Career Spotlight

Cryptanalyst

Cryptanalysts design, implement, and analyze algorithms for solving problems. They analyze and decipher secret coding systems and decode messages for military, political, or law enforcement agencies or organizations. They help provide privacy for people and corporations, and keep hackers out of important data systems. They are constantly working on new ways to encrypt information.

EDUCATION

Most cryptanalysts have at least a bachelor's degree in mathematics or computer science. In fact, many cryptanalysts have graduate degrees in mathematics. A Ph.D. is usually required for cryptanalysts employed in a research environment or those who teach at the university level.

WHEN MATH IS USED

Cryptanalysts use math to perform the following tasks:
• Study and test ideas and alternative theories
• Follow mathematical theorems and formulas
• Encode and encrypt systems and databases
• Perform cryptic computations and apply methods of numerical analysis
• Devise systems for companies to help keep hackers out and to protect the company and consumer
• Use computers to make graphs, tables and charts of data
• Act as consultant to research staff concerning cryptical and mathematical methods and applications.

MATH REQUIRED

• College Algebra
• Trigonometry
• Calculus I, II, III
• Linear Algebra
• Differential Equations
• Partial Differential Equations
• Elementary Number Theory
• Introduction to Real Analysis
• Analysis I and II
• Methods of Complex Analysis
• Mathematical Cryptography

Low-end Salary: $38,930/yr
Median Salary: $76,470/yr
High-end Salary: $112,780/yr

POTENTIAL EMPLOYERS

Cryptanalysts are employed by educational institutions, bank and trust companies, financial institutions, insurance companies, scientific institutions, and research agencies. They also may work for telecommunications companies, computer design firms, consulting firms, science and engineering firms, and all levels of government, including special services and intelligence agencies.

FACTS

Mathematicians landed the top spot in the 2009 ranking of "Best Occupations in the U.S." Cryptanalysis and cryptography are pure math and computer science. Linear algebra, probability theory, numerical analysis and mathematical structures as well as applied computing and algorithm design are at the heart of cryptanalysis techniques.

CITATIONS

http://www.schoolsintheusa.com/careerprofiles_details.cfm?carid=1587
http://en.wikipedia.org/wiki/Cryptanalysis

WeUseMath.org