying academic requirements. Such requests should be made during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist, but no later than two weeks before the compulsory academic event. Accommodation is to be worked out directly and on an individual basis between the student and the instructor(s) involved. Instructors will make accommodations in a way that avoids academic disadvantage to the student. Students or instructors who have questions or want to confirm accommodation eligibility of a religious event or practice may refer to the Equity Services website for a list of holy days and Carleton's Academic Accommodation policies, or may contact an Equity Services Advisor in the Equity Services Department for assistance. Students unable to reach a satisfactory arrangement with their instructor(s) should contact the Director of Equity Services. For more details visit the Equity Services website <https://carleton.ca/equity/accommodation/religious-observances/>

Academic Accommodation for Students with Needs Related to Family Status:

Pregnant students requiring academic accommodations are encouraged to contact an Equity Advisor in Equity Services to complete a letter of accommodation. The student must then make an appointment to discuss her needs with the instructor at least two weeks prior to the first academic event in which it is anticipated the accommodation will be required. For more details visit the Equity Services website <https://carleton.ca/equity/contact/form-pregnancy-accommodation/>

Student Conduct:

The University has adopted a policy to deal with allegations of academic misconduct. This policy is expressed in the document Carleton University Academic Integrity Policy, effective July 1, 2006. The policy describes in detail its scope of application, principles, definitions, rights and responsibilities, academic integrity standards, procedures, sanctions, transcript

notations, appeal process, and records implications. The complete policy is available at <https://carleton.ca/secretariat/wp-content/uploads/Students-Rights-and-Responsibilities-Policy.pdf>

Plagiarism:

Plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own. Plagiarism includes reproducing or paraphrasing portions of someone else's published or unpublished material, regardless of the source, and presenting these as one's own without proper citation or reference to the original source. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn from include but are not limited to: books, articles, papers, literary compositions and phrases, performance compositions, chemical compounds, art works, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, and material on the Internet.

Examples of plagiarism include, but are not limited to:

- submitting a take-home examination, essay, laboratory report or other assignment written, in whole or in part, by someone else;
- using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another's data or research findings;
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one's own;
- failing to acknowledge sources through the use of proper citations when using another's works and/or failing to use quotation marks.

For more information on academic integrity, please see <https://carleton.ca/registrar/academic-integrity/>