

## Job Description

<b>Job Title:</b>	Analytical - Chemistry Laboratory Instructor
<b>Department:</b>	Chemistry
<b>Reports To:</b>	Undergraduate Laboratory Coordinator (laboratory courses); Associate Chair (lecture/courses)
<b>Jobs Reporting:</b>	None
<b>Salary Grade:</b>	USG 9 - 11
<b>Effective Date:</b>	February 1, 2023

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### **Primary Purpose**

The Analytical - Chemistry Laboratory Instructor is responsible for the operation of assigned undergraduate laboratories in Analytical Chemistry within the Chemistry Department, e.g., CHEM 220L and CHEM 224L. This includes organizing and instructing laboratory-only courses, teaching lecture-only courses, developing and writing laboratory experiments and manuals, designing examinations and quizzes, and keeping the content and resources current. For lectures that have courses directly associated with laboratories, the Chemistry Instructor is responsible for designing experiments that reflect the contents of the relevant course.

### **Key Accountabilities**

#### **Administration of assigned lab instruction, including but not limited to:**

- Independently develops the content, organizes, and runs laboratory-only courses
- Ensures that laboratory experiments reflect the course content directly associated with the laboratory
- Organizes and creates assignments, laboratory manuals, midterms, and final exams for the laboratory courses assigned to her/him including updates to materials as necessary
- Responsible for collecting and maintaining laboratory reports, midterms and exam grades; calculates and submits final grades to the Registrar's Office
- Marks assignments, midterms and exams; calculates and submits final grades to the Registrar's Office
- Prepares protocols of laboratory procedures – individual techniques and/or manuals
- Oversees enrollment into each laboratory/tutorial section, monitors course limits and signs course override forms
- Schedules laboratory and tutorial sections and corrects scheduling problems as they may occur, in coordination with the Chemistry Undergraduate Secretary
- Actively present during all laboratory periods and thus is responsible for the safety of the students and Teaching Assistants (TAs)
- Orders chemicals needed for laboratory experiments and arranges proper disposal of waste
- Sets out chemicals in appropriate containers and at appropriate locations in the laboratories
- Purchases and maintains laboratory equipment, including fixing minor equipment problems
- Replaces chemicals that run out during the weekly experiments
- Ensures that equipment and chemicals are put away at the conclusion of each experiment
- Closes each laboratory section upon completion of the laboratory period
- Available during laboratory periods for answering students' questions

## Job Description



- Advises and provides help to students on an individual basis, as needed, and reassigning students who have missed laboratory sections
- Provides students in distress with the first step in emotional counseling for both laboratory-only courses and lecture-only courses; Interacts with and attends workshops organized by Counselling Services to obtain appropriate guidelines
- Serves on the Undergraduate Chemistry Equipment Committee, including making recommendations for major equipment purchases and negotiating competitive pricing with equipment vendors
- Contributes when appropriate, to key committees that affect her/his assigned laboratory courses (including goals and equipment purchases)
- Updates and improves existing experiments annually
- Develops new content annually for laboratory-only courses and specific courses that include laboratories

### **Teaches specific lecture-only courses as assigned by the Associate Chair, Undergraduate:**

- Plans, creates and teaches specific courses assigned by the Associate Chair, Undergraduate, of the Chemistry Department
- Independently prepares to deliver the lecture(s) either in the classroom or online
- Organizes and creates assignments, quizzes, midterms, and final exams, including make-up exams for the lecture courses assigned
- Marks assignments, midterms, and exams; calculates and submits final grades to the Registrar's Office

### **Manages laboratory Teaching Assistants and Other Teaching Supports (Co-op students) each term, including but not limited to:**

- Recruits, interviews, and selects graduate and undergraduate TAs and Co-op students for their placement in laboratory courses for which the instructor is responsible
- Meets regularly with the TAs and other teaching supports to provide them with direction/instruction/explanation regarding laboratory concepts/objectives and marking
- Trains, manages and supervises the TAs and teaching supports weekly activities
- Mentors both graduate and undergraduate Teaching Assistants and other teaching supports regarding teaching
- Trains the TAs on the particular safety aspects of the Analytical laboratories
- Ensures that all TAs and other teaching supports are trained in regards to concepts with which they may not be fully familiar and that all TAs and other teaching supports fully comprehend the equipment and procedures to be used
- Designs the marking schemes for the TAs and other teaching supports to follow
- Provides help to students on an individual basis, as needed, and reassigns students who have missed their laboratory sections
- Co-ordinates feedback regarding potential problems in the laboratories and tutorials
- Evaluates Teaching Assistants and other teaching supports' performance at the end of each term

### **Safety Administration**

- Establishes, administers, and enforces safety standards and regulations including WHMIS requirements and UW Safety policies and procedures to ensure a safe laboratory setting for students and TAs
- Update posted safety procedures including WHMIS, hazardous waste disposal etc. in the laboratories
- Ensures that the laboratory is kept clean and maintains a safe laboratory environment
- Maintains personal certifications as required by the Safety Office

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*\*All employees of the University are expected to follow University and departmental health and safety policy, procedures and work practices at all times. Employees are also responsible for the completion of all health and safety training, as assigned. Employees with staff supervision and/or management responsibilities will ensure that assigned staff abide by the above, and actively identify, assess and correct health and safety hazards, as required.*

### Required Qualifications

<b>Education</b> <ul style="list-style-type: none"><li>• MSc in Chemistry is required, PhD preferred.</li></ul>
<b>Experience</b> <ul style="list-style-type: none"><li>• Minimum of two years' teaching experience is required in a laboratory and/or classroom setting. Requires a broad knowledge of Analytical Chemistry.</li></ul>
<b>Knowledge/Skills/Abilities</b> <ul style="list-style-type: none"><li>• Knowledge of chemical handling, safety and emergency procedures is required</li><li>• Experience troubleshooting and working with scientific equipment is an asset</li><li>• Familiarity with fundamental topics in analytical chemistry including: sample preparation, experimental errors, statistics of measurements, acid-base chemistry, chemical equilibrium, analytical instrumentation theory</li><li>• Experience with operating common instrumentation used in analytical chemistry including: UV-Vis spectrophotometers, pH meters, high performance liquid chromatography (HPLC), gas chromatography (GC), mass spectrometry (MS), ion chromatography (IC), fluorometry, solid phase microextraction (SPME)</li><li>• Experience with various analytical lab techniques including: gravimetric analysis, titrations (acid-base, complexometric, photometric, potentiometric), gravity and suction filtration, spectral analysis, electrochemistry</li><li>• Proficient with the use of volumetric glassware (e.g. burettes, pipets, flasks, etc) and ability to analyze and prepare compounds/reagents to a high degree of accuracy and precision</li><li>• Familiarity with the theory and techniques associated with materials and nanoscience laboratories would be an asset. This includes: nanoparticles and colloids, quantum nano-dots, differential scanning calorimetry, dynamic light scattering</li><li>• Excellent written and oral communication skills required</li><li>• Knowledge of modern tools for online pedagogy is an asset for the successful tenure of this position.</li></ul>

### Nature and Scope

- **Contacts:** Provides input into decisions regarding curriculum and course content and they will collaborate with the Chemistry Associate Chair, Graduate, by aiding in the selection of graduate TAs and recruitment of undergraduate teaching assistants (TAs) and other TAs. Consults with instructors teaching courses related to the labs to reflect lecture content. Works closely with the Analytical and Bioanalytical Services Technician to ensure that analytical instruments are properly maintained and operational, and that teaching assistants are properly trained on them. Advises and counsels undergraduate students on subjects, such as course selection, scholarship information, research opportunities on campus, co-op opportunities, post-undergraduate education, and any personal issues that a student may disclose. Advises prep room technician on specifics regarding preparing various reagents.
- **Level of Responsibility:** No direct supervision of other staff. Accountable for the inventory and ordering of all chemicals needed for the laboratories she/he is in charge of and will be in charge of choosing appropriate reagents and chemicals for experiments that can be handled safely by students and Teaching Assistants/Co-op students. Required to create a positive and enriched learning environment for all students, which will promote and cultivate an air of confidence and self-motivation.

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USG 9 - The Laboratory Instructor has two primary responsibilities: 1. Sole responsibility for organizing and running laboratory-only courses; 2. For lectures that have courses directly associated with laboratories, the Laboratory Instructor is responsible for running experiments that reflect the contents of the relevant courses.

USG 10 - Addition of a third primary responsibility: 3. The Laboratory Instructor is responsible for designing and creating new laboratory experiments and/or making significant changes to existing experiments annually.

USG 11 – Addition of a fourth primary responsibility: 4. The Laboratory Instructor is responsible for lecturing one - two Chemistry lecture courses per year.

- **Decision-Making Authority:** Evaluate student performance through lab reports, quizzes, tests, assignments, and examinations in laboratory and lecture courses and will enforce laboratory rules and protocols and academic regulations, such as those imposed by UW Policy 71. Assigns Teaching and Online Learning Assistants to specific laboratory sections. Provides TA and other teaching supports training and direction of the weekly activities, their performance evaluations both midterm and at the end of each term, and via solicitation of feedback on problems encountered and potential problems that may occur in individual experiments. Required to make decisions concerning laboratory experiments, chemicals and equipment. All problems are to be handled with minimal supervision and referred to the supervisor when there is a possible danger to students and/or TAs or does not comply with the guidelines defined by the Chemistry Department.
- **Physical and Sensory Demands:** Requires exertion of physical effort resulting in moderate fatigue, strain due to lifting, carrying and/or handling of objects. Requires sensory effort resulting in slight fatigue due to concentrated and attentive use of one or more senses in writing and creating course content.
- **Working Environment:** Unavoidable exposure to dangerous situations and hazardous substances and environments. Unavoidable exposure to dangerous or unpleasant environmental elements such as chemicals. Disruption in lifestyle due to unusual hours: Due to the hazardous nature of chemistry laboratories, the Instructor must be present during all laboratory periods. Space, scheduling and other factors may necessitate that Instructors work special schedules, including for example, work in the evenings. The Instructor is expected to accomplish her/his duties by arranging hours of work to allow her/him to be present during scheduled laboratory hours. In particular, Instructors are responsible for closing each laboratory session. This may mean that the Laboratory Instructor will have to work more than 7 hours on a given day; should this be necessary; the Laboratory Instructor may reduce the hours worked on another day during the week or may recoup the overtime during a term with a lighter course load.