Course Outline

EN.705.743: Advanced Applied Machine Learning Fall 2025

This outline provides an overview of the course and assignments by week. Please also check the Calendar in Canvas for specific due dates. Each course module runs for seven (7) days, i.e., one week, starting on the day of the first week (**Wednesdays**). Due dates for assignments are referred to by the day of the module week in which they are due. For example, if an Assignment is due by Day 7, then the Assignment should be completed by **Tuesday** or the 7th day of the module.

Module	Dates	Module Title	Assignments
Module 1	Wed 08/27	**Introduction**	• Assignment 1 due
Module 2	Wed 09/03	**Tokenization**	• Assignment 2 due
Module 3	Wed 09/10	**Embeddings**	• Assignment 3 due
Module 4	Wed 09/17	**Multi Head Attention**	• Assignment 4 due
Module 5	Wed 09/24	**Transformers**	• Assignment 5 due
Module 6	Wed 10/01	**Training LLMs**	• Assignment 6 due
Module 7	Wed 10/08	**Sampling and Inference**	• Assignment 7 due
Module 8	Wed 10/15	**Practical Considerations**	• Assignment 8 due • Topic Proposal due
Module 9	Wed 10/22	**Scaling Laws**	• Assignment 9 due
Module 10	Wed 10/29	**Fine-Tuning and RAGs**	• Assignment 10 due
Module 11	Wed 11/05	**Parameter Efficient Tuning**	• Assignment 11 due
Module 12	Wed 11/12	**Quantization**	• Assignment 12 due
Module 13	Wed 11/19	**Reinforcement Learning with Human Feedback**	• Assignment 13 due • Project Presentation due
11/24–11/30 - Thanksgiving break - Nothing assigned or due			
Module 14	Wed 12/03	**Multimodality**	• Research Paper due