DATA ANALYTICS ENGINEERING (DAEN)

500 Level Courses

DAEN 500: *Data Analytics Fundamentals.* 3 credits.
Provides a foundation in data analytics from which the student will build. Focuses on a dataset where students will use analytics tools and apply statistical methodologies in order to extract information of value.Offered by Engineering & Computing. May not be repeated for credit.

Registration Restrictions:
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Junior Plus, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may **not** enroll.

Enrollment limited to students in the College of Science, Engineering Computing or Schar School of Policy and Gov colleges.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)

DAEN 527: *Learning From Data.* 3 credits.
This is an introductory course in machine learning and pattern recognition that covers basic theory, algorithms, and applications. Machine learning is the science of getting computers to act without being explicitly programmed. This course balances theory and practice, and covers the mathematical as well as the heuristic aspects. It provides a broad introduction to machine learning and pattern recognition. Topics include: (i) supervised learning (parametric/non-parametric algorithms, support vector machines, kernels, neural networks). (ii) Unsupervised learning (clustering, dimensionality reduction, recommender systems, autoencoders). (iii) Learning theory (bias/variance tradeoffs, VC theory, generalization). (iv) Ensemble methods (boosting and bagging, random forests). (v) Deep learning (deep belief networks, convolutional neural networks, deep autoencoders). The course will draw from numerous case studies and applications.Offered by Engineering & Computing. May not be repeated for credit. Equivalent to ECE 527.

Recommended Prerequisite: (MATH 203 and STAT 346) or equivalent

Registration Restrictions:
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Junior Plus, Non-Degree or Senior Plus.

Students in a Non-Degree Undergraduate degree may **not** enroll.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)

600 Level Courses

DAEN 690: *Data Analytics Project.* 3 credits.
Capstone project course for MS in Data Analytics program. Key activity is completion of a major applied team project resulting in an acceptable technical report and oral briefing. Students should plan to take this academically rigorous course in their last semester.Offered by Engineering & Computing. May not be repeated for credit.

Recommended Prerequisite: Completion of 21 credit hours of coursework in the MS Data Analytics program and departmental approval to register. It is also recommended that DAEN 690 be taken in your last semester and with no more than one other course at the same time.

Registration Restrictions:
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Junior Plus, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may **not** enroll.

Enrollment limited to students in the College of Science, Engineering Computing or Schar School of Policy and Gov colleges.

Schedule Type: Seminar

Grading:
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)

DAEN 698: *Data Analytics Research Project.* 1-3 credits.
Conduct a research project to be chosen and completed under guidance of a graduate faculty member that results in an acceptable technical report. Notes: No more than a total of three credits may be taken from within the DAEN program.Offered by Engineering & Computing. May be repeated within the term for a maximum 3 credits.

Specialized Designation: Topic Varies

Recommended Prerequisite: Graduate Standing, completion of at least two core courses and a minimum of 12 credits in the DAEN program, and permission of instructor.

Registration Restrictions:
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Junior Plus, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may **not** enroll.

Enrollment limited to students in the College of Science, Engineering Computing or Schar School of Policy and Gov colleges.

Schedule Type: Research #1, Research #2, Research #3, Research #4, Research #5, Research #6, Research #7, Research #8, Research #9, Research

Grading:
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)