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: _____ Advisor: _____

Department: _____ Degree (MS/Ph.D.): _____

	Credit Hours	Course	Grade
A. Required Courses:	3	_____	_____
(6 credit hours minimum)	3	_____	_____

CS 5805 Machine Learning I or STAT 5525 Data Analytics I

CS 5806 Machine Learning II or STAT 5526 Data Analytics II or ECE 5424G Advanced Machine Learning

	Credit Hours	Course	Grade
B. Restricted Elective Courses:	3	_____	_____
(6 credit hours minimum)	3	_____	_____

CS 5234 Advanced Parallel Computation
CS 5604 Information Storage and Retrieval
CS 5614 Database Management Systems
CS 5624 Natural Language Processing
CS 5764 Information Visualization
CS 5804 Introduction to Artificial Intelligence
CS 5814 Deep Learning
CS 5864 Learning-based Computer Vision
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 6524 Deep Learning
ECE 6554 Advanced Computer Vision

Courses span all 3 departments? Y / N	Grade average >= 3.0? Y / N

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.)