**Department of Human Resources**

**OPSEU Job Description**

**Job Title:** Chemical & Instrumentation Technician

**Job Number:** SS-049

**NOC:** 4012

**Band:** 8

**Department:** Chemistry

**Supervisor Title:** Chair, Chemistry

**Last Reviewed:** May 5, 2015

**Job Purpose**

Provides technical support to undergraduate teaching of Chemistry courses. Sets up laboratory equipment and experiments for laboratory courses. Operates, maintains and demonstrates the use of all instruments within the department. Instructs a laboratory session in a formal laboratory setting. Maintains and updates the departmental website. Coordinates and handles all hazardous chemical waste for assigned science departments. Assists in the operation of Science Stores.

**Key Activities**

1. Operates, demonstrates the use of, maintains and repairs analytical instruments. Explains the principles of operation of instruments to undergraduate students individually or in groups and also to faculty and researchers. Installs and commissions new instruments. Independently become familiar with the operation of the instrument and writes the operating instructions for use in lab manuals. Maintains these instruments by doing routine maintenance procedures and maintaining an inventory of supplies. Repairs these instruments in house when needed, contacts and arranges outside service. Controls the Departmental Instrumentation account, ordering supplies and parts on instruments. Maintains a running total of the expenses in this area to ensure no overspending of the account. Evaluates space priorities and requirements for departmental instruments and equipment. Identifies course requirements and facilitates laboratory scheduling to ensure availability of needed instrumentation.
2. Accurately prepares solutions and sets up equipment. Prepares and dispenses to students the chemical solutions needed for the experiments they are performing in their weekly labs. Sets up and calibrates equipment. Obtains and organizes Material Safety Data Sheets for the chemicals use.
3. Coordinates and handles all hazardous chemical waste for assigned science departments. Determines and implements procedures for proper handling and storage of hazardous waste chemicals. Moves and properly stores all waste into the secure storage area. Bulks compatible chemicals together into containers for shipping. Maintains up-to-date inventory of chemicals in the hazardous waste storage facility for use by the hazardous waste disposal company and works with this company during scheduled hazardous waste pickups. Advises faculty in Chemistry and other departments on safe chemical storage and procedures in laboratories.
4. Explains the principles of operation of instruments to undergraduate students individually or in groups and also to faculty and researchers. Instructs students during weekly laboratory sessions. Teaches and demonstrates proper laboratory techniques, equipment operation and proper safety practices to students.
5. Coordinates departmental computational requirements and maintains upgrades in Department of Chemistry webpage. Arranges installation and necessary connections for departmental computational computers. Organizes space requirements, and requires interfaces for teaching computers. Ensures that the Departmental webpage is accurate and up to date. Creates new sections and features on the departmental webpage. Utilizes a webpage editor and an image editor to make the needed changes to the webpage while ensuring consistency in style and content. Uploads changes from the office computer to the University's web server.
6. Assists in the operation of Science Stores. Dispenses chemicals and equipment to faculty, students and researchers. Ensures proper paperwork is completed for account billing and regulatory purposes. Receives and signs for goods delivered.
7. Participates in the maintenance of the LC-NMR instrument. Dispenses liquid nitrogen from bulk storage tanks to transfer tank and adds the liquid nitrogen to the NMR Magnet Dewar as needed. Also transfers Liquid Helium from delivered transfer Dewar to the cryogenic chamber of the NMR magnet.
8. Program and related record keeping for the programmable door access keypads for assigned rooms and facilities.
9. Coordinates access and availability of Chemistry teaching labs and related rooms and equipment for usages that are not scheduled for courses by the RO. For example: use of teaching labs for science fair, science camp, enrichment program, access to rooms for maintenance and repairs, access to rooms for research use purposes including billing for cost recovery purposes, access to and use of glass blowing and cutting facility for researchers, etc.
10. Other duties as assigned.

**Education**

Honours Bachelor of Science in Chemistry or a related discipline.

**Experience Required**

* Minimum two years of experience as a chemistry technician including one year of significant experience in operation and maintenance of an instrumentation facility for chromatography and spectrophotometry or spectroscopy.
* Good general scientific knowledge related to experiments and their preparation.
* Ability to instruct students in laboratory techniques.
* Good administrative and organizational skills.

**Responsibility for the Work of Others**

Indirect Responsibility

Chemical Technician's Assistant (student hired by Chair)

**Communication**

Internal:

* Students, to demonstrate the operation of an instrument
* Students, to demonstrate a laboratory technique
* Other staff, to decide how to distribute equipment between simultaneous laboratory sections
* Faculty, to persuade him/her to change a laboratory exercise to make more effective use of equipment or supplies
* Faculty/Staff, to discuss changes to laboratory exercises, either technical or logistical
* Faculty/Staff/Students, to respond to inquiries about how to handle and store a specific type of hazardous waste chemical
* Physical Resources/Science Workshop/Science Facilities Manager - arranging to have some repairs or upgrades done in the Department
* Faculty/Student, exchanging necessary information during dispensing of chemicals or equipment and completing the paper work in Science Stores
* NMR Manager, exchanging information for scheduling NMR maintenance

External:

* Suppliers, to discuss availability and price of needed supplies
* Hazardous Waste Disposal Company Representative, to discuss the details of the inventory for the upcoming waste pickup
* Delivery personnel, to receive goods at Science Stores and complete any necessary paperwork
* Liquid Helium supplier to discuss/arrange delivery of time sensitive liquid helium

**Motor/ Sensory Skills**

* Fine Motor Skills, Dexterity - Repairs and adjustments to analytical instruments requires accuracy and precise movement, weighing of chemicals and preparation of solutions to exact concentration requires accuracy and precise movement, cutting and mounting photographic films onto film backing plate and assembly of film holder to complete darkness requires accuracy and precise movement.
* Gross Motor Skills, Coordination - Pouring chemicals from 4 to 20 litre containers into 200 litre drums requires control and skilled manual action
* Dexterity - Manipulation of small vials and syringes to inject samples into chromatographs requires skillful movement of fingers and hands, keyboarding for writing procedures, editing the webpage and operation of computer interfaced instruments requires speed and accuracy, required to program door access keypads
* Coordination - Lifting equipment and instruments on and off of carts moving to different locations in the building requires skilled manual action
* Hearing - Detecting a change in tone or pitch of an operating instrument can often alert one to a problem and acting on that information can reduce the damage to the instrument and therefore reduce the cost of the repair.
* Smell - Identifying the nature and source of a smell in the case of a spill or an experiment gone wrong and acting on that information can reduce the danger from such a situation.
* Touch - Cutting and mounting photographic films onto film backing plate and assembly of film holder in complete darkness requires identifying and manipulating tools and equipment only by touch.
* Visual - Fine adjustments of small screws or dials during repair and calibration of instruments requires focus on small items, reading of small displays and numerous types of equipment and instruments including very fine vernier scales to obtain accurate results requires accurate focus on small number markings, precise focus on fine etched markings on analytical volumetric glassware is required to prepare accurate chemical solutions.

**Effort**

Mental:

* Sustained Attention - Required when adjusting or calibrating instruments, required when preparing accurate analytical solutions
* Sustained Concentration - Required when reading and absorbing information from instrument manuals, required when editing Departmental webpage
* Listening - Required when receiving verbal instructions on laboratory revisions, etc. by faculty, required when addressing student questions relating to laboratory exercises

Physical:

* Lifting - Required when pouring of chemicals from 4-20 litre containers into 200 litre drums, required when dispensing chemicals from 20 litre containers
* Lifting/Moving/Carrying - Required when moving and storing hazardous waste on shelves in the secure storage area
* Lifting/Carrying - Required when setting up equipment for undergraduate laboratories, required when dispensing and receiving chemicals and equipment in Science Stores
* Standing - Required when preparing solutions for undergraduate laboratories
* Bending - Required when repairing some instruments
* Walking/Climbing - Required when duties involve work in more than one location within the department
* Stairs - Moving heavy dewars to the NMR room, climbing ladder while maneuvering cryogenic transfer lines to fill NMR magnet

**Working Conditions**

Psychological:

* Conflicting work - Conflicting work priorities when faculty require laboratory setup changes with little notice priorities
* Interruptions - Interruptions and the expectation to respond immediately when in the midst of an equally important task.