Department of Applied Mathematics | Applied Mathematics Department Publications

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Secure Communications

Monterey, California, Naval Postgraduate School

https://hdl.handle.net/10945/39146

About This Program

What are the prerequisites?
• A Bachelor's Degree
• Completion of Discrete Mathematics
  — MA 1025 or MA 2025
• GPA of 3.0 or higher

Who is eligible to participate?
• All NPS students

Are courses taught online?
• No. All courses for this program are resident.

How long does it take to complete?
• Usually 4 quarters (1 course/qrt)

When does the program start?
• Annually in the fall quarter

In the intelligence community, nearly everything is encrypted ... defending vital information from those who should not have access.

Contact Information

Produced by

CED³

NPS
PRAESTANTIA PER SCIENTIAM

NAVAL POSTGRADUATE SCHOOL

A program focused on fundamentals of cryptography and other aspects of cyber-security

Improve Your Understanding!

"The Certificate Program gave me a great foundational understanding of why we need cryptography and how it actually works." - NPS Student

Cryptology has evolved from a means to protect military communications to helping secure systems for everyone across the globe. The Mathematics of Secure Communications Certificate Program offered at NPS will cover topics such as Cryptography, Cryptanalysis, and Coding Theory.

Advance Your Skills

- Gain cryptologic skills to protect military and civilian communications
- Improve technical expertise for policy and decision makers in cyber-security and secure communications
- Learn about historical cryptosystems and codes
- Understand modern cryptosystems and codes and their computational challenges

Certificate Courses

Upon successful completion of the coursework, students will be awarded a certificate of accomplishment.

MA3025 - LOGIC & DISCRETE MATHEMATICS

Provides a rigorous foundation in logic and elementary discrete mathematics to students of mathematics and computer science.

MA3560 - APPLIED MODERN ALGEBRA & NUMBER THEORY

This course is devoted to aspects of modern algebra and number theory that directly support applications, principally in communication.

MA4560 - CODING & INFORMATION THEORY

Mathematical analysis of codes used over communication channels is made. Techniques developed for efficient, reliable, and secure communication are stressed.

MA4570 - CRYPTOGRAPHY

The methods of secret communication are examined, including both classical cryptographic techniques, e.g. substitution and transposition, and also current methods, e.g. public-key cryptosystems, RSA, Discrete Logarithm and other schemes.

MA4550 – Optional – COMBINATORIAL & CRYPTOGRAPHIC PROPERTIES OF BOOLEAN FUNCTIONS

Boolean functions as primitives in cryptosystems and their combinatorial properties to counter attacks are discussed.

The Mission

The Secure Communications Certificate Program at NPS provides graduate level mathematics education to military and DoD civilian personnel. This program satisfies the Knowledge, Skills, and Abilities (KSA) requirement in the Applied Technology field of Fundamentals of Cryptography, Cryptanalysis and Coding Theory for Professional Military Education.

Relevance To Your Job!

"In the Department of Defense, cryptography plays a huge role because our communications have to be secure. The Certificate Program lays that foundation and explains it in a way relevant to all DoD fields which makes it very powerful." - NPS Student

MATHEMATICS OF SECURE COMMUNICATIONS