Course Information

Course Title: Mastering The Systems Modeling Language (SysML) V1; for Model Based Systems Engineering (MBSE) and the OMG Certified Systems Modeling Professional (OCSMP) Certificates

Course Location: Zoom

Course Time: Spring 2026, Tuesdays 6:30 PM – 9:30 PM

Instructor

Name: Jiovany Soliman

Contact: jbadie@uw.edu or Jiovany.z.soliman@boeing.com

Office: N/A

Office Hours: By appointment via Zoom.

Course Content

Course Overview: This course combines the foundational strength of the Systems Modeling Language (SysML) modeling with the practical, methodology-driven approach of Object-Oriented Systems Engineering Method (OOSEM) and proven industry tools like Magic Systems of Systems Architect to equip learners with the complete toolkit for becoming effective model-based systems engineering (MBSE) practitioners, enabling them to architect unparalleled complex systems of systems spanning multiple disciplines. Additionally, this course prepares participants for OMG OCSMP certification exams, focusing on Model User (Level 1) and Model Builder: Fundamental (Level 2).

Learning Objectives: By the end of this course, students will be able to:

- Construct SysML models that represent system requirements, structure, behavior, and parametrics with correct syntax and semantics.
- Differentiate and select appropriate SysML diagram types to address specific system engineering concerns.
- Apply the Object-Oriented Systems Engineering Method (OOSEM) to develop and refine system architectures from stakeholder needs.
- Use Magic Systems of Systems Architect to create, simulate, and validate system models.

- Trace stakeholder needs through formal requirements and system elements to verify design completeness and consistency.
- Execute model-based analyses and trade studies using parametric modeling and constraint evaluation techniques.
- Integrate and communicate multi-domain models to represent systems of systems and support cross-disciplinary decision-making.
- Demonstrate proficiency in MBSE practices aligned with INCOSE and OMG standards, including readiness for OCSMP certification exams.

Course Materials: 1. Textbook **(optional)**: A Practical Guide to SysML: The Systems Modeling Language (3rd Edition) by Sanford Friedenthal, Alan Moore, and Rick Steiner, 2015.

2. Software **(required)**: Magic Systems of Systems Architect 2024x R2. Software license will be provided.

Grading

Assignment weight and frequency

Project Check-ins	25%	Due Bi-weekly	4 Total
Quizzes	35%	Due Weekly	8 Total
Final Project	40%	Due End of Quarter	1 Total

Tentative Course Schedule

Week 1: Overview of Systems Engineering, MBSE, and OOSEM

Week 2: Organizing Model Elements Using Package Diagrams

Week 3: Analyzing Stakeholder Needs Using Use Case Diagrams

Week 4: Specifying System Requirements Using Requirements Diagrams

Week 5: Capturing Operational Scenarios Using Activity Diagrams

Week 6: Decomposing Logical Architectures Using Block Definition Diagrams

Week 7: Defining Logical Connectivity Using Internal Block Diagrams

Week 8: Simulating Event-Based Behavior Using State Machine Diagrams

Week 9: Modeling Message-Based Behavior Using Sequence Diagrams

Week 10: Evaluating Constraints Using Parametric Diagrams

Course Policies

Religious Accommodations:

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities.

The UW's policy, including more information about how to request an accommodation, is available at Religious Accommodations Policy religious-accommodations-policy. Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form accommodations-request.

Accommodation & Access:

If you have already established accommodations with Disability Resources for Students (DRS), please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course. If you have not yet established services through DRS but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu or disability.uw.edu. DRS offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between the student, instructor, and DRS. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.

Academic Integrity:

Engineering is a profession demanding a high level of personal honesty, integrity and responsibility. Therefore, it is essential that engineering students, in fulfillment of their academic requirements and in preparation to enter the engineering profession, adhere to the College of Engineering Statement of Principles. Any student in this course suspected of academic misconduct (e.g., cheating, plagiarism, or falsification) will be reported to the College of Engineering Dean's Office and the University's Office of Community Standards and Student Conduct to initiate the student conduct process. For any assignment, quiz, or exam that is suspected of academic misconduct, you will be given an "X" grade until after I have received notification by the Dean's office that the conduct process is complete. If a student is found responsible for academic misconduct, the student will receive a grade of zero on the assignment, quiz, or exam. If a student is found not responsible, the student will receive a grade based on the standard grading criteria for that assignment, quiz, or exam.

Title IX:

The UW, through numerous policies, prohibits sex- and gender-based violence, harassment, and discrimination and expects students, faculty, and staff to act professionally and respectfully in all work, learning, and research environments.

For support, resources, and reporting options related to sex- and gender-based violence, harassment, or discrimination, refer to the UW Title IX's website, specifically the *Know Your Rights & Resources* guide. Should you wish to make the Office of the Office of the Title IX Coordinator aware of a Title IX concern, visit the Make a Title IX Report webpage.

Please know that if you choose to disclose information to me about sex- or gender-based violence, harassment, or discrimination, I will connect you (or the person who experienced the conduct) with resources and individuals who can best provide support and options. You can also access additional resources directly:

- You can request anonymous support, from SafeCampus
- You can request confidential support, from a confidential advocate.
- If you know you want to submit a formal complaint, contact the Civil Rights Investigation Office.

Please note that some senior leaders and other specified employees have been identified as *Officials Required to Report*. If an Official Required to Report learns of possible sex- or gender-based violence, harassment, or discrimination they are required to contact the Office of the Title IX Coordinator and report all the details they have in order to ensure that the person who experienced harm is offered support and reporting options.

Relevant Websites

- Title IX: uw.edu/titleix/
- Survivor resources: uw.edu/titleix/survivor-resources/
- Confidential advocates: uw.edu/sexualassault/support/advocacy/
- SafeCampus: uw.edu/safecampus/
- Officials Required to Report: uw.edu/titleix/employee-reporting-expectations/
- Policies: uw.edu/titleix/policies/

Privacy:

It is possible that some aspects of the course will take place over zoom (e.g. office hours). While students are encouraged to turn on their cameras if they are able, there is no requirement or penalty for keeping your camera off. For any session that is recorded on Zoom, the recording will capture the presenter's audio, video and computer screen. The recordings will only be accessible to students enrolled in the course to review materials. These recordings will not be shared with or accessible to the public. The University and Zoom have FERPA-compliant agreements in place to protect the security and privacy of UW Zoom accounts. Students who do not wish to be recorded should:

- Choose a Zoom username that does not include any personal identifying information like their name or UW Net ID; and
- Not share their computer audio or video during their Zoom sessions.