

# ELECTRICAL ENGINEERING: MACHINE LEARNING AND DATA SCIENCE, BS

## REQUIREMENTS

### REQUIREMENTS

#### MACHINE LEARNING AND DATA SCIENCE REQUIRED COURSES

Code	Title	Credits
E C E 204	Data Science & Engineering <sup>1</sup>	3
E C E 331	Introduction to Random Signal Analysis and Statistics (typically offered fall) <sup>2</sup>	3
Choose one:		3
MATH 320	Linear Algebra and Differential Equations <sup>3</sup>	
MATH 340	Elementary Matrix and Linear Algebra <sup>3</sup>	
MATH 341	Linear Algebra <sup>3</sup>	
E C E/COMP SCI/ M E 532	Matrix Methods in Machine Learning <sup>4</sup>	3
E C E/COMP SCI/ I SY E 524	Introduction to Optimization	3
<b>Total Credits</b>		<b>15</b>

<sup>1</sup> This course can be taken as a Professional Elective.

<sup>2</sup> This course fulfills the Probability requirement.

<sup>3</sup> This course can be taken as a Professional Elective and meets the advanced math auxiliary condition. MATH 375 Topics in Multi-Variable Calculus and Linear Algebra and MATH 376 Topics in Multi-Variable Calculus and Differential Equations taken in sequence will fulfill the requirement for MATH 340 Elementary Matrix and Linear Algebra.

<sup>4</sup> This course can be taken as an Advanced Elective and meets the advanced math auxiliary condition.

#### MACHINE LEARNING AND DATA SCIENCE ELECTIVE

Code	Title	Credits
Choose one as an Advanced or Professional Elective:		3-4
E C E 431	Digital Signal Processing (typically offered fall)	
E C E/ COMP SCI 533	Image Processing (typically offered fall)	
E C E/COMP SCI/ M E 539	Introduction to Artificial Neural Networks	
E C E/ COMP SCI 561	Probability and Information Theory in Machine Learning (typically offered fall)	

E C E/I SY E 570 Ethics of Data for Engineers

COMP SCI/I SY E/  
MATH/STAT 525 Linear Optimization

COMP SCI 540 Introduction to Artificial Intelligence

COMP SCI 564 Database Management Systems:  
Design and Implementation<sup>1</sup>

COMP SCI/  
B M I 567 Medical Image Analysis<sup>1</sup>

COMP SCI/  
B M I 576 Introduction to Bioinformatics

COMP SCI 577 Introduction to Algorithms<sup>1</sup>

I SY E 412 Fundamentals of Industrial Data  
Analytics

I SY E 521 Machine Learning in Action for  
Industrial Engineers

L I S 461 Data and Algorithms: Ethics and  
Policy

MATH/I SY E/  
OTM/STAT 632 Introduction to Stochastic  
Processes<sup>1</sup>

MATH 635 An Introduction to Brownian Motion  
and Stochastic Calculus<sup>1</sup>

M S & E 460 Introduction to Computational  
Materials Science and Engineering<sup>1</sup>

STAT 421 Applied Categorical Data Analysis<sup>1</sup>

STAT/M E 424 Statistical Experimental Design<sup>1</sup>

STAT 456 Applied Multivariate Analysis<sup>1</sup>

STAT 461 Financial Statistics<sup>1</sup>

<sup>1</sup> This course has additional requisites not required for the BS in Electrical Engineering.