About This Program

What are the prerequisites?
- A Bachelor's Degree
- Completion of Core Mathematics (MA1116 and MA2043)
- GPA of 3.0 or higher

Who is eligible to participate?
- All NPS students

How are courses taught?
- Currently, a resident program so all classes are held on campus

How long does it take to complete?
- Usually one year (1 course/quarter)

When does the program start?
- Check with the program coordinator

A thorough understanding of the mathematics underlying the algorithms is essential for the correct interpretation and further development of computational approaches in science. The Scientific Computation certificate program is designed to provide that very background!

Contact Information

Scientific Computation Certificate Program

Naval Postgraduate School
Department of Applied Mathematics
Spanagel Hall, Room 250
833 Dyer Road
Monterey, CA 93943-5216
Tel: (831) 656-2695 • DSN: 756-2695 • Fax: (831) 656-2355

For more information, visit the Department of Applied Mathematics at:

HTTP://MATH.NPS.EDU

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Naval Postgraduate School
Center of Educational Design, Development, and Distribution (CED3)
411 Dyer Road, Knox 154
Monterey, CA 93943

A program focused on fundamental methods, models, and algorithms that are used in advanced scientific computation.

Department of Applied Mathematics

Naval Postgraduate School

SCIENTIFIC COMPUTATION

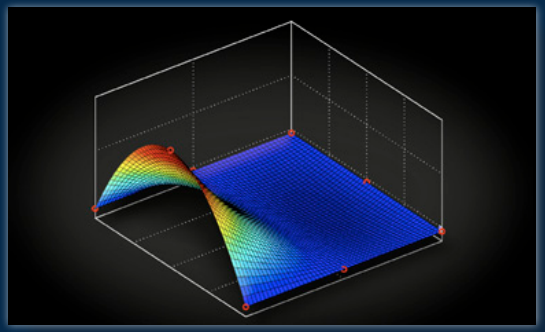
SCIENTIFIC COMPUTATION CERTIFICATE PROGRAM

Improved Understanding!

"The Certificate allows you to take all of the theory garnered through the foundation courses one step further and learn how to apply this knowledge to direct, real world applications"

- NPS Student

Scientific Computation is the use of mathematical analysis and numerical solution techniques to model science and engineering problems on computers. It has become the third pillar of scientific research, a peer with traditional methods of physical experimentation and theoretical investigation, and as such has emerged as an area critical to the success of the mission of the DoD.



Advance Your Skills

- High performance computers are already widely used in weather prediction, modeling ocean dynamics, design and testing of advanced weapons systems, development of new smart materials, etc.
- It has become very clear that even more broad application of scientific computation will be essential to accelerate scientific discovery for national competitiveness and global security.

Certificate Courses

This program comprises four courses–the first two fundamental and the other two selected from a group of nine courses–that allows the certificate to be tailored to a specific area of interest. Upon successful completion of the coursework, students will be awarded a certificate of accomplishment in keeping with standard practices of NPS.

MA3046 - Matrix Analysis
Provides applications-oriented coverage of major topics from matrix and linear algebra.

MA3232 - Numerical Analysis
Introduction to the fundamental mathematics and algorithms of numerical computation.

...and two more courses from the following list:

MA4237:
Advanced topics in numerical analysis

MA4242:
Numerical solution of ordinary differential equations

MA4243:
Numerical solution of partial differential equations

MA4245:
Mathematical foundations of Galerkin methods

MA4248:
Computational linear algebra

MA4261:
Distributed scientific computing

MA4311:
Calculus of variations

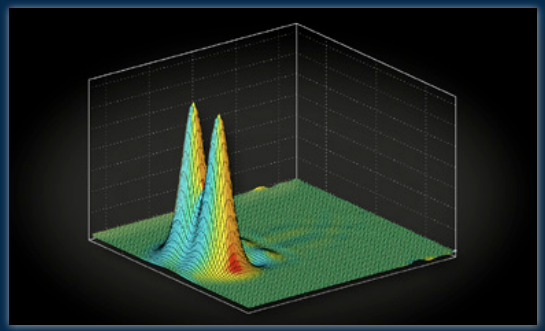
MA4377:
Asymptotic and perturbation methods

MA4620:
Theory of dynamical systems

The Mission

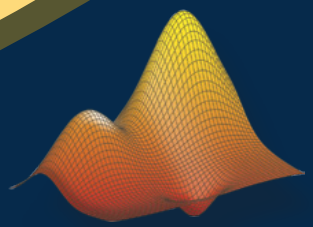
The Scientific Computation Certificate Program at NPS provides graduate-level Mathematics education to naval officers and DoD civilians in the broad area of Scientific Computation. A thorough understanding of the mathematics underlying the algorithms is essential for the correct interpretation and further development of computational approaches in science.

This program is designed to provide that very background!



Relevance to Your Job!

"... best courses I've had at NPS. This experience has stimulated my interest in numerical modeling!" *- NPS Student*



SCIENTIFIC COMPUTATION
CERTIFICATE PROGRAM