ENGI 9874: Course Project

Software Design and Verification
Raja Abbas

The course project for ENGI 9874 should be completed individually.

1 Project Report [12%]

1.1 Report Length and Requirements

- The project report should be a minimum of **12 pages** (12-point font, double-spaced max).
- Include **citations** using **IEEE format** for any references to books, journal articles, or websites.
- The report should focus on a topic within or closely related to software design and specification principles, tools, or practices. It may extend existing course material or introduce a new perspective not fully covered.
- The topic must be approved by the instructor by May 25th.

1.2 Implementation Requirement

- A **small-scale implementation** should accompany the report. This might include:
    o Designing and modeling a system using **UML**, **SysML**, or **formal specification languages** like **Z**, **VDM**, or **Alloy**.
    o Demonstrating the use of a design pattern or architecture style (e.g., MVC, Layered Architecture).
    o Generating code from design artifacts using a tool like **Enterprise Architect**, **Papyrus**, or similar.
- Submit:
    o The code/model files.
    o A **README** with clear setup/running instructions.
    o Sample output with brief analysis.

2   Presentation [8%]

2.1   Presentation Detail

- Duration: 6–8 minutes, followed by 2 minutes for Q&A.
- Presentation dates: July 21 onwards.
- Use slides (PowerPoint or PDF); submit via email before your presentation.

2.2   Slide Requirements

- Slides must follow academic standards, including:
    o   Proper citations (IEEE style).
    o   A bibliography slide.
- Provide a literature review summary (1–3 paragraphs per source) with the slides.

2.3   Suggested topics

You don't need to pick one of the topics below. They are suggestions. You are welcome to pick any approved topic that is broadly within the themes of the course: Software design and specification.

- UML-based software modeling and design.
- Domain-Specific Modeling (DSM).
- Model-Driven Architecture (MDA).
- Specification using formal languages (Z, Alloy, VDM, B-Method).
- Design by Contract (DbC).
- Architectural description languages (ADLs).
- Use of design patterns in enterprise systems.
- Agile modeling practices and tools.
- Software architecture recovery and reconstruction.
- Comparative analysis of design tools (e.g., Rational Rose vs Enterprise Architect).
- Case study: Applying Clean Architecture to a real-world project.
- Specifying requirements using SysML.