

# Universal Design for Learning in a Surveying Course

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## SUMMARY

Universal Design for Learning (UDL) is an educational framework meant to accommodate learning differences and to enhance the educational experience of all students. This framework incorporates varied means of engaging students, representing material, and expressing student understanding. Geomatics education lends itself well to the UDL framework, as demonstrated in this paper discussing its implementation in three surveying courses at the University of New Brunswick. These courses involve a large volume of challenging material, including instrument operational principles and errors, and their application in a wide variety of survey types.

Student engagement was improved by several means. Relevance of the material was communicated by incorporation of real-world problems, and relation of the course work to industry practice. Assignments allowing choice in topic better motivated students by freeing them to pursue individual interests.

Course material was represented using some traditional means such as texts, lectures, and practical lab exercises; but also included videos, simulations, demonstrations, and manipulatives. These were often incorporated in a partial flipped classroom approach, such that students were able to learn and experiment with concepts outside of class in several different ways, with class time spent on active learning or interactive discussion of challenging concepts.

Diverse assignments provided multiple means of expression, augmenting traditional written expression with verbal expression through student-led teaching sessions and oral examinations. One assignment fully employing UDL principles allowed students to choose a current topic with multiple options for

expression.

The current paper discusses key examples of innovation in each of these components of the UDL framework, showing how the framework can be effectively applied in Geomatics teaching. Some successes, failures, and lessons learned are included as well as effects on student performance and feedback.

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