University Bulletin

Undergraduate Degree Programs

Primary Navigation

Information Sciences and Technology

The College of Information Sciences and Technology's degree programs bring information, people, and technology together. The IST major helps students prepare for careers related to the ways people create, modify, and use information technologies--and how information technology affects individuals, organizations, and society. The IST major covers a broad range of topics from software development to social media to business applications for technology. The major helps students acquire the skills to have an immediate impact in the working world. Students are taught how to use technology to solve real-life problems, interact with a variety of people, and keep their skill set sharp as technology continues to evolve.

Students who wish to enter the IST major should enjoy working with information technologies and be willing to work in teams with other students. Students should have an interest in furthering their communication skills and learning how to present to and work with both technical and nontechnical audiences. Computer programming experience is not necessary, but may be helpful for some options.

IST graduates are in high demand across a spectrum of fields, as evidenced by an outstanding placement rate. Degrees from the college help students go where they want to go with information technology and find satisfying work in such areas as business, health care, government, the arts, and nonprofit service organizations.

The course of study in IST includes work in database creation and management, networks, mathematics, programming, emerging technologies, organizations and information, integration of information technology, human-computer interface, information policy and regulation, and information systems. Both the baccalaureate and associate degree programs require a professional internship.

The IST faculty is a diverse group of thought leaders in numerous fields, including computer science, engineering, psychology, chemistry, artificial intelligence, sociology, geography, and more. Through their varied expertise, they are jointly helping to guide and direct the course of development of the entire field of information sciences and technology.

Several minors are available for students throughout the University who are looking to build an academic program that includes courses in information sciences and technology.

RECOMMENDED ACADEMIC PLANS

Recommended Academic Plans provide, in table form, the courses students might schedule semester by semester as they pursue a specific undergraduate degree. Each college or campus maintains Recommended Academic Plans for its own majors/degree programs. Links to these plans are on the Division of Undergraduate Studies website at:

http://www.dus.psu.edu/semplans.htm Questions concerning the Recommended Academic Plans should be directed to the college or campus involved or the Division of Undergraduate Studies.

ADMINISTRATION

DAVID L. HALL, *Dean*

MARY BETH ROSSON, *Associate Dean for Undergraduate Studies*

8/7/12

Baccalaureate Degrees

Information Sciences and Technology

University Park, College of Information Sciences and Technology (ISTBA)

The Bachelor of Arts in Information Sciences and Technology will provide students who are inherently independent and creative with new avenues of study. This degree will be one which will provide them with a thorough grounding in information sciences and technology but also the flexibility to design a curriculum of study to fit their interests and aspirations. Whether these students wish to blend information science and technology with the arts, the humanities, or with the sciences, this degree will provide them with the breadth of experience that they need to accomplish their goals. the core of the B.A. program in IST will parallel that of the B.S. degree, thus the B.A. student will be equipped with the same core expertise and tools sets that they need to be able to navigate through the increasingly complex technology landscape. However the flexibility of the curriculum will give them the opportunity to learn how to apply IT creatively. The B.A. in IST will be highly interdisciplinary, as is fitting for an expressly interdisciplinary college. The degree will be suitable for students who wish to be entrepreneurs, who seek to go on to law or medical school, or who want to acquire an advanced degree in graduate studies.

Entrance Requirements: To be eligible for entrance to the Information Sciences and Technology (ISTBA) major, students must:

1. have achieved at least third semester classification while pursuing a program of study that includes at least two of the following four courses with a grades of C or better in each: IST 110, IST 130, IST 210, IST 220.
2. have met with a member of the IST Advising staff, with the outcome being a workable academic plan selected either from a set of example templates (e.g., pre-law) or developed in consultation with the adviser. This meeting must take place prior to the completion of 60 credits. At campuses other than University Park, students will meet with a local IST adviser to develop their academic plans.

For the B.A. degree in Information Sciences and Technology, a minimum of 125 credits is required.

Scheduling Recommendation by Semester Standing given like (Sem: 1-2)

GENERAL EDUCATION: 45 credits
(See description of General Education in front of the *Bulletin*.)

FIRST-YEAR SEMINAR:
(Included in ELECTIVES or GENERAL EDUCATION course selection)

UNITED STATES CULTURES AND INTERNATIONAL CULTURES:
(Included in REQUIREMENTS FOR THE MAJOR)

WRITING ACROSS THE CURRICULUM:
(Included in REQUIREMENTS FOR THE MAJOR)

ELECTIVES: 15 credits

BACHELOR OF ARTS DEGREE REQUIREMENTS: 24 credits
(3 of these 24 credits are included in the REQUIREMENTS FOR THE MAJOR, GENERAL EDUCATION, or ELECTIVES and 0-12 credits are included in ELECTIVES if foreign language proficiency is demonstrated by examination.)
(See description of Bachelor of Arts Degree Requirements in this bulletin.)

REQUIREMENTS FOR THE MAJOR: 41 credits

PRESCRIBED COURSES (17 credits)
IST 110 GS(3)**[1]**, IST 130 GA(3)**[1]**, IST 210(4)**[1]**, IST 220(3)**[1]** (Sem: 1-4)
IST 495(1)**[1]** (Sem: 3-8)
IST 440W(3)**[1]** (Sem: 7-8)

SUPPORTING COURSES AND RELATED AREAS (24 credits)**[1]**
Select 24 credits of IST and IST-related courses in consultation with academic adviser. (At least 12 credits must be at the 400 level.)

[1] A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

Last Revised by the Department: Fall Semester 2009

Blue Sheet Item #: 37-06-048

Review Date: 4/14/09

IS

Information Sciences and Technology

Abington College (ISSAB)
Berks College (ISSBL)
Capital College (ISSCA)
University College: Penn State Beaver, Penn State Brandywine, Penn State Greater Allegheny, Penn State Hazleton, Penn State New Kensington, Penn State Lehigh Valley, Penn State Mont Alto, Penn State Schuylkill, Penn State Wilkes-Barre, Penn State

Worthington Scranton, Penn State York (ISSCC)
World Campus

University Park, College of Information Sciences and Technology (ISTBS)

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 SYSTEMS: DESIGN & DEVELOPMENT OPTION: 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: 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.

INFORMATION CONTEXT: PEOPLE, ORGANIZATIONS, AND SOCIETY OPTION: 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.

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

1. be taking, or have taken, a program appropriate for entry to the major as shown in the *Bulletin*, including approximately 60 credits of course work.
2. have completed the following entrance-to-major requirements with grades of C or better in each: IST 110(3); IST 210(4); and IST 220(3). These courses must be completed by the end of the semester during which the entrance-to-major procedure is carried out.
3. 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.

For the B.S. degree in Information Sciences and Technology, a minimum of 125 credits is required.

Scheduling Recommendation by Semester Standing given like (Sem: 1-2)

GENERAL EDUCATION: 45 credits
(12 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of the *Bulletin*.)

FIRST-YEAR SEMINAR:
(Included in ELECTIVES or GENERAL EDUCATION course selection)

UNITED STATES CULTURES AND INTERNATIONAL CULTURES:
(Included in REQUIREMENTS FOR THE MAJOR)

WRITING ACROSS THE CURRICULUM:
(Included in REQUIREMENTS FOR THE MAJOR)

ELECTIVES: 7 credits

REQUIREMENTS FOR THE MAJOR: 85 credits
(This includes 12 credits of General Education courses: 6 credits of GQ courses; 3 credits of GS courses; and 3 credits of GWS courses.)

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 64 credits

PRESCRIBED COURSES (33 credits)
CMPSC 101 GQ(3)**[1]**, IST 110 GS(3)**[1]**, IST 210(4)**[1]**, IST 220(3)**[1]**, IST 230(3)**[1]**, IST 240(3)**[1]** (Sem: 1-4)
STAT 200 GQ(4) (Sem: 3-6)
IST 495(1)**[1]** (Sem: 3-8)
IST 301(3)**[1]**, IST 331(3)**[1]** (Sem: 5-8)
IST 440W(3)**[1]** (Sem: 7-8)

ADDITIONAL COURSES (10 credits)
ECON 102 GS(3), ECON 104 GS(3), or ECON 014 GS(3) (Sem: 1-4)
ENGL 202C GWS(3) or ENGL 202D GWS(3) (Sem: 1-4)
MATH 110 GQ(4) or MATH 140 GQ(4) (Sem: 1-4)

SUPPORTING COURSES AND RELATED AREAS (21 credits)
Attainment of third-level proficiency in a single foreign language (12 credits). 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. (Sem: 1-4)
Select 6 credits of international courses in foreign culture from College-approved list (Sem: 5-8)
Select 3 credits**[1]** at the 400 level in emerging issues and technologies from College-approved list (Sem: 5-8)

REQUIREMENTS FOR THE OPTION: 21 credits

INFORMATION SYSTEMS: DESIGN & DEVELOPMENT OPTION: 21 credits

PRESCRIBED COURSES (3 credits)**[1]**
IST 311(3) (Sem: 5-8)

ADDITIONAL COURSES (6 credits)**[1]**
Select 6 credits from IST 411(3), IST 412(3), or IST 413(3) (Sem: 5-8)

SUPPORTING COURSES AND RELATED AREAS (12 credits)

Select 12 credits from College-approved list (Sem: 5-8)

INFORMATION TECHNOLOGY: INTEGRATION & APPLICATION OPTION: 21 credits

PRESCRIBED COURSES (9 credits)**[1]**
IST 302(3), IST 420(3), IST 421(3) (Sem: 5-8)

SUPPORTING COURSES AND RELATED AREAS (12 credits)
Select 12 credits from College-approved list (Sem: 5-8)

INFORMATION CONTEXT: PEOPLE, ORGANIZATIONS, AND SOCIETY OPTION: 21 credits

PRESCRIBED COURSES (6 credits)**[1]**
IST 431(3) and IST 432(3) (Sem: 5-8)

ADDITIONAL COURSES (3 credits)**[1]**
IST 302(3) or IST 413(3) (Sem: 1-4)

SUPPORTING COURSES AND RELATED AREAS (12 credits)
Select 12 credits from College-approved list (Sem: 5-8)

[1] A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

Last Revised by the Department: Summer Session 2009

Blue Sheet Item #: 37-06-049

Review Date: 4/14/09

IS

Security and Risk Analysis

Penn State Altoona (SRAAL)
Penn State Berks (SRABL)
Penn State Harrisburg (SRACA)
University Park, College of Information Sciences and Technology (SRA)
World Campus

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

PROFESSOR FRED FONSECA, *Associate Dean for Undergraduate Studies*

The Bachelor of Science in Security and Risk Analysis (SRA) in the College of Information Sciences and Technology is intended to familiarize students with the general frameworks and multidisciplinary theories that define the area of security and related risk analyses. Courses in the major will engage students in the challenges and problems associated with assuring information confidentiality and integrity (e.g., social, economic, technology-related, and policy issues), as well as the strengths and weaknesses of various methods for assessing and mitigating associated risk.

The major provides a grounding in the analysis and modeling efforts used in information search, visualization, and creative problem solving. This knowledge is supplemented through an examination of the legal, ethical, and regulatory issues related to security that includes analyzing privacy laws, internal control and regulatory policies, as well as basic investigative processes and principles. Such understanding is applied to venues that

include transnational terrorism, cyber crimes, financial fraud, risk mitigation, and security and crisis management. It also includes overviews of the information technology that plays a critical role in identifying, preventing and responding to security-related events.

Advisory groups from within and outside the University involved in the design of the major have agreed that graduates who can understand the cognitive, social, economic, and policy issues involved in security and risk management as well as the basics of the information technology and analytics that are included in the security/risk arena will be very successful. These observations drove the design and objectives of the SRA major.

SRA majors will choose one of the following options:

INTELLIGENCE ANALYSIS AND MODELING OPTION. 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. 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.

SOCIAL FACTORS AND RISK. This option includes the legal, regulatory, ethical, and other theories associated with security and risk. Such an examination is focused on understanding the social factors and causes that are linked to transnational terrorism, investigations and litigation involved in business, and other security-related environments.

Entrance Requirements: To be eligible for entrance to the Security and Risk Analysis (SRA) major, students must:

1. be taking, or have taken, a program appropriate for entry to the major as shown in the *Bulletin*, including approximately 60 credits of course work.
2. have completed the following entrance-to-major requirements with grades of C or better in each: IST 110(3); SRA 111(3); and SRA 211(3). These courses must be completed by the end of the semester during which the entrance-to-major procedure is carried out.
3. 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.

For the B.S. degree in Security and Risk Analysis, a minimum of 120 credits is required.

Scheduling Recommendation by Semester Standing given like (Sem: 1-2)

GENERAL EDUCATION: 45 credits
(22 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of the *Bulletin*.)

FIRST-YEAR SEMINAR:
(Included in ELECTIVES or GENERAL EDUCATION course selection)

UNITED STATES CULTURES AND INTERNATIONAL CULTURES:
(Included in REQUIREMENTS FOR THE MAJOR)

WRITING ACROSS THE CURRICULUM:
(Included in REQUIREMENTS FOR THE MAJOR)

ELECTIVES: 3 credits

REQUIREMENTS FOR THE MAJOR: 94 credits
(This includes 22 credits of General Education courses: 6 credits of GQ courses; 6 credits of GS courses; 3 credits of GWS courses, 3 credits of GH, and 4 credits of GN courses)

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 73 credits

PRESCRIBED COURSES (39 credits)
CMPSC 101 GQ(3)**[1]**, SRA 111 GS(3)**[1]** (Sem: 1-2)
IST 110 GS(3)**[1]** (Sem: 1-3)
IST 210(4)**[1]** (Sem: 1-4)
SRA 211(3)**[1]**, SRA 221(3)**[1]**, SRA 231(3)**[1]** (Sem: 2-4)
STAT 200 GQ(4) (Sem: 3-6)
IST 495(1)**[1]** (Sem: 3-8)
IST 432(3)**[1]**, SRA 311(3)**[1]**, STAT 460(3) (Sem: 5-6)
IST 440W(3)**[1]** (Sem: 7-8)

ADDITIONAL COURSES (12 credits)
AG BM 101 GS(3) or ECON 102 GS(3) (Sem: 1-4)
PL SC 001 GS(3), PL SC 014 GS;IL(3), or GEOG 040 GS;IL(3) (Sem: 1-4)
PSYCH 100 GS(3) or SOC 005 GS(3) (Sem: 1-6)
ENGL 202C GWS(3) or ENGL 202D GWS(3) (Sem: 5-8)

SUPPORTING COURSES AND RELATED AREAS (22 credits)
Attainment of third-level proficiency in a single foreign language (12 credits). 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. (Sem: 1-4)
Select 4 credits of lab lecture series (GN) in consultation with adviser (Sem: 1-6)
Select 6 credits of international courses from College-approved list or other courses approved by adviser. (Sem: 5-8)

REQUIREMENTS FOR THE OPTION: 21 credits

INTELLIGENCE ANALYSIS AND MODELING OPTION: (21 credits)

PRESCRIBED COURSES (12 credits)**[1]**
ECON 302 GS(3), SRA 321(3) (Sem: 3-6)
SRA 433(3), SRA 468(3) (Sem: 5-8)

SUPPORTING COURSES AND RELATED AREAS (9 credits)
Select 9 credits from College-approved list (Sem: 5-8)

INFORMATION AND CYBER SECURITY OPTION: (21 credits)

PRESCRIBED COURSES (12 credits)**[1]**
IST 220(3) (Sem: 1-6)
IST 451(3), IST 454(3), IST 456(3) (Sem: 5-8)

SUPPORTING COURSES AND RELATED AREAS (9 credits)
Select 9 credits from College-approved list (Sem: 5-8)

SOCIAL FACTORS AND RISK OPTION: (21 credits)

PRESCRIBED COURSES (9 credits)**[1]**
IST 452(3), SRA 471(3), SRA 472(3) (Sem: 5-8)

SUPPORTING COURSES AND RELATED AREAS (12 credits)

Select 12 credits from College-approved list (Sem: 5-8)

[1] A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

Last Revised by the Department: Spring Semester 2011

Blue Sheet Item #: 39-06-097

Review Date: 04/12/2011

UCA Revision #1: 8/14/06
UCA Revision #2: 7/30/07

Comments

IS

Associate Degrees

Information Sciences and Technology

Berks College (2ISBL)
Continuing Education, University Park
University College: Penn State Beaver, Penn State DuBois, Penn State Fayette, Penn State Hazleton, Penn State Mont Alto, Penn State New Kensington, Penn State Schuylkill, Penn State Shenango, Penn State Wilkes-Barre, Penn State Worthington Scranton, Penn State York (2ISCC)
World Campus

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

PROFESSOR MARY BETH ROSSON, *Associate Dean for Undergraduate Studies*

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 multi-media 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.

Baccalaureate Option: This option provides maximum articulation with the baccalaureate degree. Students who complete this option will meet all lower division requirements for the baccalaureate degree. This is not the case with the remaining options, although the

degree of articulation is quite high for all associate degree options.

Generalized Business Option: This option enables students to specialize in the general business areas of accounting, marketing, and management.

Individualized Option: This 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 providing breadth of technical specialization. An example would be a program where a student would take some of the courses listed in the Web Administration option and the remainder in the Software option.

Software Option: This option prepares graduates for entry-level programming support positions in industry. Students take courses in Web programming, database programming, and other contemporary programming environments.

Web Administration Option: This prepares graduates for positions as Web administrators and Web programmers.

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

Data/Information Option: This option prepares graduates for entry-level database support positions. Students take courses in relational database systems and database management.

Industrial/Manufacturing Option: This option prepares graduates for entry-level manufacturing information systems positions. Students take courses in electrical and mechanical systems, and business and industrial processes.

Telecommunications Option: This option prepares graduates for entry-level positions in the telecommunications industry. Students take courses in voice and data communications, protocols, networks, and wireless systems.

For the Associate in Science degree in IST, a minimum of 60 credits is required.

Scheduling Recommendation by Semester Standing given like (Sem: 1-2)

GENERAL EDUCATION: 21 credits
(9-12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See the description of General Education in this bulletin.)

ELECTIVES: 2-6 credits

REQUIREMENTS FOR THE MAJOR: 45-47 credits
(This includes 9-12 credits of General Education courses, i.e., ALL options: 3 credits of GQ courses; 6 credits of GWS courses. The Baccalaureate Option also includes 3 credits of GS courses to equal a total of 12 credits that double count; the General Business Option also includes 0-3 credits of GS courses to equal 9-12 credits that double count.)

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 30 credits

PRESCRIBED COURSES (26 credits)
CMPSC 101 GQ(3)**[1]** (Sem: 1-2)
CAS 100B GWS(3), IST 110 GS(3)**[1]**, IST 111S(1)**[1]**, IST 210(4)**[1]**, IST 220(3)**[1]**, IST 250(3)**[1]**, ENGL 015 GWS(3) (Sem: 1-2)
IST 260W(3)**[1]** (Sem: 3-4)

ADDITIONAL COURSES (4 credits)
ENGL 202C GWS(3) or ENGL 202D GWS(3) (Sem: 3-4)

IST 295A(1)[1] or IST 295B(1)[1] (Sem: 3-4)

REQUIREMENTS FOR THE OPTION: 15-18 credits

BACCALAUREATE OPTION: (17-18 credits)

PRESCRIBED COURSES (13 credits)
IST 230(3)[1] and IST 240(3)[1] (Sem: 3-4)
ECON 102 GS(3) (Sem: 3-4)
STAT 200 GQ(4) (Sem: 3-4)

ADDITIONAL COURSES (4 credits)
MATH 110 GQ(4) or MATH 140 GQ(4) (Sem: 1-2)

GENERALIZED BUSINESS OPTION: (15-16 credits)

ADDITIONAL COURSES (15-16 credits)
Select 15 credits in consultation with the adviser from the following list: (Sem:1-4)
ACCTG 151(3), ACCTG 152(3), ACCTG 153(3), ACCTG 160(3), ACCTG 170(3), ACCTG 211(4), B A 250(3), MKTG 220(3), MKTG 221(3), MKTG 310(3), MKTG 327(3), MGMT 100(3), MGMT 150(3), MGMT 321(3), MGMT 341(3)
ECON 102 GS(3), ECON 104 GS(3), or ECON 014 GS(3)
MATH 017 GQ(3), MATH 021 GQ(3), MATH 022 GQ(3), or MATH 026 GQ(3)

INDIVIDUALIZED OPTION: (15 credits)

SUPPORTING COURSES AND RELATED AREAS (15 credits)
Select 15 credits in consultation with an adviser that follow a coherent theme in information sciences and technology with a grade of C or better required for all IST[1] courses. (Sem: 1-4)

SOFTWARE OPTION: (15 credits)

PRESCRIBED COURSES (12 credits)
CMPSC 302(3) (Sem: 2-4)
IST 211(3)[1], IST 247(3)[1], and IST 256(3)[1] (Sem: 3-4)

ADDITIONAL COURSES (3 credits)
MATH 017 GQ(3), MATH 021 GQ(3), MATH 022 GQ(3), or MATH 026 GQ(3) (Sem: 1-2)

NETWORKING OPTION: (15 credits)

PRESCRIBED COURSES (12 credits)
IST 225(3)[1], IST 226(3)[1], IST 227(3)[1], and IST 228(3)[1] (Sem: 3-4)

ADDITIONAL COURSES (3 credits)
MATH 017 GQ(3), MATH 021 GQ(3), MATH 022 GQ(3), or MATH 026 GQ(3) (Sem: 1-2)

WEB ADMINISTRATION OPTION: (15 credits)

PRESCRIBED COURSES (12 credits)
IST 255(3)[1], IST 256(3)[1], IST 257(3)[1], and IST 258(3)[1] (Sem: 3-4)

ADDITIONAL COURSES (3 credits)
MATH 017 GQ(3), MATH 021 GQ(3), MATH 022 GQ(3), or MATH 026 GQ(3) (Sem: 1-2)

MANUFACTURING OPTION: (16 credits)

PRESCRIBED COURSES (12 credits)
IST 271(3)[1], IST 272(3)[1], IST 273(3)[1], and IST 274(3)[1] (Sem: 3-4)

ADDITIONAL COURSES (4 credits)
MATH 110(4) or MATH 140(4) (Sem: 1-2)

TELECOMMUNICATIONS OPTION: (15 credits)

PRESCRIBED COURSES (12 credits)
IST 221(3)[1], IST 222(3)[1], IST 223(3)[1], and IST 224(3)[1] (Sem: 3-4)

ADDITIONAL COURSES (3 credits)
MATH 017 GQ(3), MATH 021 GQ(3), MATH 022 GQ(3), or MATH 026 GQ(3) (Sem: 1-2)

DATA/INFORMATION OPTION: (15 credits)

PRESCRIBED COURSES (12 credits)
IST 211(3)[1], IST 212(3)[1], IST 213(3)[1], and IST 214(3)[1] (Sem: 3-4)

ADDITIONAL COURSES (3 credits)
MATH 017 GQ(3), MATH 021 GQ(3), MATH 022 GQ(3), or MATH 026 GQ(3) (Sem: 1-2)

[1] A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

Last Revised by the Department: Spring Semester 2013

Blue Sheet Item #: 41-06-059

Review Date: 04/09/2013

UCA Revision #2: 7/27/07

IS

Minors

Global Security Minor

University Park, College of Information Sciences and Technology
University Park, College of the Liberal Arts (GLBSC)

The Global Security Minor will be jointly offered by the College of Information Sciences and Technology and the College of the Liberal Arts and overseen by the Department of Political Science. This joint minor is intended to provide students with a background of the theoretical frameworks and skill sets needed to understand the concepts essential to security and related analyses; the challenges and problems faced when dealing with threats to security (e.g., technology, policies, and regulations); and the strengths and weaknesses of various methods of analyzing and responding to challenges to security. The minor includes a grounding in social, historical, and cultural factors that underlie both conflict between states and conflicts between state and nonstate actors, as well as the legal, ethical, and regulatory issues related to security. A one-time tuition surcharge will be applied to all students enrolled in the minor.

A grade of C or better is required for all courses in the minor.

Scheduling recommendation by Semester Standing given like (Sem: 1-2)

REQUIREMENTS FOR THE MINOR: 18-33 credits[1]

PRESCRIBED COURSES: (9 credits)
SRA 111 GS(3), SRA 211(3), PL SC 007 GS(3) (Sem: 1-8)

ADDITIONAL COURSES (6 credits)
Select 6 credits from PL SC 410(3), PL SC 415(3), PL SC 416(3), PL SC 418(3), PL SC 437(3), PL SC 438(3), PL SC 439(3), PL SC 442(3) (Sem: 4-8)

SUPPORTING COURSES AND RELATED AREAS (3-18 credits)
Select 0-13 credits: 12th-credit-level proficiency in one foreign language demonstrated by course work or examination.

Select 3 credits from COMM 490(3), COMM 491(3), COMM 492(3), GEOG 424 US;IL(3), GEOG 428 US(3), GEOG 463(3), GEOG 464(3), HIST 420 IL(3), HIST 434 IL(3), HIST 452 US;IL(3), HIST 467 US;IL(3), HIST 473 IL(3), HIST 475Y IL(3), HIST 479 IL(3), HIST 486 IL(3), or 3 credits of appropriate internship work in consultation with adviser (Sem: 4-8)

Last Revised by the Department: Fall Semester 2007

Blue Sheet Item #: 35-06-459

Review Date: 4/10/07

LA

Information Sciences and Technology for Aerospace Engineering Minor

University Park, College of Engineering
University Park, College of Information Sciences and Technology (ISASP)

The role of Information Sciences and Technology in the practice of Aerospace Engineering is very important. Aerospace systems rely heavily on computers, software, and digital information; for control, sensors, and other onboard systems. The Boeing 777 has more than 1000 processors and roughly 20 million lines of software onboard, and F-16 and F-117As cannot fly without their onboard computers. In addition, many future aerospace vehicles will be unmanned, and the software challenges will be even greater. The onboard memory has also increased exponentially, the F-106 had 20 KBytes of memory and the new Joint Strike Fighter might have 2 GBytes of memory. The hardware and software must be carefully designed and thoroughly tested, since most aerospace systems are mission- or safety-critical systems. Computers and software are heavily used in the design, development, and manufacturing of aerospace systems. Large supercomputers are often used in the design process. The IST minor will enrich their educational achievements and increase their chances in obtaining employment or entering graduate school. The NSF and the DOD are encouraging universities to enhance their educational programs so that we have well-qualified engineers for future systems, and our IPAC members have stressed the importance of IT for our students.

Student must apply for entrance to the minor no later than their 7th semester. A one-time tuition surcharge will be applied to all students enrolled in the minor.

A grade of C or better is required for all courses in the minor.

Scheduling Recommendation by Semester Standing given like (Sem: 1-2)

REQUIREMENTS FOR THE MINOR: 19 credits

PRESCRIBED COURSES (13 credits)
CMPSC 201C(3), IST 110 GS(3) (Sem: 1-4)
IST 210(4), IST 220(3) (Sem: 5-6)

ADDITIONAL COURSES (6 credits)
Select 6 credits from: AERSP 423(3), AERSP 424(3), AERSP 440(3), or AERSP 460(3) (Sem: 5-8)

Last Revised by the Department: Spring Semester 2008

Blue Sheet Item #: 36-01-038

Review Date: 8/28/07

UCA Revision #2: 7/26/07

Comments

EN

Information Sciences and Technology for Communication Arts and Sciences Minor

University Park: College of Information Sciences and Technology and College of the Liberal Arts (ISCAS)

The Internet and other technologies are emerging as important communication channels. People establish personal relations online, develop language skills, conduct business, and make arguments online. Web sites have become important sites of public discourse and are playing an encompassing role in political campaigns. Students who pursue careers as communication consultants, in management or human resources, as political speech writers, and as independent business operators need information management skills. As a result, it is essential for Communication Arts and Sciences students to be fully versed in information sciences and technology for both personal and professional advancement. A one-time tuition surcharge will be applied to all students enrolled in the minor.

A grade of C or better is required for all courses in this minor.

Scheduling Recommendations by Semester Standing given like (Sem: 1-2)

REQUIREMENTS FOR THE MINOR: 19 credits

PRESCRIBED COURSES (10 credits)
IST 110 GS(3) (Sem: 1-2)
IST 210(4) (Sem: 3-4)
IST 220(3) (Sem: 5-6)

ADDITIONAL COURSES (9 credits)
Select 9 credits of CAS courses from a department-approved list with at least 6 credits at the 400 level. (Sem: 5-8)

Last Revised by the Department: Spring Semester 2007

Blue Sheet Item #: 35-01-183

Review Date: 8/29/06

Information Sciences and Technology for Earth and Mineral Sciences Minor

University Park, College of Earth and Mineral Sciences
University Park, College of Information Sciences and Technology (ISEMS)

Information Systems are a core component of any research, educational or industrial enterprise in the Earth and Materials Sciences. In addition, the science and engineering disciplines represented in the College have a particular focus on numerical modeling and simulation systems, and on the analysis and management of very large data sets. The EMS - IST minor provides students a basic introduction to information sciences and information technology through courses in the core curriculum of the School of Information Sciences and Technology. Students then select from a group of interdisciplinary EMS courses that focus on the particular interests of the College.

Students must apply for entrance to the minor no later than the beginning of their seventh semester. A one-time tuition surcharge will be applied to all students enrolled in the minor. A grade of C or better is required for all courses in the minor.

Scheduling Recommendation by Semester Standing like (Sem: 1-2)

REQUIREMENTS FOR THE MINOR: 19 credits

PRESCRIBED COURSES (13 credits)
IST 110 GS(3) (Sem: 1-2)
IST 210(4) (Sem: 3-4)
IST 220(3), GEOG 463(3) (Sem: 5-6)

ADDITIONAL COURSES (6 credits)
Select 6 credits from P N G 430(3), EM SC 468(3), ECEEM 425(3), or METEO 473(3) (Sem:5-8)

Last Revised by the Department: Fall Semester 2000

Blue Sheet Item #: 28-07-048

Review Date: 10/06/05

Information Sciences and Technology for HR&IM Minor

University Park, College of Health and Human Development (ISHRM)
University Park, College of Information Sciences and Technology

The Internet and associated technologies have become vital communication channels for hospitality professionals. Historically, hospitality facilities such as hotels and restaurants used telephone, printed ads, and face-to-face contact to interact with customers. Now, technology is allowing Web sites, kiosks, e-mail, cell phones, personal digital assistants, and interactive television. Within the hospitality industry, corporate communications and training for employees can be handled electronically. Clearly, it is critical for HR&IM students to be cognizant about information science and technology if they are to succeed in hospitality management. Specifically, the learning outcomes for the IST-HR&IM minor

are that students will attain the knowledge base necessary to direct the planning, design, and analysis of information technology systems for hospitality corporations and to integrate these systems for strategic, tactic, and operational use.

A one-time tuition surcharge will be applied to all students enrolled in the minor. A grade of C or better is required for all courses in the minor.

Scheduling Recommendations by Semester Standing given like (Sem: 1-2)

REQUIREMENTS FOR THE MINOR: 19 credits

PRESCRIBED COURSES (19 credits)
IST 110 GS(3) (Sem: 1-2)
IST 210(4) (Sem: 3-4)
IST 220(3), HRIM 350(3) (Sem: 5-6)
HRIM 470(3), HRIM 471(3) (Sem7-8)

Last Revised by the Department: Fall Semester 2001

Blue Sheet Item #: 29-07-062

Review Date: 10/06/05

HH

Information Sciences and Technology for Industrial Engineering Minor

University Park, College of Engineering
University Park, College of Information Sciences and Technology (ISTIE)

Collection and processing of information have increased in all sectors for solving engineering problems, including manufacturing and service related problems. Efficient and timely analysis of data is critical for the survival of companies. There is a need for industrial engineers with a strong background in information technology and systems. The minor in Information Sciences and Technology for Industrial Engineering will augment the skills of students in the Department of Industrial and Manufacturing Engineering in the information systems area. All students pursuing a baccalaureate degree in Industrial Engineering are eligible for this minor.

A one-time tuition surcharge will be applied to all students enrolled in the minor.

A grade of C or better is required for all courses in the minor.

Scheduling Recommendation by Semester Standing given like (Sem: 1-2)

REQUIREMENTS FOR THE MINOR: 22 credits

PRESCRIBED COURSES (13 credits)
IST 110 GS(3) (Sem: 1-4)
I E 330(3), IST 210(4), IST 220(3) (Sem: 5-6)

ADDITIONAL COURSES: (9 credits)
Select 6-9 credits from I E 418(3), I E 462(3) and I E 433(3) (Sem: 7-8)
Select 0-3 credits from MATH 451(3), MATH 455(3), MATH 456(3), IST 441(3) (Sem: 7-8)

Last Revised by the Department: Spring Semester 2006

Blue Sheet Item #: 34-02-092

Review Date: 3/28/06

EN/IS

Information Sciences and Technology for Labor Studies and Employment Relations Minor

University Park, College of the Liberal Arts
University Park, College of Information Sciences and Technology (ISLER)

The joint minor in Information Sciences and Technology for Labor and Employment Relations (ISLER) is designed to provide students with the opportunity to develop working knowledge of information technology, labor and employment relations, and their interdisciplinary synergies. The joint minor is designed to prepare students for professional careers in human resource management, labor relations, information systems, software development, consulting, and government. A one-time tuition surcharge will be applied to all students enrolled in the minor.

A grade of C or better is required for all courses in the minor.

Scheduling Recommendation by Semester Standing given like (Sem: 1-2)

REQUIREMENTS FOR THE MINOR: 19 credits**[1]**

PRESCRIBED COURSES: (13 credits)
LER 100 GS(3) (Sem: 1-6)
IST 110 GS(3), IST 210(4), IST 220(3) (Sem: 1-7)

ADDITIONAL COURSES: (6 credits)
Select 6 credits from: LER 400 IL(3), LER 401(3), LER 404(3), LER 411(3), LER 424(3), LER 434(3), LER 435(3), LER 437(3), LER 444(3), LER 460(3), LER 464(3), LER 465(3), LER 470(3), LER 497(3) (Sem: 5-8)

Last Revised by the Department: Fall Semester 2007

Blue Sheet Item #: 35-06-460

Review Date: 4/10/07

IS/LA

Information Sciences and Technology for Mathematics Minor

University Park, Eberly College of Science (ISMTH)
University Park, College of Information Sciences and Technology

The interaction between Information Sciences and Mathematics will continue developing in remarkable new directions. Mathematical scientists enormously benefit from information technology in the performance of research, in communicating and disseminating scientific information and results, as well as in career environments

involving data analysis and management. Mathematicians also contribute to making inroads toward the development of new information technologies. Information sciences and technology are already playing a very important role in mathematical education, at all levels, and will experience an overwhelming increase in the near future. Giving undergraduate mathematics students the opportunity to minor in IST will not only enrich their educational achievements but it will also help them succeed in the employment searches.

Students must apply for entrance to the minor no later than the beginning of their senior year. A one-time tuition surcharge will be applied to all students enrolled in the minor.

A grade of C or better is required in all courses in the minor.

Scheduling Recommendation by Semester Standing given like (Sem: 1-2)

REQUIREMENTS FOR THE MINOR: 19 credits

PRESCRIBED COURSES (10 credits)
IST 110 GS(3) (Sem: 1-2)
IST 210(4) Sem: 3-4)
IST 220(3) (Sem: 5-6)

ADDITIONAL COURSES (9 credits)
Select 9 credits from the following 400-level mathematics courses: MATH 451(3), MATH 457(3), MATH 459(3), MATH 465(3), MATH 467(3), MATH 468(3), MATH 469(3) (Sem: 5-8)

Last Revised by the Department: Fall Semester 2001

Blue Sheet Item #: 29-01-084

Review Date: 10/06/05

SC

PIC updated by Publications: 3/26/09

Information Sciences and Technology for Telecommunications Minor

University Park, College of Communications
University Park, College of Information Sciences and Technology (ISTLC)

This minor offers students an opportunity to examine the opportunities and challenges presented by convergence of telecommunications and information processing. Internet-mediated services have the potential of fundamentally changing how we communicate and engage in commerce. This convergence offers faster, better, cheaper, smarter, and more convenient services, but also raises a variety of legal, regulatory, political, social, economic, and technology management issues. The IST/Telecommunications minor offers students enrolled in majors outside the College of Communications and the College of Information Sciences and Technology an opportunity to examine how telecommunications and information processing technologies and services will impact society as well as their individual circumstances.

The Telecommunications requirements of this minor constitute three courses (nine credit hours). Students can fulfill this requirement by completing COMM 180 offered by the Telecommunications Department in the College of Communications and by completing

two additional courses from the following list: COMM 479(3), COMM 484(3), COMM 490(3), COMM 491(3) and COMM 492(3). Three IST courses (ten credit hours) constitute the other part of this minor. A one-time tuition surcharge will be applied to all students enrolled in the minor.

A grade of C or better is required for all courses in the minor.

Scheduling Recommendations by Semester Standing given like (Sem: 1-2)

REQUIREMENTS FOR THE MINOR: 19 credits

PRESCRIBED COURSES (13 credits)
IST 110 GS(3) (Sem: 1-2)
IST 210(4) (Sem: 3-4)
IST 220(3), COMM 180(3) (Sem: 5-6)

ADDITIONAL COURSES (6 credits)
Select 6 credits from the following: COMM 479(3), COMM 484(3), COMM 490(3), COMM 491(3) and COMM 492(3) (Sem: 7-8)

Last Revised by the Department: Summer Session 2005

Blue Sheet Item #: 33-01-099

Review Date: 10/06/05

CM, IS

Publications 10/06/05

Information Sciences and Technology in Health Policy and Administration Minor

University Park, College of Health and Human Development (ISHPA)
University Park, College of Information Sciences and Technology

The learning objectives of the minor in Information Sciences and Technology in Health Policy and Administration (ISHPA) are to equip students with the skills and knowledge to meet the critical need for persons with expertise in health care information technology. Specialists in this field assist health care organizations develop and apply the information technologies needed to develop Web-based systems for patient education, physician-patient interaction and physician-physician consultation, securely transmit sensitive medical information electronically, and even pioneer efforts for advanced technologies like remote robotic surgery. The ISHPA minor provides students with a solid base in the information sciences and technology through courses in IST's core curriculum. This core is then supported by selections from a group of HPA courses studying the application of information technology in health planning, financing, or marketing. Students must apply for entrance to the minor no later than the beginning of their seventh semesters. A one-time tuition surcharge will be applied to all students enrolled in the minor.

A grade of C or better is required for all courses in this minor.

Scheduling Recommendations by Semester Standing given like (Sem: 1-2)

REQUIREMENT FOR THE MINOR: 19 credits

PRESCRIBED COURSES (13 credits)

IST 110 GS(3) (Sem: 1-2)
IST 210(4) (Sem: 3-4)
IST 220(3) (Sem: 5-6)
H P A 470(3) (Sem: 7-8)

ADDITIONAL COURSES (6 credits)
Select 6 credits from H P A 431(3), H P A/BB H 440 US;IL(3), H P A 447(3), or H P A 455(3) (Sem: 5-8)

Note: The H P A courses have additional prerequisites that must be met.

Last Revised by the Department: Fall Semester 2002

Blue Sheet Item #: 30-07-92B

Review Date: 10/06/05

HH

Information Sciences and Technology Minor

Abington College
Berks College
Capital College
University College: Penn State Beaver, Penn State Brandywine, Penn State Greater Allegheny, Penn State Hazleton, Penn State Lehigh Valley, Penn State New Kensington, Penn State Schuylkill, Penn State Wilkes-Barre, Penn State Worthington Scranton, Penn State York
University Park, College of Information Sciences and Technology (IST)

This minor 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 minor 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 the intent to expose students to the cognitive, social, institutional, and global environments of Information Sciences and Technology and to then apply that knowledge as a supplement to their major. A one-time tuition surcharge will be applied to all students enrolled in the minor.

A grade of C or better is required for all courses in this minor.

Scheduling Recommendation by Semester Standing given like (Sem: 1-2)

REQUIREMENTS FOR THE MINOR: 19 credits

PRESCRIBED COURSES (10 credits)
IST 110 GS(3), IST 210(4), IST 220(3) (Sem 1-6)

ADDITIONAL COURSES (9 credits)
Select 3 credits from IST 250(3), IST 301(3), or IST 302(3) (Sem 5-8)
Select 6 credits from IST 402(3), IST 431(3), or IST 432(3) (Sem 5-8)

Last Revised by the Department: Spring Semester 2004

Blue Sheet Item #: 32-01-075

Review Date: 10/6/05

IS

Security and Risk Analysis Minor

Penn State Berks
University College: Penn State Beaver, Penn State Mont Alto, Penn State New Kensington, Penn State Worthington Scranton
University Park, College of Information Sciences and Technology (SRA)

The minor in Security and Risk Analysis (SRA) is intended to familiarize students with the general frameworks and multidisciplinary theories that define security and related risk analysis. Course work will engage students in the challenges and problems of assuring information confidentiality and integrity (e.g., social, economic, technology, and policy issues) as well as the strengths and weaknesses of various methods for assessing and mitigating associated risk in the students' major field.

The minor provides a grounding in analysis and modeling used in information search, visualization and creative problem solving. This knowledge is set in the context of legal, ethical and regulatory issues of security including analysis of privacy and security law, internal control standards, regulatory policies and basic investigative processes and principles. Such understanding overviews the information technology that plays a critical role in identifying, preventing and responding to security-related events in the student's major field. A one-time tuition surcharge will be applied to all students enrolled in the minor.

A grade of C or better is required for all courses in the minor.

Scheduling Recommendation by Semester Standing given like (Sem: 1-2)

REQUIREMENTS FOR THE MINOR: 21 credits**[1]**
(At least 6 credits must be at the 400 level.)

PRESCRIBED COURSES (15 credits)
IST 110 GS(3), SRA 111 GS(3), SRA 211(3), SRA 221(3) (Sem: 1-6)
IST 452(3) (Sem: 5-8)

SUPPORTING COURSES AND RELATED AREAS (6 credits)
Select 6 credits in consultation with the SRA Minor adviser from the following areas: Risk Management, Network Security, or Cyber Forensics. At least 3 credits must be at the 400 level. (Sem: 5-8)

[1] A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

Last Revised by the Department: Fall Semester 2007

Blue Sheet Item #: 35-06-457

Review Date: 4/10/07

IS

Supply Chain and Information Sciences and Technology Minor

University Park: Smeal College of Business and College of Information Sciences and Technology (SCIST)

The minor in SCIST is structured to provide students not majoring in Supply Chain & Information Systems (SC&IS) or Management Information Systems (M I S) with the opportunity to develop working knowledge of information technology, supply chain management, and their interdisciplinary synergies. The joint minor is designed for professional careers in business, information systems, software development, consulting, and government. The successful minor must, at a minimum, possess basic knowledge of quantitative techniques, computer applications, and microeconomics.

A one-time tuition surcharge will be applied to all students enrolled in the minor.

A grade of C or better is required for all courses in the minor.

Scheduling Recommendation by Semester Standing given like (Sem: 1-2)

REQUIREMENTS FOR THE MINOR: 19 credits

PRESCRIBED COURSES (13 credits)
IST 110 GS(3), IST 210(4), IST 220(3) (Sem 1-7)
SCM 301(3) (Sem: 5-6)

ADDITIONAL COURSES (6 credits)
Select 6 credits from SCM 404(3), SCM 405(3), SCM 406(3) (Sem: 6-8)

Last Revised by the Department: Spring Semester 2010

Blue Sheet Item #: 38-06-045

Review Date: 04/13/2010

UCA Revision #1: 8/14/06

BA/IS

| The Pennsylvania State University | ©2001-2013. All rights reserved.

- Nondiscrimination Statement |
- Equal Opportunity Policy |
- Copyright |
- Privacy and Legal Statements |
- About the University Bulletin |
- Contact Info

This is the official bulletin of The Pennsylvania State University. Programmatic expectations for General Education are those in effect at the time of admission to degree candidacy, and college and major requirements are those in effect at the time of entry to college and major. These are accurately indicated in each student's degree audit.

The University reserves the right to change the requirements and regulations listed here and to determine whether a student has satisfactorily met its requirements for admission or graduation, and to reject any applicant for any reason the University determines to be material to the applicant's qualifications to pursue higher education. Nothing in this

material should be considered a guarantee that completion of a program and graduation from the University will result in employment.

The University Faculty Senate has responsibility for and authority over all academic information contained in the Undergraduate Bulletin.