

ITIS 6880: Independent Study
(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 <ul style="list-style-type: none">Syllabus Overview and IntroductionLecture 1: Software Engineering for AI	<ul style="list-style-type: none">• Team Formations/GitHub Setup• Project (Deliverable-1) (Due: 1/19)
Week 2 (1/20)	Dr. Martin Luther King Jr. Day – University Closed	
Week 3 (1/27)	Requirements and Model Quality <ul style="list-style-type: none">Lecture 2: Requirements Gathering for AILecture 3: Quality Requirements for AI	<ul style="list-style-type: none">• Optional Reading: How to Read a Paper• Team Project Discussions
Week 4 (2/3)	AI Model Development <ul style="list-style-type: none">Lecture 4: Feature Engineering with ML FocusLecture 5: Model Development with ML and DL Focus	<ul style="list-style-type: none">• Project (Deliverable-2) Project Proposal (Due: 2/2)• Project Proposal Presentation (in-class)
Week 5 (2/10)	AI Model Development-AI Learning Types <ul style="list-style-type: none">Lecture 6: Model Development with DL-Supervised LearningLecture 7: Model Development with DL-Unsupervised Learning	<ul style="list-style-type: none">• Reading Assignment-1 (Due: 2/9)► Analyzing and Detecting Emerging Quality-Related Concerns across OSS Defect Report Summaries

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Week 6 (2/17)	AI Model Development-AI Learning Types <ul style="list-style-type: none"> Lecture 8: Model Development with DL-Reinforcement Learning 	<ul style="list-style-type: none"> Reading Assignment-2 (Due: 2/16) ► Software Engineering for Machine Learning: A Case Study ► Project (Deliverable-3)-Data Coll. & Cleaning (Due: 2/16)
Week 7 (2/24)	From Models to AI-Enabled Systems <ul style="list-style-type: none"> Lecture 9: Transition from Models to AI-Enabled Systems 	<ul style="list-style-type: none"> Presentation Assignment-3 (in-class) Reading Assignment-3 (Due: 2/23) ► How Much Logs Does My Source Code File Need? Learning to Predict the Density of Logs
Week 8 (3/3)	Student Spring Recess – No Classes	
Week 9 (3/10)	Metrics and Measures for AI <ul style="list-style-type: none"> Lecture 10: Model Quality vs. System Quality Lecture 11: Quality Metrics and Measures for AI-Enabled Systems 	<ul style="list-style-type: none"> ► Project (Deliverable-4)-Data Labeling (Due: 3/9)
Week 10 (3/17)	Model Tradeoffs and Risks <ul style="list-style-type: none"> Lecture 12: Tradeoffs among Modeling Techniques Lecture 13: Model Risks and Planning for Mistakes 	<ul style="list-style-type: none"> Reading Assignment-4 (Due: 3/16) ► Where Do Developers Log? An Empirical Study on Logging Practices in Industry
Week 11 (3/24)	Software Architecture of AI <ul style="list-style-type: none"> Lecture 14: Software Architecture of AI-Enabled Systems 	<ul style="list-style-type: none"> Reading Assignment-5 (Due: 3/23) ► A Comparative Study on Large Language Models for Log Parsing
Week 12 (3/31)	Data Quality, Processing and Management <ul style="list-style-type: none"> Lecture 15: Data Quality and Development 	<ul style="list-style-type: none"> Presentation Assignment-6 (in-class) Reading Assignment-6 (Due: 3/30) ► Do Pretrained Language Models Indeed Understand Software Engineering Tasks?
Week 13 (4/7)	Explainability and Interpretability of AI <ul style="list-style-type: none"> Lecture 16: Explainability and Interpretability of AI-Enabled Systems Lecture 17: Counterfactual Explanations 	

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Week 14 (4/14)	Data Versioning/Version Control <ul style="list-style-type: none">Lecture 18: Version Control, Data Provenance, and Reproducibility	► Project (Deliverable-5)-Feature Engineering, Model Training and Model Evaluation (Due: 4/13)
Week 15 (4/21)	Software Testing for ML Model Quality <ul style="list-style-type: none">Lecture 19: Invariant Testing and Model Evaluation	
Week 16 (4/28)	Software Testing for ML Model Development <ul style="list-style-type: none">Lecture 20: ML Pipeline Testing, Deployment, and Monitoring	Optional Reading: How to Write Your First Research Paper
Week 17 (5/5)	FINAL PROJECT PRESENTATION (in-class) Due: (5/5) from 2:00 - 4:30 pm	► Project (Deliverable-6)-Final Report Due: (5/4) @ 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)