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

ITIS/ITCS/DSBA 6010/8010

Software Engineering for AI-Enabled Systems

(Fall 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 (8/20)	**Syllabus & Overview of SE for AI** • Syllabus Overview and Introduction • Lecture 1: Software Engineering for AI	• **Group Project Member List (in-class): Due (8/20)** • **Paper Reading Selections List** • **Optional Reading**: **How to Read a Paper**
Week 2 (8/27)	**Software Requirements and Model Quality** • Lecture 2: Requirements Gathering for AI • Lecture 3: Quality Requirements for AI	• **Project (Deliverable-1)-GitHub Setup (Due 8/26)** • **Team Project Discussions**
Week 3 (9/3)	**AI Model Development with ML Focus** • Lecture 4: Feature Engineering with ML Focus	• **Project (Deliverable-2) Project Proposal (Due: 9/2)** • **Group Project Proposal Presentations (in-class)**
Week 4 (9/3)	**AI Model Development with DL Focus** • Lecture 5: Feature Engineering with DL Focus	• **Reading Assignment-1 (Paper 1) (Due: 9/2)** • **Group Presentation Assignment-1 (Paper 1) (in-class)**
Week 5 (9/10)	**AI Model Development-AI Learning Types** • Lecture 6: Model Development with DL-Supervised Learning • Lecture 7: Model Development with DL-Unsupervised Learning	• **Reading Assignment-2 (Paper 2) (Due: 9/9)** • **Group Presentation Assignment-2 (Paper 2) (in-class)** • **Project (Deliverable-3)-Data Coll. & Clean. (Due: 9/9)**

Week 6 (9/17)	**AI Model Development-AI Learning Types** • Lecture 8: Model Development with DL-Reinforcement Learning	• **Reading Assignment-3 (Paper 3) (Due: 9/16)** • **Group Presentation Assignment-3 (Paper 3) (in-class)**
Week 7 (9/24)	**From Models to AI-Enabled Systems** • Lecture 9: Transition from Models to AI-Enabled Systems	• **Reading Assignment-4 (Due: 9/23)** • **Group Presentation Assignment-4 (Paper 4) (in-class)**
Week 8 (10/1)	**Quality Metrics and Measures for AI** • Lecture 10: Model Quality vs. System Quality • Lecture 11: Quality Metrics and Measures for AI-Enabled Systems	• **Project (Deliverable-4)-Data Labeling (Due: 9/30)**
Week 9 (10/8)	**Model Tradeoffs and Risks in AI** • Lecture 12: Tradeoffs among Modeling Techniques • Lecture 13: Model Risks and Planning for Mistakes	• **Reading Assignment-5 (Due: 10/7)** • **Group Presentation Assignment-5 (Paper 5) (in-class)**
Week 10 (10/15)	**Software Architecture of AI** • Lecture 14: Software Architecture of AI-Enabled Systems	• **Reading Assignment-6 (Due: 10/14)** • **Group Presentation Assignment-6 (Paper 6) (in-class)**
Week 11 (10/22)	**Data Quality, Processing and Management for AI** • Lecture 15: Data Quality and Development	
Week 12 (10/29)	**Data Version Control and Data Provenance for AI** Lecture 16: Version Control, Data Provenance, and Reproducibility	• **Reading Assignment-7 (Due: 10/28)** • **Group Presentation Assignment-7 (Paper 7) (in-class)**
Week 13 (11/5)	**Explainability and Interpretability of AI** • Lecture 17: Explainability & Interpretability of AI-Enabled Systems • Lecture 18: Counterfactual Explanations	
Week 14 (11/12)	**Software Testing for ML Model Quality** • Lecture 19: Invariant Testing and Model Evaluation	
Week 15 (11/19)	**Software Testing for ML Model Development** Lecture 20: ML Pipeline Testing, Deployment, and Monitoring	• **Project (Deliverable-5)-Feature Engineering, Model Training and Model Evaluation (Due: 11/18)**

Week 16 (11/26)	**Thanksgiving Break-No Classes**	**Optional Reading**: • **How to Write Your First Research Paper** • **Writing Good Software Engineering Research Papers**
Week 17 (12/10)	**FINAL PROJECT PRESENTATION (in-class)** **Due: (12/10) from 2:00-4:30 pm**	▸ **Project (Deliverable-6)-Final Report** **Due: (12/10) @ 11:59PM via Canvas**

Dates to Note:

- 11/26 to 11/29 – Thanksgiving Break
- 12/2 – Last Day of Classes
- 12/3 – Reading Day (i.e., this is your day to study and prepare for your exams)