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 positions 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:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>21</td>
</tr>
<tr>
<td>Electives</td>
<td>0-5</td>
</tr>
<tr>
<td>Requirements for the Major</td>
<td>43-47</td>
</tr>
</tbody>
</table>

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/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44).
## Common Requirements for the Major (All Options)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS 100</td>
<td>Effective Speech</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 15</td>
<td>Rhetoric and Composition</td>
<td>3</td>
</tr>
<tr>
<td>IST 140</td>
<td>Introduction to Application Development</td>
<td>3</td>
</tr>
<tr>
<td>IST 210</td>
<td>Organization of Data</td>
<td>3</td>
</tr>
<tr>
<td>IST 220</td>
<td>Networking and Telecommunications</td>
<td>3</td>
</tr>
<tr>
<td>IST 260W</td>
<td>Introduction to Systems Analysis and Design</td>
<td>3</td>
</tr>
</tbody>
</table>

### Prescribed Courses

Prescribed Courses: Require a grade of C or better

### Additional Courses

ENGL 202C | Effective Writing: Technical Writing | 3
or ENGL 202D | Effective Writing: Business Writing | 3

Additional Courses: Require a grade of C or better

IST 250 | Introduction to Web Design and Development | 3
or IST 256 | Programming for the Web | 3

Select 3 credits from the following: 1

- CYBER 100 | Computer Systems Literacy | 3
- CYBER 100S | Computer Systems Literacy | 3
- HCDD 113 | Foundations of Human-Centered Design and Development | 3
- HCDD 113S | Foundations of Human-Centered Design and Development FYS | 3
- IST 110 | Information, People and Technology | 3
- SRA 111 | Introduction to Security and Risk Analysis | 3

Select 1 credit from the following: 1

- IST 295A | Distributed Team Project | 3
- IST 295B | IST Internship | 3
- IST 495 | Internship | 3

Select 3-4 credits from the following: 3-4

- MATH 21 | College Algebra with Analytic Geometry with Applications I | 3
- MATH 22 | College Algebra With Analytic Geometry and Applications II | 3
- MATH 26 | Plane Trigonometry and Applications of Trigonometry | 3
- MATH 110 | Techniques of Calculus I | 3
- MATH 140 | Calculus With Analytic Geometry I | 3
- SCM 200 | Introduction to Statistics for Business | 3
- STAT 200 | Elementary Statistics | 3

### 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

### Requirements for the Option

#### Application Development Option (12 credits)

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

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<tbody>
<tr>
<td>IST 242</td>
<td>Intermediate &amp; Object-Oriented Application Development</td>
<td>12</td>
</tr>
</tbody>
</table>
| IST 256 | Programming for the Web | 1
| IST 261 | Application Development Design Studio I | 1
| IST 311 | Object-Oriented Design and Software Applications | 1
| HCDD 264 | Design Practice in Human-Centered Design and Development | 1
| or IST 331 | Foundations of Human-Centered Design | 1

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

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<tr>
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</thead>
<tbody>
<tr>
<td>CYBER 262</td>
<td>Cyber-Defense Studio</td>
<td>12</td>
</tr>
</tbody>
</table>
| CYBER 262 | Intermediate & Object-Oriented Application Development | 1
| SRA 111 | Introduction to Security and Risk Analysis | 1
| SRA 211 | Threat of Terrorism and Crime | 1
| SRA 221 | Overview of Information Security | 1

1 Courses may not double count with the major requirements.

#### Cybersecurity Option (12 credits)

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

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<td>CYBER 262</td>
<td>Cyber-Defense Studio</td>
<td>12</td>
</tr>
</tbody>
</table>
| CYBER 262 | Intermediate & Object-Oriented Application Development | 1
| SRA 111 | Introduction to Security and Risk Analysis | 1
| SRA 211 | Threat of Terrorism and Crime | 1
| SRA 221 | Overview of Information Security | 1

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

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</tr>
</thead>
<tbody>
<tr>
<td>CYBER 262</td>
<td>Cyber-Defense Studio</td>
<td>12</td>
</tr>
</tbody>
</table>
| CYBER 262 | Intermediate & Object-Oriented Application Development | 1
| SRA 111 | Introduction to Security and Risk Analysis | 1
| SRA 211 | Threat of Terrorism and Crime | 1
| SRA 221 | Overview of Information Security | 1

1 Courses may not double count with the major requirements.

### Additional Courses

#### Additional Courses: Require a grade of C or better

Select 12 credits from the following: 12

- CYBER 100 | Computer Systems Literacy | 3
- CYBER 100S | Computer Systems Literacy | 3
- HCDD 113 | Foundations of Human-Centered Design and Development | 3
- HCDD 113S | Foundations of Human-Centered Design and Development FYS | 3
- IST 110 | Information, People and Technology | 3
- SRA 111 | Introduction to Security and Risk Analysis | 3

Select 1 credit from the following: 1

- IST 295A | Distributed Team Project | 3
- IST 295B | IST Internship | 3
- IST 495 | Internship | 3

Select 3-4 credits from the following: 3-4

- MATH 21 | College Algebra with Analytic Geometry with Applications I | 3
- MATH 22 | College Algebra With Analytic Geometry and Applications II | 3
- MATH 26 | Plane Trigonometry and Applications of Trigonometry | 3
- MATH 110 | Techniques of Calculus I | 3
- MATH 140 | Calculus With Analytic Geometry I | 3
- SCM 200 | Introduction to Statistics for Business | 3
- STAT 200 | Elementary Statistics | 3

### 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.
### Networking Option (12 credits)

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

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>IST 225</td>
<td>PC Hardware Basics</td>
<td>3</td>
</tr>
<tr>
<td>IST 226</td>
<td>Networking Essentials</td>
<td>3</td>
</tr>
<tr>
<td>IST 227</td>
<td>Network Administration</td>
<td>3</td>
</tr>
<tr>
<td>IST 228</td>
<td>Advanced Network Administration</td>
<td>3</td>
</tr>
</tbody>
</table>

### 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 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/](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/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80](https://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.

### Program Learning Objectives

- **Know Networking Systems and Industry Methods:** Demonstrate ability to apply various industry standards in system development, system maintenance, and ISO/IEC/IEEE standards.
- **Know Security Risk Factors:** Demonstrate knowledge of security risk factors impacting on various system components; understand the impact of those risk factors on the larger information system; and demonstrate the ability to design, develop, and implement secure information systems, using the latest industry standards and best practices, (i.e., securing hardware, software compliance, etc.).
- **Know the System Development Lifecycle (SDLC):** Demonstrate knowledge of the SDLC by applying its methods to information systems projects and lab exercises.
- **Manage Information Systems:** Demonstrate knowledge and execution of designing and managing various information systems.
- **Use Communication Skills:** Apply written, oral, and graphic communication effectively in both technical and nontechnical environments, and use appropriate technical literature.
- **Use Information Sciences Theory/Practice:** Use management theory and information technology processes in managing information systems, which include best practices for system design, development, and implementation.
- **Use Team Membership Skills:** Function effectively as a member of a technical team.
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/policies-and-rules-for-undergraduate-students/32-00-advising-policy/)

University Park
Undergraduate Academic Advising Center
E103 Westgate Building
University Park, PA 16802
814-865-8947
advising@ist.psu.edu

Berks
Tricia Clark
Program Coordinator, Instructor
Gaige 211
Reading, PA 19610
610-396-6349
BKInfoTech@psu.edu

DuBois
Jason Long
Assistant Teaching Professor
1 College Place
DuBois, PA 16823
814-372-3000
jel115@psu.edu

Hazleton
Barbara Brazon
Associate Teaching Professor of Information Sciences and Technology
Kostos 117
Hazleton, PA 18202
570-450-3089
bxb30@psu.edu

Mont Alto
Elizabeth Denlea
Lecturer and Program Coordinator of IST
006 Bookstore
1 Campus Drive
Mont Alto, PA 17237
717-749-6048
ebd5343@psu.edu

Scranton
Debra Smarkusky
Associate Professor
120 Ridge View Drive
Dunmore, PA 18512
570-963-2593
dls102@psu.edu

Wilkes-Barre
Wei-Fan Chen
Program Co-Coordinator, IST
44 University Drive
Dallas, PA 18612
570-675-9142
weifan@psu.edu

World Campus
Undergraduate Academic Advising
301 Outreach Building
University Park, PA 16802
814-863-3283
advising@outreach.psu.edu

York
Joseph Kasten
Assistant Professor of IST
IST Dept. Coordinator
1031 Edgecomb Ave.
York, PA 17403
jzk99@psu.edu

Contact
University Park
COLLEGE OF INFORMATION SCIENCES AND TECHNOLOGY
411 Eric J. Barron Innovation Hub Building
State College, PA 16801
814-865-3528

World Campus
COLLEGE OF INFORMATION SCIENCES AND TECHNOLOGY
411 Eric J. Barron Innovation Hub Building
State College, PA 16801
814-865-3528


Berks
EBC DIVISION
Gaige Building
Reading, PA 19610
610-396-6349
BKInfoTech@psu.edu

https://berks.psu.edu/academics/associate-information-sciences-technology

DuBois
1 College Place
DuBois, PA 16823
814-372-3000
jel115@psu.edu

https://dubois.psu.edu/academics/degrees/IT (https://dubois.psu.edu/academics/degrees/IT/)

Hazleton
Kostos 117
Hazleton, PA 18202
570-450-3089
bxb30@psu.edu

https://hazleton.psu.edu/associate-science-information-sciences-technology (https://hazleton.psu.edu/associate-science-information-sciences-technology/)

Mont Alto
006 Bookstore
1 Campus Drive
Mont Alto, PA 17237
717-749-6048
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Scranton
120 Ridge View Drive
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https://scranton.psu.edu/academics/degrees/associate/ist (https://scranton.psu.edu/academics/degrees/associate/ist/)

Wilkes-Barre
44 University Drive
Dallas, PA 18612
570-675-9142
weifan@psu.edu

https://wilkesbarre.psu.edu/academics/ist/associate-degrees (https://wilkesbarre.psu.edu/academics/ist/associate-degrees/)

York
1031 Edgecomb Ave.
York, PA 17403
jzk99@psu.edu

https://www.york.psu.edu/academics/associate/information-sciences-and-technology (https://www.york.psu.edu/academics/associate/information-sciences-and-technology/)