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Undergraduates Learning Programming for Simulation and Investigation of Mathematics Concepts and Real-World Modelling

The European Mathematical Society (2011) recently stated in a position paper on the European Commission's contributions to European Research: "Together with theory and experimentation, a third pillar of scientific inquiry of complex systems has emerged in the form of a combination of modeling, simulation, optimization and visualization." (p.2).

The Department of Mathematics and Statistics at Brock University adapted its undergraduate program in 2001 in a way that addresses the need mentioned by the EMS. In a sequence of three core mathematics courses, all mathematics majors and future mathematics teachers learn to use computer programming for simulation and investigation of mathematics concepts, conjectures, and real-world modeling. In this presentation, I will discuss the integrated teaching model used at Brock (students learn computer programming within the mathematics courses), including a short report of students' views on the nature of these courses as well as their views on competencies developed (survey study, N=56).

European Mathematical Society (2011), Position Paper of the European Mathematical Society on the European Commission's Contributions to European Research [online]. Available: http://www.euro-math-soc.eu/files/EMSPosPaper13_03_2011_NP.pdf