

INFORMATION SCIENCES AND TECHNOLOGY, A.S. (INFORMATION SCIENCES AND TECHNOLOGY)

Begin Campus: World Campus

End Campus: World Campus

Program Description

This associate degree major is structured to prepare graduates for immediate and continuing employment opportunities in the broad disciplines of information science and technology. This includes positions such as application programmers, associate systems designers, network managers, web designers and administrators, or information systems support specialists. Specifically, the major is designed to ensure a thorough knowledge of information systems and includes extensive practice using contemporary technologies in the creation, organization, storage, analysis, evaluation, communication, and transmission of information. The major fosters communications, interpersonal, and group interaction skills through appropriate collaborative and active learning projects and experiences. Technical material covers the structure of database systems, web and multimedia systems, and considerations in the design of information systems. Team projects in most courses, a required internship, and a second-year capstone experience provide additional, focused venues for involving students in the cutting-edge issues and technologies in the field.

The Associate of Science in IST degree will be offered at multiple campuses within the Penn State system of colleges and campuses. Note that not all options will be available at all locations.

Application Development Option

Available at the following campuses: Berks, Greater Allegheny, Hazleton, Mont Alto, Scranton, World Campus, York

The Application Development option prepares students for entry level position in applications development and/or web development. It also prepares students for IST related baccalaureate degrees such as HCDD, IT, ETI, and CYBER. Students take courses such as web development and advanced java programming as well as usability.

Custom Option

Available at the following campuses: Berks, DuBois, Greater Allegheny, Hazleton, Mont Alto, Scranton, Wilkes-Barre, World Campus, York

The Custom option enables students to work closely with an adviser to develop a plan of study that meets the dual objectives of allowing a flexible academic program and a specific theme related to technology. Some examples of themes are web development, psychology, and usability.

Cybersecurity Option

Available at the following campuses: Berks, Greater Allegheny, Mont Alto, World Campus, York

The Cybersecurity option prepares students for an entry level position in the cyber security field. It also prepares students for IST related

baccalaureate degrees such as Cybersecurity Analytics and Operations and SRA. Students take introductory courses in CYBER and SRA as well as advanced hand-on courses in these areas.

Generalized Business Option

Available at the following campuses: Berks, DuBois, Greater Allegheny, Mont Alto, Scranton, World Campus, York

The Generalized Business option enables students to specialize in the general business areas of accounting, marketing, and management, and is closely aligned with the requirements of the ETI major.

Networking Option

Available at the following campuses: DuBois, Mont Alto, World Campus

The Networking option prepares graduates for positions as entry-level computer network administrators. Students take courses in personal computer hardware, networking essentials, and network administration.

What is Information Sciences and Technology?

Information Sciences and Technology is a discipline that explores how we can strengthen the power of information and technology, and use it to increase human potential. This includes focusing on creating innovative systems and technological solutions that benefit businesses, organizations, and individuals, and understanding the role of technology in how we live our lives.

Entrance to Major

Students must have a minimum 2.0 GPA to change to this Associate degree after admission to the University.

Degree Requirements

For the Associate in Science degree in Information Sciences and Technology, a minimum of 60 credits is required:

Requirement	Credits
General Education	21
Electives	0-5
Requirements for the Major	43-47

6-9 of the 21 credits for General Education are included in the Requirements for the Major. For all options, this includes: 3 credits of GQ courses; 3 credits of GWS courses; 0-3 credits of GS courses. (3 credits of GQ courses in Additional Courses includes MATH 21, MATH 22, MATH 110, SCM 200 or STAT 200) and 3 credits of GWS courses including ENGL 15 or CAS 100 which are Prescribed Courses. Students may also overlap 3 credits of GS if they select SRA 111 in Additional Courses for the Major or if they select ECON 102/ECON 104 in the Generalized Business Option Additional Courses.)

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 (<https://senate.psu.edu/students/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/>).

Common Requirements for the Major (All Options)

Code	Title	Credits
Prescribed Courses		
<i>Prescribed Courses: Require a grade of C or better</i>		
CAS 100	Effective Speech	3
ENGL 15	Rhetoric and Composition	3
IST 140	Introduction to Application Development	3
IST 210	Organization of Data	3
IST 220	Networking and Telecommunications	3
IST 260W	Introduction to Systems Analysis and Design	3
Additional Courses		
ENGL 202C	Effective Writing: Technical Writing	3
or ENGL 202D	Effective Writing: Business Writing	
<i>Additional Courses: Require a grade of C or better</i>		
IST 250	Introduction to Web Design and Development	3
or IST 256	Programming for the Web	
Select 3 credits from the following: ¹		3
CYBER 100	Computer Systems Literacy	
CYBER 100S	Computer Systems Literacy	
HCDD 113	Foundations of Human-Centered Design and Development	
HCDD 113S	Foundations of Human-Centered Design and Development FYS	
IST 110	Information, People and Technology	
SRA 111	Introduction to Security and Risk Analysis	
Select 1 credit from the following:		1
IST 295A	Distributed Team Project	
IST 295B	IST Internship	
IST 495	Internship	
Select 3-4 credits from the following:		3-4
MATH 21	College Algebra with Analytic Geometry with Applications I	
MATH 22	College Algebra With Analytic Geometry and Applications II	
MATH 26	Plane Trigonometry and Applications of Trigonometry	
MATH 110	Techniques of Calculus I	
MATH 140	Calculus With Analytic Geometry I	
SCM 200	Introduction to Statistics for Business	
STAT 200	Elementary Statistics	

Supporting Courses and Related Areas

Supporting Courses and Related Areas: Require a grade of C or better
 Any first-year seminar course. Students who complete CYBER 100S or HCDD 113S as additional courses do not have to schedule an additional first-year seminar.

Requirements for the Option

Requirements for the Option: Require a grade of C or better
 Select an option 12-14

¹ Students planning to complete the Cybersecurity option must select CYBER 100/CYBER 100S. Courses may not double count with option requirements.

Requirements for the Option

Application Development Option (12 credits)

Available at the following campuses: Berks, Greater Allegheny, Hazleton, Mont Alto, Scranton, World Campus, York

Code	Title	Credits
Additional Courses		
<i>Additional Courses: Require a grade of C or better</i>		
Select 12 credits from the following:		12
HCDD 264	Design Practice in Human-Centered Design and Development	
or HCDD 331	Foundations of Human-Centered Design	
HCDD 311	Object-Oriented Design and Software Applications	
IST 242	Intermediate & Object-Oriented Application Development	
IST 256	Programming for the Web ¹	
IST 261	Application Development Design Studio I	

¹ IST 256 may count in the major requirements or the option, but may not double count toward both requirements.

Custom Option (12 credits)

Available at the following campuses: Berks, DuBois, Greater Allegheny, Hazleton, Mont Alto, Scranton, Wilkes-Barre, World Campus, York

Code	Title	Credits
Supporting Courses and Related Areas		
<i>Supporting Courses and Related Areas: Require a grade of C or better</i>		
Select 12 credits in consultation with an adviser. All courses are C-		12
required. Examples of specific themes include: Web Development, Psychology, Usability.		

Cybersecurity Option (12 credits)

Available at the following campuses: Berks, Greater Allegheny, Mont Alto, World Campus, York

Code	Title	Credits
Additional Courses		
<i>Additional Courses: Require a grade of C or better</i>		
Select 12 credits from the following: ¹		12
CYBER 221	Overview of Information Security	
CYBER 262	Cyber-Defense Studio	
IST 242	Intermediate & Object-Oriented Application Development	
SRA 111	Introduction to Security and Risk Analysis	
SRA 211	Threat of Terrorism and Crime	

¹ Courses may not double count with the major requirements.

Generalized Business Option (12-14 credits)

Available at the following campuses: Berks, DuBois, Greater Allegheny, Mont Alto, Scranton, World Campus, York

Code	Title	Credits
Additional Courses		
<i>Additional Courses: Require a grade of C or better</i>		
Select 12-14 credits from the following:		12-14

ACCTG 211	Financial and Managerial Accounting for Decision Making
BA 243	Social, Legal, and Ethical Environment of Business
or BLAW 243	Legal Environment of Business
or BA 241 & BA 242	Legal Environment of Business and Social and Ethical Environment of Business
BA 301	Finance
or FIN 301	Corporation Finance
BA 302	Supply Chains
or SCM 301	Supply Chain Management
BA 303	Marketing
or MKTG 301	Principles of Marketing
BA 304	Management and Organization
or MGMT 301	Basic Management Concepts
ECON 102	Introductory Microeconomic Analysis and Policy
or ECON 104	Introductory Macroeconomic Analysis and Policy

Networking Option (12 credits)

Available at the following campuses: DuBois, Mont Alto, World Campus

Code	Title	Credits
Prescribed Courses		
<i>Prescribed Courses: Require a grade of C or better</i>		
IST 225	PC Hardware Basics	3
IST 226	Networking Essentials	3
IST 227	Network Administration	3
IST 228	Advanced Network Administration	3

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 associate degree students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (<https://bulletins.psu.edu/undergraduate/general-education/associate-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 and Inter-Domain courses do not meet this requirement.)

- **Quantification (GQ):** 3 credits
- **Writing and Speaking (GWS):** 3 credits

Knowledge Domains

- **Arts (GA):** 3 credits
- **Humanities (GH):** 3 credits
- **Social and Behavioral Sciences (GS):** 3 credits
- **Natural Sciences (GN):** 3 credits

Note: Up to six credits of Inter-Domain courses may be used for any Knowledge Domain requirement, but when a course may be used to

satisfy more than one requirement, the credits from the course can be counted only once.

Exploration

- **Any General Education course (including GHW and Inter-Domain):** 3 credits

University Degree Requirements

Cultures Requirement

3 credits of United States (US) or International (IL) cultures coursework are required and may satisfy other requirements

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 60 degree credits must be earned for a associates degree. The requirements for some programs may exceed 60 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

Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (<https://senate.psu.edu/students/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/>)). For more information, check the Suggested Academic Plan for your intended program.

Program Learning Objectives

- **Knowledge/Application:** Understand and apply the use of information systems, through extensive practice using contemporary technologies in the creation, organization, storage, analysis, evaluation, communication, and transmission of information
 - Define and explain the core concepts, principles, processes, and theories within the information technology domain
 - Apply the core concepts of the academic coursework of IST and translate practical problems, through domain analysis into software applications usable in a human or organizational context via application creations that use high-level programming languages, combining original code with existing code libraries and application programming interfaces (APIs), to real-world problems
 - Formulate a solid understanding of the fundamental knowledge of the design and management of "data" via the utilization of database concepts and practical skills to analyze and implement a well-defined database design
 - Demonstrate a basic understanding of the working of digital networks
- **Problem-Solving:** Demonstrate, apply and adapt various problem-solving strategies, using appropriate technology and methods
 - Identify, analyze, and define information problems and/or opportunities through effective customer/client communication in terms of the human, information, and technology dimensions; and determine the right information technology requirements that are appropriate to their business scenarios

- 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) that emphasizes customer requirements at all stages of the process and address business constraints, and react to the existing designs as new needs arise
- Deploy up-to-date, relevant 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)
- **Use Communication Skills:** Apply written, oral, and graphic communication and work effectively (both individually and in teams) in both technical and non-technical environments 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
 - Seek out, analyze, and incorporate diverse ideas and broader perspectives represented in the diversity of people
 - Demonstrate 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:** Understand professional responsibilities in terms of the ethical, legal, security and social aspects of any given problem and its solution
 - Demonstrate an understanding of the cognitive, social, legal, ethical, diversity, and security perspectives surrounding a given problem
 - 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
 - Understand the rules, regulations and issues related to compliance with applicable laws and regulations related to Information Security and Privacy

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 (<https://senate.psu.edu/students/policies-and-rules-for-undergraduate-students/32-00-advising-policy/>)

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<https://www.worldcampus.psu.edu/degrees-and-certificates/penn-state-online-information-sciences-and-technology-associate-in-science-degree>

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<https://montalto.psu.edu/academics/associate/associate-information-sciences-and-technology-degree>

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