



JOB TITLE: Engineering Educational Developer

REPORTS TO: Director, Engineering Ideas Clinic

JOBS REPORTING: Teaching and Research Assistants, Co-op Students

DEPARTMENT: Office of the Dean of Engineering

GRADE: USG 10-12

LOCATION: Main Campus

DATE:	September 2016
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PRIMARY PURPOSE:

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

KEY ACCOUNTABILITIES:

This position is accountable to the National Sciences and Engineering Research Council (NSERC) – Waterloo Chair in Design Engineering (CDE). This is an initiative funded under NSERC’s Chair in Design Engineering program.

The Engineering Ideas Clinic will supplement a 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 Engineering Ideas Clinic 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 CDE 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 CDE.

1.	<p>Development:</p> <ul style="list-style-type: none"> • 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.
2.	<p>Research:</p>

	<ul style="list-style-type: none"> • 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 • Writing grant applications, both internal and external to the University depending upon the level of the incumbent
3.	Delivery: <ul style="list-style-type: none"> • Facilitate Engineering Ideas Clinic activities • Present at internal and external symposia, conferences • Training Teaching Assistants, co-op students, instructors to facilitate activities
4.	Management: <ul style="list-style-type: none"> • Manage Ideas Clinic space, such as: labs, offices, and store rooms • Track and document progression of activity development • Managing equipment and supplies inventory, including any necessary maintenance • Budgeting and managing existing grants depending upon the level of the incumbent • 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

Specific details depend on the staff member's USG grade level and is given in the accompanying Career Path document for this position.

POSITION REQUIREMENTS:

Education & Experience:

A minimum Master's degree in engineering, with the ideal candidate having an advanced degree in an engineering discipline, and very strong communication and technical writing skills. Teaching experience, with a strong understanding of how engineering courses are developed, is essential. Experience as a laboratory coordinator or engineer would definitely be an asset. Most importantly, you are passionate and dedicated to developing innovative new approaches to education. A background in educational research would be a strong asset.

The incumbent will have a broad and in-depth knowledge base from which to generate solutions to highly unstructured and complex problems at both theoretical and practical levels and will need to apply a sound analytical and interpretive level of critical thinking to achieve this goal. Excellent organizational, communication, presentation and interpersonal skills. Sound judgment, tact, diplomacy and demonstrated problem solving skills. Ability to learn quickly and to work independently with a minimum of supervision and in a team environment is necessary. Supervisory experience in a technical environment is preferred. Engineering experience and eligibility for licensing as a Professional Engineer in Ontario are assets.

Technical:

- Microsoft Office products: basic knowledge of Word, Excel, Access 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:

- **Interpersonal Contacts:**

Internally, the incumbent has significant communications with:

- All engineering students, both undergraduate and graduate,
- Course instructors, Lab instructors, Teaching and Research Assistants as required during the development, deployment and evaluation of Ideas Clinic activities
- Engineering Ideas Clinic Operational Team which includes the Faculty of Engineering Graduate Attributes Lecturers, sessional lecturers hired by the Ideas Clinic, administrative assistant(s), 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
- Engineering Ideas Clinic Design Engineer in Residence
- Waterloo Engineering Endowment Fund
- Engineering Machine Shop, Engineering Computing, Safety Office, Centre for Extended Learning, Engineering Outreach, Office of Research Ethics, and Departmental staff (administrative and technical)
- Student teams (e.g. Formula SAE, Solar Car, etc)

Externally, the incumbent has significant communications with:

- NSERC
 - Industry Partners
 - Incubators, such as: The Accelerator Centre, Communitech
 - Selected Community Colleges and partner Universities
 - Local Secondary Schools
 - Members of the Canadian Engineering Education Association (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.