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

Begin Campus: Abington, Altoona, Berks, Beaver, Brandywine, DuBois, Erie, Fayette, Greater Allegheny, Harrisburg, Hazleton, Lehigh Valley, Mont Alto, New Kensington, Shenango, Schuylkill, University Park, Wilkes-Barre, Scranton, York

End Campus: University Park

Program Description

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

This major is structured to provide students with the theoretical frameworks and skill sets necessary to compete and be productive in the information technology-intensive global context that defines the new "Information Age." Specifically, the degree will be focused on a program that will build an understanding of core information technologies and related areas of study; will prepare students for the practical application of various information sciences and related technologies; and engage students in sharpening their abilities to think critically and to work in teams. All this will be done with considerable interdisciplinary integration in order to expose students to the cognitive, social, institutional, and global environments of IST. Team projects in most courses, a required internship, and a senior capstone experience provide additional, focused venues for involving students in the cutting-edge issues and technologies of the field.

Information Context: People, Organizations, and Society Option

Available at the following campuses: Beaver, Berks, Scranton, University Park, World Campus

This option focuses on how information technology affects social change and the delivery of information to the consumer. This includes the human-machine interface; organization and retrieval of information; digital libraries; information and telecommunications services; information and media industry structures; software services and intermediaries; telecommunications and information law and policy; sociological aspects of technology change; multimedia; and art, design, and aesthetics.

Information Systems: Design & Development Option

Available at the following campuses: Abington, Beaver, Berks, Brandywine, Harrisburg, Lehigh Valley, Scranton, University Park, World Campus, York

This option is focused on expanding the skills needed to develop advanced information technology systems using state-of-the-art tools and techniques. The emphasis is on providing the student with both knowledge in the design, implementation, testing and evolution of complex software systems as well as a set of project-oriented, team-programming experiences.

Information Technology: Integration & Application Option

Available at the following campuses: Abington, Beaver, Berks, Brandywine, Greater Allegheny, Harrisburg, Hazleton, Lehigh Valley, Mont Alto, New Kensington, Schuylkill, Scranton, University Park, Wilkes-Barre, World Campus, York

This option is designed to prepare students to use information technology to realize a variety of system-based goals (e.g., reliability, accessibility, efficiency, etc.). It is focused on developing a theoretical foundation and the skill set needed for integrating information technology into different systems for the purpose of enhancing system performance. The emphasis is on providing the student with both the theoretical frameworks needed to use information technology as a system attribute as well as a set of application-oriented experiences and skills.

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.

MORE INFORMATION ABOUT INFORMATION SCIENCES AND TECHNOLOGY (https://ist.psu.edu/students/undergrad/majors/istbs)

You Might Like This Program If...

• You want to develop new software and web applications, help businesses operate more effectively by creating and implementing technological solutions, or understand how technology is connected to broader social issues.
• You are interested in technology but also want to work with people.
• You enjoy coming up with creative solutions to difficult challenges.

MORE INFORMATION ABOUT WHY STUDENTS CHOOSE TO STUDY INFORMATION SCIENCES AND TECHNOLOGY (https://issuu.com/istpsu/docs/ist-major)

Entrance to Major

University Park

This program currently has administrative enrollment controls. Administrative Enrollment Controls are initiated when limitations of space, faculty, or other resources in a major prevent accommodating all students who request them. Students must follow the administrative enrollment controls that are in effect for the semester that they enter the university.

First-Year Students Entering Summer 2019, Fall 2019, Spring 2020

In order to be eligible for entrance to this major, students must satisfy the following requirements:

• 40-70 graded Penn State credits (excludes transfer and AP credits)
• completed with a grade of C or better: IST 110, IST 140 or CMPSC 101 or CMPSC 121, IST 210, and IST 220
• earned a minimum of 3.00 cumulative GPA
Students Who Entered Prior to Summer 2019
Students who entered the University during Summer 2018, Fall 2018, and Spring 2019 should view the administrative enrollment controls in the archived 2018-19 Undergraduate Bulletin (http://bulletins.psu.edu/archive/2018-19/undergraduate/general-information/academic-information/#administrativeenrollmentcontrolstext). Students who entered the University prior to the summer 2018 semester should view the administrative enrollment controls for the semester that they entered the university (http://advising.psu.edu/entrance-major-requirements) on the Academic Advising Portal.

World Campus
To be eligible for entrance to the Information Sciences and Technology (ISTBS) major, students must:

1. have completed the following entrance-to-major requirements with a grade of C or better in each: IST 110; IST 140 (or equivalent CMPSC 101 or CMPSC 121) IST 210; and IST 220.
2. have achieved a minimum cumulative grade point average of 2.00 prior to and through the end of the semester during which the entrance-to-major procedure is carried out.

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. Information Sciences and Technology undergraduates may apply for admission to the ISTBS/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 ISTBS undergraduate degree program.
2. Must have completed 60 credits of an ISTBS undergraduate degree program.
3. 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.
4. 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://gradschool.psu.edu/apply).
5. Must apply to the IUG program by February 15 of their junior year.

Degree Requirements
For the Bachelor of Science degree in Information Sciences and Technology, a minimum of 125 credits is required:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>45</td>
</tr>
<tr>
<td>Electives</td>
<td>8</td>
</tr>
<tr>
<td>Requirements for the Major</td>
<td>84</td>
</tr>
</tbody>
</table>

12 of the 45 credits for General Education are included in the Requirements for the Major. This includes 12 credits of General Education courses: 6 credits of GQ courses; 3 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)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prescribed Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAT 200</td>
<td>Elementary Statistics</td>
<td>4</td>
</tr>
<tr>
<td>IST 110</td>
<td>Information, People and Technology</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 230</td>
<td>Language, Logic, and Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>IST 301</td>
<td>Information and Organizations</td>
<td>3</td>
</tr>
<tr>
<td>IST 331</td>
<td>Foundations of Human-Centered Design</td>
<td>3</td>
</tr>
<tr>
<td>IST 440</td>
<td>Internship</td>
<td>3</td>
</tr>
<tr>
<td>IST 495</td>
<td>Internship</td>
<td>1</td>
</tr>
<tr>
<td><strong>Additional Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGL 202C</td>
<td>Effective Writing: Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 202D</td>
<td>Effective Writing: Business Writing</td>
<td></td>
</tr>
<tr>
<td>MATH 110</td>
<td>Techniques of Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 140</td>
<td>Calculus With Analytic Geometry I</td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
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</tr>
<tr>
<td>CMPSC 101</td>
<td>Introduction to Programming</td>
<td>3</td>
</tr>
<tr>
<td>CMPSC 121</td>
<td>Introduction to Programming Techniques</td>
<td></td>
</tr>
<tr>
<td>IST 140</td>
<td>Introduction to Application Development</td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECON 14</td>
<td>Principles of Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 102</td>
<td>Introductory Microeconomic Analysis and Policy</td>
<td></td>
</tr>
<tr>
<td>ECON 104</td>
<td>Introductory Macroeconomic Analysis and Policy</td>
<td></td>
</tr>
<tr>
<td><strong>Supporting Courses and Related Areas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attainment of third-level proficiency in a single foreign language ¹</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Select 6 credits of international courses in foreign culture from College-approved list</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>Supporting Courses and Related Areas: Require a grade of C or better</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select 3 credits at the 400 level in emerging issues and technologies from College-approved list</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Requirements for the Option
Select an option

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prescribed Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IST 431</td>
<td>The Information Environment</td>
<td>6</td>
</tr>
<tr>
<td>&amp; IST 432</td>
<td>and Legal and Regulatory Environment of Information Science and Technology</td>
<td></td>
</tr>
<tr>
<td><strong>Additional Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IST 240</td>
<td>Intermediate &amp; Object-Oriented Application Development</td>
<td>3</td>
</tr>
<tr>
<td>or IST 413</td>
<td>Usability Engineering</td>
<td></td>
</tr>
<tr>
<td><strong>Supporting Courses and Related Areas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select 12 credits from College-approved list (at least 3 credits at the 400-level and no more than 6 credits below the 200-level)</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Information Systems: Design & Development Option (24 credits)
Available at the following campuses: Abington, Beaver, Berks, Brandywine, Harrisburg, Lehigh Valley, Scranton, University Park, World Campus

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td><strong>Prescribed Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IST 242</td>
<td>Intermediate &amp; Object-Oriented Application Development</td>
<td>3</td>
</tr>
<tr>
<td>or IST 311</td>
<td>Object-Oriented Design and Software Applications</td>
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</tr>
<tr>
<td><strong>Additional Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IST 261</td>
<td>Application Development Design Studio I</td>
<td>3</td>
</tr>
<tr>
<td>or IST 361</td>
<td>Application Development Design Studio II</td>
<td></td>
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<tr>
<td>Select 6 credits of the following:</td>
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<td></td>
</tr>
<tr>
<td>IST 411</td>
<td>Distributed-Object Computing</td>
<td>3</td>
</tr>
<tr>
<td>IST 412</td>
<td>The Engineering of Complex Software Systems</td>
<td></td>
</tr>
<tr>
<td>IST 413</td>
<td>Usability Engineering</td>
<td></td>
</tr>
<tr>
<td><strong>Supporting Courses and Related Areas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select 9 credits from College-approved list (at least 3 credits must be at the 400-level)</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

¹ Proficiency must be demonstrated by either examination or course work. See the admission section of the general information in this Bulletin for the placement policy for Penn State foreign language courses.

¹ Students in the Information Systems: Design and Development Option are expected to take IST 242 prior to taking the prescribed and additional courses for that option.
Information Technology: Integration & Application Option (24 credits)
Available at the following campuses: Abington, Beaver, Berks, Brandywine, Greater Allegheny, Harrisburg, Hazleton, Lehigh Valley, Mont Alto, New Kensington, Schuylkill, Scranton, University Park, Wilkes-Barre, World Campus, York

Code  Title  Credits
Prescribed Courses
Prescribed Courses: Require a grade of C or better
IST 302  IT Project Management  3
IST 420  Fundamentals of Systems and Enterprise Integration  3
IST 421  Advanced Enterprise Integration: Technologies and Applications  3

Additional Courses
Additional Courses: Require a grade of C or better
IST 240  Introduction to Computer Languages  3
or IST 242  Intermediate & Object-Oriented Application Development

Supporting Courses and Related Areas
Select 12 credits from College-approved list (at least 3 credits at the 400-level and no more than 6 credits below the 200-level)

Integrated B.S. in Information Sciences and Technology / M.S. in Informatics
Available at the following campuses: University Park

The College of Information Sciences and Technology offers an integrated B.S./M.S. (IUG) program designed to allow academically superior students in the Information Sciences and Technology major to obtain both the bachelor’s in Information Sciences and Technology and M.S. degree in Informatics in a shorter period of time than would be necessary if the degrees were pursued separately. The first two to three years of undergraduate coursework follow the same undergraduate curriculum that other students follow in the Information Sciences & Technology major. Interested students may apply for admission to the IUG program no earlier than February 15 of their sophomore year and no later than February 15 of their junior year after completing a minimum of 60 credits. If admitted to the IUG, the final years of study include two graduate courses, IST 504 in the fall and IST 505 in the spring, plus six credits of research methods courses, twelve to fifteen credits of graduate specialty courses, and three to six credits of graduate thesis (IST 600) or scholarly paper (IST 594). Details are provided in the Sample Sequence of Graduate Coursework.

(Note: For Schreyer Honors College students, those who complete the graduate thesis for the Master’s requirement may use the graduate thesis, itself, to fulfill the undergraduate honors thesis requirement, as well. Honors students who opt for the Master’s scholarly paper must also complete an undergraduate honors thesis.)

The integrated B.S. in Information Sciences and Technology/M.S. in Informatics (IUG) degree meets the needs of the most academically talented students in the Information Sciences and Technology undergraduate major. A proportion of these successful students wish to pursue graduate studies sometime after graduation. Offering the IUG benefits these students by offering an accelerated path to a graduate degree. Additionally, the IUG program can provide these students with a more cohesive program of study with opportunities to engage in more comprehensive research leading to both the Bachelor’s and Master’s degree.

For the B.S. in Information Sciences & Technology/M.S. in Informatics IUG program, a minimum of 125 credits are required for the bachelor’s degree and 30 credits for the M.S. degree. Students admitted to the IUG program may double-count a maximum of 12 credits to their graduate and undergraduate degrees. The required 6 credits of IST 504 and IST 505 will apply to both the graduate program and the undergraduate program. Students may choose an additional 6 credits to double-count for both the undergraduate and graduate degrees from the following:

Code  Title  Credits
IST 411  Distributed-Object Computing  3
IST 412  The Engineering of Complex Software Systems  3
IST 413  Usability Engineering  3
IST 420  Fundamentals of Systems and Enterprise Integration  3
IST 421  Advanced Enterprise Integration: Technologies and Applications  3
IST 431  The Information Environment  3
IST 432  Legal and Regulatory Environment of Information Science and Technology  3

Graduate thesis or scholarly paper credits may not double-count.

The objectives of the Integrated Undergraduate Graduate Program include:

1. To offer highly qualified students the opportunity to earn two degrees in less time than it would take to do two sequential degrees. In particular, IUG students may count up to 12 credits towards both their B.S. and M.S. degree requirements.
2. To permit coherent planning of studies through the graduate degree, with advising informed by not only the requirements of the baccalaureate program, but also the longer-range goals of the graduate degree.
3. To introduce undergraduate students to the rigors of both graduate study and graduate faculty.
4. To make the resources of the Graduate School available to IUG students.
5. To allow students with IUG status to benefit from their association with graduate students whose level of work and whose intensity of interest and commitment parallel their own.

Admission Requirements
To initiate the application process, students must submit an Integrated Undergraduate-Graduate (IUG) Plan of Study, a transcript, and two letters of recommendation (both from faculty members) to the IST Graduate Programs Office. The IUG Coordinator in Graduate Programs will help undergraduate candidates determine a proposed sequence of courses that will prepare them for their application to the Integrated Undergraduate-Graduate (IUG) degree program. Acceptance into the IUG program will be determined by the Graduate Recruitment Committee.

Information Sciences and Technology undergraduate majors may apply for admission no earlier than 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 ISTBS undergraduate degree program.
2. Must have completed 60 credits of an ISTBS undergraduate degree program.
3. 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 course work completed for the major.
4. Must meet with the Graduate Program IUG Coordinator to declare interest and receive information about the IUG Program.
5. Must present an approved plan of study. The plan should cover the entire time period of the integrated program, and it should be reviewed periodically with an adviser.
6. Must acquire two letters of recommendation from faculty members.
7. 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.
8. Must apply to the IUG program by February 15 of their junior year.

In addition, applicants must apply to and be admitted to the Graduate School of the Pennsylvania State University at the time of their application to the IUG degree program. These admission standards are high, as it is thought the program will only be appropriate for students with high levels of academic skills. The program area does have discretion in admitting Information Sciences and Technology majors into the integrated program, and extenuating circumstances can always be considered in terms of possible admission. Individuals who are unable to be admitted into the integrated program of study can apply for regular admission to the graduate program when they complete their undergraduate program of study.

Sample Sequence of Graduate Coursework in Addition to Undergraduate Courses

Students admitted to the IUG program may double-count a maximum of 12 credits toward their graduate and undergraduate degrees in Information Sciences and Technology. In their senior year, IUG students will take 6 credits of specified graduate work, courses IST 504 and IST 505, and 6 credits of methods courses. These 6 credits of IST 504 and IST 505 will apply to both the graduate program and the undergraduate IST/B.S. support of option requirement. In their senior year, students may choose an additional 6 credits to double-count for both the undergraduate and graduate degrees. These courses must be at the 400-level or above. Students may choose any 400-level undergraduate option course (see below) that they are using to fulfill an undergraduate option requirement and the graduate specialty course requirement.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IST 411</td>
<td>Distributed-Object Computing</td>
<td>3</td>
</tr>
<tr>
<td>IST 412</td>
<td>The Engineering of Complex Software Systems</td>
<td>3</td>
</tr>
<tr>
<td>IST 413</td>
<td>Usability Engineering</td>
<td>3</td>
</tr>
<tr>
<td>IST 420</td>
<td>Fundamentals of Systems and Enterprise</td>
<td>3</td>
</tr>
<tr>
<td>IST 421</td>
<td>Integration: Technologies and Applications</td>
<td>3</td>
</tr>
<tr>
<td>IST 431</td>
<td>The Information Environment</td>
<td>3</td>
</tr>
<tr>
<td>IST 432</td>
<td>Legal and Regulatory Environment</td>
<td>3</td>
</tr>
</tbody>
</table>

Credits associated with the thesis or culminating scholarly paper, i.e., IST 600 and IST 594, may not be double-counted. However, for Schreyer Honors College students who choose the research thesis option, the Master's thesis deliverable, itself, may double-count for the undergraduate thesis deliverable requirement.

### First Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IST 504</td>
<td>3</td>
<td>IST 505</td>
<td>3</td>
</tr>
<tr>
<td>Methods course</td>
<td>3</td>
<td>Methods course</td>
<td>3</td>
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<tr>
<td></td>
<td>6</td>
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<td>6</td>
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</tbody>
</table>

### Second Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IST 600 or 594 (or Grad Speciality Course)</td>
<td>3 IST 600 or 594</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Grad Speciality Course</td>
<td>3 Grad Speciality Course</td>
<td>3</td>
<td></td>
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<tr>
<td>Grad Speciality Course</td>
<td>3 Grad Speciality Course</td>
<td>3</td>
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<tr>
<td></td>
<td>9</td>
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<td>9</td>
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</tbody>
</table>

Total Credits 30

1. These courses will double-count in the student’s undergraduate support of option area. Although IST 505 is an optional course for Master’s students in the Informatics program, it is a required course for students in the IUG; because IUG students will benefit from additional coursework on research paper writing.
2. Choose graduate level methods course after consultation with the student’s faculty adviser.
3. Students who choose to do a research thesis for their culminating experience must take 6 credits of IST 600. Students who choose to do a scholarly paper for their culminating experience may take either 3 or 6 credits of IST 594. Honors students in the IUG degree must choose the research thesis option and take 6 credits of IST 600, in order for their Master’s research thesis to count for their undergraduate honors thesis requirement.
4. Choose from approved list of 400-level required option courses in the student’s undergraduate major. These courses will double-count in the student’s graduate and undergraduate programs.
5. Choose any 400 or 500 level course that contributes to the student’s chosen area of specialty, such that the total number of credits at the 500 level or above equals at least 18. Total number of graduate specialty credits will vary according to the number of credits taken for the culminating experience (i.e., IST 600 or IST 594), such that the total number of credits toward the MS requirement equals 30.

The total resulting credits will be a minimum of 155 credits, with 125 credits completed for the undergraduate IST degree. Twelve graduate credits will be completed in the senior year, and the remaining 18 graduate credits will be completed in the super senior year.

If for any reason a student admitted to the B.S./M.S. program is unable to complete the requirement for the Master of Science degree program in Informatics, the student will be permitted to receive the Bachelor's degree assuming all degree requirements have been satisfactorily completed.

Student performance will be monitored on an ongoing basis by the student’s adviser and Graduate Programs. Students admitted to the integrated program must maintain a minimum cumulative GPA of 3.3 overall and a minimum 3.0 GPA in all courses used toward the M.S. degree in order to maintain good academic standing and meet graduation requirements. (See information on Grade-Point Average in the Graduate Bulletin (http://gradschool.psu.edu/graduate-education-policies)) For Schreyer Honors College students in the IUG program, students must maintain a minimum cumulative GPA of 3.4 overall and a minimum 3.0 GPA in all courses used toward the M.S. degree.
GPA in all courses used toward the M.S. degree in order to maintain good academic standing and meet graduation requirements. Successful completion of a Schreyer Scholar's Master's thesis will be accepted as completion of the honors thesis requirement.

**Program Learning Objectives**

**Knowledge/Application:**

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

**Problem-Solving:**

1. Understand, apply and adapt various problem solving strategies, using appropriate technology and methods.
   - a. Identify information problems and/or opportunities in terms of the human, informational and technology dimensions.
   - b. 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.
   - c. 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).
   - d. 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.
   - e. 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):**

1. Communicate and work effectively (both individually and in teams) with a range of perspectives and audiences through a variety of media.
   - a. Participate effectively on teams in order to accomplish a common goal.
   - b. 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)

**University Park**

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

**Abington**

Joseph Oakes
Program Chair
1600 Woodland Road
Abington, PA 19001
267-633-3316
jxo19@psu.edu

**Berks**

Tricia Clark
Program Coordinator, Instructor
Gaige 211
Reading, PA 19610
610-396-6349
tlc3@psu.edu

**Brandywine**

Nannette D’Imperio
Lecturer in Computer Science
25 Yearsley Mill Road
### 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).

### Design and Development Option, University Park 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

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits Spring</th>
<th>Credits</th>
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<tr>
<td>IST 110*#</td>
<td>3 IST 210*#</td>
<td>3</td>
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<tr>
<td>IST 140 or CMPSC 121*#</td>
<td>3 IST 220*#</td>
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<tr>
<td>MATH 110 or 140†</td>
<td>4 CAS 100†</td>
<td>3</td>
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<tr>
<td>World Language Level 1</td>
<td>4 ENGL 15, 30, or ESL 15†</td>
<td>3</td>
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</table>
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.

All incoming Schreyer Honors College first-year students at University Park will take ENGL/CAS 137 in the fall semester and ENGL/CAS 138 in the spring semester. These courses carry the GWS designation and replace both ENGL 30 and CAS 100. Each course is 3 credits.

Advising Notes:

- 1 credit of IST 495 is required. A grade of C or better must be earned for this course.
- IST courses have enforced pre-requisites.

Integration and Application Option, University Park 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.

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<th>Fall</th>
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<td>ECON 102 or 104*</td>
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<td>MATH 110 or 140†</td>
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<td>ENGL 15, 30, or ESL 15†</td>
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<td>General Education Course (GHW, GN, GA, or GS)</td>
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17

### Second Year

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<td>4 CAS 100†</td>
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16

### Third Year

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<td>IST 302*</td>
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<td>IST 420*</td>
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<td>Elective</td>
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<td>General Education Course (GHW, GN, GA, or GS)</td>
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<td>General Education Course (GHW, GN, GA, or GS)</td>
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15

### 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.

- Generic course requirements (GWS and GQ) require a grade of C or better for General Education.
- Specific course requirements (GHW, GN, GA, or GS) require a grade of C or better for the major.
- Course is an Entrance to Major requirement.
- Course satisfies General Education and degree requirement.
### Information Sciences and Technology, B.S. (Information Sciences and Technology)

#### Fourth Year

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<th>Fall</th>
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<td>IST 421*</td>
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<td>Support of Option 400 Level</td>
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<td>General Education Course (GHW, GN, GA, or GS)</td>
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<td>Foreign Cultures (IL)</td>
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<td>US Cultures or Elective</td>
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</table>

| Total Credits | 15 | 14 |

* 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:**

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**Advising Notes:**

- 1 credit of IST 495 is required. A grade of C or better must be earned for this course.
- IST courses have enforced pre-requisites.

**People, Organizations, and Society Option, University Park 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.

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<th>Spring</th>
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<td>World Language Level 1</td>
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| Total Credits | 17 | 16 |

**Second Year**

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<td>IST 240 or 242</td>
<td>3</td>
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<td>IST 230*</td>
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<td>STAT 200†</td>
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<td>CAS 100†</td>
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| Total Credits | 16 | 16 |

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<td>Foreign Culture (IL)</td>
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<td>IST 440*</td>
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</tr>
<tr>
<td>IST 432*</td>
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<td>Support of Option 400 Level</td>
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Career Paths

IST allows you to explore some of the biggest challenges facing society and work to solve them by leveraging information and using technology. It blends skills from a number of fields – computer science, business, psychology, math, sociology, political science – so you can help people and organizations thrive. IST’s Office of Career Solutions helps students navigate their internship and career development in the field through coaching, workshops, interview preparation, resume reviews, career fairs, job postings, and networking opportunities.

Careers

Because our courses blend technical knowledge with skills in communication and business, an IST degree allows for careers in nearly every industry including consulting, business, government, defense, entertainment, and medicine.

MORE INFORMATION ABOUT POTENTIAL CAREER OPTIONS FOR GRADUATES OF THE INFORMATION SCIENCES AND TECHNOLOGY PROGRAM (https://www.ist.psu.edu/students/careers)

Contact

University Park
OFFICE OF THE ASSOCIATE DEAN FOR GRADUATE AND UNDERGRADUATE STUDIES
E397F Westgate Building
University Park, PA 16802
814-863-3450
programs@ist.psu.edu

https://ist.psu.edu/directory/office/grad_undergrad_studies

Abington
DIVISION OF SCIENCE AND ENGINEERING
1600 Woodland Road
Abington, PA 19001
267-633-3316
jxo19@psu.edu

http://abington.psu.edu/information-sciences-and-technology-ist

Berks
EBC DIVISION
Gage Building
Reading, PA 19610
610-396-6349
tlc3@psu.edu

http://berks.psu.edu/bs-information-sciences-and-technology

Brandywine
25 Yearsley Mill Road
Media, PA 19063
610-892-1343
nxd13@psu.edu

http://brandywine.psu.edu/information-sciences-and-technology

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

http://dubois.psu.edu/ist

Greater Allegheny
101 Frable Building
4000 University Drive
McKeesport, PA 15132
412-675-9140
GA-Academics@lists.psu.edu

http://greaterallegheny.psu.edu/information-sciences-and-technology-bs

Harrisburg
SCHOOL OF BUSINESS ADMINISTRATION
Olmsted Building, E355
717-948-6141
ljc43@psu.edu


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

http://hazleton.psu.edu/bachelor-science-information-sciences-and-technology

Lehigh Valley
2809 Saucon Valley Road
Center Valley, PA 18034
610-285-5071
kmb6846@psu.edu

https://lehighvalley.psu.edu/academics/degrees/information-sciences-and-technology
**Mont Alto**  
6 Bookstore Building  
Mont Alto, PA 17237  
717-749-6241  
pjb159@psu.edu  

http://montalto.psu.edu/directory/baccalaureate-information-technology-program

**New Kensington**  
ACADEMIC AFFAIRS  
3550 Seventh Street Road  
New Kensington, PA 15068  
724-334-6031  
aea13@psu.edu  

https://newkensington.psu.edu/2-year-information-sciences-technology

**Scranton**  
212F Dawson  
Dunmore, PA 18512  
570-963-2593  
dls102@psu.edu  

http://worthingtonscranton.psu.edu/information-sciences-and-technology

**Wilkes-Barre**  
P.O. Box 264  
Lehman, PA 18627  
570-675-9142  
weifan@psu.edu  

http://wilkesbarre.psu.edu/academics/ist

**World Campus**  
OFFICE OF THE ASSOCIATE DEAN FOR GRADUATE AND UNDERGRADUATE STUDIES  
E397F Westgate Building  
University Park, PA 16802  
814-863-3450  
programs@ist.psu.edu  

https://www.worldcampus.psu.edu/degrees-and-certificates/information-sciences-and-technology-bachelors/overview

**York**  
226 Grumbacher Building (GISTC)  
York, PA 17403  
717-771-4143  
wpc2@psu.edu  

http://york.psu.edu/academics/baccalaureate/information-sciences-and-technology