# ME/ISyE 4803  Model Based Systems Engineering (MBSE)
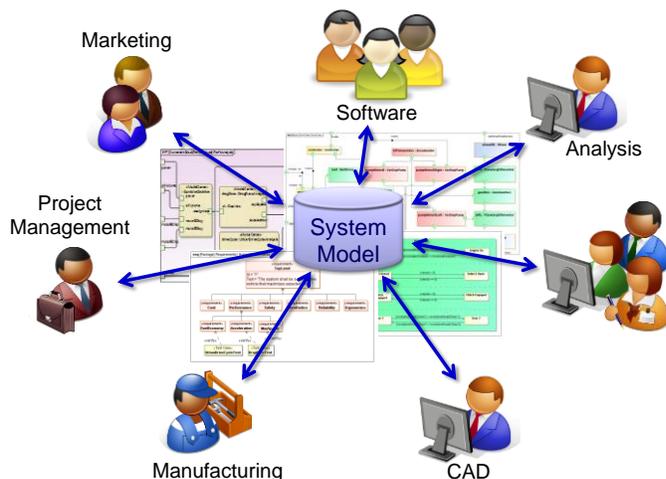## Fall 2012, T-Th 12-1:30

### www.srl.gatech.edu/education/ME4803

**WHY?**  As an ME graduate, you can expect (hope) to be involved in the design, development, and deployment of systems, whether in manufacturing, automotive, thermal or any other domain.  Today, more than ever, "systems engineers" are both needed, and in short supply.  Students with skills in MBSE are in high demand in industry and are almost guaranteed to get a summer internship and/or a job once they graduate.

**THE COURSE.**  In ME/ISyE 4803 students learn both a powerful new systems modeling language (SysML) and an approach and methods for using this language in the design of complex systems in the ME and IE domains. About half the course focuses on learning SysML itself, using a state-of-the-art modeling tool and drawing on numerous examples.  Learning SysML is supported with a library of audio-visual streams explaining in detail how to use the modeling tool.  The remainder of the course focuses on using SysML in the MBSE processes, with special emphasis on supporting design.

"MBSE is the formalized application of modeling to support system requirements, design, analysis, verification and validation activities beginning in the conceptual design phase and continuing throughout development and later life cycle phases. MBSE is part of a long-term trend toward model-centric approaches adopted by other engineering disciplines, including mechanical, electrical and software. In particular, MBSE is expected to replace the document-centric approach that has been practiced by systems engineers in the past and to influence the future practice of systems engineering by being fully integrated into the definition of systems engineering processes."

Students will learn how to link formal systems designs to a variety of analysis tools, from spreadsheets and Mathematica to discrete event simulations, and how to specify an engineering analysis and make it executable using Model Center.  Grading will consider individual exams, and team-based homeworks and an end-of-term project.



Marketing, Software, Analysis, Project Management, System Model, Manufacturing, CAD

### Examples of applications covered in the class
From ME:  designing and analyzing an automotive drivetrain, a transportation system, or a manufacturing system.

### Comments from Fall 2010 CIOS:
"I enjoyed it, it was a different yet exciting learning curve, and the professor s did a very good job!"
"I think it was an excellent class. … Overall, it was a fantastic class and I enjoyed it."

### Internship Opportunities:
If you do well in this course, you are likely to land an internship with companies such as JPL, Lockheed Martin, Ford, John Deere, etc. These companies are practicing MBSE daily.  The instructor will introduce you to the appropriate recruiters.

According to a **_Best Jobs in America_** survey "systems engineer" is the number 1 best job.  They said: "Demand is soaring for systems engineers, as what was once a niche job in the aerospace and defense industries becomes commonplace among a diverse and expanding universe of employers, from medical device makers to corporations like Xerox and BMW. … Pay can easily hit six figures for top performers, and there's ample opportunity for advancement. But many systems engineers say they most enjoy the creative aspects of the job and seeing projects come to life."

### For more information:
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