Carnegie Mellon University

MACHINE LEARNING
DEPARTMENT

Relevant Courses offered for Spring 2015

CORE COURSES:

10-701 Machine Learning
10-702 Statistical Machine Learning
10-708 Probabilistic Graphical Models
10-725 Convex Optimization
15-750 Graduate Algorithms

ML JOURNAL CLUB

10-915, ML PhD students must register if you plan to satisfy either the Speaking Skills or Data Analysis Project (DAP) requirements.

Incoming PhD students should register in Spring.

Research Courses:
10-920 Grad Reading & Research
10-930 Dissertation Research

Students should register for 10-920 R & R until they propose.
After you propose, register for Dissertation Research.

Suggested Research Depth Electives:

For ML PhD students, two advanced electives, chosen in consultation with the student's advisor, form a research depth concentration. Approved Research Depth electives are listed below.
Full list of *Approved Electives*

Research Depth in AI:
10-708 Probabilistic Graphical Models
10-725 Convex Optimization
15-780 Graduate Artificial Intelligence

Research Depth in CNBC Track:
03-762 Systems Neuroscience
36-759 Statistical Models of the Brain
Applicable Courses from the University of Pittsburgh
http://www.cmu.edu/hub/registration/undergraduates/cross/outgoing.html

Research Depth in Algorithms & Theory
10-725 Convex Optimization
15-859 (E) Special Topics in Theory: Advanced Algorithms

Research Depth in NLP or Text Analysis:
10-708 Probabilistic Graphical Models
11-741 Machine Learning for Text Mining
11-745 Adv. Statistical Learning Seminar (6)
11-761 Language and Statistics

Research Depth in Computational Biology:
02-710 Computational Genomics
10-708 Probabilistic Graphical Models

Research Depth in Computer Vision:
10-725 Convex Optimization
16-720 Computer Vision
16-822 Geometry-Based Methods in Vision
16-824 Learning Based Methods in Vision

Suggested Electives from Statistics

(For ML PhD Students, one elective or courses combined for a total of 12 units must be chosen from Statistics)
36-728 Time Series
36-752 Adv. Probability Overview

Other electives from SCS approved but don't have a category:

10-704 Information Processing & Learning
11-755 Machine Learning for Signal Processing
18-755 Networks in the Real World

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Electives

ML PhD students:

One elective or courses combined for a total of 12 units must be chosen from Statistics.
You must also have a research depth of 24 units.

Both Statistics and Tepper offer "mini" half-term courses. Two such "mini" courses are equivalent to one (12 unit) graduate course.

Suggested Electives from Statistics

36-703 Intermediate Probability
36-707 Regression Analysis
36-708 Experimental Design, 6 units, A4 mini
36-709 Linear Models, 6 units, A3 mini
36-720 Discrete Multivariate Analysis, 6 units, A2 mini
36-722 Applied Continuous Multivariate Analysis, 6 units, A4 mini
36-724 Applied Bayesian Methods, 6 units, A3 mini
36-728 Time Series
36-737 Applied Multilevel & Hierarchical Models, 6 units, A2 mini
36-752 Adv. Probability Overview
36-754 Adv. Probability
36-755 Advanced Statistical Theory I
36-759 Statistical Models of the Brain
36-781 Advanced Statistical Methods I mini, 6 units, A1 mini
36-782 Advanced Statistical Methods II mini, 6 units, A2 mini
36-786 Bayesian Theoretical Statistics 1, 6 units, A1 mini
36-787 Bayesian Theoretical Statistics 2, 6 units, A2 mini
36-825 Statistics Journal Club
36-835 Foundations of Statistics Seminar
36-900 Selected Topics of the Contemporary Frontiers of High Dimensional Inference
36-905 Seminar on Latent Variable Models, 6 units

Suggested Depth Requirement Electives from SCS

AI:
10-725 Convex Optimization
10-708 Probablistic Graphical Models
15-780 Graduate Artificial Intelligence
15-857 Analytical Performance Modeling & Design of Computer Systems
15-859 (M) Randomized Algorithms
15-887 Planning, Execution, and Learning

Algorithms & Theory:
10-725 Convex Optimization
15-855 Computational Complexity Theory
15-857 Analytical Performance Modeling & Design of Computer Systems
15-859 Special Topics in Theory - check for appropriate topics
15-859 (B) Machine Learning Theory
15-859 (E) Special Topics in Theory: Advanced Algorithms
16-811 Mathematical Fundamentals for Robotics
21-801 Adv. Topics Discrete Math (Random Graphs)

Computational Biology:
02-750 Automation of Biological Research: Robotics & Machine Learning
02-710 Computational Genomics
10-708 Probablistic Graphical Models

Computer Vision:
10-725 Convex Optimization
16-720 Computer Vision
16-822 Geometry-Based Methods in Vision

16-824 Learning Based Methods in Vision

Databases:
15-823 Advanced Database Topics

NLP or Text Analysis:
10-708 Probablistic Graphical Models
10-710/11-763 Structured Prediction for Language & Other Discrete Data
10-802/11-772 Analysis of Social Media
11-711 Algorithms for NLP
11-741 Machine Learning for Text Mining
11-744 Experimental Information Retrieval
11-745 Advanced Statistical Learning Seminar (6 units)
11-761 Language and Statistics
11-762 Language and Statistics II
11-773 Text-Driven Forecasting

Robotics:
02-750 Automation of Biological Research: Robotics & Machine Learning
15-887 Planning, Execution, and Learning
16-811 Mathematical Fundamentals for Robotics
16-831 Statistical Techniques in Robotics
16-899C Adaptive Control and Reinforcement Learning

Other electives from SCS approved but don't have a Depth Requirement category:
10-704 Information Processing & Learning
11-745 Adv. Statistical Learning Seminar (6 units)
11-755 Machine Learning for Signal Processing
15-830 Computational Methods in Sustainable Energy
18-755 Networks in the Real World

Suggested Depth Requirement Electives for CNBC Track

03-762 Advanced Cellular Neuroscience
03-763 Systems Neuroscience
15-883 Computational Models of Neural Systems
36-759 Statistical Models of the Brain
85-719 Introduction to Parallel Distributed Processing
85-765 Cognitive Neuroscience (12 units)

Applicable Courses from the University of Pittsburgh (Please see http://www.cmu.edu/hub/registration/undergraduates/cross/outgoing.html)
NROSCI 2100 Cellular & Molecular Neurobiology
NROSCI 2102/2103 Systems Neurobiology
MATH 3375 Computational Neuroscience

Suggested Concentration Electives from School of Public Policy & Management:

10-830/90-904 Research Seminar in Machine Learning & Policy, 6 units, A3 mini
10-831/90-921 Special topics in Machine Learning & Policy, 6 units, A4 mini

Suggested Concentration Electives from Tepper (Must follow Tepper special registration rules)

Finance Track:
45-814 Options
46-926 Linear Models/Equity Portfolio Management
46-929 Financial Time Series Analysis
46-944 Stochastc Calc Fin 1

Marketing Track:
15-892 Foundations of Electronic Marketplaces (CS course)
47-800 Intermediate Microeconomic Analysis
47-741 Seminar in Marketing I
47-742 Seminar in Marketing II
47-743 Seminar in Marketing III
47-744 Analytical and Structural Marketing Models
45-821 Marketing with Electronic & Social Media
45-824 Database Marketing

Information Systems Track:
47-800 Intermediate Microeconomic Analysis
45-870 Management of Information Systems
45-871 Information Strategy, Systems and Economics
47-951 Seminar in Information Systems I
47-952 Seminar in Information Systems II
47-953 Seminar in Information Systems III
47-954 Seminar in Information Systems IV

NOTE: Tepper courses are on the mini-system.45-* and 46-* are Master level courses and the 47-

*** are PhD level courses Suggested**

Concentration Electives from Philosophy

80-605 Rational Choice
80-614 Logic in Artificial Intelligence
80-616 Probability and Artificial Intelligence
80-621 Causality in the Social Sciences