

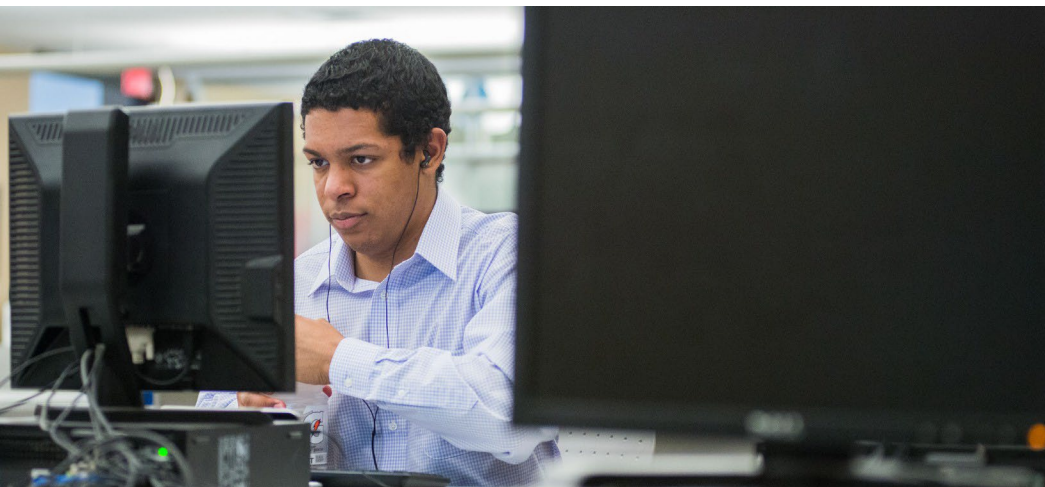


PennState
College of Information
Sciences and Technology

Office of Graduate Programs

2022–2023

GRADUATE DEGREE GUIDE



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About the College of Information Sciences and Technology

Solving society's most challenging problems—from responding to natural disasters to improving human health and well-being; from protecting national security to making sense of big data in community and scientific settings; from exploring the connections between gender and technology to finding novel ways to use artificial intelligence in socially responsible ways—calls for approaches that transcend traditional disciplinary boundaries. Precise computational models are needed to learn from the vast datasets available. Scientific theory is needed to describe the complex relationships we encounter in the ecosystem we inhabit, one that includes complex and overlapping networks with an increasing number of virtual friends, collaborators, and customers.

At Penn State's College of Information Sciences and Technology (IST), you will receive a multidisciplinary education that prepares you to address complex issues related to technology and society. Our graduate students come from a variety of backgrounds, including computer science, engineering, psychology, sociology, economics, philosophy, visual arts, and math. The students work with graduate faculty distributed across four focus areas: Human-Centered Design and Development; IST and Security Risk Analysis; Cybersecurity; and Data Sciences.

The College of IST's faculty and graduate students engage in cutting-edge research in areas such as human-centered design of software, devices and platforms; artificial intelligence and cognitive science; computer security and information privacy; health- and bio-informatics; and the sociology of disaster response, to name just a few. We excel in cybersecurity research, exploring how we can better protect companies from cyber-attacks and nations from cyber war. We examine information retrieval, search engines, and big data as a means to understand complex knowledge and societal and economic relationships. We study cognition and human-computer interfaces in order to comprehend how an individual's abilities and limitations fit into a connected world full of technology. To succeed in all of these areas, as a graduate student in IST you will develop important skills in the computer and data sciences, as well as in the social and behavioral sciences. You will learn how to analyze qualitative and quantitative effects in data, and be able to understand, test, and contribute to scientific theory.

Rankings

Penn State is ranked by Times Higher Education (2020) in the top 6% of higher education institutions worldwide. Penn State's graduate schools also consistently rank highly in disciplines relevant to IST by U.S. News & World Report. Among iSchools, a consortium of information schools dedicated to advancing the information field in the 21st century, IST at Penn State is unique in its focus on human-centered design, enterprise informatics, cybersecurity, and data and computational sciences.

Faculty Adviser and Annual Review

In IST, each Integrated Undergraduate Graduate (I.U.G.), M.S., or Ph.D. student must identify a member of the IST Graduate Faculty who is willing to serve as his or her faculty adviser. The role of the faculty adviser, the process used to make initial assignments of faculty advisers to students entering the I.U.G., M.S., or Ph.D. program, and an explanation of the annual review are all described below.

A. Role of Faculty Adviser

The faculty adviser provides advice and mentoring to the I.U.G., M.S., or Ph.D. student (advisee) on issues related to research and academics. During the first year of a student's graduate study, the adviser helps the student to identify potential research topics and to begin the reading and synthesis of related literature. As appropriate, the adviser also guides the student toward specific research projects and outcomes, either individually or as part of a larger ongoing research team. The adviser also provides feedback to the student about research ideas, research progress, and research outcomes; once a year this is synthesized as an annual evaluation. The adviser helps the student regarding his or her academic studies. In the doctoral program, after the student passes the qualifying examination, the adviser helps in the formation of the student's doctoral committee and in the preparation of the dissertation proposal. In general, the faculty adviser helps the student become familiar with the program and its requirements. Finally, the adviser assists and advises the student on career planning.

B. Adviser Matching Process for Newly Admitted Students

New students are encouraged to interact with faculty members of interest using e-mail, phone or online meeting conversations during the summer prior to arriving at Penn State (or, in the case of I.U.G. students, during the semester in which the student applies). Thus, in many cases, new students will have already been in contact with their preferred advisers prior to beginning their studies (e.g., through email or as part of the recruiting and decision process). New graduate students are required to arrive on campus before mid-August to participate in various orientation events; and may also use this time to conduct face-to-face meetings with potential advisers. As needed, the student can meet with the Director of Graduate Programs to explore potential adviser matches.

The expectation is that most new graduate students will begin working with their advisers by the first day of fall classes; some may continue to work toward identifying an adviser. Advisers are officially recorded by filling out a Student-Adviser Agreement form to be submitted to the Graduate Programs Office no later than early **October**.

C. Annual Review

An annual review will be conducted each September/October to evaluate the progress of Ph.D./M.S. /I.U.G. students in their graduate studies. As part of the review process, each graduate student completes an online Annual Evaluation form and updates his/her curriculum vitae (CV). Then, each student meets with his/her adviser to discuss coursework completed or to be taken, research progress, related issues, and plans for the following year. After this meeting, the adviser rates the student's performance and provides written comments to explain the rating. Each year, the Graduate Advisory Committee (GAC) reviews the evaluation materials prepared by the students and their advisers, to ensure that all students are making the progress expected.

In the event that the faculty adviser or the GAC determines a student's progress needs improvement or fails to meet performance expectations, steps are taken to understand the nature of the problem and to develop a plan for addressing these issues. Each student receives a formal notification of their annual evaluation results with associated actions to take as needed. On some occasions, an adviser change will be recommended, while in other cases, the student may be required to complete specific tasks on a stated timeline.

In cases of extreme and continued academic difficulties, a student may be terminated from the program. If a student may be terminated for academic reasons (unsatisfactory scholarship, he or she will first receive a written notice of the problem(s), in accordance with Graduate School policy [GCAC-803](#), enabling a possible appeal and/or a self-correction process to address the stated problem(s). In some cases (for example if a milestone is failed), a doctoral student may be counseled to transfer to the master's program rather than continue with his or her Ph.D. studies.

General Assistantship Policies

A. M.S. and I.U.G. Students

Master's and I.U.G. students accepted into the College of IST are rarely offered a college-based teaching assistantship (TA). In some cases when teaching support needs are extensive, a few M.S. or I.U.G. students may be offered a TA. Some M.S. and I.U.G. students may also qualify for research assistantships (RA) to work on a specific project. In other cases where there are teaching support needs, an M.S. or I.U.G. student may be hired to fill a wage payroll instructional assistant position, but these wage-payroll positions do not include a tuition waiver or health benefits. Appointments automatically end at the conclusion of each semester and appointments carry no guarantee of renewal.

Instructional Assistant (IA)

An IA is assigned to support one or more specific courses for a particular semester, not to support a faculty member. Funds are provided by the College. In other words, if a faculty member other than the student's adviser teaches a course to which an IA is assigned, the

student is supervised in his/her teaching-related responsibilities by this other faculty member. We refer to the faculty member who teaches the course section(s) to which an IA is assigned as the IA's *supervisor*. Students who receive IA support generally possess specialized skills or experience gained through prior academic or work experience.

IAs should meet with their supervisors no later than the week prior to the start of the semester to coordinate plans for teaching support; they will also meet regularly during the semester as specified by the supervisor. Once assignments have been announced, IAs should contact their supervisors to let them know when they are available for meetings prior to the start of the semester. Initially, the IAs should expect to receive a course syllabus and possibly a textbook if one is used; any information to be distributed to the students; and specific details about what they are expected to do over the course of the semester. IAs and their supervisors should discuss the instructional goals and objectives of the course and the means to accomplish them. Periodically, meetings should be held to emphasize specific assignments or projects and how these should be evaluated. IAs may be asked to attend course lectures and labs, and should be fully aware of their instructors' emphases and expectations of the students.

IA positions provide compensation by hourly wages. IAs may be asked to complete a wide variety of tasks including the following: grading homework, projects, and examinations; preparing assignments; preparing solutions for posting or distribution; maintaining office hours and holding special lab or review sessions; helping to prepare, photocopy, and administer examinations; preparing and setting up demonstrations; processing grade data, and perhaps, assigning grades. IAs should track the number of hours they spend completing these tasks each week; the hours worked will be submitted every two weeks for payment.

Before the first week of the semester, the IA and supervisor are required to meet and complete a Responsibility Agreement form to assure that all start-up details have been discussed and arranged. At mid-semester and again at the end of the semester, the supervisor and students enrolled in the course should complete evaluation forms electronically for each IA in the course.

If an IA must be absent from an assigned job due to illness, a personal emergency, or professional trips, the IA must notify the supervisor at the first knowledge of such an absence and work with the supervisor to ensure that responsibilities are covered.

IMPORTANT: *IAs should not make travel plans the week before the semester begins, the last week of the semester, or the week immediately following the end of classes.* These periods are critical for preparation before the semester begins, and for end-of-semester grading and grade calculations. In exceptional situations, a supervisor may agree to allow an IA to depart early or arrive late, but this should never be assumed by the IA. Permission for such exceptions must be requested in advance from the supervisor and documented through the Graduate Programs Office. Assistants who fail to follow these requirements will not receive funding for the following semester.

NOTE: Enrollment in IST 602 (Supervised Experience in College Teaching) is required for all students during the first semester they are serving as an IA. This course is offered every fall and spring semester and is designed to help new instructional assistants become more effective in their teaching. It also provides instructional assistants with the opportunity to discuss particular issues that arise in the classroom.

B. Ph.D. Students

Assistantships for Ph.D. students fall into two categories: Research Assistantship (RA) and Teaching Assistantship (TA). In general, research assistantships are funded by a student's faculty adviser (or by another faculty member who has extra funds available); teaching assistantships are provided by the College.

Assistantship appointments are generally half-time, requiring service of approximately 20 hours per week. Students with half-time teaching or research assistantships receive tuition to cover the mandatory course load of 9 to 12 credits per semester. Appointments automatically end at the conclusion of each semester and appointments carry no guarantee of renewal. Both research and teaching assistantships are contingent on satisfactory performance of assigned duties.

Students may lose funding in the event that they fail to meet the responsibilities of the position. In these very rare situations, a position may be terminated in the middle of a semester, after following the guidance of Graduate School Policy [GCAC-804](#).

IMPORTANT: *Assistants should not make travel plans the week before the semester begins, the last week of the semester, or the week immediately following the end of classes.* These periods are critical for preparation before the semester begins, and for end-of-semester grading and grade calculations. In exceptional situations, a supervisor may agree to allow an RA or TA to depart early or arrive late, but this should never be assumed by the assistant. Permission for such exceptions must be requested in advance from the supervisor and documented through the Graduate Programs Office. Assistants who fail to follow these requirements will be under review and may not receive funding for the following semester.

Research Assistantships (RA)

An RA's supervisor is most often the student's faculty adviser; the supervisor will, to some degree, dictate the supporting coursework and other aspects of the research assistant's preparation needed to fulfill the assistantship responsibilities. When the research supervisor is also the faculty advisor, supervision of research assistant duties and progress towards completion of the doctoral dissertation may be difficult to separate, but these concerns can be addressed through conversation with the advisor. The combination of the research appointment and the registration for coursework or dissertation credits should represent a realistic workload. The university does not require RAs to track the hours worked each week, but a research supervisor may ask for this information.

RAs may be expected to do any of the following: design and implement software; design and conduct experiments involving human subjects, including applications for Institutional Review Board (IRB) approval; collect and process data; search for materials at the University Libraries or perform Web research; interact with sponsors and vendors; prepare reports and related presentation materials; attend meetings and seminars; participate in writing manuscripts for conference and journal submissions; participate in preparing presentations for conferences; and assist in preparing research funding proposals as directed.

The RA's supervisor will clarify the specific work needed for a given research assistantship position, regularly oversee the work, and evaluate the work, dependability, and readiness of the RA to move to higher levels of responsibility such as taking the lead on data analysis, helping to supervise undergraduate research assistants, crafting of manuscripts, and making presentations.

IMPORTANT: RA's should not make travel plans the week before the semester begins, the last week of the semester, or the week immediately following the end of classes. RA's must be present during the time frame stated on the signed terms of offer form. In exceptional situations a supervisor may agree to allow a RA to depart early or arrive late, but this should never be assumed by the RA. Permission for such exceptions must be requested in advance from the supervisor and documented through the Graduate Programs Office. Assistants who fail to follow these requirements will not receive RA funding for the following semester.

Teaching Assistantships (TA)

A TA is assigned to support one or more specific courses for a particular semester, not to support a faculty member. Funds are provided by the College. In other words, if a faculty member other than the student's adviser teaches a course to which a TA is assigned, the student is supervised in his/her teaching-related responsibilities by this other faculty member. We refer to the faculty member who teaches the course section(s) to which a TA is assigned as the TA's *supervisor*. Students who receive TA support generally possess specialized skills or experience gained through prior work experience.

TAs should meet with their supervisors no later than the week prior to the start of the semester to coordinate plans for teaching support; they will also meet regularly during the semester as specified by the supervisor. Once assignments have been announced, TAs should contact their supervisors to let them know when they are available for meetings prior to the start of the semester. Initially, the TAs should expect to receive a course syllabus, a textbook if one is used, any information to be distributed to the students, and specific details about what they are expected to do over the course of the semester. TAs and their supervisors should discuss the instructional goals and objectives of the course and the means to accomplish them. Periodically, meetings should be held to emphasize how specific assignments or projects should be evaluated. TAs should expect to attend course lectures and labs, and should be fully aware of their instructor's emphasis and expectations of the students.

TAs may be asked to complete a wide variety of assignments including the following: grading homework, projects, and examinations; preparing assignments; preparing solutions for posting or distribution; maintaining office hours and holding special lab or review sessions; helping to prepare, photocopy, and administer examinations; prepare and set up demonstrations; processing grade data, and perhaps, assigning grades.

Before the first week of the semester, the TA and supervisor are required to meet and complete a Responsibility Agreement form to assure that all start-up details have been

discussed and arranged. At mid-semester and again at the end of the semester, the supervisor and students enrolled in the course should complete evaluation forms electronically for each TA in the course.

If a TA must be absent from an assigned job due to illness, a personal emergency, or professional trips, they must notify the supervisor at the first knowledge of such an absence and work with the supervisor to ensure that his/her responsibilities are covered.

IMPORTANT: *TA's should not make travel plans the week before the semester begins, the last week of the semester, or the week immediately following the end of classes.* These periods are critical for preparation before the semester begins, and for end-of-semester grading and grade calculations. In exceptional situations, a supervisor may agree to allow a TA to depart early or arrive late, but this should never be assumed by the TA. Permission for such exceptions must be requested in advance from the supervisor and documented through the Graduate Programs Office. Assistants who fail to follow these requirements will not receive TA funding for the following semester.

NOTE: Enrollment in IST 602 (Supervised Experience in College Teaching) is required for all students during the first semester that they serve as a TA. This course is offered every fall and spring semester and is designed to help new teaching assistants become more effective in their teaching-related responsibilities. It also provides teaching assistants with the opportunity to discuss particular issues that arise in the classroom.

Graduate Teaching Fellows

The Ph.D. in Informatics encourages qualified Ph.D. students to take on primary teaching responsibility one or more times during their program of study. Such experience is particularly valuable for students seeking academic positions after graduation. Thus, the College has a Graduate Teaching Fellow program, wherein advanced students (generally after completing the comprehensive exam), or those who arrive with prior teaching experience, may apply to teach a class independently. This program is based on the availability of appropriate course assignments and student qualifications; in all cases a teaching mentor will also be assigned to provide oversight of the teaching process.

Additional Information

A. Student Insurance

All graduate assistants (RAs and TAs) and any dependents who accompany them must have health insurance. A student may choose to purchase insurance separately and provide evidence that their policy meets the standards of Penn State. Otherwise, a student will be enrolled in a group policy for students. More information can be obtained by contacting the [Graduate Student Association](#) or the [Graduate Student Insurance Office](#).

B. Stipends- (TAs or RAs Only)

Stipends are delivered electronically into the student's local bank account five times each semester on the last working day of the month and twice during the summer (if hired for summer). **Please note - a newly appointed graduate assistant arriving in August may not receive his or her first paycheck until the end of September.**

C. AEOCPT

All international students must take the American English Oral Communication Proficiency Test (AEOCPT) upon arrival. No international student will be assigned to a teaching assistantship until this test is passed or remediation steps (typically taking English language courses) have been completed. More information can be obtained by contacting the [Department of Applied Linguistics](#).

D. Scholarship and Research Integrity (SARI) Training

All graduate students are required to complete Scholarship and Research Integrity (SARI) training specified by their college/department. Penn State's Scholarship and Research Integrity (SARI@PSU) program is designed to offer Penn State researchers and scholars comprehensive, multilevel training in the responsible conduct of research (RCR), in a way that is tailored to address the issues typically faced by individual disciplines. SARI@PSU programs address topics such as publication practices and responsible authorship, conflicts of interest, research misconduct, peer review, mentoring, data management, collaborative research, human subjects' protections, and animal welfare. In general, SARI@PSU addresses these issues through two initiatives: an online RCR training program offered by CITI (Collaborative Institutional Training Initiative at the University of Miami), and interactive, discussion-based RCR education. All graduate students at Penn State, who matriculate in fall of 2009 or later, are required to complete the SARI@PSU requirements prior to graduation.

The College of IST requires the following trainings within the first semester:

Doctoral Students -

- Human Subjects Research (IRB) **and**
- Responsible Conduct of Research (RCR), along with five hours of discussion-based training that is covered in IST 590 (graduate colloquium).

Masters Students –

- Human Subjects Research (IRB) **and**
- Responsible Conduct of Research (RCR), along with case study within the online modules.

The detailed SARI Training information will be sent to students prior to the start of the first semester.

This training plan and student participation report is available from the [Office for Research Protections](#) upon request.

E. Important International Student Registration Information

Enrollment Requirements

Both F-1 and J-1 students must maintain full-time academic status. Graduate students may enroll for variable credits up to fifteen (15), with nine (9) credits being the minimum required to fulfill DHS visa requirements for full-time enrollment.

[Exceptions to full-time study](#) must be cleared through the International Student Adviser in advance by completing the [Reduced Course Load eForm](#) in iStart. All exceptions granted by the International Student Adviser must be reported to DHS within 21 days as well as the return to full-time status. Note: Exceptions to full-time study due to academic difficulties are limited to one semester during the entire program of study; documented medical illnesses are limited to one year during the program of study. Failure to enroll for full-time study or to obtain approval from the International Student Adviser in advance is automatically out-of-status.

Distance Education or Web-Based Courses

F-1 students may count only one 3-credit course in distance education (Independent Learning, World Campus, web) or on-line course towards full-time enrollment each semester

J-1 students must enroll full-time in resident instruction classes.

F-1 and J-1 students cannot change their campus designation to World Campus. Full-time enrollment in World Campus is a violation of F-1 and J-1 status. In addition, if you have been approved for a reduced course load or your last enrollment is in summer session, you cannot be enrolled for only distance education (web-based) courses. Both full-time or part-time students must have resident instruction classes or you do not need to be in F-1 or J-1 status. You can take web-based course from outside the United States.

Summer Enrollment

If a student does not intend to enroll in fall then summer is not a vacation period.

Students who intend to graduate or complete their program in summer, ***must enroll*** in the summer. Enrollment must be for a resident credit (not web-based); although 3 credits of online course (Penn State World Campus) is allowed, a resident class must also be taken. Full-time enrollment must be maintained at Penn State.

Students who are not completing their program of study in summer and who plan to return in the subsequent fall semester are not required to enroll in summer because it is considered a vacation period.

Master's (M.S. and I.U.G.)

M.S. in Cybersecurity Analytics and Operations

M.S. in Informatics

I.U.G. - available for the M.S. in Informatics

The Master's Programs

In the master's programs, you are expected to engage more deeply in an intellectual conversation with research and science than what you would normally do as part of an undergraduate degree. The degree typically opens up advanced career opportunities, both in industry or as preparation for a Ph.D. As an M.S. or I.U.G. student; you will take many of the same courses as the Ph.D. students, and have the option to produce a thesis worthy of publication or a scholarly paper that could be submitted to a conference. The M.S. programs are available to be completed in one year or two years.

On the following pages, you will find useful information about how our master's programs are structured, and a description of the expectations we have for our graduate students. In addition, this Handbook provides details of the university and college policies and procedures that will govern your time here at Penn State.

Master's Degree Requirements (M.S. and I.U.G.)

Master's degree students complete a minimum of 30 credits. M.S. and I.U.G. students have the option of completing a thesis or a scholarly paper. This decision is made in conjunction with the student's adviser and should be determined during the first year of study. Students electing to complete a thesis take IST 600 research credits and those electing a scholarly paper take IST 594 research credits. Once an option has been chosen and either IST 600 or IST 594 taken, the student may only switch to the other option with the approval of his adviser and the IST Graduate Program. Students cannot substitute IST 600 credits for IST 594 credits except by approval of both the IST Graduate Programs Office and the Graduate School. In the event that approval is granted, additional credits of preparation may be required.

Master's in Cybersecurity Analytics and Operations Curriculum Plans

Master of Science in Cybersecurity Analytics and Operations One Year Curriculum Plan (30 credits)

Fall Semester	Courses*	Credits	Notes
Required	IST 815 – Foundations of Information Security and Assurance	3	Cybersecurity
Required	IST 554 – Network Management and Security	3	Cybersecurity
Required	IST 825 – Foundations of Web and E-Commerce Application Security	3	Cybersecurity
Required	IST 594– Research Topics (Scholarly Paper)	3	Research
Total Credits		12	

Spring Semester	Courses*	Credits	Notes
Required	IST 543 – Foundations of Software Security	3	Cybersecurity
Required	IST 820 – Cybersecurity Analytics	3	Cybersecurity
Required	IST 594 – Research Topics (Scholarly Paper)	0-3	Research
Required	Elective (choose from list)	3	Elective
Total Credits		9-12	

Summer Semester	Course*	Credits	Notes
Required	IST 594 – Research Topics (Scholarly Paper)	0-3	Research
Required	Elective (choose from list)	3	Elective
Required	Elective (choose from list)	3	Elective
Total Credits		6-9	

*Suggested curriculum plan with an aggressive 1-year completion goal. Course availability subject to change.

- At least 18 credits must be in the 500 or 600 series, combined.
- **Thesis Option:** Selecting the thesis option may require more than 1-year to complete. Also, IST 600 replaces IST 594 on the above plan.
- WC – World Campus, a maximum of 10 credits may be taken online

Cybersecurity Analytics and Operations Elective Course List

Course	Credits
IST 504 – Foundations of Theories and Methods of Information Sciences and Technology Research	3
IST 511 – Information Management: Information and Technology	3
IST 555 – Intelligent Agents and Distributed Decision Making	3
IST 557 – Data Mining: Techniques and Applications	3
IST 558 – Data Mining II	3
IST 564 – Crisis, Disaster and Risk Management	3
IST 805 – Cybersecurity Forensics and Management	3
IST 841 – Search Engines & Information Retrieval	3
IST 868 – Topics in Visual Analytics for Security Intelligence	3

Scholarship and Research Integrity (SARI) Requirements	
Each student must complete the SARI training – prior to starting the program or by the end of August.	Date completed & submitted to ISTgradprograms@psu.edu
Institutional Review Board (IRB) training	
Responsible Conduct of Research (RCR) training	

Master of Science in Cybersecurity Analytics and Operations Two Year Curriculum Plan (30 credits)

First Year Courses

Fall Semester	Courses*	Credits	Notes
Required	IST 815 – Foundations of Information Security and Assurance	3	Cybersecurity
Required	IST 554 – Network Management and Security	3	Cybersecurity
Required	IST 594– Research Topics (Scholarly Paper) – Research prep.	3	Research
Total Credits		9	

Spring Semester	Courses*	Credits	Notes
Required	IST 543 – Foundations of Software Security	3	Cybersecurity
Required	IST 820 – Cybersecurity Analytics	3	Cybersecurity
Required	Elective (choose from list)	3	Elective
Total Credits		9	

Second Year Courses

Fall Semester	Courses*	Credits	Notes
Required	IST 825 – Foundations of Web and E-Commerce Application Security	3	Cybersecurity
Required	IST 594– Research Topics (Scholarly Paper)	0-3	Research
Required	Elective (choose from list)	3	Elective
Total Credits		6-9	

Spring Semester	Courses*	Credits	Notes
Required	IST 594 – Research Topics (Scholarly Paper)	0-3	Research
Required	Elective (choose from list)	3	Elective
Total Credits		3-6	

*Suggested curriculum plan with an aggressive 1-year completion goal. Course availability subject to change.

- At least 18 credits must be in the 500 or 600 series, combined.
- **Thesis Option:** Selecting the thesis option may require more than 1-year to complete. Also, IST 600 replaces IST 594 on the above plan.
- WC – World Campus, a maximum of 10 credits may be taken online

Cybersecurity Analytics and Operations Elective Course List

Course	Credits
IST 504 – Foundations of Theories and Methods of Information Sciences and Technology Research	3
IST 511 – Information Management: Information and Technology	3
IST 555 – Intelligent Agents and Distributed Decision Making	3
IST 557 – Data Mining: Techniques and Applications	3
IST 558 – Data Mining II	3
IST 564 – Crisis, Disaster and Risk Management	3
IST 805 – Cybersecurity Forensics and Management	3
IST 841 – Search Engines & Information Retrieval	3
IST 868 – Topics in Visual Analytics for Security Intelligence	3

Scholarship and Research Integrity (SARI) Requirements	
Each student must complete the SARI training – prior to starting the program or by the end of August.	Date completed & submitted to ISTgradprograms@psu.edu
Institutional Review Board (IRB) training	
Responsible Conduct of Research (RCR) training	

Master's in Informatics Curriculum Plans

MS in Informatics – Two Year Curriculum Plan First Year Courses

Fall Semester	Courses*	Credits	Notes
Required course	IST 504 – Foundations of Theories and Methods of Information Sciences and Technology	3	Foundations
Choose one of these three courses or a specialization course	IST 521 – Human-Computer Interaction: The User and Technology	3	Human-Centered Design
	IST 557 – Data Mining: Techniques and Applications	3	Data Sciences
	IST 815 – Foundations of Information Security and Assurance	3	Cybersecurity
	Specialization Course	3	Approval required from adviser
Choose STAT 500 or an approved research methods course	STAT 500 – Applied Statistics	3	Data Sciences
	Research Methods Course	3	Approval required from adviser
Total Credits		9	

Spring Semester	Courses*	Credits	Notes
Required course	IST 505 – Foundations of Research Design in Information Sciences and Technology	3	Foundations
Choose one of these three courses or a specialization course	IST 520 – Foundations in Human-Centered Design	3	Human-Centered Design
	IST 543 – Foundations of Software Security	3	Cybersecurity
	IST 558 – Data Mining II	3	Data Sciences
	Specialization Courses	3	Approval required from adviser
Choose an approved research methods course	Research Methods Course	3	Approval required from adviser
Total Credits		9	

**Suggested curriculum plan with an aggressive 2-year completion goal. Course availability subject to change.*

MS in Informatics – Two Year Curriculum Plan Second Year Courses

Fall Semester	Course	Credits	Notes
Choose this course or a specialization course	IST 554 – Network Management and Security	3	Cybersecurity
	Specialization Course	3	Approval required from adviser
Choose one of these two courses	IST 594 – Research Topics	1 – 6	Research
	IST 600 – Thesis Research	1 - 6	Thesis
Total Credits	4 – 9 (as needed)		

Spring Semester	Course	Credits	Notes
Choose one of these two courses or a specialization course	IST 820 - Cybersecurity Analytics	3	Cybersecurity
	IST 525 - Computer-Supported Cooperative Work	3	Human-Centered Design
	Specialization Course	3	Approval required from adviser
Choose one of these two courses	IST 594 – Research Topics	1 – 6	Research
	IST 600 – Thesis Research	1 – 6	Thesis
Total Credits	4 – 6 (as needed)		

**Suggested curriculum plan with an aggressive 2-year completion goal. Course availability subject to change.*

- *At least 18 credits must be in the 500 or 600 series, combined.*
- **Thesis Option:** *Selecting the thesis option may require more than 1-year to complete. Also, IST 600 replaces IST 594 on the above plan.*
- *WC – World Campus, a maximum of 10 credits may be taken online*
- *Research Methods Course List:*
<https://ist.psu.edu/sites/default/files/current-grad/methods-course-list.docx>
- *Suggested Electives - go to LP and search for any IST 5XX class that is not a required course*

Scholarship and Research Integrity (SARI) Requirements	
Each student must complete the SARI training – prior to starting the program or by the end of August.	Date completed & submitted to ISTgradprograms@psu.edu
Institutional Review Board (IRB) training	
Responsible Conduct of Research (RCR) training	

MS in Informatics – One Year Curriculum Plan
Cybersecurity Analytics and Operations
(30 credits)

Fall Semester	Courses*	Credits	Notes
Required	IST 504 – Foundations of Theories and Methods of Information Sciences and Technology	3	Foundations
Required	IST 815 – Foundations of Information Security and Assurance	3	Cybersecurity
Required	Research Methods (choose from list)	3	Advisor Approval Required
Required	IST 594 – Research Topics (Scholarly Paper)	0-3	Research
Total Credits		9-12	

Spring Semester	Courses*	Credits	Notes
Required	IST 543 – Foundations of Software Security	3	Cybersecurity
Required	IST 820 – Cybersecurity Analytics	3	Cybersecurity
Required	IST 594 – Research Topics (Scholarly Paper)	0-3	Research
Required	Research Methods (choose from list)	3	Advisor Approval Required
Total Credits		9-12	

Summer Semester	Courses*	Credits	Notes
Required	IST 554 WC – Network Management and Security	3	Cybersecurity
Required	IST 594 – Research Topics (Scholarly Paper)	0-3	Research
Suggested Elective	IST 564 WC – Crisis, Disaster, and Risk Management	3	Cybersecurity
Total Credits		6-9	

*Suggested curriculum plan with an aggressive 1-year completion goal. Course availability subject to change.

- At least 18 credits must be in the 500 or 600 series, combined.
- **Thesis Option:** Selecting the thesis option may require more than 1-year to complete. Also, IST 600 replaces IST 594 on the above plan.
- WC – World Campus, a maximum of 10 credits may be taken online
- Research Methods Course List:
<https://ist.psu.edu/sites/default/files/current-grad/methods-course-list.docx>
- Suggested Electives - go to LP and search for any IST 5XX class that is not a required course

Scholarship and Research Integrity (SARI) Requirements	
Each student must complete the SARI training – prior to starting the program or by the end of August.	Date completed & submitted to ISTgradprograms@psu.edu
Institutional Review Board (IRB) training	
Responsible Conduct of Research (RCR) training	

MS in Informatics – One Year Curriculum Plan Data Sciences (30 credits)

Fall Semester	Courses*	Credits	Notes
Required	IST 504 – Foundations of Theories and Methods of Information Sciences and Technology	3	Foundations
Required	IST 557 – Data Mining: Techniques and Applications	3	Data Sciences
Required	IST 594 – Research Topics (Scholarly Paper)	0-3	Research
Required	Research Methods STAT 500 – Applied Statistics (recommended course)	3	Data Sciences
Total Credits		9-12	

Spring Semester	Courses*	Credits	Notes
Required	IST 558 – Data Mining II	3	Data Sciences
Required	IST 594 – Research Topics (Scholarly Paper)	0-3	Research
Required	Specialization Course	3	Data Sciences
Required	Research Methods (choose from list)	3	Advisor Approval Required
Total Credits		9-12	

Summer Semester	Courses*	Credits	Notes
Required	Specialization Course	3	Data Sciences
Required	Specialization Course	3	Data Sciences
Required	IST 594 – Research Topics (Scholarly Paper)	0-3	Research
Total Credits		6-9	

*Suggested curriculum plan with an aggressive 1-year completion goal. Course availability subject to change

- At least 18 credits must be in the 500 or 600 series, combined.
- **Thesis Option:** Selecting the thesis option may require more than 1-year to complete. Also, IST 600 replaces IST 594 on the above plan.
- WC – World Campus, a maximum of 10 credits may be taken online
- Research Methods Course List:
<https://ist.psu.edu/sites/default/files/current-grad/methods-course-list.docx>
- Suggested Electives - go to LP and search for any IST 5XX class that is not a required course

Scholarship and Research Integrity (SARI) Requirements	
Each student must complete the SARI training – prior to starting the program or by the end of August.	Date completed & submitted to ISTgradprograms@psu.edu
Institutional Review Board (IRB) training	
Responsible Conduct of Research (RCR) training	

MS in Informatics – One Year Curriculum Plan

Human Centered Design (30 credits)

Fall Semester	Courses*	Credits	Notes
Required	IST 504 – Foundations of Theories and Methods of Information Sciences and Technology	3	Foundations
Required	IST 521 – Human-Computer Interaction: The User and Technology	3	Human-Centered Design
Required	IST 594 – Research Topics (Scholarly Paper)	0-3	Research
Required	Research Methods (choose from list)	3	Advisor Approval Required
Total Credits		9-12	

Spring Semester	Courses*	Credits	Notes
Required	IST 520 – Foundations in Human-Centered Design	3	Human-Centered Design
Required	IST 525 – Computer-Supported Cooperative Work	3	Human-Centered Design
Required	IST 594 – Research Topics (Scholarly Paper)	0-3	Research
Required	Research Methods (choose from list)	3	Advisor Approval Required
Total Credits		9-12	

Summer Semester	Courses*	Credits	Notes
Required	Specialization course	3	Human-Centered Design
Required	Specialization course	3	Human-Centered Design
Required	IST 594 – Research Topics (Scholarly Paper)	0-3	Research
Total Credits		6-9	

*Suggested curriculum plan with an aggressive 1-year completion goal. Course availability subject to change

- At least 18 credits must be in the 500 or 600 series, combined.
- **Thesis Option:** Selecting the thesis option may require more than 1-year to complete. Also, IST 600 replaces IST 594 on the above plan.
- WC – World Campus, a maximum of 10 credits may be taken online
- Research Methods Course List:
<https://ist.psu.edu/sites/default/files/current-grad/methods-course-list.docx>
- Suggested Electives - go to LP and search for any IST 5XX class that is not a required course

Scholarship and Research Integrity (SARI) Requirements	
Each student must complete the SARI training – prior to starting the program or by the end of August.	Date completed & submitted to ISTgradprograms@psu.edu
Institutional Review Board (IRB) training	
Responsible Conduct of Research (RCR) training	

A. Full-time Matriculation

Graduate students in the IST M.S. program are expected to matriculate on a full-time basis at the University Park campus each fall and spring semester. There are no exceptions to the requirement for full-time, on-site matriculation. In addition, new students in the M.S. program are ordinarily expected to begin their studies in the fall semester of their first year.

B. General Requirements

M.S. in Informatics and I.U.G.

Master's students in Informatics (M.S. and I.U.G.) must complete a minimum of 30 credits for both the thesis and scholarly paper option with 20 of these credits earned at the University Park campus. These include 3-6 credits of core requirements and 24-27 credits of primary and supporting field requirements. Reflecting the interdisciplinary nature of the program, many of the approved elective courses are offered by other colleges.

M.S. in Cybersecurity Analytics and Operations

Master's students in Cybersecurity Analytics and Operations (M.S.) must complete a minimum of 30 credits at the 400, 500, 600 or 800 level for both the thesis and scholarly paper option with at least 18 credits in the 500 or 600 series combined; 27 of the 30 credits must be earned at Penn State.

(1) Core Requirements

M.S. in Informatics (3-6 credits)

All Informatics M.S. and I.U.G. students are expected to develop a broad understanding of the core constructs of people, information, technology, and the significant interactions among those elements by taking IST 504 (required) in the fall and IST 505 (optional) in the spring of their first year. Students pursuing a research-focused program are strongly encouraged to register for IST 505 in the spring of their first year.

M.S. in Cybersecurity Analytics and Operations (15 credits)

The objectives of this M.S. degree are to create a deep understanding of cybersecurity analytics and operations, by blending education relating to technology, incident response, strategic planning, and crisis management. Students wanting to gain a deeper understanding of research and its importance to cybersecurity should consider taking IST 504 in the fall. The core courses of this program are:

- IST 543 (Foundations of Software Security)
- IST 554 (Network Management and Security)
- IST 815 (Foundations of Information Security and Assurance)
- IST 820 (Cybersecurity Analytics)
- IST 825 (Technologies for Web and E-Commerce Application Security)

(2) Research Methods Requirements (6 credits) - M.S. in Informatics only

All Informatics candidates must develop a basic understanding of the research methods utilized in the information sciences, by taking two graduate level research methods courses offered in IST or elsewhere. The focus of the course must be on the methods being learned rather than application of some method to a research domain. A list of approved courses is kept on file with the graduate programs office.

(3) Specialty Area Requirements and Electives

M.S. in Informatics - Specialty Area Requirements (12-18 credits)

In consultation with his/her adviser, a candidate is expected to choose courses in one or more areas customized to support the thesis or scholarly paper requirement. In addition to advanced courses in IST, a specialty area could be in law, business, education, engineering, the liberal arts, science, or any area that is linked to the information sciences. These courses can be at the 400 or 500 level with a maximum of 6 credits at the 400 level. Students who register for IST 596 as part of their coursework must fill out a Request for Independent Study form.

M.S. in Cybersecurity Analytics and Operations – Electives (9-12)

In consultation with his/her adviser, a candidate is expected to choose courses in one or more areas customized to support the thesis or scholarly paper requirement.

- IST 504 (Foundations of Theories and Methods of IST Research)
- IST 511 (Information Management: Information and Technology)
- IST 512 (Information Processing Architecture and Technology)
- IST 555 (Intelligent Agents and Distributed Decision Making)
- IST 557 (Data Mining)
- IST 558 (Data Mining II)
- IST 564 (Crisis, Disaster, and Risk Management)
- IST 805 (Cybersecurity Forensics and Management)
- IST 841 (Search Engines and Information Retrieval)
- IST 868 (Topics in Visual Analytics for Security Intelligence)

(4) Thesis or Scholarly Paper (3-6 credits)

In conjunction with their adviser, students may choose a thesis or scholarly paper option. Students who choose the thesis option must write a thesis, orally defend the thesis to the thesis committee, and register for 6 credits of IST 600. The thesis should focus on a well-defined problem relevant to the information sciences. Students who choose the scholarly paper option must complete a scholarly paper and register for 3 credits of IST 594.

The scholarly paper is to be a focused piece of technical work that applies the student's expertise and knowledge base, and that is documented and presented as a scholarly research paper. The scholarly paper is to be submitted to the student's committee; an oral presentation is at the discretion of the student's adviser.

(5) Time Limitation

All requirements for a master's degree (including acceptance of a thesis or scholarly paper as may be specified), whether satisfied on the University Park campus or elsewhere, must be met within two years of admission to degree status.

(6) Language and Communication

In addition to successfully fulfilling the English competency expectation through the AEOCPT exam and/or remediation, all candidates must be competent in the English language and must have demonstrated skills in the communication of ideas both orally and in writing commensurate with the requirement of professional work.

Master's Committee Selection

An M.S. and I.U.G. degree-seeking student who selects the thesis option must formally select his or her Master's Degree Committee no later than the completion of their general degree requirements. This normally occurs after completing the first year of studies.

This committee will be composed of three members with at least two Penn State graduate faculty members. At least two of the committee members should be graduate faculty members of IST.

By the end of the first semester of study, the student should formulate a plan of research and begin to identify members of the Master's Degree Committee.

Master's Thesis Defense

A. Objective

The objective of the Master's Thesis Defense is to assess a M.S. or I.U.G. candidate's research accomplishments based on the completion of a final draft of the candidate's thesis. This is to be facilitated by the M.S. or I.U.G. candidate submitting the final draft of the thesis to the Master's Committee and by presenting the thesis at a formal meeting of his or her committee that is open to the University community. Once the final thesis is approved, it will be submitted and archived electronically via eTD's to be accessible worldwide.

B. Graduate School Guidelines

Changes to the official [Graduate School Bulletin](#) take precedence over the content of this section.

The M.S. or I.U.G. candidate who has satisfied all other requirements for the degree will schedule the final examination on the recommendation of the Master's Committee chair. Please note that there will be specific deadlines determined by the Graduate School for each semester. In particular, note that the deadline for submitting the thesis draft is very early in the semester (see [Thesis, Dissertation, Performance and Oral Presentation](#)

[Calendar](#)). The date to upload the **final draft** of the thesis is about one month before the end of the semester. One month's notice is required for scheduling this examination. Please go to the [IST Graduate Student website](#) to submit the IST Exam Request Form and IST Degree Audit. The deadline for holding the examination is six weeks before commencement. It is the responsibility of the M.S. or I.U.G. candidate to provide a copy of the thesis to each member of the Master's Committee *at least two weeks* before the date of the scheduled examination.

Both the thesis adviser and the student are responsible for ensuring the completion of a draft of the thesis and for adequate consultation with members of the Master's Committee well in advance of the final oral examination. Major revisions to the thesis should be completed before this examination. The thesis should be in its final draft, with appropriate notes, bibliography, tables, etc., at the time of the final oral examination. Both the content and style should be correct and polished by the time this final draft of the thesis is in the hands of the Master's Committee.

The Master's Thesis Defense is an oral examination administered and evaluated by the entire Master's Committee. It consists of an oral presentation of the thesis by the candidate and a period of questions and responses. These will relate in large part to the thesis, but may cover the candidate's entire program of study, because a major purpose of the examination is also to assess the general scholarly attainments of the candidate.

At least two members of the Master's Committee (including the thesis adviser or chair) must be physically present at the final oral examination. The graduate student also must be physically present at the exam. No more than one member may participate via telephone or video conferencing. The Master's Thesis Defense request and a request for exceptions must be submitted to the Graduate Programs Office for approval at least two weeks prior to the date of the exam. Special arrangements, such as requirements for meeting participation via distance, should be communicated to the student and the Master's Committee members well in advance of the examination.

A favorable vote of at least two-thirds of the members of the committee is required for passing the final master's oral examination. The results of the examination are reported to the IST Graduate Programs Office via the Completion of Master's Final Defense form to become part of the student's graduate file. Students should go to the Thesis Office website and print a copy of the [Master's Signatory Page](#) and each committee member sign this form. If a candidate fails, it is the responsibility of the Master's Committee to determine whether or not another examination may be taken.

General Thesis Requirements

The Graduate School, the University Libraries, and the graduate faculty of Penn State have established format standards that a thesis must meet before it receives final approval as a fulfillment of a graduate requirement. The [Thesis Office](#) is the unit of the Graduate School responsible for certifying that dissertations/theses have been prepared in accordance with these established regulations.

Every dissertation/thesis must be reviewed and approved by the Thesis Office staff. That office reviews for format only and does not edit for spelling, grammar, or punctuation. When a dissertation/thesis is submitted to the Thesis Office, it must meet the formatting and deadline requirements set forth in the latest edition of the [Thesis Guide](#). Information Technology Services (ITS) offers [PSTT](#) (Penn State Thesis Template). This is a software package that contains templates including styles, macros, toolbars, menus, and layouts. The [Statistical Consulting Center](#) gives advice to graduate students working on thesis research. The [Graduate Writing Center](#) in 111-H Kern Graduate Building provides consultation to graduate students in all disciplines.

A master's thesis must be submitted electronically. Please go to the following site for mandatory deadlines, the first of which comes **very early** in the semester. The link is: [Thesis, Dissertation, Performance and Oral Presentation Calendar](#). For more information on electronic dissertations/theses (eTDs), visit the [eTD's website](#).

In all cases, the dissertation/thesis author bears the ultimate responsibility for meeting Graduate School requirements. It is the dissertation/thesis author who must pay the dissertation/thesis fee, activate the intent to graduate, meet deadlines for submission and corrections, and obtain faculty signatures.

A summary of the dissertation/thesis submission requirements is provided below. The dissertation/thesis author should:

- Become familiar with the format requirements by reading the [Thesis Guide](#) carefully and be aware of all Graduate School and Thesis Office deadlines as indicated on the [Thesis, Dissertation, Performance and Oral Presentation Calendar](#).
- Active the intent to graduate on [LionPATH](#) during the semester in which you plan to graduate. Go to the [Thesis, Dissertation, Performance and Oral Presentation Calendar](#) for deadlines.
- Upload a draft of your thesis for format review (word or pdf file) to the [eTD website](#) by the specified deadline. Corrections and detailed instructions will be returned to you by e-mail within two weeks.
- Make any changes required by the adviser and committee members. Receive approval in the form of signatures on the [Master's Signatory Page](#).
- Review the thesis one final time to be sure that no further changes are needed. It will not be possible to make corrections after final approval by the Thesis Office.
- Go to the [eTD website](#) and upload the final eTD; submit supporting materials to the Thesis Office (Note: It doesn't matter if you upload first or submit the materials first).

Supporting materials are: signed Master's Signatory Page and \$25 thesis fee collected via PSUPAY.

- Await notification of thesis approval by e-mail. If changes are required, you will be notified. Your eTD will be accessible on the eTD website immediately after graduation unless you have restricted access (See top of Master's Signatory Page).
- If bound copies are needed, contact [Multimedia & Printer Center](#) on campus or you may use an off-campus source. All copies are the author's responsibility. The Graduate School does not provide copies.

Master's Scholarly Paper

A. Objective

The Master's Scholarly Paper should be a focused piece of technical work that applies the student's expertise and knowledge base. This option is for those whose primary goal is to gain advanced knowledge and skills in the information sciences and technology field. The scholarly paper is not submitted to the Graduate School's Thesis Office and is not archived.

B. IST Guidelines

The M.S. or I.U.G candidate who has satisfied all other requirements for the degree will submit the scholarly paper to their adviser. If desired by the candidate's adviser or candidate, an oral presentation may be scheduled. If a presentation is to be scheduled, one month's notice is required for scheduling the oral presentation. Please go to the [IST Graduate Student website](#) to complete and upload a degree audit and submit a request for the completion of your Master's Scholarly Paper.

Integrated Undergraduate Graduate (I.U.G.)

(Available for the M.S. in Informatics only)

The Integrated Undergraduate Graduate (I.U.G) Degree Program offers the chance for highly qualified students to obtain the baccalaureate and master's degree in less time than it would take to obtain these degrees sequentially. The I.U.G. allows students accepted into the program to count up to 12 credits toward both their baccalaureate and master's degree requirements. This I.U.G. program introduces undergraduate students to graduate faculty and to the rigors of graduate study.

I.U.G. Degree Requirements

Students in the I.U.G. program must satisfy the requirements for both their B.S. degree (either in Security and Risk Analysis or in Information Sciences and Technology) and the M.S. degree in Informatics. The first three years of the I.U.G. program are identical to the first three years of the

student's chosen B.S. program. The fourth year of the I.U.G. program differs from the fourth year of the B.S. program because of the inclusion of courses that count toward the Master's of Science degree requirements.

The graduate portion of the program requires 30 credits of coursework (3-6 credits of core courses, 6 credits of research methods, 12-18 credits of specialization, and 6 credits of research). These requirements are the same as for the M.S. degree (see previous). Double-counting of courses aids the I.U.G. student in completing these requirements within the projected 5-year period for the B.S. and M.S. degrees.

I.U.G. students have the option of completing a Thesis or a Scholarly Paper. This decision is made in conjunction with the student's adviser and should be determined during the first year of study. (Note: Schreyer Honors College students should choose the thesis option, because the Master's thesis can double count for the undergraduate honors thesis). Students electing to complete a thesis take IST 600 research credits, and those electing a scholarly paper take IST 594 research credits. Once an option has been chosen and either IST 600 or IST 594 taken, the student may only switch to the other option with the approval of his/her adviser and the IST Graduate Program Director. Students cannot substitute IST 600 credits for IST 594 credits except by approval of both the IST Graduate Programs Director and the Graduate School. In the event that approval is granted, additional credits of preparation may be required.

Contrast of Thesis vs Scholarly Paper Options

Thesis	Scholarly Paper
30 total credits	30 total credits
6 credits core courses: - IST 504	3-6 credits core courses: - IST 504 (required)
12 credits specialization	12-18 credits specialization
6 credits research methods	6 credits research methods
6 credits 600 for thesis	3-6 credits 594 for scholarly paper

A. Double Counting of Coursework

Students admitted to the I.U.G. program may double-count a maximum of 12 credits to their graduate and undergraduate degrees in the College of Information Sciences and Technology. At least 50% of the courses proposed to double-count must be at the 500 or 800 level. In their senior year, I.U.G. students will take 6 credits of specified graduate work, courses IST 504 and IST 505 (IST 505 is optional for those doing a scholarly paper), along with their other courses. These 6 credits of IST 504 and IST 505 (or another 500-level course) will apply to both the graduate program and the undergraduate IST/SRA support of option requirement. As part of the graduate specialty course requirements (12-18 credits), students will 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 in the IST B.S. / IST M.S. I.U.G. program may choose any 400-level undergraduate option course (IST

411, IST 412, IST 413, IST 420, IST 421, IST 431, IST 432) that they are using to fulfill an undergraduate option requirement and apply the credits to both the undergraduate option requirement and the graduate specialty course requirement.

Students in the SRA B.S. /IST M.S. I.U.G. program may choose any 400-level undergraduate option course (SRA 433, SRA 468, SRA 471, IST 451, IST 452, IST 454, IST 456) that they are using to fulfill an undergraduate option requirement and apply the credits to both the undergraduate option requirement and the graduate specialty course requirement. Credits associated with the thesis or culminating scholarly paper, such as IST 594 and IST 600, may not be double-counted.

B. Enrollment Guidelines

Student should follow the I.U.G. enrollment guidelines listed in Appendix B (forms). Failure to follow the guidelines may impact a student's financial aid.

Students should note that depending on the guidelines for a given student's situation, students may need to use a paper form and manual processing to enroll (instead of simply enrolling via LionPATH). A manual override is required to allow for cross-career (i.e., undergraduate and graduate) enrollment. This occurs when graduate (500/800) level courses are shared between the undergraduate and graduate record while the student is primarily enrolled as an undergraduate student. A form is submitted to Graduate Enrollment Services (GER) for approval that is then forwarded to the Office of the University Registrar (OUR) for processing. If a student fails to follow the I.U.G. enrollment guidelines, a student must use a 'Swap' form for correct registration. The form is submitted to GES for approval then forwarded to the Office of the University Registrar for processing.

C. General Requirements

Academic Performance Requirements

A student admitted into the I.U.G. program will be monitored by his or her adviser and the IST Graduate Programs Office on an on-going basis. Students who have not maintained a 3.5 GPA in their senior year will be put on probationary status with respect to the I.U.G. program. Their ability to continue in the I.U.G. program will be based on their academic performance in the first semester of their graduate year.

D. Committee and Thesis/Scholarly Paper

All requirements and direction provided in the M.S. Degree section (previously) for Committee Selection, M.S. Thesis Defense, General Thesis Requirements, and M.S. Scholarly Paper Requirements hold for I.U.G. students as well.

E. Opting Out

If for any reason a student admitted to the I.U.G. program is unable to complete the requirements for the master's degree, the student will be permitted to receive the B.S. degree, assuming all the undergraduate degree requirements have been satisfactorily completed.

Doctor of Philosophy (Ph.D.) Informatics

The Ph.D. in Informatics

The Ph.D. program provides foundational training that will prepare you for a career in information science, related sciences, and technology research. The first-year core curriculum will give you the skills and background to conduct interdisciplinary technology research. A flexible elective structure will provide customization for your interests and needs. After the first two years of courses, you will engage in further research, leading to a comprehensive exam and dissertation proposal, followed by a dissertation defense. Typically, you will graduate in 4-5 years after you enter the program.

As a Ph.D. student, you will work on a series of research projects, publishing work with your adviser(s) and fellow lab members in international conferences and journals, effectively beginning a career in research while still a student. As you progress through the program, you will be advised and become self-directed, rather than managed. Given this level of autonomy, students find the Ph.D. program both extremely challenging and rewarding.

On the following pages, you will find useful information about how our Ph.D. program is structured, and a description of the expectations we have for our graduate students. In addition, this handbook provides details of the university and college policies and procedures that will govern your time here at Penn State.

Doctor of Philosophy Degree Requirements (Ph.D.)

F. Full-time Matriculation

Graduate students in the Ph.D. in Informatics program are expected to matriculate on a full-time basis at the University Park campus each fall and spring semester. New Ph.D. students are ordinarily expected to start in the fall semester of their first year. To be considered full-time, students do not need to be registered in summer if they have been registered the previous fall and spring semesters.

G. General Requirements (32 credits)

The doctor of philosophy degree in Informatics (INMAC) offers advanced graduate education for students contemplating careers in academic teaching and research, as well as research in non-academic settings. The program is interdisciplinary and expects scholarship at the highest levels with each student exhibiting depth of competency in at least one of the core areas of IST.

The curriculum consists of a core requirement, which provides a theoretical foundation for all Ph.D. students in IST. Students must complete a minimum of 32 course credits plus additional dissertation credits (for example, IST 600/601). Reflecting the interdisciplinary nature of the program, many elective courses will be those offered by other colleges.

Course Requirements:

- 3 credits IST 501 (required first semester)
- 2 credits IST 590 (graduate colloquium required in the first and second semesters)
- 9 credits foundation courses: select three courses from the department-maintained list of foundational courses, following breadth constraints
- 18 credits: select six research methodology or other specialization courses in consultation with your adviser to support progress on your dissertation research

Note: In general, research methodology and specialization courses should be at the graduate level; students may include a maximum of six 400-level credits.

NOTE: Students must maintain a GPA of 3.0 and receive a C or better in their courses to complete milestones and to graduate.

(1) First-Year Core Requirements (14 credits)

All Ph.D. students are expected to develop a broad understanding of foundations, theories and methods across the disciplines that together constitute the research landscape of the college. In their first semester, students must take the 3-credit introduction to interdisciplinary research methods (IST 501) and one credit of graduate colloquium (IST 590). In their second semester, students must take a second credit of graduate colloquium. During their first two semesters, students must also complete a selection of three foundation courses that are offered to provide interdisciplinary perspectives on research; these first-year requirements help the students to prepare for the Qualifying Exam that takes place at the end of the first year.

Students are expected to develop interdisciplinary knowledge across computational and information science as well as human-centered and social informatics. Because the core curriculum is designed to provide a shared multidisciplinary foundation, *substitutions for the first-year requirements are not permitted*. If a student has already achieved graduate level mastery of one of the foundation areas, the student is expected to broaden via courses in other areas.

(2) Research Methods and Specialization Requirements (18 credits)

All candidates must take 18 credits of courses that will guide them to acquire and practice research methods relevant to their dissertation project or other research activities, or to acquire specialized knowledge and skills relevant to their doctoral studies. In general, these courses should be 500-level, but up to 6 credits of advanced undergraduate courses may also be accepted. The coursework should be selected (generally over the first two years) with the help of the faculty adviser to ensure that they best support the student's research program.

(3) 600-Level Credits

In addition to the 32 credits of core courses and specialized study, students will also register for IST 600 research credits. All 600-level credits will receive a grade of “R”, signifying their role as research credits. Upon successful completion of the comprehensive exam, students register for IST 601 to pursue their dissertation research. The following is a list of the various research courses and a brief description of each:

IST 600 Thesis Research (This is for BOTH M.S. and Ph.D. students. This is for I.U.G. and M.S. students writing a thesis and for Ph.D. students who have **not yet passed** their comprehensive exams, and who are actively doing research **ON campus**)

IST 601 Ph.D. Dissertation Full-Time (This is for Ph.D. students who **have passed** their comprehensive exams, who are actively doing research **ON campus**)

IST 610 Thesis Research Off Campus (This is for Ph.D. students who have **not yet passed** their comprehensive exams, who are semi-actively doing research **OFF campus**)

IST 611 Ph.D. Dissertation Part-Time (This is for Ph.D. students who **have passed** their comprehensive exams, who are semi-actively doing research **OFF campus**)

(4) Time Limitation

A doctoral student is required to complete the program, including approval of the doctoral dissertation and the passing of the dissertation defense, within *eight years* after successful completion of the Qualifying Examination (generally completed at the end of the first year). To request an extension, the IST Graduate Programs Office must send a memo from the Graduate Programs Director to the Director of Graduate Enrollment Services for review. The extension may be granted in appropriate circumstances.

(5) Language and Communication Requirements

In addition to successfully fulfilling the English competency expectation through the AEOCPT exam and/or remediation, all candidates must be competent in the English language and must have demonstrated skills in the communication of ideas orally and in writing that are commensurate with the requirement of professional work. One component of the Qualifying Examination is an assessment of written and oral English proficiency. If English proficiency problems are discovered through coursework or the qualifying exam, the student may be assigned specific remedial coursework or other activities; more generally, students experiencing language difficulties must work with their advisers to plan for remediation.

Minor

A Ph.D. candidate is not required by the Graduate Council to have a minor field of study. However, a department, advisor or committee who are supervising a Ph.D. student may require the candidate to pursue work in a minor field outside of IST; a student may also elect to pursue such a minor with the permission of his or her doctoral committee.

A doctoral minor consists of no fewer than 15 graduate credits of integrated or articulated work in one field related to, but different from, that of the major. Programs should consider that a doctoral minor should represent curriculum and study that reflect graduate-level concepts and scholarship, with a preponderance of courses at the 500-level, at a minimum, six credits must be at the 500-level. A minor may be taken in one of the approved graduate degree programs offered at Penn State. The minor field chosen must have the approval of the departments or committees responsible for both the major program and the minor field. If more than one minor is being proposed, a separate group of courses must be taken for each (i.e., none of the courses may be used to fulfill the requirements of two or more minors). If the student received a master's minor in the same field as is being proposed for a doctoral minor, the 15 credits taken must be above and beyond those used for the master's minor. However, credits earned in the master's program over and above those applied to either the master's minor or major may be applied to a minor in the Ph.D. program.

At least one faculty member from the minor field must be on the candidate's doctoral committee. To be identified on the official transcript as a minor, students must formally declare it by submitting a Request to Add Graduate Minor form to the Graduate Programs Office.

Qualifying Exam

A. Purpose

The Qualifying Examination is a University-mandated procedure to assess whether the student is capable of conducting doctoral-level research. Toward this goal, the Qualifying Examination of the College of Information Sciences and Technology assesses the student's ability to reason about a research topic of personal interest from multiple perspectives (e.g., as represented by the core curriculum). In keeping with Penn State Graduate School policies to assess high-level competence of the English language, the exam also includes an assessment of written and oral communication fluency.

B. Committee

The Qualifying Examination is administered by a committee assigned by the College. Each committee will typically administer exams to 4-6 students. There will be as many committees as deemed necessary to cover the number of students to be examined.

Voting members of the committee will consist of three IST graduate faculty members, unless the student is pursuing a dual degree (which requires involvement of a dual degree faculty member). Typically, these three committee members would come from different disciplinary areas representing the breadth of research in IST and the corresponding foundational courses.

C. Eligibility

To be eligible to take the qualifying exam, a student must be enrolled in the Ph.D. Program in the College of IST at Penn State. The student must have completed 18 graduate credits at Penn State (these do not include courses used for transfer or substitution purposes) by the end of the first spring semester. The student must have a cumulative GPA of 3.0. The student must have received credit for IST 501 and three courses that are selected from the list of foundation courses maintained by the department. The student must also have support of her/his adviser to continue with Ph.D. studies, in the form of a letter of support.

D. Grading

There will be 3 parts to the overall exam; Portfolio, Written and Oral.

PART 1: PORTFOLIO

From the student: Each student eligible to take the qualifying exam will submit a Portfolio to the Qualifying Committee by the middle of the spring semester. The Portfolio should include:

1. A current curriculum vitae
2. A copy of the student's transcript plus the anticipated grades for spring.
3. A 500-word Abstract. The student, with his or her adviser's assistance, will identify a research area that he or she is currently interested in pursuing. Following this, he or she will *independently* write an abstract of approximately 500 words, including all appropriate citations to relevant scientific research and an appropriate title. Although research discussions between student and adviser are expected and encouraged, the exam abstract will be written by the student without assistance from the adviser.

From the adviser: A confidential letter to the Qualifying Committee detailing the student's readiness and potential to do research.

From the instructors of IST 501 and the foundational courses: Each instructor will be asked to provide feedback on the performance of first-year students in their classes. Instructors are not required to provide feedback on high performing students, but may offer it if they wish. Instructors are required to provide feedback on all students who have received a grade of "B-" or less.

PART 2: WRITTEN EXAMINATIONS

***Typically, these will take place during the week after final exams.**

Written exam questions are created by each Qualifying Committee prior to the beginning of the Qualifying Examination. The goal of these questions is to allow the students to demonstrate that they can make sense of research literature both inside and outside their research areas, and that they can apply their new understanding to identify and discuss implications for their research topics. Each question is written to address both the research abstract submitted and the student's record of foundational courses. The research proposal should contain approximately 3,000 words (not counting bibliography); this is a guideline, but is intended to aid with consistency across questions and students. Further direction on the written examinations is provided to the candidates in IST 501, IST 590 and also via email in the spring semester.

PART 3: ORAL EXAMINATIONS

***Typically, these take place the week following the due date for the written exams, so as to permit grading by the committees.**

The Qualifying Committee meets with each student for approximately one hour. Note that an oral exam will take place even if the committee has recommended a failing grade for the portfolio and written portions of the exam. During the exam, the student will first present his/her research proposal (15 minutes; the preparation of this presentation must be the sole work of the student; no consultation is permitted). The committee members will then ask questions related to the proposal. After the oral exam, the student will depart and the committee will discuss the oral exam performance. The committee will follow a rubric that guides evaluation of the student's performance on several dimensions.

Exam Results

For students who receive a passing grade, no further action is required and they will be encouraged to begin preparation for their next milestone (Comprehensive Exam). For students who receive a failing grade, counseling will ensue to determine whether a shift to the master's program is warranted or whether the student should terminate his or her studies. The outcome determined by the exam committee will be shared as soon as possible with the student, the student's adviser, and the committee. The adviser and/or any dissenting committee member will have one week to register concerns or to appeal this outcome. Such concerns should be submitted to the Director of Graduate Programs and to the Graduate Programs office, and should include a description of the concern and rationale for any requested review.

Failed Exams

- Students who fail the exam will be dropped from the Ph.D. program by the Graduate School after notification from IST Graduate Programs.
- If the student wants to continue with a master's degree, she/he will fill out a Change of Degree form and submit to Graduate School.
- If Change of Degree form is not filled out, the student's status will be changed to Non-Degree starting with the semester after the qualifying exam is taken.

Exam Appeals

- Appeals by the student, adviser or committee member concerning an exam outcome will be submitted for review to GAC, who will in turn appoint an appeal committee of two graduate faculty members not part of the original committee. Remediation conditions attached to a Pass outcome may also be the subject of appeal. The appeal requests must be submitted no later than 48 hours after the outcome determination is communicated to the student and his or her adviser.
- The appeal committee will review the entire set of exam documents and comments and submit a recommendation to GAC. The committee will then decide whether to support the appeal (i.e. to reverse the original decision) and communicate this to the parties involved. Note that if GAC at that time includes a member from the committee whose exam result is being appealed (or an adviser of a student submitting an appeal), that individual will not be involved in the appeal process.
- If the secondary decision is appealed, a final review and decision will be made by the Associate Dean for Graduate and Undergraduate Studies.

The next major milestone for doctoral students who successfully complete the qualifying examination is to complete his or her coursework and prepare for their Ph.D. dissertation proposal and the Comprehensive Examination. This exam is normally taken early in the student's third year in the Ph.D. program (12-18 months after completing the qualifying examination).

Doctoral Committee Selection

No later than one year following successful completion of the Qualifying Examination, and before scheduling the Comprehensive Examination, the student must formally select a Ph.D. Committee in alignment with the [Graduate School Policy GCAC-602](#). Consistent with that policy, this committee should be formed to assist in guiding the student's research training. Note that this Committee may become the student's doctoral committee as a research topic is identified and formalized as a dissertation proposal, but shifts or additions to membership are normal as the student's research interests evolves and specializes.

The Ph.D. (and doctoral) committee must be composed of four or more faculty members with graduate status at Penn State. The committee is chaired by the student's dissertation advisor, who must be a graduate faculty member with full or partial budgetary appointment in IST; the student may also have a dissertation co-chair who can hold an appointment in IST or an outside unit. The committee must include at least three internal faculty members who have graduate status and full or partial budgetary appointments in IST (these can include the chair and co-chair). It must also include at least one outside field/unit member who is a Penn State graduate faculty member with no budgetary connection or conflict of interest with the IST program. There is no limit to the size of the committee.

Special cases. A faculty member with a courtesy appointment in IST and graduate faculty status at Penn State may be counted as an outside field/unit member of an IST student's doctoral committee. Individuals who are not members of the Penn State Graduate Faculty but are otherwise qualified and have particular expertise in the student's research area may be appointed as Special Members. There are additional committee composition requirements for students pursuing a doctoral Dual Degree or a Minor. Please see the Graduate Programs Office to determine the specific composition needs for these cases.

The overall responsibility of the Ph.D. committee is to guide the scholarly development of the student as described in [Graduate School Policy GCAC-603](#). This guidance includes overview of the student's educational program and input to the student's annual evaluation. All Ph.D. Committee members will help to design and carry out the student's Comprehensive Examination; in general, the entire committee is responsible for the intellectual development and research activities of the student during the post-qualifying period. To document this step, a Graduate Student Committee Procedures and Doctoral Committee Appointment Signature Form must be completed within one calendar year following successful completion of the Qualifying Exam. The form can be obtained from the [IST Graduate Programs website](#).

Comprehensive Examination

When a candidate for the Ph.D. degree has completed most or all of their coursework, a Comprehensive Examination is given. The Comprehensive Examination is generally taken within 12-18 months of passing the qualifying examination. The Comprehensive Examination is intended to evaluate the candidate's mastery of the major, and if appropriate, minor field.

A. Content and Format of the Comprehensive Examination

- An international candidate for the Ph.D. must have satisfied the English competency and the communication and foreign language requirement before taking the comprehensive examination.
- All candidates are required to have a minimum grade-point average of 3.00 for coursework done at the University at the time the Comprehensive Examination is given and may not have deferred or missing grades.
- The candidate must be registered as a full-time or part-time student for the semester in which the Comprehensive Examination is taken.
- The College of IST does not allow students to receive a letter grade for a research class. Students will receive an “R” as a grade in the following classes. IST 600, IST 601, IST 610, IST 611. IST 594 is the only class that may receive either an “R” or letter grade, depending on whether it is used for a M.S. scholarly paper or M.S. cumulative experience.
- When a period of more than six years has elapsed between the passing of the Comprehensive Examination and the completion of the dissertation defense, the student is required to pass a second Comprehensive Examination before the final oral examination will be scheduled.

The Comprehensive Exam has a written and oral component. Each college in the university determines how the Comprehensive Exam will be structured. In the College of IST, the Graduate Faculty have chosen to combine the Comprehensive Exam and the dissertation proposal defense into a single session. In this section, we offer details specific to the Comprehensive Exam process and in the following section, we highlight expectations for the dissertation research proposal defense itself. Students are encouraged to familiarize themselves with both activities and the way that they are linked in the College of IST.

Because the Comprehensive Exam and proposal defense happen in a single session, students are assessed on their mastery of their major field of study (and minor or dual degree, if appropriate) as demonstrated by the content of their literature review and methodology sections presented in the written proposal, and as ascertained through oral questioning by the committee members. Committee members assign a rating of the candidate’s mastery (Superior, Above Average, Average, Below Average or Fail). A vote of at least two-thirds is required for passing the comprehensive. Students should note that a two-thirds assessment of Fail results in the student’s termination from the Ph.D. program. The results are formally reported by the IST Graduate Programs Office to the Office of Graduate Enrollment Services.

Working with their adviser and other committee members, the student prepares a dissertation proposal (see the next section for details). The proposal must be available to the committee to review at least two weeks prior to the date of the examination. The proposal is evaluated by the committee members completing the College of IST Doctoral Comprehensive Examination Dissertation Proposal Approval form after the proposal defense. The examination is scheduled by the IST Graduate Programs Office. Students should go to the [IST Graduate Student website](#) to submit the IST Exam Request Form and IST degree audit. Since a two-week notice is required by the University’s Office of Graduate Enrollment Services for preparing the paperwork for this examination, which is open to the public at the adviser’s and student’s discretion, the IST Graduate Programs Office requires notification at least one month prior to the anticipated date.

The exams are announced by the IST Graduate Programs Office one week prior to the exam. Students must submit electronically a research abstract to graduateprograms@ist.psu.edu at the time of scheduling their exam.

At least three members of the doctoral committee (including the dissertation adviser or Chair) must be physically present at the Comprehensive Examination. The graduate student also must be physically present at the exam. No more than one member may participate via telephone; a second remote member may choose to participate via video-conferencing. The examination request and a request for exceptions must be submitted to the Director of Graduate Enrollment Services by the IST Graduate Programs Office for approval at least two weeks prior to the date of the exam. Special arrangements (i.e., requirements for meeting participation via distance) should be communicated to the student and the doctoral committee members well in advance of the examination.

A student must be registered continuously for each fall and spring semester following the semester he or she passes the Comprehensive Exam until his or her dissertation defense (final oral examination) by selecting IST 601.

Dissertation Research Proposal

A. Objective

The objective of the dissertation research proposal is to assess the direction and the appropriateness of the research that will serve as a basis of the Ph.D. dissertation. As part of the Comprehensive Exam, the Ph.D. candidate submits to their doctoral committee a dissertation research proposal that will be presented and defended at a formal meeting of the student's committee. This meeting is open to the university community, and scheduling timelines have been presented in the previous section.

B. Written Dissertation Research Proposal Format

The written proposal must include a review of the relevant literature, definition of the research concepts and methods, and a research schedule with milestones. The written proposal should be given to the candidate's doctoral committee at least two weeks prior to the scheduled comprehensive exam/proposal defense meeting.

C. Sample Research Proposal Outline

- I. Abstract
- II. Introduction
 - Problem definition and scope
 - Motivation from the perspectives of information, technology, and people
 - Research objective (s)
 - Research question(s)
- III. Review of literature

- IV. Proposed research
 - Research framework and approaches to be used
 - Rationale for proposed approaches
- V. Research plan
 - Key tasks and activities
 - Schedule
 - Expected and contributions of the research
- VI. Bibliography/references

If human subjects are to be used, the student must complete the Application for the Use of Human Participants and submit it for approval to the [Office of Research Protections](#) (ORP) upon successful defense of the proposal.

D. Defense of Dissertation Research Proposal

The candidate is asked to present and defend his or her dissertation research proposal to those attending the Comprehensive Exam and proposal defense. Questions are permitted from any of those in attendance as instructed by the doctoral committee chair (typically the student's faculty advisor). At the conclusion of the presentation and defense, all attendees except the candidate and the candidate's doctoral committee may be requested to leave the meeting. Committee members can then ask any additional questions they feel are appropriate for only the candidate's participation. The candidate is then asked to leave the meeting for a short period of time as the committee discusses and evaluates the proposal, the presentation, and the proposal's defense. The candidate then will be called back to discuss the evaluation.

The committee's assessment of the proposal defense focuses on the candidate's readiness to conduct the proposed research. This assessment includes conceptual readiness and methodological readiness. Candidates will be assessed as "Acceptable to Proceed", "Needs Revision" or "Needs a Complete Overhaul Before Proceeding." In addition, the committee members may request additional committee review of any revisions prior to proceeding to the research phase. Note that the proposal defense is evaluated separately from the Comprehensive Exam; that is, students may pass one aspect of the evaluation but not the other.

Dissertation Defense (Final Oral Examination)

A. Objective

The objective of the dissertation defense (final oral examination) is to assess a Ph.D. candidate's research accomplishments based on the completion of a final draft of the candidate's dissertation. This is to be facilitated by the Ph.D. candidate submitting the final draft of the dissertation to his or her Ph.D. committee and by presenting and defending the dissertation to his or her committee at a formal meeting that is open to the University community. The final draft should be in a format that meets the editorial standards of the Graduate School.

B. Graduate School Guidelines

Changes to the official [Graduate School publication](#) take precedence over the content of this section.

The doctoral candidate who has satisfied all other requirements for the degree will be scheduled to take a final examination. Two weeks' notice is required by the Office of Graduate Enrollment Services for scheduling this examination. The student must submit his/her request by going to the [IST Graduate Student website](#) one month prior to the examination. Normally, the final oral examination may not be scheduled until at least three months after the student has passed his or her Ph.D. dissertation proposal (oral comprehensive examination). The Director of Graduate Enrollment Services may grant a waiver in appropriate cases. **The deadline for holding the examination is ten weeks before commencement.** It is the responsibility of the doctoral candidate to provide a copy of the dissertation to each member of the doctoral committee at least two weeks before the date of the scheduled examination.

Both the dissertation adviser and the student are responsible for ensuring the completion of a draft of the dissertation and for adequate consultation with members of the doctoral committee well in advance of the final oral examination. The dissertation should be in its final draft, with appropriate notes, bibliography, tables, etc., when it is submitted to committee members for review. The final examination of the doctoral candidate is an oral examination administered and evaluated by the entire doctoral committee. It consists of an oral presentation of the dissertation by the candidate and a period of questions and responses.

These questions will relate, in large part, to the dissertation, but may also cover the candidate's entire program of study because a major purpose of the examination is also to assess the general scholarly attainments of the candidate. The portion of the examination in which the dissertation is presented is open to the public.

At least three members of the doctoral committee, including the dissertation adviser or chair, must be physically present at the final oral examination. The doctoral candidate must also be physically present at the examination. No more than one member may participate via telephone or video-conferencing. The examination request and a request for exceptions must be submitted to the Director of Graduate Enrollment Services through the IST Graduate Programs Office for approval at least one month prior to the date of the examination. Special arrangements, such as requirements for meeting participation via distance, should be communicated to the student and the doctoral committee members well in advance of the examination.

At the time of the dissertation defense, the doctoral candidate must also meet the following criteria:

- The student must be registered as a full-time or part-time degree student for the semester in which the final oral examination is taken.
- The student is required to have a minimum grade-point average of 3.00 for work done at the university at the time of the final oral examination and may not have deferred or missing grades.
- The student must have completed the residency requirement by the time the final oral examination is scheduled. This means that over some twelve-month period during the interval between admission to the Ph.D. program and completion of the Ph.D. program, the

candidate must spend at least two semesters (**summer sessions are not included**) as a registered full-time student engaged in academic work at the University Park campus.

- There must be a three-month time lapse between the comprehensive exam and the final examination.
- The final oral examination must be scheduled within six years of the comprehensive examination.

A favorable vote of at least two-thirds of the committee members is required for passing. The results of the examination are reported by IST Graduate Programs to the Office of Graduate Enrollment Services within ten days of the examination. Frequently the committee requests clarification and/or revision to one or more sections in the dissertation before believing the dissertation to be successfully completed. The committee can determine whether these clarifications can be monitored by the student's adviser or whether the committee seeks to review the clarifications in a revised version.

General Dissertation/Thesis Requirements

The Graduate School, the University Libraries, and the graduate faculty of Penn State have established format standards that a dissertation or thesis must meet before it receives final approval as a fulfillment of a graduate requirement. The [Thesis Office](#) is the unit of the Graduate School responsible for certifying that dissertations and theses have been prepared in accordance with these established regulations.

Every dissertation/thesis must be reviewed and approved by the Thesis Office staff. That office reviews for format only and does not edit for spelling, grammar, or punctuation. When a dissertation is submitted to the Thesis Office, it must meet the formatting and deadline requirements set forth in the latest edition of the [Thesis Guide](#). Information Technology Services (ITS) offers [PSTT](#) (Penn State Thesis Template). This is a software package that contains templates including styles, macros, toolbars, menus, and layouts. The [Statistical Consulting Center](#) gives advice to graduate students working on thesis research. The [Graduate Writing Center](#) in 111-H Kern Graduate Building provides consultation to graduate students in all disciplines.

A doctoral dissertation must be submitted to the University. For more information on electronic dissertations or theses (eTDs), visit the [eTD's website](#).

In all cases, the dissertation/thesis author bears the ultimate responsibility for meeting Graduate School requirements. It is the dissertation/thesis author who must pay the dissertation/thesis fee, activate the intent to graduate, meet deadlines for submission and corrections, and obtain faculty signatures.

A summary of the dissertation/thesis submission requirements is provided below. The dissertation/thesis author should:

- Become familiar with the format requirements by reading the [Thesis Guide](#) carefully and be aware of all Graduate School and Thesis Office deadlines as indicated on the [Thesis, Dissertation, Performance and Oral Presentation Calendar](#).

- Active the intent to graduate on [LionPATH](#) during the semester in which you plan to graduate. Go to the [Thesis, Dissertation, Performance and Oral Presentation Calendar](#) for deadlines.
- Upload a draft of your thesis for format review (word or pdf file) to the [eTD website](#) by the specified deadline. Corrections and detailed instructions will be returned to you by e-mail within two weeks.
- Defend the dissertation and make any changes required by the committee. This can be done either before or after the format review, as long as deadlines are met. Receive approval from the committee in the form of signatures on the [Doctoral Signatory Page](#).
- Review the dissertation one final time to be sure that no further changes are needed. It will not be possible to make corrections after final approval by the Thesis Office. Convert the file into a PDF for [eTDs](#) submission. If you cannot do this, contact the [Thesis Office](#) for assistance.
- Go to the [eTD website](#) and upload the final eTD. Submit supporting materials to the Thesis Office. Supporting materials are:
 - Signed [Doctoral Signatory Page](#)
 - [ProQuest/UMI Agreement](#)
 - [Survey of Earned Doctorates](#)
 - \$95 dissertation fee. To pay this fee, go to the [Payment Portal](#)
 - Note: It doesn't matter if you upload the dissertation first or submit the supporting materials first
- Await notification of thesis approval by e-mail. If changes are required, you will be notified. Your eTD will be accessible on the eTD website immediately after graduation unless you have restricted access (See top of Doctoral Signatory Page).
- If bound copies are needed, contact [Multimedia & Printer Center](#) on campus or you may use an off-campus source. All copies are the author's responsibility. The Graduate School does not provide copies.

IST Graduate Program Policies

A. Course Waiver Policy

The College of IST requires Ph.D. students to take a minimum of 18 credits (6 courses) to acquire the research methodology and specialized skills needed to complete the dissertation research. The student should select these courses in consultation with his or her faculty adviser. In some cases, the college will accept a *maximum of nine credits* of graduate-level courses from other institutions to meet the methodology and specialization course requirements under the following guidelines:

1. The course must be from an accredited institution.
2. The student must have received an "A" or "B" grade value.

3. The course may have been taken in pursuit of a graduate degree, but completion of that degree is not a requirement.
4. The course must appear on an official graduate transcript.
5. The course must have been taken within the five years prior to the date of registration to the IST graduate program.
6. To receive a course waiver, the student must submit the following to the Graduate Programs Office:
 - a. An IST Graduate Course Waiver Form with the student's adviser's signature.
 - b. An official transcript with the course and grade listed if the Graduate Programs Office does not have this already on file.
 - c. The syllabus for the course that is proposed for waiver.
 - d. An explanation of how the course contributes to the doctoral dissertation research.
7. All course waiver requests must be processed before the Comprehensive Exam.

B. Independent Study Policy

The College of IST allows students to take independent study courses with IST graduate faculty members to learn about areas that are not taught in regular IST graduate courses or in graduate courses in other departments and programs. The college will use the following guidelines for the Independent Study policy:

1. Students requesting an independent study course must submit a completed Independent Study Form to the Graduate Programs Office. (Found on the [IST Graduate Student website](#))
2. The maximum number of independent study credits a student can obtain is six. The maximum hours per independent study course is three but can range from 1-3 depending on the work proposed. These credits may be used as part of the specialization area requirements.
3. Independent study is not to be used for Ph.D. dissertation research. Rather, it is for students to do independent coursework on a subject that is not being offered in IST or elsewhere at Penn State.
4. The student must meet with the independent study instructor for the contact hours related to the number of requested credits. For example, a three-credit independent study would require three contact hours per week.
5. The output of the independent study course must be a deliverable that is relevant to the course and agreed upon by the student and the instructor.

Graduate Student Termination Policy

IST Graduate Student Termination Policy

(Approved by the Graduate Advisory Committee, February 2017)

The College of IST Graduate Student Termination Policy is derived from the [Graduate Education Policies](#).

This policy will pertain to Ph.D., M.S., M.P.S., and I.U.G. students.

Students may be terminated from the graduate program in the College of IST for unsatisfactory

scholarship, which includes not meeting academic standards, such as, but not limited to, minimum required grade-point average or grades in required courses for the program as well as violating ethical, moral and professional standards. A violation of these standards may result in academic sanctions including suspension or dismissal by the graduate program in which the student is enrolled, from that academic program, and/or by the Graduate School from continued or future enrollment in any graduate program at the University.

Examples of unsatisfactory scholarship may include, but are not limited to, behavior which demonstrates a failure to exhibit acceptable ethical, moral, and professional standards; violations of the academic integrity policy or other university policies; inadequate grade-point average; failure to obtain satisfactory grades in required courses for the program; failure to make satisfactory progress in research or other activities related to the culminating experience; or failing the qualifying, comprehensive, or final oral examination for doctoral students. Behaviors, which violate the Student Code of Conduct, will result in a referral to the Office of Student Conduct for further action. Once the Office of Student Conduct completes their review of the matter, the program will proceed with their review and determine appropriate academic sanctions.

The termination process may be initiated by the student's adviser, the student's M.S. or Ph.D. (thesis or dissertation) committee, the student's research or teaching supervisor, the Director of the College's graduate programs or the Graduate Advisory Committee (GAC) for the college. When one of these entities determines that the program of a graduate student must be terminated, a letter describing the need for termination will be sent to the Director of Graduate Programs. The termination recommendation will be reviewed by the Director of Graduate Programs, and with concurrence, the student will be notified by the Director of Graduate Programs that the termination process has been initiated. This termination recommendation then will be reviewed by the Graduate Advisory Committee. If approved by the GAC, the student will receive a letter from the Director of Graduate Programs indicating the reason for the termination and the date the termination will be effective, along with any other necessary information regarding the student's status.

Upon receipt of this notice, the student has the opportunity to seek a review of the decision per Appendix III of the Graduate Degree Programs Bulletin. If the student desires such a review, the student must, within ten days of receipt of the notice, submit a written appeal to the Director of Graduate Programs of the college. The Director of Graduate Programs then provides an opportunity for the student to meet with the faculty member(s) who made the decision to terminate the student's program, including the members of the Graduate Advisory Committee. This meeting must be held within 30 days of receipt of the student's written appeal.

Following this meeting, the Director of Graduate Programs must notify the student within five days, in writing, whether the termination decision has been sustained or reversed. If it is sustained, the program head shall notify the student in writing, providing the reasons for the termination, the evidence upon which the termination decision was sustained and notice of the right to appeal in writing to the Graduate School. The program head will also notify the Graduate School of the decision. Termination will be effective at the end of the semester in which the final decision is made, unless circumstances warrant immediate termination from the program.

If the termination is based upon failure to exhibit and promote the highest ethical, moral, and professional standards expected of graduate students, the Graduate School may also make a determination to dismiss the student from continued or future enrollment in any graduate program at the University.

Forms

Examples of student forms can be found in Appendix A. To obtain IST graduate forms, please visit the [IST Graduate Student Website](#). The Graduate School forms are available on the [Graduate School Website](#).

APPENDIX A

IST and University Forms

Forms used by the Ph.D., M.S., and I.U.G. programs vary. For the most up-to-date versions, please visit the “Current Graduate Students” page located on the IST website at:

<https://ist.psu.edu/current/graduate>

Forms located at this site include:

- Audit Check Sheet
- Adviser Agreement Form
- Adviser Change Form
- Independent Study Form
- Internship Leave Form
- Research Methods Course Substitution Form
- Specialization Course Waiver Form

and others.

APPENDIX B

Reporting and Assistance Resources

As we welcome new and returning students to campus, all members of the Penn State community are asked to be mindful of their individual responsibility to help keep the University a safe and ethical institution and an accountable steward of University funds whether generated from state, federal, student, or any other sources.

The University does not condone wrongful conduct by any member of the Penn State community no matter what position he or she may hold.

Thus, all members of the University community are urged to speak up if they see or suspect illegal, unethical, or unsafe conduct. If you do so, be assured that the University will protect you from retaliation. See [AD67](#) or contact the [Office of Ethics & Compliance](#) for more information.

The following resources are available for faculty, staff, students, and others:

TO MAKE A REPORT

Crime or *emergency situation*

- Contact the campus police or security office
- In an emergency, dial **911**

Child abuse, including child sexual abuse

- Contact the [Pennsylvania Child Welfare Services](#) “ChildLine” at **800-932-0313**
- If the child is in immediate danger, dial **911** first
- Penn State Authorized Adults (per AD72) are also to email AD72@psu.edu communication that a report has been made. More information on [AD72](#)

Behavioral threat

- Contact the [Behavioral Threat Management Team](#) at **855-863-BTMT (2868), 814-863-BTMT (2868), reportBTMT@psu.edu**

Bias or discrimination

- Contact the [Affirmative Action Office](#) at **814-863-0471**
- Visit the [Report Bias](#) website
- Students at University Park should call the Lion Support Help Line at 814-863-2020 to report acts of intolerance
- Students at other campuses may contact their campus Student Affairs office to report acts of intolerance

Sexual Harassment and other forms of sexual misconduct

- Contact the [Affirmative Action Office](#) at **814-863-0471** or another appropriate office listed
- To file a complaint outside of the University contact:
 - The Office for Civil Rights (Philadelphia Office) at **(215) 656-8541** or email OCR.Philadelphia@ed.gov
- The Equal Employment Opportunity Commission (Philadelphia District Office) at **800-669-4000**
- The Pennsylvania Human Relations Commission (Harrisburg Regional Office) at **714-787-9780**

Research-related

- Contact the [Office for Research Protections](#) at **814-865-1775** or ORProtections@psu.edu

Suspected ethical or policy violations

(Including fraud, theft, conflict of interest, retaliation, athletics compliance)

- Use Penn State Ethics and Compliance Hotline at **800-560-1637** or <https://psuethicsandcompliance.tnwreports.com> (Both are anonymous and available 24/7)

TO ASSIST VICTIMS

Sexual violence, sexual abuse or sexual harassment

- The Penn State Sexual Assault and Relationship Violence Hotline is available 24/7 at **800-550-7575 (TTY 866-714-7177)**
- The [University's Sexual Harassment and Assault Reporting Website](#)
- The University-wide designated sexual harassment resource person for students, regardless of sex or gender, is the Director of the [Center for Women Students](#) at 814-863-2027
- The University-wide designated sexual harassment and sexual misconduct resource person for employees is the Vice Provost for Affirmative Action at **814-864-0471**
- For University Park, the Centre County Women's Resource Center Hotline is available 24/7 at **814-234-5050** or **877-234-5050**

All others

- Contact the [Center for Counseling and Psychological Services](#) (CAPS) at **814-863-0395**
- Contact the [Employee Assistance Program](#) (EAP) at **866-799-2728**

RESOURCES

All employees should be aware of Penn State's Conflict of Interest policy. Please see the following for more information:

- <https://news.psu.edu/story/143476/2013/01/04/employees-reminded-disclose-conflicts-interest>
- Policy [HR91](#) – Conflict of Interest
- Policy [RA20](#) – Disclosure and Management of Significant Financial Interests
- Policy [AD86](#) – Acceptance of Gifts and Entertainment

If it is not clear where to turn for assistance, any of these offices will guide the individual to someone who can help:

- [Office of Human Resources Employee Relations Division](#) at **814-865-1412**
- [Office of University Ethics and Compliance](#) at **814-867-5088**
- [Office of Affirmative Action](#) and Title IX Coordinator at **814-863-0471**
- [Office of Student Conduct](#) at **814-863-0342**
- [Office of Internal Audit](#) at **814-865-9596**
- [Cleary Act](#) Compliance Manager at **814-863-1273**
- Your campus, college, or unit's Human Resources representative. Contact information is available at <https://hr.psu.edu/content/hr-strategic-partner-and-consultant-directory>
- [Office of Disability](#) at **814-863-1807**

TRAINING

Training is available on many of the above topics. Contact the [Office of Human Resources Center for Workplace Learning and Performance](#) at **814-865-1473**

The Pennsylvania State University is committed to the policy that all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. It is the policy of the University to maintain an academic and work environment free of discrimination, including harassment. The Pennsylvania State University prohibits discrimination and harassment against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, gender identity, or veteran status. Discrimination or harassment against faculty, staff, or students will not be tolerated at The Pennsylvania State University. Direct all inquiries regarding the nondiscrimination policy to the Affirmative Action Director, The Pennsylvania State University, 328 Boucke Building, University Park, PA 16802-5901; Tel. 814-865-4700/V, 814-863-1150/TTY. U. Ed. IST 20-06

This publication is available in alternative media on request.