

Understanding Impacts and Professional Obligations to Society: Preparing Geomatics Engineers for the 21st Century

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SUMMARY

Over the course of an engineering program, engineering students develop the base of what it really means to be a “geomatics engineer”; students begin to develop their professional identities. There is an increasing emphasis to develop holistic thinking for engineers of the 21st century by engineering accreditation boards (CEAB in Canada, ABET in America) and professional regulating bodies. Holistic thinking is a professional skill where engineers are able to frame and understand problems in multiple dimensions from an engineering context, which includes an understanding of impact on society and the environment. This also includes developing a professional sense of obligation to society.

Many engineering programs are not designed to embed the social and environmental dimension into the core of the engineering courses. Societal and environmental impact topics are often left as discrete courses in curriculum or a few discrete lectures in a design course. Problem framing and understanding an impact on society while working on engineering problems is not something that can be learned in a single course, or a few lectures – it is a way of thinking. We must look at new ways to include this into our educational context to prepare engineers ready to manage the grand challenges of the 21st century. So how can educators become attuned to how their students are developing an understanding of social implications of engineering work, and how can educators begin to develop a different sense of professional social obligation and holistic thinking in the engineering context?

This presentation will review the current research in engineering education in Schulich School of Engineering at the University of Calgary with regards to social responsibility development, share some current patterns and available tools for measuring a sense of social responsibility, and finally discuss case studies and ways in which geomatics engineering courses can be modified to

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encourage thinking of the professional responsibilities with regards to society. These case studies illustrate techniques such as having discussions with community members, incorporating reflection into the classroom exercises, setting social/environmental context during problem framing.

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