

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

Begin Campus: Any Penn State Campus

End Campus: University Park, World Campus

Program Description

The Enterprise Technology Integration major (ETI) in the College of Information Sciences and Technology is a Bachelor of Science degree program that educates students in the fundamental concepts and state-of-the-art skills in three essential areas: information technology (IT), business concepts, and "soft skills" such as working in teams. The ETI major focuses on the technology implementation perspective of enterprise system integration. The learning outcomes focus on a) information systems interconnectedness, data interchange, process modeling and reengineering, and distributed computing environments; b) business knowledge in accounting, supply chains and more; and c) teaming, leadership, and other "soft skills." Students graduating with a degree in ETI are prepared for successful careers across industries and government in systems integration and development, as well as IT and business consulting.

The ETI major is interdisciplinary, combining foundational coursework in information technology, application development and business with specialized courses in systems integration. The major draws on courses including introductory programming, databases, networks, organizational theory, project management and enterprise integration. In the ETI major, we add courses in emerging information technologies used to integrate information systems from an underlying back-end technology needed to accomplish system integration.

What is Enterprise Technology Integration?

Enterprise technology integration (ETI) explores how information technology resources and data are linked together within and across companies and organizations. Integrating information technology solutions in an enterprise is essential for businesses in conducting day-to-day activities as well as moving organizations forward as new business strategies emerge. Enterprises that can readily unify applications, services, information systems and databases through information technology integration experience a competitive advantage. As an ETI major, you will gain knowledge and skills in analyzing the technology-related needs of an organization, formulating and implementing technology-based solutions, and evaluating the outcomes.

MORE INFORMATION ABOUT ENTERPRISE TECHNOLOGY INTEGRATION (<https://ist.psu.edu/prospective/undergraduate/academics/eti/>)

You Might Like This Program If...

- You have an interest in information technology and business.
- You want to help organizations operate more effectively by creating and implementing information technology solutions and evaluating outcomes.

- You are interested in emerging technologies, such as cloud computing and advanced databases.
- You want to understand how computing systems and programs operate.
- You enjoy working on a team to solve information technology problems.

MORE INFORMATION ABOUT WHY STUDENTS CHOOSE TO STUDY ENTERPRISE TECHNOLOGY INTEGRATION (<https://ist.psu.edu/prospective/undergraduate/academics/eti/>)

Entrance to Major

To be eligible for the Enterprise Technology Integration major, students must:

1. Have completed the following entrance-to-major requirements with a grade of C or better in each: HCDD 113S (FYS) or HCDD 113 or IST 110 or CYBER 100 or CYBER 100S (FYS), IST 140 or CMPSC 121 or CMPSC 131, IST 210, IST 220, IST 242 or CMPSC 122 or CMPSC 132, STAT 200 or SCM 200
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 is requested.

Degree Requirements

For the Bachelor of Science degree in Enterprise Technology Integration, a minimum of 124 credits is required:

Requirement	Credits
General Education	45
Electives	5-6
Requirements for the Major	91-92

18 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 3 credits of GS courses, 6 credits of GQ courses, 9 credits of GWS courses.

Requirements for the Major

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

Code	Title	Credits
Prescribed Courses		
<i>Prescribed Courses: Require a grade of C or better</i>		
ACCTG 211	Financial and Managerial Accounting for Decision Making	4
ETI 300W	Development and Documentation of Enterprise Web	3
ETI 461	Database Management and Administration	3
IST 210	Organization of Data	3
IST 220	Networking and Telecommunications	3
IST 230	Language, Logic, and Discrete Mathematics	3
IST 256	Programming for the Web	3
IST 301	Information and Organizations	3
IST 302	IT Project Management	3

IST 495	Internship	1
IST 420	Fundamentals of Systems and Enterprise Integration	3
IST 421	Advanced Enterprise Integration: Technologies and Applications	3
Additional Courses		
<i>Additional Courses: Require a grade of C or better</i>		
BA 302	Supply Chains	3
or SCM 301	Supply Chain Management	
CAS/ENGL 138T	Rhetoric and Civic Life II	3
or CAS 100	Effective Speech	
ECON 102	Introductory Microeconomic Analysis and Policy	3
or ECON 104	Introductory Macroeconomic Analysis and Policy	
ENGL 202C	Effective Writing: Technical Writing	3
or ENGL 202D	Effective Writing: Business Writing	
HCDD 264	Design Practice in Human-Centered Design and Development	3
or IST 331	Foundations of Human-Centered Design	
IST 402	Emerging Issues and Technologies	3
or IST 423	Enterprise Information Management and Storage Architecture	
MATH 110	Techniques of Calculus I	4
or MATH 140	Calculus With Analytic Geometry I	
STAT 200	Elementary Statistics	4
or SCM 200	Introduction to Statistics for Business	
Select 3-4 credits from the following:		3-4
BA 243	Social, Legal, and Ethical Environment of Business	
BA 301	Finance	
BA 303	Marketing	
BA 304	Management and Organization	
BLAW 243	Legal Environment of Business	
FIN 301	Corporation Finance	
IB 303	International Business Operations	
MGMT 301	Basic Management Concepts	
MKTG 301	Principles of Marketing	
Select 3 credits from the following:		3
CAS/ENGL 137H	Rhetoric and Civic Life I	
ENGL 15	Rhetoric and Composition	
ENGL 30H	Honors Rhetoric and Composition	
Select 3 credits from the following:		3
CMPSC 121	Introduction to Programming Techniques	
CMPSC 131	Programming and Computation I: Fundamentals	
IST 140	Introduction to Application Development	
Select 3 credits from the following:		3
CMPSC 122	Intermediate Programming	
CMPSC 132	Programming and Computation II: Data Structures	
IST 242	Intermediate & Object-Oriented Application Development	
Select 3 credits from the following:		3
CYBER 100	Computer Systems Literacy	
CYBER 100S	Computer Systems Literacy	

HCDD 113	Foundations of Human-Centered Design and Development	
HCDD 113S	Foundations of Human-Centered Design and Development FYS	
IST 110	Information, People and Technology	
Select 3 credits from the following:		3
ETI 435	Enterprise Analytics	
ETI 463	Distributed Database Management Systems	
IST 440W	Information Sciences and Technology Integration and Problem Solving	

Supporting Courses and Related Areas

Supporting Courses and Related Areas: Require a grade of C or better

A student must complete 12 credits from a single Application Focus. ¹ For most focuses, at least 3 of those credits must be at the 400-level.

¹ As an alternative to the pre-defined application focuses, a student may select 12 credits, with at least 3 credits at the 400-level from any courses offered by the university if done so in consultation with an academic adviser and with approval of a teaching faculty member of the Enterprise Technology Integration major.

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 (<https://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 and Inter-Domain courses do not meet this requirement.)

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

Breadth in the Knowledge Domains (Inter-Domain courses do not meet this requirement.)

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

Integrative Studies

- **Inter-Domain Courses (Inter-Domain):** 6 credits

Exploration

- **GN**, may be completed with Inter-Domain courses: 3 credits
- **GA, GH, GN, GS, Inter-Domain courses.** This may include 3 credits of World Language course work beyond the 12th credit level or the

requirements for the student's degree program, whichever is higher: 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 (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80>)). For more information, check the Suggested Academic Plan for your intended program.

Integrated B.S. in Enterprise Technology Integration and M.S. in Cybersecurity Analytics and Operations

Available at the following campuses: University Park

Requirements for the Integrated B.S. in Enterprise Technology Integration and M.S. in Cybersecurity Analytics and Operations can be found in the Graduate Bulletin (<https://bulletins.psu.edu/graduate/programs/majors/cybersecurity-analytics-operations/#integratedundergradgradtext>).

Program Learning Objectives

1. **Knowledge Application:** Understand and apply the interdisciplinary, theoretical knowledge of enterprise technology integration (ETI)

- a. Define and explain the core concepts, principles, processes, and theories within the academic major
- b. Apply the core concepts of ETI to real-world problems
2. **Problem Solving:** 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)
3. **Communication:** 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)
4. **Professional Responsibilities:** 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.
5. **Lifelong Learning:** 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 (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy/>)

University Park

Undergraduate Academic Advising Center

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

World Campus

Undergraduate Academic Advising

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Suggested Academic Plan

The suggested academic plan(s) listed on this page are the plan(s) that are in effect during the 2023-24 academic year. To access previous years' suggested academic plans, please visit the archive (<https://bulletins.psu.edu/undergraduate/archive/>) to view the appropriate Undergraduate Bulletin edition (*Note: the archive only contains suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin*).

Enterprise Technology Integration, B.S. at 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

Fall	Credits	Spring	Credits
IST 140 ^{*#1}	3	IST 242 ^{*#1}	3
IST 110 or CYBER 100 ^{*#}	3	IST 220 ^{*#}	3

CAS 100 [‡]	3	ECON 102 or 104 [*]	3
MATH 110 ^{*‡}	4	ENGL 15 or 30H [‡]	3
General Education Selection	3	General Education Selection	3
16		15	
Second Year			
Fall	Credits	Spring	Credits
IST 210 ^{*#}	3	IST 256 [*]	3
IST 230 [*]	3	ACCTG 211 [*]	4
Pick from Smeal College Business Fundamentals Certificate list [*]	3	Application Focus Selection ¹	3
Elective	3	General Education Selection	3
General Education Selection	3	STAT 200 ^{‡#}	4
15		17	
Third Year			
Fall	Credits	Spring	Credits
ETI 300W [*]	3	IST 302 [*]	3
IST 301 [*]	3	ETI 461 [*]	3
BA 302 [*]	3	IST 331 or HCDD 264 [*]	3
ENGL 202C or 202D [‡]	3	Application Focus Selection ¹	3
General Education Selection ¹	3	General Education Selection ¹	3
15		15	
Fourth Year			
Fall	Credits	Spring	Credits
IST 420 [*]	3	IST 421 [*]	3
IST 423 or 402 [*]	3	Elective	3
ETI 435, 463, or IST 440W [*]	3	Application Focus Selection ¹	3
Application Focus Selection ¹	3	General Education Selection ¹	3
General Education Selection ¹	3	General Education Selection	1.5
General Education Selection	1.5		
16.5		13.5	
Total Credits 124			

- * 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

¹ Student can also take CMPSC 121 and CMPSC 122; or CMPSC 131 and CMPSC 132

² 1 credit of IST 495 is required. A grade of "SA" must be earned in this course. This course can be completed at any time before graduation.

University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity 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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

Application Focus Areas:

- Students pick one of the tracks below or create a custom 4-course application focus. All 12 credits must be in the same application focus area.
- **University Park Business Competency**
 - Select 12 credits from the courses below:
 - BA 301
 - BA 303
 - BA 304
 - BLAW 243
 - IB 303
 - Note 1: This option does not require 3-credits of 400-level courses as part of the application focus.
 - Note 2: Students are encouraged to take these courses from the Smeal College of Business at University Park.
 - Note 3: One of these courses is required to be taken to satisfy major requirements. The student needs to take the remaining courses on this list to complete the application focus. The student may not double-count these credits as both a requirement of the major and to meet the requirements of the application focus.
 - Note 4: Taking all of the courses listed here, along with BA 302, ECON 102 or ECON 104, a Statistics course, and ACCTG 211

(which are requirements of the ETI major) will meet the requirements for the Smeal Business Fundamentals Certificate.

• Application Development

- Select 12 credits from below, with at least three (3) credits at the 400 level:
 - Any 200-400 level HCDD Course
 - IST 261
 - IST 311
 - IST 361
 - IST 411
 - IST 412
 - IST 413

• Cybersecurity

- Select 12 credits from below, with at least three (3) credits at the 400 level:
 - SRA 111
 - SRA 221
 - CYBER 262
 - Any CYBER course at the 300- or 400-level
 - IST 451
 - IST 454
 - IST 456

• People, Policy and Context

- Select 12 credits from below, with at least three (3) credits at the 400 level:
 - IST 234N
 - IST 431
 - IST 432
 - IST 452
 - IST 453
 - IST 442
 - SRA 472

• International and World Cultures

- Select 12 credits from below, with at least three (3) credits at the 400 level:
 - IST 199
 - IST 299
 - IST 399
 - IST 499
 - IST 445
 - AFR 440

• ROTC, Intelligence and Cyberwarfare

- Select 12 credits from below, with at least three (3) credits at the 400 level:
 - Any courses in AIR, NAVSC or ARMY ROTC Programs
 - SRA 211
 - SRA 231
 - SRA 421
 - SRA 450

• Custom Application Focus

- There is an option for a student to create a custom 4-course application focus sequence. It must be a coherent sequence of courses that provides context for the student in terms of ETI content. Students can select the custom application focus in consultation with an academic adviser, and courses must be selected in consultation with an ETI teaching faculty member.

Students may want to consider choosing courses that also fulfill US and/or IL requirements.

Career Paths

The Enterprise Technology Integration program responds to growing national and international needs in organizational computing, particularly in the areas of application systems integration, cloud computing and database technologies. The ETI degree prepares students to analyze organizational challenges and employ information technology solutions.

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

ETI graduates will be prepared for careers in application systems integration, as well as IT and business consulting. The program equips graduates with the skills needed to analyze business processes; identify information requirements and the systems essential to implement solutions; and implement those solutions in information systems in a variety of computing environments. The program positions graduates to compete with information systems professionals and technical business analysts who drive innovation through data, information and systems implementation to solve problems for organizations and the people within them.

MORE INFORMATION ABOUT POTENTIAL CAREER OPPORTUNITIES FOR GRADUATES OF THE ENTERPRISE TECHNOLOGY INTEGRATION PROGRAM (<https://www.ist.psu.edu/current/careers/development/>)

Contact

University Park

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