SYST 618: Model-Based Systems Engineering

Spring 2016
Innovation Hall 133
Monday 7:20 pm-10:00 pm

Instructor: Chien-Chung (Edward) Huang
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Office hours: Tuesday 10 am – 11 am, and by appointment; via e-mail at other times

Textbook: *A Practical Guide to SysML: The Systems Modeling Language, The MK/OMG Press, (Elsevier) 2012 (2nd Edition).*

Course objectives: Model-based Systems Engineering (MBSE) provides a formalized application of modeling to support the engineering of systems. The purpose of the course to study and practice the leading methodologies for MBSE and illustrate the MBSE approaches in systems engineering and management. The advanced objected-oriented systems engineering methodology and model transformation techniques are addressed. Software tools are introduced and used for supporting systems engineering design. Students are expected to develop a system design of their choice using MBSE approaches presented in class and they will make presentations on these designs.

Tentative Course Schedule

Date	Topic	Homework/Project	Chapters
Jan 25	Introduction to Model-based Systems Engineering		2
Feb 1	System Modeling Language (SysML)		3, 4, 6
Feb 8	Structure– Physical Decomposition		7
Feb 15	Structure– Interface Design	Homework 1 Due Date	7
Feb 22	Structure– Engineering Analysis Integration		8
Feb 29	Behavior– Activity modeling in MBSE	Homework 2 Due Date	9
Mar 7	Spring Break; No Class;		
Mar 14	*Midterm*	Project Proposal	
Mar 21	Behavior– Interaction and State Machine		10, 11
Mar 28	Object-oriented Systems Engineering Modeling Process		17
Apr 4	Integration Techniques– Model Integration	Homework 3 Due Date	
Apr 11	Integration Techniques– Stereotypes and Profiling		
Apr 18	Integration Techniques– Model-driven Architecture	Homework 4 Due Date	
Apr 25	Integration Techniques– Model Transformation		
May 2	Closure and Team Design Presentations	Project Presentation	

Grading:
30% Homework
30% Midterm exam
30% Project
10% In-Class Assignments and Participation

Homework
All homework assignments are due at the beginning of class. Homework assignments will be accepted only in electronic format. You can submit homework directly to me via email at chuang10@gmu.edu.

Exams:
Final exam will be cumulative in that it may include all the topics covered in class. You can bring any document for all exams. The electronic device including the laptop is not allowed. Late to the exam is acceptable but won't have extra time because of it.

Coursework & Grading Policies
Unless otherwise indicated, you are expected to work individually on homework assignments, projects, and exams. Late submissions are not accepted. You can submit homework directly to me via email at chuang10@gmu.edu or upload to Blackboard.

Discussion Board:
We recommend using the discussion board on Blackboard to ask course material-related questions. I will answer all questions during our office hour and other available time.

E-mail Communication:
Feel free to email us. Please note that it may take a day to respond to an e-mail message.

GMU Email Accounts
Students must use their Mason email accounts to receive important University information, including messages related to this class. See http://masonlive.gmu.edu for more information.

Technology Policies
Cell phones, pagers, and other communicative devices are not allowed in this class. Please keep them stowed away and out of sight. Laptops or tablets (e.g., iPads) are permitted only if it is related to the course. Engaging in activities not related to the course (e.g., gaming, email, chat, etc.) will result in a significant deduction in your participation grade.

Academic Integrity
GMU is an Honor Code university; please see the Office for Academic Integrity for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation

that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

Disability Services
If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS. http://ods.gmu.edu

Mason Diversity Statement
George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth. An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals. Diversity is broadly defined to include such characteristics as, but not limited to, race, ethnicity, gender, religion, age, disability, and sexual orientation. Diversity also entails different viewpoints, philosophies, and perspectives. Attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard and respected. The reflection of Mason's commitment to diversity and inclusion goes beyond policies and procedures to focus on behavior at the individual, group and organizational level. The implementation of this commitment to diversity and inclusion is found in all settings, including individual work units and groups, student organizations and groups, and classroom settings; it is also found with the delivery of services and activities, including, but not limited to, curriculum, teaching, events, advising, research, service, and community outreach. Acknowledging that the attainment of diversity and inclusion are dynamic and continuous processes, and that the larger societal setting has an evolving socio-cultural understanding of diversity and inclusion, Mason seeks to continuously improve its environment. To this end, the University promotes continuous monitoring and self-assessment regarding diversity. The aim is to incorporate diversity and inclusion within the philosophies and actions of the individual, group and organization, and to make improvements as needed.

Student Support Resources on Campus
Resources that you may find helpful may be found at:
http://ctfe.gmu.edu/teaching/student-support-resources-on-campus/