

Abstract Submitted
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Computational simulations of frictional losses in pipe networks confirmed in experimental apparatuses designed by honors students
NICHOLAS A. POHLMAN, ERIC HYNES, APRIL KUTZ, Northern Illinois University — Lectures in introductory fluid mechanics at NIU are a combination of students with standard enrollment and students seeking honors credit for an enriching experience. Most honors students dread the additional homework problems or an extra paper assigned by the instructor. During the past three years, honors students of my class have instead collaborated to design wet-lab experiments for their peers to predict variable volume flow rates of open reservoirs driven by gravity. Rather than learn extra, the honors students learn the Bernoulli head-loss equation earlier to design appropriate systems for an experimental wet lab. Prior designs incorporated minor loss features such as sudden contraction or multiple unions and valves. The honors students from Spring 2015 expanded the repertoire of available options by developing large scale set-ups with multiple pipe networks that could be combined together to test the flexibility of the student team's computational programs. The engagement of bridging the theory with practice was appreciated by all of the students such that multiple teams were able to predict performance within 4% accuracy. The challenges, schedules, and cost estimates of incorporating the experimental lab into an introductory fluid mechanics course will be reported.

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