All topics and dates are tentative and subject to change. Any substantive changes (such as due dates) will be announced on Piazza

Week	Date	High-level topic	Specific topics	Quizzes	Project checkpoints	Assignments
1	Mon, Aug 24	1. Introduction to artificial intelligence	a. Overview of AI	Prereq Quiz (ungraded)		
1	Wed, Aug 26		b. Research in AI	Prereq Quiz (ungraded)		
1	Fri, Aug 28		c. Selecting research papers, PCA motivation, intution	Prereq Quiz (ungraded)		
2	Mon, Aug 31	2. Principal components analysis (PCA)	a. Brief review of linear algebra			
2	Wed, Sep 02		b. NumPy and Matplotlib libraries	Quiz 1		
2	Fri, Sep 04		c. PCA formulation and different algorithms		1st paper review	
3	Mon, Sep 07	3. Machine learning basics	a. KNN classification and regression			
3	Wed, Sep 09		b. Scikit learn library	Quiz 2		
3	Fri, Sep 11		c. Evaluation - Cross validation or held-out test set		*Peer reviews due*	Assignment 1
4	Mon, Sep 14		d. Linear and logistic regression / loss functions			
4	Wed, Sep 16	4. Basics of deep learning	a. Fully connected NN and activation functions	Quiz 3		
4	Fri, Sep 18		b. PyTorch / Keras / TensorFlow libraries		Selection of 3 papers	
5	Mon, Sep 21		c. Convolutional networks			
5	Wed, Sep 23		d. Other common layers: residual, batch norm.	Quiz 4		
5	Fri, Sep 25		e. Gradient descent / learning rates / GPU acceleration		*Peer reviews due*	Assignment 2
6	Mon, Sep 28	5. Clustering	a. Clustering loss function			
6	Wed, Sep 30		b. K-means clustering	Quiz 5		
6	Fri, Oct 02		c. Spectral clustering (another use of SVD)		Draft of 3 papers	
7	Mon, Oct 05	6. Review of probability	a. Review of probability and random variables			
7	Wed, Oct 07		a. (continued)	Quiz 6		
7	Fri, Oct 09		a. (continued)		*Peer reviews due*	Assignment 3
8	Mon, Oct 12	6. Density estimation	a. KL divergence and maximum likelihood (MLE)			
8	Wed, Oct 14		b. Gaussian and non-parametric density estimators	Quiz 7		
8	Fri, Oct 16		c. Gaussian Mixture Models and EM		Preliminary implementation results	
9	Mon, Oct 19	7. Non-linear dimensionality reduction	a. Autoencoder, Denoising / Sparse / Probabilistic			
9	Wed, Oct 21		b. Variational Autoencoder (VAE)	Quiz 8		
9	Fri, Oct 23	8. Generative Adversarial Networks (GAN)	a. Original GAN and theory		*Peer reviews due*	
10	Mon, Oct 26		a. (continued)			
10	Wed, Oct 28		b. Deep Convolutional GAN (DCGAN)	Quiz 9		Assignment 4
10	Fri, Oct 30		c. Other GAN-based models			
11	Mon, Nov 02	9. Normalizing Flows	a. Flow concept and invertible models			
11	Wed, Nov 04		b. Image flows - RealNVP / GLOW	Quiz 10		
11	Fri, Nov 06		c. Continuous normalizing flows / iterative flows			
12	Mon, Nov 09	10. Language modeling	a. Graphical models introduction		Term paper due	
12	Wed, Nov 11		b. Latent Dirichlet Allocation (Topic modeling)	Quiz 11		
12	Fri, Nov 13		c. LDA Gibbs sampling		Implementation and video due	
13	Mon, Nov 16		Presentations	Pres Quiz		
13	Wed, Nov 18		Presentations	Quiz 12, Pres Quiz		
13	Fri, Nov 20		Presentations	Pres Quiz		
14	Mon, Nov 23		d. Special topic - Word2vec			
14	Wed, Nov 25		*Thanksgiving*			
14	Fri, Nov 27		*Thanksgiving*			
15	Mon, Nov 30		Presentations	Pres Quiz		
15	Wed, Dec 02		Presentations	Pres Quiz		
15	Fri, Dec 04		Presentations	Pres Quiz	*Final peer reviews due*	
16	Mon, Dec 07		No final exam			
16	Wed, Dec 09		No final exam			
16	Fri, Dec 11		No final exam			