**BAIT 509 - Business Applications of Machine Learning**

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This is a curated list of **optional** video and lecture resources accompanying lectures for BAIT 509 - Business Applications of Machine Learning. Videos aim to be high-level overviews of concepts. There are two texts referenced here as reading material:

1. Python Data Science Handbook (PDSH) by Jake VanderPlas. This is a practical text specifically about data science with Python.
2. An Introduction to Statistical Learning (ISL) by Gareth James, Daniela Witten, Trevor Hastie & Robert Tibshirani. This text offers a more statistically-focused explanation of many of the concept we will cover in BAIT 509.

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| **Lecture** | **Topic** | **Optional additional material** | |
| **Videos/Blogs/Other** | **Reading** |
| 1 | Introduction to machine learning and decision trees | <https://www.youtube.com/watch?v=R9OHn5ZF4Uo>  <https://www.youtube.com/watch?v=7VeUPuFGJHk> | [PDSH](https://jakevdp.github.io/PythonDataScienceHandbook): What is Machine Learning?  [ISL](http://faculty.marshall.usc.edu/gareth-james/ISL/): 2.1 |
| 2 | Fundamentals of machine learning and error | <https://www.youtube.com/watch?v=MyBSkmUeIEs>  <https://www.youtube.com/watch?v=EuBBz3bI-aA> | [PDSH](https://jakevdp.github.io/PythonDataScienceHandbook): Hyperparameters and Model Validation  [ISL](http://faculty.marshall.usc.edu/gareth-james/ISL/): 5.1.1 |
| 3 | Cross-validation, kNN and loess | <https://www.youtube.com/watch?v=fSytzGwwBVw> | [PDSH](https://jakevdp.github.io/PythonDataScienceHandbook): Hyperparameters and Model Validation  [ISL](http://faculty.marshall.usc.edu/gareth-james/ISL/): 3.5, 5.1 |
| 4 | Feature pre-processing | <https://scikit-learn.org/stable/modules/preprocessing.html> | [PDSH](https://jakevdp.github.io/PythonDataScienceHandbook): Feature Engineering  [ISL](http://faculty.marshall.usc.edu/gareth-james/ISL/): 4.6.6 shows a practical example |
| 5 | Naïve Bayes and logistic regression | <https://www.youtube.com/watch?v=yIYKR4sgzI8>  <https://www.youtube.com/watch?v=M59h7CFUwPU> | [PDSH](https://jakevdp.github.io/PythonDataScienceHandbook): Naïve Bayes Classification  [ISL](http://faculty.marshall.usc.edu/gareth-james/ISL/): 2.2.3 |
| 6 | Model and feature selection | <https://scikit-learn.org/stable/modules/feature_selection.html>  <https://scikit-learn.org/stable/model_selection.html> | [PDSH](https://jakevdp.github.io/PythonDataScienceHandbook): Hyperparameters and Model Validation  [ISL](http://faculty.marshall.usc.edu/gareth-james/ISL/): 6.1 |
| 7 | Workflow and forming good machine learning questions from business questions | <https://www.altexsoft.com/blog/business/supervised-learning-use-cases-low-hanging-fruit-in-data-science-for-businesses/> |  |
| 8 | Support Vector Machines | <https://www.youtube.com/watch?v=efR1C6CvhmE> | [PDSH](https://jakevdp.github.io/PythonDataScienceHandbook): Support Vector Machines  [ISL](http://faculty.marshall.usc.edu/gareth-james/ISL/): 9 |
| 9 | Advanced ML techniques | <https://scikit-learn.org/stable/modules/ensemble.html> | [PDSH](https://jakevdp.github.io/PythonDataScienceHandbook): Decision Trees and Random Forests  [ISL](http://faculty.marshall.usc.edu/gareth-james/ISL/): 8.2 |