

# SECURITY AND RISK ANALYSIS, B.S. (ALTOONA)

**Begin Campus:** Any Penn State Campus

**End Campus:** Altoona

## Program Description

*Not all options are available at every campus. Contact the campus you are interested in attending to determine which options are offered.*

The Bachelor of Science in Security and Risk Analysis (SRA) in the College of Information Sciences and Technology responds to the expanding need for a highly trained analytic workforce to address a wide range of security and risk domains including national/homeland security, emergency and disaster management, law and crime, as well as enterprise risk management.

SRA program prepares students with core competence in four knowledge areas:

1. understanding the fundamentals of security, risk, analytic methods and decision support for the purpose of recognizing, articulating, and addressing analytic needs;
2. understanding the roles of data and analytics in various security domains and organizational contexts;
3. applying data analytics, methods, and tools (structured analytics; data gathering and manipulation; visual analytics; analytic judgements and presentation) to derive and communicate insights and actionable knowledge;
4. the legal, ethical, and professional issues within which analytics of security and risk are conducted.

Students may specialize in risk domains ranging from national security to community emergency preparedness and response. The SRA program positions our students to be future leaders to address the current and emerging security and risk challenges that face individuals, organizations and our nation.

SRA majors will choose one of the following options:

### Intelligence Analysis and Modeling Option

**Available at the following campuses: University Park**

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.

### Information and Cyber Security Option

**Available at the following campuses: Altoona, Berks, Harrisburg, University Park, World Campus**

This option includes a set of courses that provides an understanding of the theories, skills, and technologies associated with network security, cyber threat defense, information warfare, and critical infrastructure protection across multiple venues.

## What is Security and Risk Analysis?

Security and risk analysis is a field that explores the integrated processes conducted to provide decision-makers with the information needed to understand factors that can negatively influence operations and outcomes, and make informed judgments concerning the extent of actions needed to reduce vulnerabilities, protect resources, and optimize investments. Security and risk analysis is a field of practice with two blended concentration areas: 1) security, which seeks to identify, understand, and analyze critical local, national and international security issues, and 2) risk, which includes risk assessment, risk characterization, risk communication, risk management, and the formulation of risk policy. In practice, the issues and processes for conducting of security and risk analytics are neither separate nor sequential. To be effective, the issues of security and risk must be addressed concurrently and synergistically.

MORE INFORMATION ABOUT SECURITY AND RISK ANALYSIS (<https://ist.psu.edu/students/undergrad/majors/sra>)

### You Might Like This Program If...

- You want to protect people, information, and assets from manmade and natural threats.
- You want to understand the role of data in protecting individuals, organizations and our nation.
- You are mission oriented, a good critical thinker and wish to put your problem-solving skills to work to make the world a safer place.
- You want to make informed strategic decisions that help to defend critical infrastructures that supports our daily lives.

MORE INFORMATION ABOUT WHY STUDENTS CHOOSE TO STUDY SECURITY AND RISK ANALYSIS ([https://issuu.com/istpsu/docs/sra\\_major](https://issuu.com/istpsu/docs/sra_major))

## Entrance to Major

In addition to the minimum grade point average (GPA) requirements described in the University Policies\*, all Security and Risk Analysis (SRA) entrance to major course requirements must also be completed with a minimum grade of C: IST 140 (or equivalent CMPSC 101 or CMPSC 121), IST 210, SRA 111, and SRA 211. All of these courses must be completed by the end of the semester during which the admission to major process is carried out.

*\* In the event that the major is under enrollment control, a higher minimum cumulative grade-point average is likely to be needed at the time of confirming their major choice.*

## Entrance to the Integrated Undergraduate-Graduate (IUG) Program

The Integrated Undergraduate Graduate (IUG) program is available for strong undergraduate students who wish to pursue a bachelor's and master's degree in a shorter period of time than would be necessary if the degrees were pursued separately. Security and Risk Analysis undergraduates may apply for admission to the SRABS/ISTMS IUG program as early as February 15 of their sophomore year and no later than February 15 of their junior year after completing a minimum of 60 credits, if they meet the following admission requirements:

1. Must be enrolled in the SRABS undergraduate degree program.
2. Must have completed 60 credits of an SRABS undergraduate degree program.

- Must have an overall GPA of 3.5 (on a 4.0 scale) in undergraduate coursework and a minimum GPA of 3.5 in all coursework completed for the major.
- Must apply to and be accepted without reservation into the Graduate School and M.S. program in Informatics. Students must complete the Graduate School application (<http://www.gradschool.psu.edu/apply>).
- Must apply to the IUG program by February 15 of their junior year.

## Degree Requirements

For the Bachelor of Science degree in Security and Risk Analysis, a minimum of 120 credits is required:

Requirement	Credits
General Education	45
Electives	5-13
Requirements for the Major	77-85

15 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 6 credits of GQ courses; 6 credits of GS courses; and 3 credits of GWS courses.

### General Education

Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (<http://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program>) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

### Foundations (grade of C or better is required.)

- Quantification (GQ): 6 credits
- Writing and Speaking (GWS): 9 credits

### Knowledge Domains

- Arts (GA): 6 credits
- Health and Wellness (GHW): 3 credits
- Humanities (GH): 6 credits
- Social and Behavioral Sciences (GS): 6 credits
- Natural Sciences (GN): 9 credits

### Integrative Studies (may also complete a Knowledge Domain requirement)

- Inter-Domain or Approved Linked Courses: 6 credits

## University Degree Requirements

### First Year Engagement

All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

### Cultures Requirement

6 credits are required and may satisfy other requirements

- United States Cultures: 3 credits
- International Cultures: 3 credits

### Writing Across the Curriculum

3 credits required from the college of graduation and likely prescribed as part of major requirements.

### Total Minimum Credits

A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

### Quality of Work

Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

### Limitations on Source and Time for Credit Acquisition

The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80>)). For more information, check the Suggested Academic Plan for your intended program.

## Requirements for the Major

To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44>).

### Common Requirements for the Major (All Options)

Code	Title	Credits
<b>Prescribed Courses</b>		
<i>Prescribed Courses: Require a grade of C or better</i>		
IST 110	Information, People and Technology	3
IST 210	Organization of Data	3
IST 432	Legal and Regulatory Environment of Information Science and Technology	3
IST 495	Internship	1
SRA 111	Introduction to Security and Risk Analysis	3
SRA 211	Threat of Terrorism and Crime	3
SRA 221	Overview of Information Security	3
SRA 231	Decision Theory and Analysis	3
STAT 200	Elementary Statistics	4
<b>Additional Courses</b>		
ENGL 202C	Effective Writing: Technical Writing	3

or ENGL 202D	Effective Writing: Business Writing	
PSYCH 100	Introductory Psychology	3
or SOC 5	Social Problems	
Select one of the following:		3
AGBM 101	Economic Principles of Agribusiness Decision Making	
ECON 102	Introductory Microeconomic Analysis and Policy	
ECON 104	Introductory Macroeconomic Analysis and Policy	
Select one of the following:		3-5
MATH 22	College Algebra II and Analytic Geometry	
MATH 26	Plane Trigonometry	
MATH 40	Algebra, Trigonometry, and Analytic Geometry	
MATH 41	Trigonometry and Analytic Geometry	
MATH 110	Techniques of Calculus I	
MATH 140	Calculus With Analytic Geometry I	
Select one of the following:		3
GEOG 128	Geography of International Affairs	
PLSC 1	American Politics: Principles, Processes and Powers	
PLSC 14	International Relations	
<i>Additional Courses: Require a grade of C or better</i>		
SRA 365	Statistics for Security and Risk Analysis	3
or STAT 460	Intermediate Applied Statistics	
Select one of the following:		3
IST 140	Introduction to Application Development	
CMPS 101	Introduction to Programming	
CMPS 121	Introduction to Programming Techniques	
<b>Requirements for the Option</b>		
Select an option		30-36

**Requirements for the Option**  
**Intelligence Analysis and Modeling Option (36 credits)**  
*Available at the following campuses: University Park*

Code	Title	Credits
<b>Prescribed Courses</b>		
<i>Prescribed Courses: Require a grade of C or better</i>		
IST 452	Legal and Regulatory Environment of Privacy and Security	3
SRA 268	Visual Analytics	3
SRA 311W	Risk Analysis in a Security Context	3
SRA 421	The Intelligence Environment	3
SRA 433	Deception and Counterdeception	3
SRA 440W	Security and Risk Analysis Capstone Course	3
SRA 468	Visual Analytics for Security Intelligence	3
<b>Supporting Courses and Related Areas</b>		
Select 15 credits from College-approved list (at least 3 credits must be at the 400-level)		15

**Information and Cyber Security Option (30 credits)**  
*Available at the following campuses: Altoona, Berks, Harrisburg, University Park, World Campus*

Code	Title	Credits
<b>Prescribed Courses</b>		
<i>Prescribed Courses: Require a grade of C or better</i>		
IST 220	Networking and Telecommunications	3
IST 451	Network Security	3
IST 454	Computer and Cyber Forensics	3
IST 456	Information Security Management	3
SRA 311	Risk Analysis in a Security Context	3
<b>Additional Courses</b>		
<i>Additional Courses: Require a grade of C or better</i>		
IST 440	Information Sciences and Technology Integration and Problem Solving	3
or SRA 440W	Security and Risk Analysis Capstone Course	
<b>Supporting Courses and Related Areas</b>		
Select 12 credits from College-approved list (at least 3 credits must be at the 400-level)		12

## Program Learning Objectives

### Knowledge/Application:

- Understand and apply the interdisciplinary, theoretical knowledge of the information sciences or security sciences.
  - Define and explain the core concepts, principles, processes, and theories within the academic majors of IST and/or SRA.
  - Apply the core concepts of the academic majors of IST and/or SRA to real-world problems.

### Problem-Solving:

- Understand, apply and adapt various problem solving strategies, using appropriate technology and methods.
  - Identify information problems and/or opportunities in terms of the human, informational and technology dimensions.
  - Analyze issues surrounding the problem and/or opportunity in terms of the human, informational, and technology dimensions; and determine the requirements appropriate to understanding the situation.
  - Design systems, architectures, processes, components, or programs to meet desired needs of the human context at varying levels of analysis (e.g., individual, group, organization, society, and/or world).
  - Deploy up-to-date and appropriate techniques, methodologies, and/or tools necessary for understanding opportunities and constraints and/or the optimal design, implementation and continuance of an information based solution.
  - Evaluate the success of systems, architecture, processes, components, or programs intended to meet desired needs of the human context at varying levels of analysis (e.g., individual, group, organization, society, and/or world).

### Communication (Individual and Team):

- Communicate and work effectively (both individually and in teams) with a range of perspectives and audiences through a variety of media.
  - Participate effectively on teams in order to accomplish a common goal.
  - Communicate effectively with a range of audiences, formally or informally, through writing and the spoken word.

- c. Seek out, analyze, and incorporate diverse ideas and broader perspectives represented in the diversity of people.
- d. Make respectful and inclusive choices in interacting with customers, peers, supervisors, and/or subordinates with a diversity of identity characteristics (e.g., age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, gender identify, or veteran status).

**Professional Responsibilities:**

1. Understand professional responsibilities in terms of the ethical, legal, security and social aspects of any given problem and its solution.
  - a. Demonstrate an understanding of the cognitive, social, legal, ethical, diversity, and security perspectives surrounding a given problem.
  - b. Assess the impact of information, computing and technology on individuals, groups, organizations, society, and the world for the purpose of making informed decisions from a sociological, governmental, legal, and/or security perspective.

**Lifelong Learning:**

1. Commit to the continuous acquisition of relevant knowledge for professional development by self-teaching and/or on-going education and learning.
  - a. Employ information-seeking strategies and self-directed learning in pursuit of current knowledge.
  - b. Enroll in professional development and tutoring opportunities.

## Academic Advising

The objectives of the university's academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee's unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy>)

### Altoona

**David Barnes**

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### Berks

**Tricia Clark**

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### Harrisburg

**Jesse Middaugh, PMP**

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### University Park

**Office of Undergraduate Academic Advising**

E103 Westgate Building  
 University Park, PA 16802  
 814-865-8947  
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### World Campus

**Undergraduate Academic Advising**

301 Outreach Building  
 University Park, PA 16802  
 814-863-3283  
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## Suggested Academic Plan

The suggested academic plan(s) listed on this page are the plan(s) that are in effect during the 2019-20 academic year. To access previous years' suggested academic plans, please visit the archive (<http://bulletins.psu.edu/undergraduate/archive>) to view the appropriate Undergraduate Bulletin edition (*Note: the archive only contain suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin*).

## Information and Cyber Security Option at Commonwealth Campuses

### Altoona Campus

The course series listed below provides **only one** of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an **Academic Requirements** or **What If** report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

**First Year**

Fall	Credits Spring	Credits
SRA 111 <sup>*†‡#†</sup>	3 SRA 211 <sup>*</sup>	3
IST 110 <sup>*†‡#†</sup>	3 World Language Course Level 2	4
ENGL 15, 30, or ESL 15 <sup>†</sup>	3 General Education Course	3
World Language Course Level 1	4 CAS 100 <sup>†‡</sup>	3
IST 140 or CMPSC 101	3 ECON 102	3
	16	16

**Second Year**

Fall	Credits Spring	Credits
SRA 221	3 SRA 231	3
STAT 200 <sup>*†</sup>	4 PSYCH 100 or SOC 5	3

World Language Course Level 3	4 IST 210	3
IST 220	3 General Education Course	3
14		12

**Third Year**

Fall	Credits Spring	Credits
SRA 311	3 IST 432	3
International Cultures	3 ENGL 202C or 202D <sup>‡</sup>	3
Support of Option Course	3 IST 451	3
PLSC 1 or 14	3 STAT 460 or SRA 365	3
General Education Course	3 General Education Course	3
15		15

**Fourth Year**

Fall	Credits Spring	Credits
IST 456	3 IST 440	3
International Cultures Course	3 IST 454	3
Support of Option Course	3 Support of Option Course	3
General Education Course	3 General Education Course	3
General Education Course (GN)	2 or 3 Elective	3
14-15		15

Total Credits 117-118

- \* Course requires a grade of C or better for the major
- ‡ Course requires a grade of C or better for General Education
- # Course is an Entrance to Major requirement
- † Course satisfies General Education and degree requirement

**University Requirements and General Education Notes:**

US and IL are abbreviations used to designate courses that satisfy University Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

GWS, GQ, GHW, GN, GA, GH, and GS are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of 'C' or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

**Career Paths**

The Security and Risk Analysis program responds to the expanding need for a highly trained analytic workforce to address a wide range of security and risk domains including national/homeland security, emergency and disaster management, law and crime, as well as enterprise risk management. The SRA degree prepares students to be future leaders to address the current and emerging security and risk challenges that face individuals, organizations and our nation. IST's Office of Career Solutions helps students navigate internship and career development through

coaching, workshops, interview preparation, resume reviews, career fairs, job postings, and networking opportunities.

**Careers**

Security and Risk Analysis students may specialize in risk domains ranging from national security to community emergency preparedness and response. Because our courses blend technical knowledge with skills in communication and business, a Security and Risk Analysis degree allows students to pursue opportunities in intelligence, counterterrorism, computer forensics, and a number of other growing careers. SRA graduates work in a variety of fields, including defense, business, and emergency management; and many graduates go on to work for government intelligence agencies like the CIA, FBI, and NSA.

MORE INFORMATION ABOUT POTENTIAL CAREER OPTIONS FOR GRADUATES OF THE SECURITY AND RISK ANALYSIS PROGRAM (<https://www.ist.psu.edu/students/careers>)

**Opportunities for Graduate Studies**

With a focus on problem solving, critical thinking and the presentation of analytic findings, the SRA program is a great stepping-stone to graduate education and higher learning. Many SRA graduates will go on to pursue graduate degrees in fields like law, cyber security, and data science. The foundational skills obtained in the SRA degree directly apply to graduate education.

**Contact**

**Altoona**

DIVISION OF BUSINESS, ENGINEERING, AND INFORMATION SCIENCES AND TECHNOLOGY  
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 Altoona, PA 16601  
 814-949-5275  
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<http://altoona.psu.edu/academics/bachelors-degrees/security-risk-analysis/request-information>

**Berks**

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<http://berks.psu.edu/bs-security-and-risk-analysis>

**Harrisburg**

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<http://harrisburg.psu.edu/business-administration/information-sciences-technology-security-risk-analysis/bachelor-science-security-risk-analysis>

**University Park**

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 E397F Westgate Building

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814-863-3450  
programs@ist.psu.edu

[https://ist.psu.edu/directory/office/grad\\_undergrad\\_studies](https://ist.psu.edu/directory/office/grad_undergrad_studies)

## **World Campus**

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<https://www.worldcampus.psu.edu/degrees-and-certificates/security-and-risk-analysis-bachelors/overview>