

Jan 27, 2010

## **Development of a UNBC Engineering Curriculum**

As the first stage in the preparation of the curricula for the proposed Civil and/or Mechanical Engineering undergraduate degrees, the engineering community is being solicited for input.

Following are the proposed subject areas, for comment:

### Civil Engineering topics

- 1) Timber and wood structures
- 2) mechanics of materials,
- 3) fluid mechanics, open channel flow and hydrology,
- 4) water and wastewater,
- 5) construction materials and construction management,
- 6) soil/rock mechanics, geotechnical engineering and foundations,
- 7) infrastructure and municipal engineering,
- 8) concrete/steel structures,
- 9) highways and transportation

### Mechanical Engineering topics

- 1) mechanics of materials,
- 2) fluid mechanics, numerical analysis and computing,
- 3) thermodynamics, heat transfer,
- 4) industrial engineering,
- 5) mechanical vibrations,
- 6) instrumentation and control
- 7) sound and vibrations

### Topics common to Civil and Mechanical Engineering

- 1) math,
- 2) physics,
- 3) chemistry,
- 4) engineering drawing & AutoCAD,
- 5) statics and dynamics, mechanics of materials, fluid mechanics,
- 6) materials science and engineering
- 7) economics,
- 8) law, ethics,
- 9) technical communication and report writing,
- 10) social aspects of engineering, sustainability,
- 11) design

## Potential Areas of Focus

### *Entrepreneurship*

Project based courses to provide experience in project development in a knowledge based resource economy

### *Project Management*

Construction management in a northern environment, including business and risk management skills

### *Geotechnical: earthworks and structure foundations*

Topics may include dam & earth structures, geo-environmental engineering, mining (equipment design, drilling & blasting, rock mechanics and structures, mine design)

### *Structural*

Topics may include advanced timber structural design, (reinforced) concrete/steel, structural analysis, construction engineering

### *Renewable Energy: hydroelectric, geothermal energy, bioenergy, wind energy, building efficiencies (e.g. HVAC systems),*

Topics may include: energy conversion engineering, green buildings, renewable energy, dam & earth structures, water resources engineering and hydropower development

### *Wood engineering*

Topics may include, forest harvesting systems, forest products, wood composites, advanced materials

### *Biomedical engineering*

Potential synergy with the medical program and the new cancer centre

The goal of this process is to prepare curricula for Civil and Mechanical Engineering by the spring of 2010. The process of determining the proposed curricula will be iterative, with the first iteration focusing on the required skills, or competencies, of the graduates of the proposed program(s). This information will be compiled and used in the formulation of a draft curriculum for each program, which will be sent out to the engineering community for further comment. In order to allow time for detailed curriculum development and preparation of support materials, this iterative consultation period will commence immediately and ideally be completed by the end of March. To this end, we are asking that you provide your first set of comments by **February 20, 2010**.

The proposed degrees, in both Civil and Mechanical Engineering, will be developed in parallel. Key components of the proposed new engineering programs are 1) internship/coop opportunities for students, firmly committed to by industrial partners, and 2) an integrated laddering program with the Technologist Diploma at CNC.

The framework of subjects listed above originated at meetings of the Engineering Advisory Committee. Comments from the engineering community on these previously discussed competencies, in as much detail as possible, will significantly strengthen the first draft of the curricula. Now is the time to voice concerns, stress and rank areas of importance (e.g. recommendations of how many courses might be involved in addressing a given subject, in which educational years, and whether or not a given competency should be part of the unique northern degree, or offered as an option), and contribute any other ideas you may have.

Please forward your comments by **February 20, 2010** to either:

Steve Helle  
[helle@unbc.ca](mailto:helle@unbc.ca)  
250-960-5206

Belinda Larisch  
[larisch@unbc.ca](mailto:larisch@unbc.ca)  
250-960-5277

Jueyi Sui  
[sui@unbc.ca](mailto:sui@unbc.ca)  
250-960-6399

Ron Thring  
[tring@unbc.ca](mailto:tring@unbc.ca)  
250-960-5804

We look forward to compiling your comments, and urge you to contribute to the effort of launching a new engineering program in the north.