

Abstract Submitted  
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**Computational Fluid Dynamics - Applications in Manufacturing Processes** MARIA LAURA BENINATI, AUSTIN KATHOL, CONSTANCE ZIEMIAN, Bucknell University — A new Computational Fluid Dynamics (CFD) exercise has been developed for the undergraduate introductory fluid mechanics course at Bucknell University. The goal is to develop a computational exercise that students complete which links the manufacturing processes course and the concurrent fluid mechanics course in a way that reinforces the concepts in both. In general, CFD is used as a tool to increase student understanding of the fundamentals in a virtual world. A “learning factory,” which is currently in development at Bucknell seeks to use the laboratory as a means to link courses that previously seemed to have little correlation at first glance. A large part of the manufacturing processes course is a project using an injection molding machine. The flow of pressurized molten polyurethane into the mold cavity can also be an example of fluid motion (a jet of liquid hitting a plate) that is applied in manufacturing. The students will run a CFD process that captures this flow using their virtual mold created with a graphics package, such as SolidWorks. The laboratory structure is currently being implemented and analyzed as a part of the “learning factory”. Lastly, a survey taken before and after the CFD exercise demonstrate a better understanding of both the CFD and manufacturing process.

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