University of North Carolina at Charlotte
College of Computing and Informatics
Department of Software and Information Systems

# ITIS 6010/8010: Software Engineering for AI-Enabled Systems

## (Spring 2025)
## Course Schedule

The following table provides an outline for the topics and activities that will be delivered during each module for this course. Any changes on the given dates will be updated accordingly and announced on Canvas.

| Calendar | Topic | Activities and Submissions |
|---|---|---|
| Week-1 (1/13) | **Syllabus & Overview of SE for AI**<br>• Syllabus Overview and Introduction<br>• Lecture 1: Software Engineering for AI | • **Team Formations**<br>• **GitHub Setup** |
| Week 2 (1/20) | Dr. Martin Luther King Jr. Day – University Closed | |
| Week 3 (1/27) | **Requirements and Model Quality**<br>• Lecture 2: Requirements Gathering for AI<br>• Lecture 3: Quality Requirements for AI<br>• Lecture 4: Model Quality | • **Optional Reading**: **How to Read a Paper**<br>• **Team Project Discussions** |
| Week 4 (2/3) | **From Models to AI**<br>• Lecture 5: Transition from Models to AI-Enabled Systems<br>• **PROJECT PROPOSAL PRESENTATION (in-class)** | • **Project Proposal Submission (Due 2/2)** |
| Week 5 (2/10) | **AI Model Development**<br>• Lecture 6: Model Development with ML Focus<br>• Lecture 7: Model Development with DL Focus | • **Presentation Assignment-1 (in-class)**<br>• **Reading Assignment-1 (Due: 2/9)**<br>▸ **Analyzing and Detecting Emerging Quality-Related Concerns across OSS Defect Report Summaries** |
| Week 6 (2/17) | **AI Model Development-AI Learning Types**<br>• Lecture 8: Model Development with DL-Supervised Learning<br>• Lecture 9: Model Development with DL-Unsupervised Learning<br>• Lecture 10: Model Development with DL-Reinforcement Learning | • **Presentation Assignment-II (in-class)**<br>• **Reading Assignment-2 (Due: 2/16)**<br>• **How Much Logs Does My Source Code File Need? Learning to Predict the Density of Logs** |
| Week 7 (2/24) | **Metrics and Measures for AI**<br>• Lecture 11: Metrics and Measures for AI-Enabled Systems | • **Presentation Assignment-3 (in-class)**<br>• **Reading Assignment-3 (Due: 2/23)**<br>▸ **Leveraging Statistical Machine Translation for Code Search** |

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| Week 8 (3/3) | Student Spring Recess – No Classes | |
| Week 9 (3/10) | **MID-PROJECT PRESENTATION (in-class)** | • **Project Mid-Report Submission (Due: 3/9)** |
| Week 10 (3/17) | **Model Tradeoffs and Risks**<br>• Lecture 12: Tradeoffs among Modeling Techniques<br>• Lecture 13: Model Risks and Planning for Mistakes | • **Presentation Assignment-4 (in-class)**<br>• **Reading Assignment-4 (Due: 3/17)**<br>▸ **TraceJIT: Evaluating the Impact of Behavioral Code Change on Just-In-Time Defect Prediction** |
| Week 11 (3/24) | **Software Architecture of AI**<br>• Lecture 14: Software Architecture of AI-Enabled Systems | • **Presentation Assignment-5 (in-class)**<br>• **Reading Assignment-5 (Due: 3/23)**<br>▸ **Retrieve and Refine: Exemplar-based Neural Comment Generation** |
| Week 12 (3/31) | **Data Quality, Processing and Management**<br>• Lecture 15: Data Quality and Development<br>• Lecture 16: Large Dataset Management | • **Presentation Assignment-6 (in-class)**<br>• **Reading Assignment-6 (Due: 3/30)**<br>▸ **Do Pretrained Language Models Indeed Understand Software Engineering Tasks?** |
| Week 13 (4/7) | **AI Infrastructure**<br>• Lecture 17: Infrastructure Quality, Deployment, and Operations | |
| Week 14 (4/14) | **Explainability and Interpretability of AI**<br>• Lecture 18: Explainability and Interpretability of AI-Enabled Systems | |
| Week 15 (4/21) | **Data Versioning/Version Control**<br>• Lecture 19: Version Control, Data Provenance, and Reproducibility | |
| Week 16 (4/28) | **Debugging in AI**<br>• Lecture 20: Debugging in AI | |
| Week 17 (5/5) | **FINAL PROJECT PRESENTATION (in-class)**<br>**Due: (5/5) from 2:00 - 4:30 pm** | ▸ **FINAL PROJECT Report Submission**<br>**Due: (5/5) @ 11:59PM via Canvas** |

**Dates to Note:**

- 1/20 – University Closed
- 4/30 – Last Day of Classes
- 5/1 – Reading Day (i.e., this is your day to study and prepare for your exams)