

## Checksheet for the Graduate Certificate in Data Analytics at Virginia Tech

The Graduate Certificate in Data Analytics is available to all graduate students in the university. Graduate students can select courses from the list below. Courses taken must span all three departments: Computer Science, Statistics and Electrical and Computer Engineering (cross-listed courses can count either way). Per university requirements, all 12 of the required credits for the certificate can be double counted toward a student's degree program. All courses are 3-hour credit unless otherwise noted in the Graduate Catalog. Students must achieve GPA of at least 3.0 in the four courses. Transfer credits are not permitted.

Student Name: \_\_\_\_\_

Department: \_\_\_\_\_ Degree (MS/Ph.D.): \_\_\_\_\_

Advisor: \_\_\_\_\_

	Credit Hours	Course	Grade
<b>A. Required Courses:</b>	<b>3</b>	_____	_____
<b>(6 credit hours minimum)</b>	<b>3</b>	_____	_____
CS 5805 Machine Learning I <b>or</b> STAT 5525 Data Analytics I			
CS 5806 Machine Learning II <b>or</b> STAT 5526 Data Analytics II <b>or</b>			
ECE 5424G Advanced Machine Learning			
<b>B. Restricted Elective Courses:</b>	<b>3</b>	_____	_____
<b>(6 credit hours minimum)</b>	<b>3</b>	_____	_____
CS 5234 Advanced Parallel Computation			
CS 5604 Information Storage and Retrieval			
CS 5614 Database Management Systems			
CS 5764 Information Visualization			
CS 5804 Introduction to Artificial Intelligence			
CS 5984 Deep Learning			
CS 6604 Advanced Topics in Data and Information			
STAT 5114 Statistical Inference			
STAT 5314 Monte Carlo Methods in Statistics			
STAT 5414 Time Series Analysis I			
STAT 5444 Bayesian Statistics			
STAT 5444G Advanced Applied Bayesian Statistics			
STAT 5504 Multivariate Statistical Methods			
STAT 5544 Spatial Statistics			
ECE 5524 Pattern Recognition			
ECE 5554 Computer Vision			
ECE 5605 Stochastic Signals and Systems			
ECE 5606 Signal Detection and Estimation			
ECE 5734 Convex Optimization			
ECE 6504 Deep Learning for Perception			
ECE 6554 Advanced Computer Vision			

The above student has successfully completed the program requirements.

Signed: \_\_\_\_\_ (Chair, Oversight Committee)

Date: \_\_\_\_\_

**Student: Based on what you have learned, please answer the following required essay question to the best of your ability. Attach your answer essay as a separate PDF document.**

The Graduate Certificate in Data Analytics emphasizes interdisciplinary perspectives by requiring courses be taken from all three host departments. Based on the courses you took, describe how you would take into account these **three interdisciplinary perspectives** (namely computer science, statistical, and engineering perspectives) and how you would apply **specific technical methods** from each course, when undertaking a challenging big data analytics problem. As an example context, consider a scenario in which you are consulting for a major city government to tackle the problem of understanding new trends in citizen use of alternative transportation, such as ride sharing and rental scooters. Make sure your response addresses the specific issues of how you would apply the above three interdisciplinary perspectives (**breadth**) in formulating a solution, and what specific methods you might apply from each course you took (**depth**). To measure the success of the Certificate educational goals, your essay will be evaluated on both the breadth and depth metrics. (You may not use generative AI tools to write your answer essay.)