Systems Science and Industrial Engineering

Thomas J. Watson College of Engineering and Applied Science
Binghamton University (The State University of New York at Binghamton) Binghamton, New York 13902-6000

SSIE Graduate Student Handbook

This handbook provides SSIE Department Graduate Students with relevant information to assist you during your graduate studies. This handbook is not intended to represent, nor does it contain, all regulations and policies that relate to graduate students. Students remain responsible for all University policies and regulations that pertain to them. Every effort has been made to provide students with complete and accurate information on the topics provided in the SSIE Graduate Student Handbook. SSIE reserves the right to amend, revise or modify this content at any time.

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I. Welcome

We are extremely delighted to welcome you to the Systems Science and Industrial Engineering (SSIE) Department of the Thomas J. Watson College of Engineering and Applied Science (Watson College) at Binghamton University for graduate studies. It is always amazing to see new students from so many countries, including the United States, arriving each semester. We are pleased with your decision to pursue graduate studies in the SSIE Department, and we extend our heartfelt wishes for you to achieve great success and fulfill your goals during your studies here.

The purpose of this SSIE Graduate Student Handbook ("Handbook") is to aid you with both your transition to and during your graduate studies within the Department. It is expected that all SSIE students have read and are familiar with its contents. This Handbook is also intended to supplement the existing Watson College of Engineering and Applied Science Graduate Student Handbook, which provides information common to all Watson College students and the Graduate School Manual, which provides information for all University graduate students.

We hope you take advantage of the numerous opportunities and resources available to you in the Department, the Watson College, and the University to meet or exceed your goals. We are pleased you have chosen our Department to accomplish them. Please feel free to ask us any questions throughout your stay here.

Dr. Mohammad Khasawneh
Chair & Professor – Systems Science and Industrial Engineering Department (SSIE)
Graduate Director – Healthcare Systems Engineering (HSE)
Graduate Director – Executive Program in Health Systems – Manhattan (Manhattan program)

Dr. Sarah Lam
Professor & Graduate Director – Industrial and Systems Engineering (ISE)

Dr. Hiroki Sayama
Professor & Graduate Director – Systems Science (SS)

II. Graduate Student Responsibilities

A. General Information

You have the responsibility to work toward successful completion of your degree by demonstrating your efforts in the classroom and in your research. It is expected that you will complete your degree in a timely manner as well. Maintaining a high level of professionalism, self-motivation, engagement, research curiosity, and ethical standards, and meeting the established deadlines are a few of the expectations for you as a graduate student.

You are expected to be knowledgeable of the policies and requirements of your graduate program, Graduate School, and University and you should commit to meeting these requirements, including your teaching responsibilities. You need to comply with the Watson Academic Honesty Policy, institutional safety laboratory practices and research policies, human resources rules and regulations, and all other policies and procedures related to the graduate student program. As a teaching assistant or a research assistant, make certain you discuss policies such as work hours, absences, vacation, etc. with your advisor(s). Though it is your primary responsibility to develop your career following the completion of the degree, you may also seek guidance from your advisor, the Fleishman Career and Professional Development Center, your project/thesis/dissertation committee, other mentors, and any other resources available across the University for advising you on career plans or opportunities.

While you can find additional information regarding the determination of academic standing for graduate students in the online Graduate School Manual, it is important for you to remember that a cumulative grade point average (GPA) of at least 3.0 is required for a graduate degree. If your GPA falls below a 3.0 at any time, you need to immediately consult with your academic advisor and the Graduate Director to develop plans to improve your GPA.

B. Meeting Deadlines

Time and schedules are extremely important for you to manage as a graduate student. It is essential for you to learn quickly by managing both. Arriving on time to class, faculty appointments, meetings, seminars, office hours as a teaching assistant, project work, and enrolling in courses, submitting paperwork, etc. all require you to manage your time and your schedule effectively and efficiently. Start now and use the resources on campus that are available.

C. Speaking and Writing English

The University has a successful English Language Institute (ELI) available to students. Its mission is to provide classes and academic English language support designed to increase non-native English speaking students' English language proficiency and facilitate their academic success at Binghamton University and beyond. If English is your second language, you are strongly encouraged to take advantage of all of the resources offered by the Program. It will build your confidence with the English language and will serve you well in both your academic and personal lives.

All incoming international students are required to take an exam upon arrival to the University. Depending upon your score on this exam, you may be required to take an ELI course(s). Graduate students may earn credit hours (1-4) towards your full time student status.

III. SSIE Organization

The current graduate degree offerings are listed below. Each Watson College PhD Program requires a Learning Contract. Additional degree requirement information is also found in Sections VI and VII of this Handbook.

A. Industrial and Systems Engineering

- Master of Science - ISE
- Master of Science - ISE (4+1)
- Master of Science - ISE - Health Systems Concentration
- Master of Science - ISE - Health Systems Concentration (4+1)
- Master of Science - ISE - Engineering Management Concentration
- Master of Science - ISE - Engineering Management Concentration (4+1)
- Executive Master Degree in Health Systems – Manhattan
- PhD - ISE

B. Systems Science

- Master of Science - SS
- Master of Science - SS (4+1)
- Master of Science - SS - Health Systems Concentration
- Master of Science - SS - Health Systems Concentration (4+1)
- Executive Master Degree in Health Systems – Manhattan
- PhD - SS

C. Healthcare Systems Engineering

- Masters of Science - HSE

D. Other Programs

- Advanced Graduate Certificate Program in Complex Systems Science and Engineering

E. Office Locations

The Department offices are located on the main campus within the "BU Brain" in the Engineering Building (EB) on East Drive in the R-pod, S-pod, and T-pod. Teaching and Research Assistants typically have offices in the J-pod or K-pod. The Dean's Office is located just across the street from the main campus on Murray Hill Road in the Engineering & Sciences (ES) Building. Classes are held in several of the buildings on campus. Here is a link to the University map to help you get acclimated to the campus layout. While the campus may look confusing and large, once you are here, you will see how easy it is to find your way around.

IV. Getting Familiar

Getting familiar with and introducing yourself to new people and a new environment are extremely important to enhance your skills and knowledge in your new graduate life and to ease the transition from undergraduate studies to graduate studies. The University's culture may also differ from your undergraduate studies, your family and/or perhaps your country. To avoid or minimize confusion for you, some programs outlined below are designed to support you with socializing and familiarizing yourself for your smooth transition to graduate studies here.

A. Ambassador Program

During the past several years, the Department has taken an informal approach to connecting

newly admitted students with current students during the summer and first semester to make the transition a smooth one. The student ambassadors have once been in the same positions as you, so they are a wonderful resource.
https://www.binghamton.edu/ssie/graduate/ambassadors.html

B. Orientation

The Graduate School has a virtual online orientation for all new graduate students. This orientation is required for all fall and spring degree-seeking, matriculated students. Not completing the required modules will result in a hold on your student account at the end of your first semester. You will be unable to register for future courses until the modules are completed online. The required modules include:

- Virtual Orientation- general overview for students
- Professional Ethics – learning module
- Graduate-level Writing Skills – learning module

Health Promotion and Prevention Services also has some mandatory online trainings which are listed below:

- Mandatory Interpersonal Violence Prevention Education
  https://binghamtonstudents-ny.safecolleges.com/
- Alcohol Abuse
  https://interwork.sdsu.edu/echeckup/usa/alc/coll/Binghamton
  Keep unique identifying number given at the beginning, will need it on verification page at the end of training
- Marijuana
  https://interwork.sdsu.edu/echeckup/usa/mj/coll/index.php?id=Binghamton
  Keep unique identifying number given at the beginning, will need it on verification page at the end of training

1. For all Departmental Students

Before the first week of classes of every academic year, the SSIE Department conducts a new student orientation program which is beneficial for all new and transferring graduate students. The purpose of this meeting is to familiarize you with the SSIE Department. This program is mandatory for all new graduate students.

If you are a transfer student already accustomed to University life, this orientation is also required and helpful to you to become acquainted with the SSIE Department and to meeting other graduate students. You also have an opportunity to meet and converse with the Program Advisors.

You will also be scheduled to attend an SSIE Orientation Program with your Program's Graduate Director.

2. For International Students

The International Students and Scholars Services (ISSS), also referred to as "I triple S", is one you want to become very familiar with. You will see that there is an orientation program designed specifically for you. The orientation program will help you begin your graduate studies and to familiarize with the University's culture. The Program provides you with essential information such as US immigration rules, University regulations,

academic success, as well as an opportunity to interact with graduate students from different countries and different programs, campus tours, formal and informal interactions with University staff and faculty, plus much more. Please take advantage of all of the services they have to offer.

C. Meet the Faculty

Faculty members have provided a brief outline of their research interests and course(s) they generally teach.

- Session 1: Assistant Professors Yu (Chelsea) Jin, Zeynep Ertem, Yingge Zhou, and Zimo Wang: https://binghamton.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=25ba2f8d-43c7-41fb-9e9d-ac4e011e2501&start=55
- Session 2: Assistant Professors Jia Deng, Christopher Greene, Soongeol Kwon, Fuda Ning, and Yong Wang: https://binghamton.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=d47fc68a-419d-47b8-bc01-ac6301215287&start=57
- Session 3: Assistant Professors Changqing Cheng, Daehan Won, Sung Hoon Chung, and Bing Si: https://binghamton.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=e667377b-f682-4356-b814-ac6a01302fe1&start=75
- Session 4: Professors Mark Poliks, Peter Borgesen, Kenneth McLeod, Nagendra Nagarur, and Sang Won Yoon: https://binghamton.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=e22ccb70-d710-42e6-8753-acfd011f32e6&start=126
- Session 5: Professors Hiroki Sayama, Daryl Santos, Harold Lewis, Susan Lu, and Sarah Lam: https://binghamton.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=053b724e-d38c-4bf9-8705-ad0401218be5&start=46

V. Course Information

A. Course Offerings

The Department offers a range of graduate courses. The offerings will vary from semester to semester. It is strongly recommended that you take the courses in the suggested order directed to you by your graduate director. The schedule of classes is available on BU Brain. You can view descriptions for SSIE courses here:

https://www.binghamton.edu/ssie/graduate/courses.html

Please note that:

- Required courses are offered at least once per year;
- Elective courses may be offered once a year (either fall or spring semesters), or once every two/four years;
- Courses are offered in accordance with the availability of full-time or adjunct faculty with expertise in the field and the need for the course;
- Additional courses are offered when there is a perceived need, and the requisite minimum enrollment (typically ten or more students) is satisfied;
- Non-traditional terms (summer/winter) may have limited or no course offerings.

B. Course Numbering

Graduate courses at the Master's and PhD levels are numbered at the SSIE 500 level and SSIE 600 level. The SSIE 600 level courses are more advanced graduate courses and typically have a 500-level course as a prerequisite.

C. Non-SSIE Electives for MS Degrees

Registration in non-SSIE courses may be subject to requirements and/or restrictions of the offering department. You will need to address these issues with the offering department. It is strongly recommended that you work directly with your advisor and the Graduate Director before registering for a non-SSIE elective to ensure that your advisor and the Graduate Director believe it will enhance your graduate studies. In addition, if a non-SSIE graduate course has a reasonably equivalent SSIE course, then the out-of-department course may not be allowed as an SSIE elective. Generally a maximum of two (2) non-SSIE courses may be accepted.

D. Graduate Distance Learning Program

Although most of the graduate courses are taught on campus, some are offered through Watson's Graduate Distance Learning Program - EngiNet. Course lectures are recorded live on-campus and offered online. The distance learning student can stream the lectures weekly online.

E. Transfer Courses

A maximum of two courses taken by a graduate student outside Binghamton University may be accepted as valid transfer courses into the master's programs. Transfer courses require approval by the Program's Graduate Director and the Graduate School. The approved transfer courses are counted as non-SSIE courses but will not count toward the residency requirements. More information can be found on the Graduate School website at: https://www.binghamton.edu/grad-school/resources/policies-procedures/manual/enrollment.html#transfer

F. General Course Registration Information

As a new student, you can register for courses by first discussing them with the Program's Graduate Director and other faculty during your initial orientation. All continuing students can pre-register for fall or spring semesters in the preceding semester the course is offered, i.e., pre-registration for the fall semester is open during the spring semester and vice versa. For summer and winter sessions, registration is made available 1-2 months prior to the start of the semester. Information related to course registration could be found at: https://www.binghamton.edu/registrar/student/course-registration/index.html

Here is another Graduate School website that will be helpful to better understand the importance of total number of credits, continuous registration, and the online tools available to you related to this topic: http://www2.binghamton.edu/grad-school/new-and-current-students/new-graduate- students/registration.html

For master degree program students, please remember to meet with your primary advisor and Graduate Director to ensure that you are progressing through the program appropriately.

G. Continuous Registration

Once enrolled, you are expected to continuously progress towards your graduate degree. You need to maintain continuous registration for all fall and spring semesters for a minimum of one (1) credit hour until you graduate. If you need to register for just one (1) credit, follow these

basic guidelines:

- If you are a masters' student and course complete with:
  - a thesis, register for SSIE 599,
  - an ISE project, register for SSIE 598, or
  - an SS project, register for SSIE 598.
- If you are in a doctoral program and course complete or ABD, register for SSIE 699.
- If you are graduating at the end of the summer semester, register for at least one (1) credit hour in the summer session.
- If you are planning to be absent or withdraw from all the courses for a semester or two, then register for one credit of continuous registration (SSIE 700).
- And finally, you should remain registered if you are going off campus to participate in an internship. Please make certain you review your plans with and receive approval from your academic advisor.

Complete information related to continuous registration, leave of absence, incomplete grades, academic standings, transferring graduate credits, etc., can be found at: http://www2.binghamton.edu/grad-school/manual/enrollment.html#continuous

H. Confirmation

At the beginning of each semester, you will need to confirm your enrollment through BU Brain. Failure to confirm enrollment will result in the cancellation of your courses irrespective of the status of your semester bill payment. More information related to confirming enrollment is at: https://www.binghamton.edu/registrar/student/course-registration/enrollment.html

I. Applicable Deadlines

While there are many deadlines you will encounter as a student, please make certain you keep track of your Course Registration and Graduate Program deadlines. These will vary by term based on number of credits. More information about registration can be found here: https://www.binghamton.edu/registrar/index.html

Please note that each semester the tuition refund deadline and drop/add deadline do not coincide. You may be responsible for paying a portion of the tuition for courses you change after the established deadlines. A link to the Tuition Refunds/Adjustment web page is included here for your convenience https://www.binghamton.edu/student-accounts/tuition-fees/tuition-liability.html. This is yet another reason for you to pay close attention to schedules and deadlines!

J. Graduation Requirements for Degree Completion

Early in the semester in which you are planning to graduate it is extremely important for you visit the Graduate School's Graduating Students website, which includes important information regarding:

- Degree completion deadlines - if you miss these deadlines you can't graduate that semester!
- Commencement information
- Thesis/Dissertation preparation & submission information - these are the requirements you must follow to submit your MS thesis or PhD dissertation
- An MS Thesis or PhD Dissertation must be submitted to and defended in front of your committee
- An MS project report must be submitted to and defended in front of your committee

Timing for MS Thesis or PhD Dissertation Completion: Please note that you must allow ample time before the deadlines posted by the Graduate School for submission of your thesis/dissertation in order for:

- Your Committee to read it,
- You to have timely completion of your thesis/dissertation defense, and
- Timely completion of any revisions requested by your Committee.

Very early in the process, you should consult with your academic advisor to understand the timing requirements for you.

Timing for MS Project Completion: Please note that you must allow sufficient time before the deadlines posted by the Graduate School for submission of your Recommendation of Degree form in order for your advisor and committee to read and approve your project report and presentation. It is very likely that your revisions will need to be made prior to approving your report, so please schedule your time accordingly.

Completion of a graduate degree requires submission of:

- The Graduate Application for Degree (GAFD). You must complete this online early **in the semester in which you plan to graduate** (see the Graduate School's deadlines for the appropriate date). This serves as a declaration of intent to graduate and an application for degree completion. If you complete the GAFD but fail to graduate, you must submit a new GAFD during the semester in which you will actually graduate.

- A Recommendation for Award of Degree Form. This is an online form that is available via BU Brain. For MS students, this form requires your advisor's approval and the SSIE Program's Graduate Director's approval after the defense is successfully completed. For PhD students, this form requires your committee's signatures and the SSIE Program's Graduate Director's signature after successful defense of your dissertation.

Please note: Incomplete grades, missing grades, and a cumulative GPA of less than 3.0 will prevent you from graduating.

VI. Requirements for Master Degree

A. University Bulletin and Proposed Course of Study

Master Degree students are encouraged to read the University Bulletin and the Proposed Course of Study documents:

The University Bulletin is located on the University's website. This link is based on the current academic year. When you use the Bulletin, please make certain you are using the appropriate academic year.

B. Full Time Status and Continuous Registration

As an MS student, if you have completed fewer than 24 graduate credits* at the University, you must enroll for 12 graduate credits to maintain full-time status. Once you complete at least 24 graduate credits* at the University, then you need to enroll in only nine** (9) graduate credits to maintain full- time status. However, once you have completed all of your course work and will only be registering for thesis or project credits you may be certified for full-time status despite registering for fewer than nine (9) credits. You will use either the form for full-time certification as a funded student or non-funded student. The Graduate School's Full-time Certification web page provides you with the detail related to this topic, and the form can be found here. Full-time certification can only be applied to students who are course-complete.

* Only completed courses count towards these 24 credits –Incomplete (I), Failure (F), and Unsatisfactory (U) grades do not count towards these 24 credits.

**Please note that if you are in the 4+1 or 3+2 Master's Program, you are required to maintain twelve (12) credits each semester in the fifth year of your studies to maintain your full time status.

All students who have been admitted into a degree-granting program must maintain continuous registration each semester for a minimum of one (1) credit hour. Refer to Page 8 to determine the course you need to enroll in. If you do not maintain registration, your student status is severed and you may not return unless you reapply for admission and pay a new application fee. Students who are readmitted are required to register and pay for one (1) credit for each semester they have not registered, plus one (1) credit for the semester they re-enter, up to a maximum of four credits. You are not required to maintain matriculation during the summer unless you intend to complete your final degree requirements during this period. However, students graduating in the summer must be registered for at least one (1) credit in one summer session.

C. Full Time Status and Immigration Rules

Immigration rules require that international students maintain full-time status. Please be aware that if you are an international student who withdraws from a course without replacing those credits with some other course, then you risk being in violation of immigration rules. If that occurs, please immediately see the International Student & Scholar Services for help in these matters.

D. Options for Degree

Students pursing a master's degree in Industrial and Systems Engineering have three routes they can pursue. The first option is a thesis, which requires four (4) electives (at least one at 600-level) plus 6 credits of thesis work followed by oral presentation and defense. The second option is the non-thesis (or project) option which requires 5 electives (at least one at 600-level) plus a project of at least 3 credits. The third option is a coursework-only option which requires 6 electives, including at least one of the following 600-level courses that include project-based coursework to serve as capstone for the termination requirement:

SSIE 605, SSIE 612, SSIE 613, SSIE 615, SSIE 616, SSIE 617, SSIE 621, SSIE 631, SSIE 633, SSIE 637, SSIE 641, SSIE 643, SSIE 644, SSIE 650, SSIE 660, SSIE 661, SSIE 664, SSIE 665, SSIE 671, SSIE 673.

Students pursuing a master's degree in Systems Science have three routes they can pursue. The first option is a thesis, which requires 4 electives (at least one at 600-level) plus 6 credits of thesis work followed by oral presentation and defense. The second option is a project which requires 5 electives (at least one at 600-level) plus a project of at least 3 credits. The third option is a coursework-only option which requires 6 electives, including at least one of the following 600-level courses that include project-based coursework to serve as capstone for the termination requirement:
SSIE 605, SSIE 612, SSIE 613, SSIE 615, SSIE 616, SSIE 617, SSIE 621, SSIE 631, SSIE 633, SSIE 637, SSIE 641, SSIE 643, SSIE 644, SSIE 650, SSIE 660, SSIE 661, SSIE 664, SSIE 665, SSIE 671, SSIE 673.

VII. Requirements for PhD Degree

A. General Information

The PhD program needs to be designed to meet the needs of each student through an individualized learning program. The program requires a minimum of eight (8) courses beyond the Master's degree (including at least three 600 level courses). To meet the Residency Requirement, you must complete a minimum of twenty-four (24) course-credits at the University (a few of which could be independent studies if that is acceptable to your advisor).

Note: PhD ISE students from non-engineering backgrounds and/or non-ISE backgrounds are required to take more than 8 courses and should discuss this with the ISE Graduate Director.

B. Full Time Status and Continuous Registration

To maintain full-time status as a post-MS PhD student you must enroll in a minimum of nine (9) graduate credits. A new PhD student who has not yet provided the graduate school with an official copy of a transcript showing the award of an MS degree must register for 12 credits to be full-time. Once a PhD student has completed all requirements except for defense of and submission of a dissertation only one (1) credit of registration is needed for full-time status as long as the full-time certification form has been completed. The Graduate School's Full-time Certification web page provides you with the detail related to this topic.

All students who have been admitted into a degree-granting program must maintain continuous registration each semester for a minimum of one (1) credit hour. Refer to Page 8 for the course you need to enroll in. If you do not maintain registration, your student status is severed and you may not return unless you reapply for admission and pay a new application fee. Students who are readmitted are required to register and pay for one (1) credit for each semester they have not registered, plus one (1) credit for the semester they re-enter, up to a maximum of four credits. You are not required to maintain matriculation during the summer unless you intend to complete your final degree requirements during this period. However, students graduating in the summer must be registered for at least one (1) credit in one summer session.

C. PhD Advisor and Guidance Committee

Your research advisor is central in directing your development. Upon admission to the doctoral

program, you will have the Program's Graduate Director as your advisor until if/when an alternate advisor is identified and agrees to work with you as their advisee. Until then, as the initial academic advisor, the Program's Graduate Director is responsible for (a) explaining the Watson College regulations governing the doctoral program; (b) assisting you in establishing a course of study and finding an advisor; and (c) assisting you in forming a guidance committee. **These actions should be completed during the first year in residence.**

As soon as you find a faculty member to serve as your Principal Advisor, you and your advisor should identify faculty members to serve on your guidance committee. Initially, the guidance committee must have a minimum of three members with a minimum of two members (including the Principal Advisor) from the Department. Each of these members is expected to take an active role in supervising your development. Members in addition to those mentioned above can be added to enhance the committee, and a recommendation for an Outside Examiner will need to be made to the Graduate School so that the outside person can be appointed before dissertation defense (see more about the outside examiner in the section below on the Dissertation).

D. Steps to Complete a PhD

The major steps in the completion of the PhD program include the sequence described in detail below. Although the presented order is typical, it is not necessary; however, only small deviations from this sequence are possible.

- completion of coursework
- satisfaction of the *learning contract,
- *proficiency in teaching and residence requirements,
- satisfaction of the comprehensive qualifying requirement,
- presentation of a colloquium on proposed research,
- acceptance of a prospectus outlining dissertation research,
- submission of a dissertation, and
- defense of a dissertation at oral examination.

*The student prepares a learning contract, in which a program of study is specified, including the major area of research, additional course requirements, teaching requirement, evaluation procedures, and the form of the comprehensive examination. Although the learning contract may be modified as the research interests of the student develop, to assure competence and depth in the major area and breadth in relevant disciplines, each modification must be approved by the Guidance Committee, and must be properly documented.

1. Completion of Coursework

You are required to complete a minimum of 24 credits of course work (including at least 3 courses at the 600 level) beyond a Master's degree. These 24 credits can include regular courses and independent study courses; pre-dissertation and dissertation credits don't count towards this requirement. The specific selection of courses to be taken must be outlined in the learning contract. **Note: PhD ISE students from non-engineering backgrounds and/or non-ISE backgrounds are required to take more than 8 courses and should discuss this with the ISE Graduate Director.**

2. Learning Contract

You should start to work immediately with your advisor to develop a learning contract. The learning contact should be completed as early as possible in your PhD studies. The purpose of the learning contract is to define the knowledge and skills required in order to pass the qualifying examination. Toward that, the learning contract will identify core courses and concepts, which must be mastered in order to provide breadth of background, as well as specialized courses and concepts that are relevant to the proposed area of research. The learning contract may be modified later if additional knowledge is required, or if the field of research is changed. Once completed, a copy of the learning contract, with signatures indicating approval of the Guidance Committee, is then signed by the Graduate Program Director and a copy is kept in the student file. **The learning contract must be approved by the committee and the Graduate Project Director before scheduling the qualifying exam.** A copy is also shared with the graduate degree completion office.

3. Comprehensive Qualifying Exam

You are encouraged to attempt this examination as early as possible in your program, preferably after you have completed your first three semesters. The comprehensive qualifying exam is used to assess the background of you as a beginning PhD student and identify any areas of weakness that should be addressed early in your PhD program and is scheduled based on the input and guidance of your Guidance Committee. On the comprehensive qualifying examination, you must demonstrate quantitative skills and subject knowledge within key areas of SSIE.

The results from the examination are reviewed by your advisor with the Guidance Committee, and you are given an honest assessment of your progress toward your PhD. The possible recommendations of the Guidance Committee are: (1) satisfactory progress has been demonstrated; (2) the examination should be re-taken in accordance with the Graduate School policy; (3) you should withdraw from the PhD program.

After successfully completing the comprehensive qualifying examination, and any additional requirements, you can be admitted to candidacy for the doctorate. The Graduate Office is notified of the satisfactory completion of the comprehensive qualifying examination of your admission to candidacy on the Recommendation for Admission to Candidacy for Doctoral Degree Form.

4. Presentation of a Colloquium on Proposed Research

Within six months after being admitted to candidacy (ABD), the student will prepare a written prospectus that identifies: (i) the research topic to be undertaken, (ii) the relevance of the results-to-date, and (iii) a proposed approach for completing the dissertation. The prospectus is presented and defended in an open colloquium. Upon acceptance of the prospectus by the Guidance Committee, a copy is stored in the student's file in the department.

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Note: Although not actually required, it is quite common and often useful to hold one or more Dissertation Research Progress Review Meeting during the time between the colloquium and the defense.

5. Submission of Dissertation and Defense

With the guidance of the dissertation advisor, you complete the research and prepare a dissertation, which is an original written contribution demonstrating originality and competence in the chosen field of research. The Guidance Committee has direct charge of all matters pertaining to the dissertation. The dissertation must comply with the format and filing requirements set forth in the Graduate School Manual.

The student works with their dissertation advisor to identify an Outside Examiner for their dissertation committee, at least one month before scheduling their dissertation defense. The dissertation advisor submits their recommendation of the outside examiner to the Graduate Director who in turn will submit the recommendation to the Graduate School for approval. After the Graduate School's approval, an Outside Examiner will be added to the committee. Please see the Graduate School Manual for more information regarding this topic. The Outside Examiner reviews and participates in the dissertation defense with the Guidance Committee.

After distributing the dissertation for review, an oral defense of the PhD dissertation is scheduled. You are required to present an oral defense of your dissertation in an open colloquium. Upon satisfactory defense of the dissertation, the student initiates a recommendation for award of degree form via BU Brain. This form requires your committee's signatures and the SSIE Program's Graduate Director's signature after successful defense of your dissertation.

6. Five-Year Admission to Candidacy

As stated in the Graduate Student Manual:

A student in a doctoral program must be admitted to candidacy within five years of admission to the Graduate School if entering directly into a doctoral program or within five years after award of a master's degree at Binghamton University. The following clarifications to this policy should be noted:

- If a student is granted a leave of absence, the period of the leave is not counted against the time limit to be admitted to candidacy.
- If a student earns a master's degree at Binghamton University and then does not continue immediately for the doctoral degree, the five-year limit begins when the student is readmitted to the University for doctoral studies.
- A student may petition for an extension of the time limit by submitting a request to the director of graduate studies in his or her program unit. The director of graduate studies, if he/she endorses the request, then forwards it to the Graduate School for final action by the Vice Provost and Dean of the Graduate School.

VIII. Teaching/Research Assistantships

Every academic year many of our first year graduate students (Master and PhD students) are financially supported by funding opportunities in the form of Teaching Assistantships (TAs) or Research

Assistantships (RAs). Responsibilities of these positions include assisting professors with instructional responsibilities, conducting discussion sections, grading, aiding faculty in their research work, etc. These will help you lessen your financial burden and also with real time work experience with other professionals, faculty, and graduate and undergraduate students. The assistantships typically consist of a stipend along with a tuition waiver. These positions (TAs and RAs) are generally awarded after a review of applicants based on the following criteria:

- Outstanding undergraduate record,
- GRE score, and
- Fit of background to existing research

Note that a TA appointment is not indefinitely renewable; typically, the Program will support a Master's student with a TA for up to one academic year. In special cases, PhD students may receive a TA award for two academic years. Maintaining a TA appointment requires maintaining an excellent academic record after an award has been made.

An online orientation program for new Teaching Assistants is available each fall and includes a series of six (6) modules and two books. It is required for all new TAs.

As a result of faculty and WISE projects, there are generally a significant number of Research Assistantships available. Students can be appointed to these positions at the beginning of the semester or throughout the academic year. Assignments may be made outside of the University setting. Again, all of this is project-dependent. If you are interested in a Research Assistantship position, please make certain you provide an up-to-date resume to the Graduate Secretary who maintains a file of interested students. There is no application process required for these positions.

IX. Research

A. General Information

Research is a critical and key component to the success of the University and to our Department. You will want to familiarize yourself with the campus-wide research efforts by viewing this website: http://research.binghamton.edu/. You also want to become very familiar with all of the research efforts within the SSIE Department.

B. Research Areas

SSIE faculty members have their focus on numerous research areas and most of the graduate students receive mentoring in these areas with world-class technical support. These research areas include, but are not limited to the areas shown here: https://www.binghamton.edu/ssie/research/index.html.

There are also a few labs associated with or established for the research work being conducted. More information related to the labs can be found at: http://www2.binghamton.edu/ssie/research/labs/. In addition, there are a few labs available for students in the newly constructed Engineering Sciences building.

C. Lab Safety Training

The Watson College and SSIE Department recognize that training all personnel and carefully

applying sensible practices are important for a safe working environment. The Office of Environmental Health and Safety is available to provide required general training to departments. More information related to Lab Safety training is located at: http://www2.binghamton.edu/ehs/lab-safety/index.html.

D. Research Groups

There are research groups within the Department that may be available to you as a graduate student. It is important for you to become familiar with and take advantage of the many opportunities afforded to you in the research areas.

1. Watson Institute for Systems Excellence (WISE)

WISE is an institute of advanced studies at Binghamton University. WISE is an internationally known organization assisting industry with an economical approach and at the same time working concurrently boosting the competitiveness of industry. Many Master and PhD level students, along with a few undergraduate students, are brought together with federal and industry sponsors to conduct innovative industry-based research. WISE also provides students with real-life experiences working closely and making helpful contacts with the industry, at the same time to collaborate strongly with distinguished faculty on cutting-edge research. More information about WISE is located at: https://www.binghamton.edu/watson/research/wise.html

2. External Research Facilities

Information regarding external research facilities that the Department collaborates with is located by going to the links provided below:

a) SPIR: More information related to SPIR (Strategic Partnership for Industrial Resurgence) is at:
   - https://www.binghamton.edu/watson/research/spir/index.html /

b) IEEC: More information related to IEEC (Integrated Electronics Engineering Center) is at: http://www.binghamton.edu/ieec/

c) CAMM: More information related to CAMM (The Center for Advanced Microelectronics Manufacturing) is at:
   - http://www2.binghamton.edu/camm/

d) CASP: More information related to CASP (Center for Autonomous Solar Power) is at: http://www2.binghamton.edu/casp/

X. Advising

A. General Information

Graduate advising within the Department is carried out at the following levels:

- For matters pertaining to appropriateness of course structure, interpretation of certain rules (at the Watson and Departmental level), and other structural issues, you may consult the Program's Graduate Director and/or the Watson College Graduate Coordinator.
- For matters pertaining to University rules and policies, you may consult the Watson

Graduate Coordinator or the University Graduate Office directly.

- For matters pertaining to financial aid and scholarships, you may consult the Department Chair and/or the Program's Graduate Director.
- For all matters pertaining to graduate research (dissertation, thesis, or project), and associated processes such as selection of coursework and evaluation committees, you must consult your thesis/project advisor. Note that the thesis/project advisor is the person with whom you need to establish a close professional relationship, and interact with frequently.

B. Selecting Your Project/Thesis Advisor

The Department has many faculty members who are available and eager to serve as your graduate advisor. Selecting an advisor is very important to you. Before deciding on your thesis, project, or dissertation topic and advisor, it is highly recommended that once you believe you have decided upon your research interest to converse with other graduate students and faculty members working in the same research area, research group or any affiliated research organizations. You can also speak with the Program's Graduate Director and/or Department Chair, who can serve as valuable resources for advice about the path you are following to launch your career. It is highly recommended that you select your faculty advisor and seek approval by the end of your first semester, but no later than the beginning of your second semester.

Master Students – Coursework-Only, Project, or Thesis
When considering your Master's Degree, give serious consideration to what your future plans are for obtaining your degree and the amount of time you want to spend obtaining it. This should help you decide on pursuing either a thesis or a non-thesis degree.

If your goal is to work in industry and not continue for a PhD, then your best option may be to obtain a non-thesis degree (project option or coursework-only option). This degree allows you to replace the thesis requirement with one additional elective and the completion of a project or two additional electives, as approved by your faculty advisor or graduate program director.

C. Department Hours and Professor Availability

During the semester, the Department is open from 8 am until 5 pm. Faculty office hours are located at their respective office doors or at the Department's main entrance in the "R" pod in Engineering Building.

XI. Financial Aid

For detailed financial aid information visit the Graduate School's web site at: https://www.binghamton.edu/grad-school/cost-aid-funding/. A variety of sources are outlined to help with your financial needs.

XII. Watson College Graduate Organizations

Student activities help you make the most of your University experience. We encourage you to get involved in at least one organization during your stay here. We strongly encourage you to gain the experiences, knowledge and leadership opportunities provided by organizations. For more information on student organizations associated with the Department and other departments within the Watson

College, please follow the link provided below:
https://www.binghamton.edu/watson/about/student-groups.html

Being part of organizations associated with other departments will also help those of you involved in multi-disciplinary research, so you can interact with people from your areas of research and also participate in related activities.

XIII. Resources

A. General Information

Much of your interaction for course enrollment, course confirmation, and general communication is based on technology. Please familiarize yourself with the following:

1. Forms

There are different procedures for you to follow from the beginning of your program until the day of graduation. Please make certain you read emails sent to you and follow the instructions to avoid any confusion or delays. Forms required for both the Masters' and Doctoral programs, are on the SSIE Department website at: https://www.binghamton.edu/ssie/graduate/forms.html the Watson Advising website and the Graduate School's website.

2. University Bulletin

The University Bulletin provides a wealth of information about the University, the Department and its programs, as well as a list and description of the many courses offered by the University. You will want to familiarize yourself with using the Bulletin, which is updated each academic year.

3. Department Facebook

Important updates and notifications related to jobs, interns, accomplishments, etc., are posted by the Department on the SSIE Department Facebook Page. It is a good idea for you to "like" this page to stay current with the events and notifications.

4. LinkedIn

The Department has also created Linkedin page. For professional networking purposes, you may want to consider creating a Linkedin page and linking yourself to the Department's Group.

5. Pods ID

The Pods ID is a major identifier used for many campus technological and network resources. It is:

- Binghamton University's official email ID: e.g., jsuny@binghamton.edu **Note:** Your email ID is the same as your Pods ID, but your email password is maintained by Google. See question What electronic mail environment is used? for more information.
- Login ID for public and multimedia classroom computers.
- Login ID for BU wireless network. (SSID: busecure)
- Login ID for Brightspace: https://brightspace.binghamton.edu/d2l/home
- Login ID for BUbrain: http://bubrain.binghamton.edu

- Login ID for SSL VPN: You can use a web browser (IE, Firefox, Safari, Opera) to connect to the campus network from home or on the road. The URL is https://ssl.binghamton.edu. The Pods ID and password are used to authenticate to this resource.
- Login ID for Virtual Desktop at bingview.binghamton.edu. For more information on Virtual Desktop, please visit: https://www.binghamton.edu/its/helpdesk/bingview.html.
- Login ID for off-campus access to Library resources: https://www.binghamton.edu/libraries/

6. B-Number

This is the primary identification number for students, faculty and staff. It is used in lieu of your social security number. Except for employment purposes, you should not be asked or you should not provide your social security number. If you forget your B-Number, you can look it up online. Using your PODS ID, log into BU BRAIN and click on "View Your B-Number."

7. BU Brain

The BU Brain Self Service is used to register for classes, view grades, view unofficial academic transcripts, request official transcripts, print class schedules, view your student account, view holds, view and update personal information, view and accept financial aid awards, plus more. Simply use your PODS user ID and password and login to BU Brain.

8. BU E-mail

You are provided with an official e-mail account that is powered by Google. This address will be yours as both a student and an alumnus. Please read the University's Computer and Network Usage Policy as well as the other information on this page.

9. Brightspace

This tool is used by faculty for the different courses you will be taking. You are able to view your semester progress, assignments, projects, exam grades, and can also communicate with class students/project groups' regarding courses, to submit your assignments, etc. To login to your Brightspace simply enter your Pods ID.

10. Labs and Printing

There are multiple labs available for use by students of the SSIE Department. All students have access to the EB Q23 lab on the third floor of the Engineering Building. Access to other lab areas may vary depending on focus and/or association with different research teams. Access for SSIE labs can be obtained by contacting a department administrator; your advisor should put in the request for access to any areas that are generally restricted (e.g., EB S12 for human factors) to demonstrate that it is an approved request.

11. Virtual Desktop (VMWare)

To access software required from remote places or even off campus from your desktop, VMWare is available. Please note that for now, this only works with the Internet Explorer browser, and is also available for Mac Operating Systems.

12. MSDN

All students enrolled in a Watson College course for credit qualify for to the Watson College MSDN Academic Alliance program. There they can download fully licensed and

function version of Microsoft's Operating Systems and applications including Microsoft Project. The web address for this site is:
https://www.binghamton.edu/watson/facilities/computing/hub.html

The username is the student's campus email address. To retrieve the password, select the "I've forgotten my password!" option and enter your campus email address as your username. The site will email the password to the address provided.

After retrieving your password, the first step to accessing your account is to register it. Using the link above, select the "Your Account" tab then select the "Register" button and follow the screen prompts. Accounts only have to be registered once.
Please note that downloading software via MSDN is a privilege which is only active while you are a current and enrolled student within the Watson College.

13. SSL VPN

The SSL VPN is a secure and safe way for off-campus users to connect to on-campus network resources such as email, network data drives and other network resources. To connect to the SSL VPN, point your web browser to ssl.binghamton.edu and login using your PODS ID and password.

XIV. In Summary

By using this Handbook as well as the existing Graduate School Manual and the Binghamton University website you now have a wealth of information available to you. Please remember that all of us are here to help you be successful in your endeavors. Please stop by our office or send us an email with any open issues you have during your studies here as well as an alumnus.

Thank you!

XV. Contacts

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