

MS ECE (Machine Learning and Data Science)

Course requirements

Foundational Proficiency (both required)

- Pass DSP proficiency test or take EE 483 (as elective)
- Pass software proficiency test or take EE 538 (as elective)

Set 1: Foundations (all are required) (16 units)

- EE 503 Probability for Electrical and Computer Engineers (4)
- EE 510 Linear Algebra for Engineering (4)
- EE 541 A Computational Introduction to Deep Learning (2)
 - Co-req: EE 503 and EE 510
- EE 547 Applied and Cloud Computing for Electrical Engineers (2)
 - Pre-req: EE 538
- EE 559 Machine Learning I: Supervised Methods (4)
 - Co-req: EE 503 and EE 510

Set 2: Learning and Data Analytics (2 courses are required) (6-8 units)

- EE 546 Mathematics of High Dimensional Data (4)
 - Pre-req: EE 503 and EE 510
- EE 556 Stochastic Systems and Reinforcement Learning (4)
 - Pre-req: EE 503
- EE 588 Optimization for the Information and Data Sciences (4)
 - Pre-req: EE 510
- EE 641 Deep Learning Systems (2)
 - Pre-req: EE 541 and EE 559
- EE 660 Machine Learning II: Mathematical Foundations and Methods (4)
 - Pre-req: EE 503 and EE 510 and EE 559

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Set 3: Technical Electives (8-10 units)

Remainder of the unit requirement must come from Set 3 (any courses below) or Set 2 (above)

Theory and Methods

- CSCI 570 Analysis of Algorithms (4)
- CSCI 585 Database Systems (4)
- EE 517 Statistics and Data Analysis for Engineers (4)
- EE 542 Internet and Cloud Computing (3)
- EE 546 Mathematics of High-Dimensional Data (4)
- EE 556 Stochastic Systems and Reinforcement Learning (4)
- EE 561 Foundations of Artificial Intelligence (4)
- EE 562 Random Processes in Engineering (3)
- EE 563 Estimation Theory (3)
- EE 564 Digital Communications and Coding Systems (4)
- EE 565 Information Theory and its Application to (Big) Data Sciences (4)
- EE 575 Computational Differential Geometry for Engineers (3)
- EE 586L Advanced DSP Design Laboratory (4)
- EE 592 Computational Methods for Inverse Problems (3) (4)
- EE 596 Wavelets and Graphs for Signal Processing and Machine Learning (4)
- EE 689 Neural Learning and Computational Intelligence (4)
- ISE 538 Markov Models for Performance Analysis (3)
- MATH 541a Introduction to Mathematical Statistics (3)

Foundational Proficiency

- EE 483 Intro to DSP (4)
- EE 538 Computing Principles for EEs (2)

Applications

- CSCI 544 Applied Natural Language Processing (4)
- CSCI 677 Advanced Computer Vision (4)
- EE 519 Speech Recognition and Processing for Multimedia (3)
- EE 569 Introduction to Digital Image Processing (4)
- EE 619 Advanced Topics in Automatic Speech Recognition (3)
- EE 669 Multimedia Data Compression (3)

Research (4 units max)

- EE 590 Directed Research
- EE 594ab Master's Thesis

Total number of units required for the degree = 32