

# OPERATIONS RESEARCH AND ENGINEERING GRADUATE CERTIFICATE

Banner Code: EC-CERG-OR

## Systems Engineering and Operations Research

2100 Nguyen Engineering Building  
Fairfax Campus

Phone: 703-993-5689  
Email: seor@gmu.edu  
Website: seor.gmu.edu/

## Admissions & Policies

### Admissions

#### Computational Modeling Concentration

For admission to the certificate with a Computational Modeling concentration, applicants must meet minimum entrance requirements for the MS in operations research (<http://catalog.gmu.edu/colleges-schools/engineering-computing/engineering/systems-operations-research/operations-research-ms/>), the MS in statistical science (<http://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/statistics/statistical-science-ms/>), or the PhD in computational sciences and informatics (<http://catalog.gmu.edu/colleges-schools/science/computational-data-sciences/computational-sciences-informatics-phd/>).

#### Military Operations Research Concentration

Admissions requirements for the certificate with a Military Operations Research concentration are identical to those for the Operations Research, MS (<http://catalog.gmu.edu/colleges-schools/engineering-computing/engineering/systems-operations-research/operations-research-ms/>).

#### Predictive Data Analytics Concentration

The certificate with Predictive Analytics concentration will be open to all students who hold a BS degree in scientific and engineering disciplines from an accredited university program, with a minimum GPA of 3.0. Students who are already enrolled in a master's program must submit a secondary certificate form to enroll in this certificate with concentration program; all others must apply for graduate admission to this certificate with concentration program.

### Policies

For policies governing all graduate certificates, see AP.6.8 Requirements for Graduate Certificates (<http://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-8>).

Courses taken for the Computational Modeling certificate can count toward a master's degree in operations research or statistics or a PhD in computational sciences and informatics (<http://catalog.gmu.edu/colleges-schools/science/computational-data-sciences/computational-sciences-informatics-phd/>). One must be concurrently enrolled in the program for courses to count toward the certificate and the other degree.

## Requirements

### Certificate Requirements

Total credits: 12-15

This certificate may be pursued on a part-time basis only.

Students must complete all requirements within a concentration.

#### Concentration in Computational Modeling (CCM)

Code	Title	Credits
OR 541	Operations Research: Deterministic Models	3
OR 635	Discrete System Simulation	3
OR 682	Computational Methods in Engineering and Statistics	3
	or MATH 685 Numerical Analysis	
Select one from the following Electives:		3
CSI 744	Linear and Nonlinear Modeling in the Natural Sciences	
OR 542	Operations Research: Stochastic Models	
SYST 611	System Methodology and Modeling	
SYST 683	Modeling, Simulation, and Gaming	
ECE 521	Linear Systems and Control	
MATH 673	Dynamical Systems	
Total Credits		12

#### Concentration in Military Operations Research (MOR)

Certificate candidates must complete five courses, with an average grade of B or better, for a total of 15 graduate credits.

Code	Title	Credits
OR 541	Operations Research: Deterministic Models	3
OR 635	Discrete System Simulation	3
OR 651	Military Operations Research I: Cost Analysis	3
OR 652	Military Operations Research Modeling II: Effectiveness Analysis	3
SYST 683	Modeling, Simulation, and Gaming	3
Total Credits		15

#### Concentration in Predictive Data Analytics (PDA)

Code	Title	Credits
OR 541	Operations Research: Deterministic Models	3
OR 568	Applied Predictive Analytics	3
One from the following:		3
OR 542	Operations Research: Stochastic Models	
OR 604	Practical Optimization	

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OR 635	Discrete System Simulation	
One from the following:		3
CS 504	Principles of Data Management and Mining	
CS 584	Theory and Applications of Data Mining	
Total Credits		12