**Important note:** The material given below is for guidance only. An additional major source of information about the course is **your own notes** from attending the lectures. Your participation is essential for understanding the concepts.

Our main textbooks are:

* S. Theodoridis, Machine Learning – A Bayesian and Optimization Perspective, 1st Edition, Academic Press, 2015.
* S. Theodoridis and K. Koutroumbas, Pattern Recognition, 4th Edition, Academic Press, 2008.

**Lecture 1 material:**

* MLintroduction.pdf
* SlidesChapt-1.pdf
* Mathematical Prerequisites-Part 1.pdf
* Machine Learning Lecture 1, Video Urls.pdf

**Lecture 2 material:**

* Mathematical Prerequisites-Part 2.pdf
* SlidesChapt-3-updated.pdf, pages 1-30
* notes\_lecture\_2.pdf

**Lecture 3 material:**

* SlidesChapt-3-updated.pdf, pages 31-35,41-60,81-90
* notes\_lecture\_3.pdf

**Lecture 4 material:**

* Distribution estimation.pdf, pages 1-18
* notes\_lecture\_4.pdf

You can play with the parameters of the Gamma distribution here:

<https://homepage.divms.uiowa.edu/~mbognar/applets/gamma.html>

**Lecture 5 material:**

* SlidesChapt-3updated.pdf, pages 64-67
* SlidesChapt-12,13-updated.pdf, pages 1-28,47-71
* Bayesian Linear Regression-Gaussian.pdf
* Classifiers\_Bayes.pdf, pages 1-10
* notes\_lecture\_5.pdf

**Lecture 6 material:**

* Classifiers\_Bayes.pdf, pages 10-34
* notes\_lecture\_6.pdf

**Lecture 7 material:**

* Classifiers\_Bayes.pdf, pages 36-47
* ANN Introduction.pdf
* notes\_lecture\_7.pdf
* http://www.ltcconline.net/greenl/java/Statistics/clt/cltsimulation.html
* <https://www.youtube.com/watch?v=HOxSKBxUVpg>

**Lecture 8 material:**

* PERCEPTRON.pdf
* Multilayered Perceptrons.pdf, pages 1-8
* notes\_lecture\_8.pdf

**Lecture 9 material:**

* Multilayered Perceptrons.pdf, pages 9-32
* notes\_lecture\_9.pdf
* <http://neuralnetworksanddeeplearning.com/chap4.html> (Michael Nielsen’s ‘visual proof of a universal approximation theorem)

**Lecture 10 material:**

* SlidesChapt-18-updated.pdf, pages 55-103, 122-128
* SVMLINEAR.pdf, pages 1-12
* notes\_lecture\_10.pdf

**Lecture 11 material:**

* SVMLINEAR.pdf, pages 13-27
* SVMNONLINEAR.pdf, pages 1-24
* notes\_lecture\_11.pdf

**Lecture 12 material:**

* SVMLINEAR.pdf, pages 28-35
* SVMNONLINEAR.pdf, pages 25-27
* notes\_lecture\_12.pdf
* Midterm exam December 2024 solutions.pdf