

Job Description

Job Title:	Lab Instructor - Biomedical
Department:	Systems Design Engineering
Reports To:	Lab Director, Systems Design Engineering
Jobs Reporting:	Teaching Assistants, Co-op Student (on occasion)
Salary Grade:	USG 12
Effective Date:	January 2020

Primary Purpose

The “Lab Instructor – Biomedical” is a key educator and resource for the undergraduate students in the Biomedical Engineering program within the Department of Systems Design Engineering. The Lab Instructor – Biomedical provides instruction, guidance, and technical assistance for those enrolled in courses with labs in the Biomedical Engineering program, design-project and workshop courses, and is responsible for ensuring safe practices in labs are taught and maintained at all times.

The Lab Instructor – Biomedical must have comprehensive theoretical and practical knowledge of biomedical systems and equipment, tissue mechanics, human physiology and anatomy, biochemistry and cell biology, biomedical design principles, medical imaging, biomechanics of human movement and instrumentation, analogue and digital circuits, control systems, software design, sensors, actuators, mechanical components, and fabrication techniques along with other common technical areas found in the Biomedical curricula. The Lab Instructor – Biomedical is responsible for the operation of several laboratory spaces offering Biomedical Engineering courses and acts as the primary manager and mentor to the associated Teaching Assistants

Key Accountabilities

Provide instructional support and mentoring to students in all Biomedical Engineering laboratory courses:

- Present theory and concepts to students pertaining to laboratory experiments
- Demonstrate safe laboratory practices and ensure safety protocols are maintained
- Demonstrate all laboratory experiments in all assigned Biomedical Engineering courses with labs
- Present and develop information for students concerning laboratory safety
- Prepare and modify laboratory manuals and procedures as needed
- Apply pedagogical expertise to continuously improve lab course structure and content; this may include independent and significant modification or redesign of lab material in addition to development of innovative material for new or existing courses
- Collaborate with academic counterparts of lab courses to synchronize the presentation of material
- Enrich the student experience of the lab component through the development of multi-media instructional aids such as videos, demonstrations, web content, etc.
- Resolve student/lab issues such as attendance and special situations

Management of the Biomedical Engineering teaching assistants:

- Manage laboratory teaching assistants with regard to lab schedules and procedures
- Train teaching assistants in the safe and proper usage of lab equipment and software
- Participate in the selection of teaching assistants and in their performance evaluations
- Assume an active leadership role in the mentorship and development of teaching assistants

<p>Management of the Biomedical Engineering undergraduate labs:</p> <ul style="list-style-type: none"> • Prepare and maintain lab experiments and equipment for scheduled lab times • Lead in and provide assistance in the design, development and fabrication of complex laboratory experiments • Participate in keeping the labs and experiments current with new technology • Responsible for setup and maintenance of equipment per manufacturers' design specifications • Maintain lab spaces in accordance with University health and safety standards • Maintain current First Aid certification and act as first point of contact for incidents
<p>Provide mentoring and technical support to students in Biomedical Engineering design project and workshop courses:</p> <ul style="list-style-type: none"> • Participate as a technical consultant for students taking Biomedical Engineering workshop and design courses distributed throughout the entire undergraduate program • Participate as a supervisor/advisor for student design projects as time permits • Resolve unstructured technical problems • Ensure that safe practices are followed in the Biomedical Engineering workshops and labs • Demonstrate the proper use of lab and workshop equipment and tools • Manage and track departmental funds used to supplement student design project costs
<p>Other duties, but not limited to:</p> <ul style="list-style-type: none"> • Participates in special projects (e.g. curriculum development, faculty-wide initiatives, special reports, etc.) as assigned by the Lab Director or Program Director • The incumbent will occasionally be required to serve on committees pertaining to lab and workshop outcomes, departmental staffing, student experience reviews, and others as the need arises

**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

<p>Education</p> <ul style="list-style-type: none"> • Bachelor's and Master's degree in Biomedical Engineering or equivalent • Must be a licensed Professor Engineer in the Province of Ontario or be eligible and licensed within two years of hire • Valid First-Aid certification is an asset.
<p>Experience</p> <ul style="list-style-type: none"> • 2 years of experience in running labs, giving tutorials/lectures and demonstrations, writing and updating lab manuals, developing new labs, marking reports and evaluating technical presentations • Experience monitoring and enforcement of safety standards in labs or in an academic environment is required • Demonstrated experience in safe handling of biological materials and chemical substances and performing chemistry and biology lab experiments • Must have experience collecting and analyzing a broad array of bio-signals and data • Must have experience working with electro-mechanical components and systems • Should have practical experience with and sound knowledge of sensors, actuators, hardware design and fabrication, software design, embedded systems, mechanical systems, and mechanical system fabrication • Should have experience with biomechanical measures and analyses

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- Should have experience with biomedical signals such as ECG, EEG, and measures such as X-rays and MRI
- Should have experience with biomedical devices such as assistive devices, implants, prostheses/orthoses, biomedical equipment and design for the aged
- Demonstrated experience and competency using scientific and lab software applications such as Matlab, various simulators, and CAD.

Knowledge/Skills/Abilities

Must have fundamental knowledge of the core Biomedical Engineering lab material including:

- Proven aptitude for teaching and a demonstrated interest in working with students in a professional manner to provide technical advice and instructional material
- Extensive knowledge and understanding of biological materials and bio-material testing, electro-mechanical systems and modelling and chemical reactions and procedures for experiments
- Solid knowledge of human anatomy and physiology, movement and biomechanical measurements
- Solid knowledge of biosignal collection and processing
- Proficiency with Microsoft Office suite of programs required
- Demonstrated ability to work independently and as part of a team within a busy and dynamic environment
- Excellent and demonstrable oral and written communication skills, including strong technical documentation and presentation/facilitation skills
- Strong leadership and supervisory skills with the proven ability to mentor and develop staff.
- Excellent interpersonal, analytical, research, organizational, and creative problem-solving skills
- Must have a strong sense of pedagogy how it is applied to diverse and changing student group

Nature and Scope

- **Contacts:** Internally, frequent communication is required with staff, students, and faculty members in the department. In addition, the incumbent will regularly present information to students with regard to labs and workshop courses. Externally, this position will occasionally require contact with vendors/suppliers/manufacturers for the purposes of purchasing and maintaining equipment.
- **Level of Responsibility:** The job has specialized work with some supervision and provides guidance to others.
- **Decision-Making Authority:** N/A
- **Physical and Sensory Demands:** Requires exertion of physical and sensory effort resulting in moderate fatigue, strain or risk of injury. Lab supervision requires long periods of standing. Some lifting and transporting of heavy and/or awkward equipment will be required.
- **Working Environment:** Involves moderate physical or psychological risk resulting from unavoidable exposure to hazardous, disagreeable or uncomfortable environmental conditions. In certain cases, the "Lab Instructor", the teaching assistants, and the students may work with biomaterials, hazardous voltage levels and electromechanical apparatuses. Consequently, safety procedures must be strictly enforced. Incumbent will work within an open concept laboratory and work is subject to several interruptions. Occasional after hours and weekend work will be required.