



Security and Risk Analysis

INTELLIGENCE ANALYSIS AND MODELING OPTION (IAM)

This option focuses on developing a more thorough knowledge of the strategic and tactical levels of intelligence collection, analysis, and decision-making. This includes examining the foundations of decision analysis, economic theory, statistics, data mining*, and knowledge management, as well as the security-specific contexts in which such knowledge is applied.

1. What campuses offer this option? Not all options are available at all campuses, so be sure to [check for availability](#) at your campus.

2. What is the focus of this option in terms of specific knowledge and skills?

- Understanding the process of intelligence collection and analysis.
- Understanding social, economic and policy implications of intelligence gathering and use.
- Knowledge and skills for intelligence extraction (dealing with strategies for gaining access to classified information).
- Skills to make defensible arguments based on verifiable evidences and sound judgment.
- Using visual and computational models to predict future scenarios and behaviors.
- Using visual and computational models to evaluate threats and risks including those associated with natural disasters.

3. How do the courses in this option integrate with each other?

Courses in this option prepare students with conceptual understandings and analytical skills that are required in intelligence analysis and risk modeling. Strong emphasis is given to the skills in using a diverse set of analytical methods and tools for extracting intelligence and supporting decision-making.

The core courses for this option (IST 110, SRA 111, SRA 211, SRA 221, SRA 231, and SRA 311) are designed to cover in increasing breadth and depth key issues such as information security, cyber security, risk and threats, crisis management, and crime analysis.

The set of prescribed courses and support of option courses provide foundations for the following:

- Quantitative methods (such as ECON 402, STAT 480, PLSC 409).
- Geo-spatial analysis (GEOG 160, GEOG 363).
- Visual analytics (SRA 468).
- Legal, cultural, and policy issues (IST 453).

4. Realizing that students majoring in SRA will be prepared to work in many different areas, here are specific examples of the activities /work assignments that best illustrate this option:

- Intelligence analysis for homeland security.
- Decision-support for emergency response.
- Security analyst for government and businesses.

- Mining unstructured information from multiple sources to identify threats and danger.
- Crisis management using geospatial intelligence.
- Modeling risks of natural hazards.
- Crime mapping for law enforcement.
- Strategic planning for protecting critical infrastructure.

5. What related or additional information should students focus on outside of classes?

- Keep up with current research/ practice on privacy, security, risk, and terrorism.
- Create a personal collection of good books, stories, case analyses, and news reports that you can reflect on when learning new theories and methods.
- Do multiple internships.
- Create a personal network with professionals and practitioners (get to know people in your discipline).

6. Recommended Web sites that supplement this option and the IST major:

- <http://infoviz.pnl.gov/>
- The National Visualization and Analytics Center: <http://nvac.pnl.gov/>
- Mapping and Analysis for Public Safety (MAPS): <http://www.ojp.usdoj.gov/nij/maps/>
- The Society for Risk Analysis: <http://www.sra.org/>
- Information Sharing & Analysis The Department of Homeland Security: <http://www.dhs.gov/xinfoshare/>

7. What are typical job descriptions for Security and Risk Analysis graduates? Please note: The following is a brief list containing some of the career positions a graduate in SRA may encounter. It is not intended to serve as a comprehensive career guide, but rather to give students a sense of the general pathways to which this option may lead. Graduates from IST successfully apply their broad-based technology background in myriad professional settings. Some IST graduates also choose to continue their studies in graduate or professional schools.

- **Business Intelligence Consultant/Analyst:** Responsibilities include: Work with business clients to understand their business and analytical requirements, and produce functional specification documents; design and implement solutions (e.g. Customer Insight) to enable our clients to maximize the learning and insight they can derive from their varied sources of customer data; selection and implementation of tools, technologies, and applications to maintain state-of-the-art data management and decision-making capabilities for our clients; assist in planning and managing a project; deliver information effectively to clients through documentation and presentations; build and maintain client relationships.
- **Counter-Intelligence Threat Analyst:** Counter-intelligence (CI) analysts identify, monitor, and analyze the efforts of foreign intelligence entities against U.S. persons, activities, and interests, including the threats posed by emerging technologies to U.S. operations and interests. Their efforts support U.S. policymakers and provide tactical analysis and advice for clandestine operations by producing strategic analysis. CI analysts also produce a range of current and longer-term intelligence products and brief key U.S. policymakers. Agency analysts are encouraged to maintain and broaden their professional ties through academic study, contacts, and attendance at professional meetings. They also may choose to pursue additional studies in fields relevant to their areas of responsibility. Opportunities exist for foreign and domestic travel, language training, analytic and

management training, and assignments to other offices in the Agency and throughout the U.S. Government.

- **Counter-Terrorism Analyst:** Counter-terrorism analysts assess developments related to terrorism worldwide in support of U.S. policymakers. They monitor and assess the leadership, motivations, plans, and intentions of foreign terrorist groups and their state and non-state sponsors. Counter-terrorism analysts also produce a range of current and longer-term intelligence products, brief key U.S. policy-makers and provide tactical analytic support to law enforcement and intelligence operations. Agency analysts are encouraged to maintain and broaden their professional ties through academic study, contacts, and attendance at professional meetings. They also may choose to pursue additional studies in fields relevant to their areas of responsibility. Opportunities exist for foreign travel, language training, analytic and management training, and assignments in other offices in the Agency and throughout the U.S. Government.
- **Cyber Intelligence Analyst:** This position requires intelligence analysis and production tasks related to counter-intelligence and/or computer investigations and operations. Experience in counter-terrorism and/or counter-intelligence analysis is essential. Excellent communication skills, both verbal and written, are critical. Experience in providing analytical support for cyber investigations, working with link analysis tools, analyzing network logs, and interacting with databases is highly desirable. A basic knowledge of computer and network security principles is important. A Top-Secret security clearance and bachelors degree are required. Locations are worldwide.
- **Intelligence Analyst:** An intelligence analyst is primarily responsible for supervising, coordinating, and participating in the analysis, processing and distribution of strategic and tactical intelligence. Some of the duties may include: preparing all-source intelligence products to support the combat commander; assisting in establishing and maintaining systematic, cross-referenced intelligence records and files; receiving and processing incoming reports and messages; assisting in determining the significance and reliability of incoming information; assisting in the analysis and evaluation of intelligence holdings to determine changes in enemy capabilities, vulnerabilities, and probable courses of action; assembling and proofreading intelligence reports and assisting in consolidating them into Army intelligence; storing and retrieving intelligence data using computers.
- **Intelligence Operations:** Comprised of various positions in the intelligence field, intelligence operations are concerned with the development of collection plans, the organization of activities for the collection of raw intelligence data in a variety of subject-matter areas, and the dissemination of finished intelligence reports. Those involved in intelligence operations apply knowledge of the organization and operations of the entire intelligence function to a variety of different kinds of tasks and functions designed to collect and disseminate information.
- **Intelligence Operations Specialist:** The approved title for positions in the field of intelligence operations is intelligence operations specialist. Intelligence operations specialists apply the knowledge of a professional discipline such as international relations, current history, military science, or political science and knowledge of the operations and resources of the organizations that make up the intelligence community to a subject-matter specialty in the field of intelligence operations. Examples of such subject-matter specialties are collection techniques for electronics, intelligence, and

liaison activities. U.S. Office of Personnel Management 8 Intelligence Series, GS-0132 TS-28 June 1960, TS-27 April 1960 Intelligence Operations Specialists determine the need for and write collection manuals and guides, edit requests for intelligence data, perform liaison functions within the intelligence community, and determine the distribution of raw intelligence data and finished intelligence reports.

In all these activities, intelligence operations specialists apply knowledge of the organization and methods of collecting intelligence data to the resources and interests of the intelligence community, utilizing imagination in relating the collection and dissemination processes to the needs of research. For example, when an intelligence research specialist requests a specific piece of information he may do so with little regard for the relative availability of the information or of the methods by which it may be acquired. The intelligence operations specialist has knowledge of the resources of the entire intelligence community. He or she considers whether another intelligence organization or an outside source has the required data, whether other intelligence research specialists in the same or other organizations have need for the same or related data, how they may best be acquired and which organization has the best collection facilities for their acquisition. He or she also considers, with the research specialist, the relative importance of the requested information to the research report versus the cost of acquisition, both monetarily and in terms of compromising sources of information. He assures the fullest exploitation of all data received, by referring it to all interested members of the intelligence community. Intelligence operations specialists exercise their functions through interactions with other people; they are generalists who are primarily engaged in facilitating the entire intelligence process.

- **Intelligence Research Specialist:** Intelligence research specialists apply a basic knowledge of a professional discipline, the principles and techniques of inductive and deductive reasoning, and subject-matter knowledge of either a geographical area or a functional area to the production of finished intelligence reports. To accomplish this, they receive and review data from various documents, reference books, periodicals, newspapers, reports, photographs, and other forms of communication. They analyze and evaluate the significance and validity of such data and provide for its storage and maintenance. They exploit (as used in the intelligence field, this means to acquire the maximum intelligence use out of raw data.), interpret, and project existing data to fill gaps in information, request the collection of data to fill gaps in knowledge, and review and evaluate finished intelligence reports from the point of view of their specific subject-matter fields. In addition, some intelligence research specialists (1) provide guidance to officials stationed or traveling overseas, and to others in a position to collect raw data, as to type and significance of information needed; (2) interview (debrief) returning foreign travelers to obtain intelligence data; and (3) conduct briefing sessions on specific topics for policy and decision makers who are in need of specific intelligence information.
- **Intelligence Specialists:** Intelligence specialists analyze intelligence data. They break down information to determine its usefulness in military planning. From this intelligence data, they prepare materials that describe in detail the features of strategic and tactical areas throughout the world. Duties performed by intelligence specialists include analyzing intelligence information; identifying and producing intelligence from raw information; assembling and analyzing multi-source operational intelligence; preparing and presenting intelligence briefings; preparing planning materials for photographic reconnaissance missions; analyzing the results; preparing reports; preparing graphics, overlays and photo/map composites; plotting imagery data using maps and charts;

providing input to and receiving data from computerized intelligence systems ashore and afloat; maintaining intelligence databases, libraries, and files.

*Data mining can be defined as "the nontrivial extraction of implicit, previously unknown, and potentially useful information from data".^[1] Data mining may also be defined as "the science of extracting useful information from large data sets or databases".^[2]

1. W. Frawley and G. Piatetsky-Shapiro and C. Matheus (Fall 1992). "Knowledge Discovery in Databases: An Overview". *AI Magazine*: pp. 213-228. [ISSN 0738-4602](#).
2. D. Hand, H. Mannila, P. Smyth (2001). *Principles of Data Mining*. MIT Press, Cambridge, MA. [ISBN 0-262-08290-X](#). Wikipedia http://en.wikipedia.org/wiki/Data_mining