**Department of Human Resources**

**OPSEU Job Description**

**Job Title:** Demonstrator

**Job Number:** SS-030

**NOC:** 4012

**Band:** 7

**Department:** Physics & Astronomy

**Supervisor Title:** Chair, Physics & Astronomy

**Last Reviewed:** January 2, 2001

**Job Purpose**

Assist in the delivery of academic services by teaching in laboratories, preparing laboratory manuals, assignments, and handouts, supervising and coordinating Teaching Assistants, marking undergraduate assignments, tutoring undergraduate students individually and providing technical support for teaching facilities.

**Key Activities**

Reporting to the Chair of Physics & Astronomy, the Demonstrator assists in the delivery of academic services by developing, updating, and instructing undergraduate laboratories, and providing technical support for teaching facilities.

1. In co-operation with faculty, and under general direction of the Chair, supervises and grades undergraduate students at all levels in laboratory components of courses.
2. Designs and prepares lab manuals, handouts and laboratory assignments.
3. Modernizes existing labs, maintains lab equipment, and develops new laboratory experiments as needed.
4. Develops and instructs computational labs as required.
5. Implements and updates computer technology in undergraduate laboratories.
6. Repairs and if needed, purchases department equipment and supplies.

**Analytical Reasoning**

Highly complex analysis, understanding and application of physics concepts and material from physics courses at all undergraduate levels.

Academic leadership in physics laboratories at all levels.

Applications of teaching pedagogy and determination of the best approach for effective communication of difficult concepts to a wide variety of students.

Relevant work example: leads a set of physics labs; organizes students into groups; effective instruction of difficult theoretical and experimental concepts to a wide range of students; determines the optimal way to update the laboratories and researches the tools and technology required to initiate such improvements.

**Decision Making**

Leads a set of laboratories and tutorials and determines the best laboratory equipment, teaching resources, pace and order of delivery, marking scheme, and assignment of marks to a wide range of students. Determines when students have valid mitigating circumstances for work not submitted.

Relevant work example: runs a tutorial session in which a bi-weekly test needs to be conducted, assignments are marked in-class, and solutions shown to the students on a board in real-time.

**Impact**

This person has enormous impact on the majority of laboratory and tutorial marks for all Physics students. This person plays an essential role in laboratory and tutorial development and the updating of such course deliveries in conjunction with changes in technology. This person is a ‘point person’ for students who have questions about laboratories and tutorials.

Relevant work example: develops and leads all first year labs and tutorials, either directly, or through the managing of TAs; sets marking schemes and assigns marks; responds to students’ concerns or questions about the course.

**Education**

Honours’ Bachelor of Science in Physics required. M.Sc. or Ph.D. in Experimental Physics or Engineering preferred.

**Experience Required**

1. Two years related laboratory and teaching experience.
2. Experience with maintenance, design, and development of technical equipment.
3. Programming experience (e.g. Matlab, Python); experience working with relevant computer hardware.
4. Strong organizational, interpersonal and communication (written and verbal) skills required.
5. Strong analytical and planning skills.
6. Strong judgment and decision-making skills.

**Responsibility for the Work of Others**

Direct Responsibility

None

Indirect Responsibility

* Teaching Assistants

**Communication**

**Internal Contact**

* Students: teaching, assignment and report critique
* Technicians: equipment repair and replacement
* Technicians from other departments to discuss sharing of equipment
* Staff and Faculty: answer queries
* Faculty: department business
* Teaching Assistants: explanation of assignments and how to grade/evaluate
* Computer Technicians: Hardware/software problems

**External Contacts:**

* Suppliers: gather information and order equipment
* Technical Staff from other Universities
* Trent Community: act as a resource
* High School teachers: act as a resource
* Science Fair Board: act as a resource
* Primary School teachers: project assistance, lectures, demonstrations.
* Parents and prospective students: act as a resource in recruitment efforts

**Motor/ Sensory Skills**

* Fine Motor Skills: manipulating equipment and measuring devices, keyboarding and data entry
* Dexterity: precision in manipulating equipment and measuring devices

**Sensory Skills:**

* Hearing: responding to student and faculty queries
* Sight: reading reports, precision in manipulating equipment and measuring devices
* Touch: precision in manipulating equipment and measuring devices

**Effort**

**Mental Effort:**

* Sustained concentration: marking assignments, reading new material, analyzing problems, debugging software and working with equipment

**Physical Effort:**

* Standing, Walking: administering labs
* Lifting: Moving equipment and rearranging labs/classrooms.

**Working Conditions:**

**Psychological Conditions:**

* Complaints from faculty and students
* Conflicting work priorities and deadlines: labs, manuals, assignments
* Angry students upset with grades
* Handling of student appeals
* Interruptions from students
* Lack of control over pace of work - academic term “end rush”
* Multiple competing demands instructing in several courses.

**Physical Conditions:**

* Injury from operation of dangerous equipment, repetitive strain, data entry, exposure to dangerous materials
* Poor lighting and noise conditions