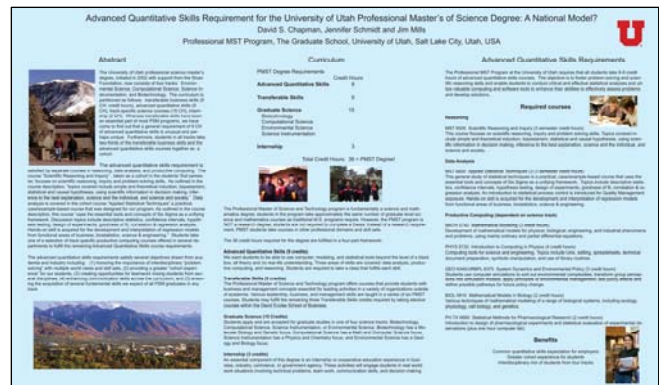


Advanced Quantitative Skills Requirement for the University of Utah Professional Master¹s of Science Degree: A National Model?

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The University of Utah professional science master's degree, initiated in 2002 with support from the Alfred P. Sloan Foundation, now consists of four tracks: Environmental Science, Computational Science, Science Instrumentation, and Biotechnology. The curriculum is partitioned as follows: transferable business skills (9 CH- credit hours), advanced quantitative skills (9 CH), track-specific science courses (15 CH), internship (3 CH). Whereas transferable skills have been an essential part of most PSM programs, we have come to find out that a general requirement of 9 CH of advanced quantitative skills is unusual and perhaps unique. Furthermore, students in all tracks take two-thirds of the transferable business skills and the advanced quantitative skills courses together as a cohort.

The advanced quantitative skills requirement is satisfied by separate courses in reasoning, data analysis, and productive computing. The course "Scientific Reasoning and Inquiry," taken as a cohort in the students' first semester, focuses on scientific reasoning, inquiry and problem-solving skills. As outlined in the course description,



“topics covered include simple and theoretical induction, bayesianism, statistical and causal hypotheses, using scientific information in decision making, inference to the best explanation, science and the individual, and science and society.” Data analysis is covered in the cohort course, “Applied Statistical Techniques,” a practical, case/example-based course that was designed for our program. As outlined in the course description, this course “uses the essential tools and concepts of Six Sigma as a unifying framework. Discussion topics include descriptive statistics, confidence intervals, hypothesis testing, design of experiments, goodness of fit, correlation & regression analysis. Hands-on skill is acquired for the development

and interpretation of regression models from functional areas of business, biostatistics, science & engineering.” Students take one of a selection of track-specific productive computing courses offered in several departments to fulfill the remaining Advanced Quantitative Skills course requirements.

The advanced quantitative skills requirements satisfy several objectives drawn from academia and industry including: (1) honoring the importance of interdisciplinary “problem solving” with multiple world views and skill sets, (2) providing a greater “cohort experience” for our students, (3) creating opportunities for teamwork mixing students from several disciplines, (4) enhancing communication skills across the curriculum, and (5) ensuring the acquisition of several fundamental skills we expect of all PSM graduates in any track.

This poster is intended to highlight the University of Utah experience and pose the following question for discussion: Should such Advanced Quantitative Skills requirements be a fundamental part of PSM programs nationwide?