Job Description

Job Title:	Engineering Educational Developer
Department:	Mechanical and Mechatronics Engineering
Reports To:	Director, Engineering Ideas Clinic
Jobs Reporting:	Teaching and Research Assistants, Co-op Students
Salary Grade:	USG 10-12
Effective Date:	June 2023

Primary Purpose

Support the Engineering Ideas Clinic to research, develop and evaluate innovative, multi-disciplinary, educational activities and methods.

This position is accountable to the Director of the Pearl Sullivan Engineering Ideas Clinic (EIC).

The Engineering Ideas Clinic supplements the traditional engineering curriculum with open-ended activities to spark student self-learning and exploration. Through Ideas Clinic activities, students will learn good engineering practices by experimenting with real-world engineering problems, and they will exercise their creativity, judgement and problem-solving skills, while acquiring soft skills such as communication and team work. Students will gain an appreciation for the connections between courses in their curriculum. Most importantly, the activities will provide students with a breadth of experience in an enjoyable, and safe, environment.

You will be an integral member of the EIC team as you use your technical expertise and creativity to develop engaging courseware, rich real-world applications, and exciting hands-on demonstrations. Depending on your interests, this position can easily scale to a wide variety of diverse design-related tasks associated with any of the engineering programs offered by Waterloo Engineering (architecture, biomedical, chemical, civil, computer, electrical, environmental, geological, management, mechanical, mechatronics, nanotechnology, software, and systems design), as well as research in the Scholarship of Teaching and Learning.

The Engineering Educational Developer is accountable to the EIC for functional leadership in the implementation of Engineering Ideas Clinic Activities throughout the Faculty of Engineering; generation and development of activities; liaising with faculty instructors; graduate student teaching, and research, assistants; industrial contacts; participating in internal and external committees; liaising with key stakeholders; functional management of co-op student staff; and other administrative functions as required to support the teaching, learning and research goals of the EIC.

Key Accountabilities

Development

- Custom R&D and application development required
- Frequent collaboration with instructors for courseware, applications, demonstrations, documentation, etc.
- Sourcing and procuring equipment and supplies

- Stay current in their subject matter (both engineering and education) through professional development, involvement in professional organizations, and attending professional meetings, conference or workshops
- Enrich the student experience through the development of multi-media instructional aids such as videos, demonstrations, web content, etc.

Research

- Researching, developing and evaluating innovative, multi-disciplinary, educational activities and methods depending upon the level of the incumbent
- Disseminate findings in conferences and journals depending upon the level of the incumbent
- Design and implement survey instruments, focus group sessions depending upon the level of the incumbent
- Leads the collection and analysis of confidential data, such as: student, TA, and instructor survey feedback; and student grades

Fundraising and Budgeting

- EIC has an approved internal budget to support its operations.
    - Manages resources (financial, personnel, equipment) to ensure timely delivery of activities within budgetary constraints
    - Contributes to future resource planning, depending upon the level of the incumbent
- Depending upon the level of the incumbent, this position will assume responsibility for the preparation, coordination, implementation and reporting on major funding proposals, this will include:
    - Orchestrating direct funding opportunities from the corporate sector and government ministries and agencies at both the provincial and federal levels.
    - Writing grant applications, both internal and external to the University depending upon the level of the incumbent
    - Budgeting and managing existing grants depending upon the level of the incumbent

Delivery

- Facilitate Engineering Ideas Clinic activities
- Present at internal and external symposia, conferences
- Training Teaching Assistants, co-op students, instructors to facilitate activities

Management

- Manage Ideas Clinic space, such as: labs, offices, and store rooms
- Track and document progression of activity development
- Managing external relationships, including servicing and developing client relationships and tracking outcomes.
- Managing equipment and supplies inventory, including any necessary maintenance
- Train teaching assistants and staff in the proper usage of lab equipment and software
- Hiring, management, scheduling, and evaluation of undergraduate co-op students
- Mentoring of undergraduate co-ops students and other staff members depending upon the level of the incumbent.
- Maintain current First Aid certification and act as a first point of contact for incidents

**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

Education • Master's degree in engineering, with the ideal candidate having an advanced degree in an engineering, or engineering education discipline
Experience • Experience as a laboratory coordinator or engineer would definitely be an asset. • Background in educational research would be a strong asset. • Supervisory experience in a technical environment is preferred • Engineering experience and eligibility for licensing as a Professional Engineer in Ontario are assets.

Knowledge/Skills/Abilities
• Very strong communication and technical writing skills.
• Teaching experience, with an understanding of how engineering courses are developed.
• Demonstrated problem solving skills including a broad and in-depth knowledge base from which to generate solutions to highly unstructured and complex problems at both theoretical and practical levels
• Excellent organizational, communication, presentation and interpersonal skills.
• Sound judgment, tact, and diplomacy
• Ability to learn quickly and to work independently with a minimum of supervision and in a team environment is necessary
• Microsoft Office products: basic knowledge of Teams, Word, Excel, and PowerPoint
• Learning Management Systems, such as: D2L, Blackboard
• Three or more of:
  ○ Programming languages: advanced knowledge of a number of procedural and object oriented programming languages, such as: C, C++, C#, Java, Matlab, Maple, Python or similar
  ○ Specialist engineering software, for example CAD (e.g.: AutoCAD, Solidworks, Catia), process simulation and modelling (e.g, Aspen Plus, Aspen HYSYS, gPROMS), statistical analysis (e.g., R, SAS, Statistica), optimization (e.g., GAMS), etc.
  ○ Embedded systems: advanced knowledge of commonly available hardware and software
  ○ Electrical measurement laboratory equipment: advanced knowledge of analog and digital multimeters, oscilloscopes, DC power supplies, LCR meters
  ○ Process equipment (e.g., heat exchangers, pumps, reactors, tubing and piping, valves) and related analytical, instrumentation and control equipment (e.g., specific instrument types, programming of PLCs, DCS and SCADA systems)

Nature and Scope

- **Contacts:** Internally, the incumbent has significant communications with: All engineering students, both undergraduate and graduate; Course instructors; Lab instructors; Teaching and Research Assistants; Operational Team which includes sessional lecturers hired by the Ideas Clinic, other Engineering Educational Developers, Ideas Clinic co-op students, and Director of the Ideas Clinic Engineering Associate Deans, and the Dean of Engineering; The Office of the Dean of Engineering staff; The Centre for Teaching Excellence; The Student Success Office; Cooperative Education and Career Action; Waterloo Engineering Endowment Foundation; Engineering Machine Shop and Student Machine Shop; Engineering Computing; Safety Office; Centre for Extended Learning; Engineering Outreach; Office of Research Ethics; Departmental staff (administrative and technical); Student design teams (e.g. Formula SAE, etc). Externally, the incumbent has significant communications with: Government funding agencies (e.g. eCampus Ontario); industry partners;

professional societies like the Canadian Engineering Education Assocation (CEEA) and American Society for Engineering Education (ASEE); External vendors as required

- **Level of Responsibility:** The details of the support provided vary based on the needs of a specific course, the needs of a particular course team, and the level of the incumbent. Different instructional support responsibilities are assigned to different levels depending upon the breadth and depth of course support provided. Details are given in the accompanying Career Path document for this position.
- **Decision-Making Authority:** The decision making authority will increase progressively with the level of experience and abilities of the staff member. Details are given in the accompanying Career Path document for this position.
- **Physical and Sensory Demands**: Requires exertion of physical or sensory effort resulting in ***moderate*** fatigue, strain or risk of injury. Lab supervision requires long periods of standing. Person must be able to project his/her voice to communicate with students in a laboratory setting. 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 (e.g. hazardous voltage levels, electro-mechanical apparatuses, etc). Consequently, safety procedures must be strictly enforced. Incumbent will work within an open concept laboratory and work is subject to several interruptions.