
MSE Computer Science Manual

The Department of Computer Science classifies its courses into 5 designators to reflect the breadth of approaches in CS today. Computer Science MSE and PhD students will be required to complete at least one course from four of the five following sub-areas: Theory, Applications, Systems, Software, and Reasoning. By taking this course of study, students will accumulate a broadly useful set of perspectives and tools and have the flexibility to explore other burgeoning areas in engineering. Every graduate course in the department has been given a single designator, and the department consistently offers a choice of several courses with each designator. A [current listing of courses](#) with area designators is provided on the CS departmental website. Course selections must be approved by the student's faculty advisor in addition to a departmental audit completed at the end of your program to ensure compliance.

M.S.E. students must also complete elective courses (chosen from any CS area or from closely related departments such as Electrical and Computer Engineering, Cognitive Science, Mathematics, or Applied Mathematics and Statistics) approved by the faculty advisor, for a total of eight graduate-level courses. However, the majority (more than half) of the courses counted toward the degree must be taught in the Department of Computer Science. Depending on how a student is completing the requirements, this would be 6 out of 10 or 5 out of 8 courses. Students also remain able to fulfill requirements by transferring graduate credit from another institution with departmental approval. In addition to these 8 required courses, a graduate student must elect one of the following options to complete the MSE degree requirements:

1. 2 additional (graduate-level) courses in Computer Science, approved by their CS advisor
2. An original, faculty-approved master's essay, submitted to the Milton S. Eisenhower Library
3. A faculty-supervised research project including an approved project report that may be made publicly available. For students enrolled in the PhD program, a PhD qualifying project may be used to meet this requirement.

All M.S.E. degree candidates are encouraged to regularly attend the department seminars.

Here is a basic timetable of requirements:

Semester 1	3 or 4 courses	3 or 4 courses
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Semester 2	3 or 4 course and project*	3 or 4 courses
Semester 3	1 or 2 courses and project*	2, 3 or 4 courses

*CS faculty approved research projects can be taken in semester 2, 3 or during both.

Qualifying Projects

If a student opts to complete their program with eight courses and a project, the project will be under the supervision of a faculty advisor with a primary or joint CS [appointment](#). Upon conclusion of the project, the qualifying project form must be submitted to the Academic Program Manager signed and dated by the project advisor. This requirement is also an opportunity to write some publishable research papers.

If a project is of interest to a faculty advisor that does not have a CS appointment, it will be necessary to find a faculty co-advisor who does have a CS appointment. Otherwise, the project will not qualify as satisfying the qualifying project for the MSE degree requirement. Once you have a CS faculty member that has agreed to supervise or co-supervise a project, a signed and completed Masters Qualifying Project Agreement Form must be submitted to the Academic Program Manager *prior to* the project starting.

It is the student's responsibility to find faculty members who are willing to supervise on a project of mutual interest. It is recommended for a student to take a professor's graduate course before trying to do research with him or her. The idea for a project may come from the student or from the faculty member. Note that faculty members may have varying ideas about the appropriate topic, scope and duration of a project, so it is critical to discuss the details. If a qualifying project builds on a course project, the work done for course credit or an independent study should not be double-counted. This is the case even if the work does not immediately lead to a published paper -- for example, it is a coding project intended to enable future research -- it must still be written up as a project report. This ensures that the student will receive some relatively early feedback about their writing and potential future research considerations.

Concentrations and Tracks

The MSE degree in CS offers an official concentration in Human Language Technology (HLT) and an Artificial Intelligence track. Both options require the completion of the MSE degree requirements.

HLT is CS' only concentration jointly administered with the Center for Language and Speech Processing. HLT is the science behind computer processing of human language and is the driving force in modern software and consumer electronics.

Students will have the opportunity to work on group projects under the direct supervision of distinguished academic researchers in a practicum-style course. The HLT concentration requirements are intended to allow specialization in a particular technology, such as machine translation, machine learning, or automatic speech recognition.

Students will have to fulfill the requirements for the MSE degree program, and take the following courses:

- Introduction to Human Language Technology (601.667)
- Natural Language Processing (601.665)
- Information Extraction from Speech and Text (520.666)

They will also be required to complete a Master's project/thesis related to Human Language Technology.

Finally, students who successfully complete the HLT concentration will have this credential exclusively noted on their official transcript.

Students on the AI track will gain a deep foundational knowledge in artificial intelligence, including core areas such as machine learning, computer vision, natural language processing, and robotics. Through electives and project-based learning, students will apply this knowledge to real-world problems.

The requirements to complete the AI track involve taking either five AI courses or four AI courses and a master's project/thesis in AI. At least one course must be taken from the following core areas:

- Machine Learning
- Text and Speech
- Vision Robotics

For a comprehensive list of the courses to choose from to satisfy this track, review [here](#).

Unlike the HLT concentration, completion of this track will not result in an additional credential noted on any official documentation.

Important People

M.S.E. students will get to know many of the faculty. However, students will have special relationships with the following people:

Your Faculty Advisor

Every graduate student in the Department of Computer Science must follow a program approved by a faculty advisor in the department. The advisor assigned to a student may change, subject to the acceptance of the new advisor. Any consenting JHU CS professor may serve as your advisor, including those with secondary and joint appointments in the Department of Computer Science.

Graduate Academic Program Staff

The Graduate Academic Program Manager and the Sr. Academic Program Coordinator are available to assist students with various academic and administrative matters. Additionally, academic staff refer students to appropriate partner departments and act as liaisons as needed.

Graduate Program Chair

The Graduate Program Chair oversees the CS graduate program and CS graduate student life generally. If you feel you need to talk to someone outside of your advisor, confidentially or otherwise, try the Graduate Program Chair. The Graduate Program Chair also welcomes more general questions, comments, and concerns.

Program Requirements

- All courses counted toward the M.S.E. degree requirement must be taken at a graduate-appropriate level. In the Department of Computer Science, this includes courses that are 600-level and above, as well as 400-level courses for students in the combined BS/MSE program who have not yet switched to graduate status.
- At most, two courses with grades less than B- may be counted toward the coursework requirements. No courses with grades less than C- may be counted.
- The overall grade point average of the courses counted toward the coursework requirements must be a 3.0 or higher (B average).
- At most, two independent study courses can be counted toward the course requirements. Other than independent study courses, no courses with grades of P or S can be counted toward the coursework requirement. Courses with grades of P or S will not be included in the grade point average calculation.
- One of the courses required for the M.S.E. degree, but only one, can be replaced by 3 credits from comparable short courses.
- A majority of the courses counted toward the degree must be taught in the Department of Computer Science; depending on how a student is completing the requirements, this would be 6 out of 10 or 5 out of 8 courses.
- At most, two courses can be transferred from graduate programs of other institutions to be counted toward the degree requirements. Such transfer courses must be approved by the student's faculty advisor and the department. It is the obligation of the student to provide all necessary data to the Department of Computer Science regarding the course(s) for which transfer credit is being requested.
- Students in the combined BS/MSE program may transfer up to two graduate-qualified courses which also are counted toward the undergraduate degree, as well as any other graduate-qualified courses taken while an undergraduate which are not counted toward the undergraduate degree requirements.
- At most, two courses completed in the Engineering for Professionals (EP) program may count towards the degree requirements from the approved list. With advisor approval, EP courses that are not on the approved course listing may be considered as well.
- "Selected Topic" and "Seminar" courses do not count towards degree requirements.
- A grade of D or F can result in probation; a second D or F is cause for being dropped from the program.
- Every student must successfully pass Academic Ethics (EN.500.603).
- Any master's student engaged in research for payment or to help meet degree requirements is required to complete Responsible Conduct of Research training. Students receiving payment from NIH training grants or fellowships must take the in-person course—[AS.360.625](#) Responsible Conduct of Research. Instructions for accessing and signing up for the course can be found [here](#). All other WSE master's students are required to complete and pass the online-[AS.360.624](#) Responsible Conduct of Research course prior to degree conferral.

How do I know if a CS course can be used as a graduate course? Eligible CS courses are generally those courses numbered 601.6XX and above. The rarely used "Independent Study" (601.805) may be taken for graduate credit and a letter grade, under a faculty member's supervision. Courses do not count unless they are taken for a grade; thus, you cannot count pass/fail seminars or the required department seminar series (601.801). *

How do I know if a non-CS course can be used as one of the elective graduate courses? Any graduate course offered by a full-time JHU program is eligible with faculty advisor approval. Your advisor must agree that the course is relevant to your degree -- either to computer science generally or to your specific program of study and research. Graduate level courses in most departments are numbered 600 and above.

Can I fulfill any of these requirements using graduate courses taken elsewhere? Yes, WSE graduate students may transfer in up to two graduate-level courses from another institution which were completed after the undergraduate degree was conferred, if evidence is provided that the course was not applied to any previous degree, and with faculty advisor/program director approval. They must be of comparable rigor and appropriate for the requirements in question (e.g., Application, Reasoning, Software, Systems and Theory), as attested by a course description, syllabus, problem sets, or other course materials along with an official transcript. You may apply up to 2 appropriate non-JHU courses toward the course requirements with faculty advisor approval.

*Up to 2 independent study courses may be applied to the program requirements if they are graded P or S.

Whiting School of Engineering General Graduate Degree Requirements

1. **Residency Requirement:** Every master's student must register as a full-time graduate student for at least two semesters. (Concurrent bachelor's-master's degree students are exempt, as are those who enter a WSE master's degree program after two or fewer semesters, following the completion of a JHU undergraduate degree.)
2. **Registration Requirement:** Every student must be registered in the semester that degree requirements are met; this includes students who have no courses remaining in which to enroll but must resolve coursework for which an "Incomplete" grade was assigned and those who must complete other academic requirements, such as a computing requirement or responsible conduct of research. Note that degree-seeking WSE graduate students cannot be simultaneously enrolled in a degree-seeking program at another institution.
3. **Degree Completion Verification:** Every student must provide certification by their department or program committee that all of their departmental or committee degree requirements have been fulfilled.
4. **Formal Essay:** If a master's student is submitting a formal essay to the MSE library as part of their master's degree requirements, the essay must be approved by at least one JHU faculty reader. (See the [Homewood Academic Council Faculty Status table](#), under "Thesis Supervision of Graduate Students," to determine who may serve as the reader/advisor. Additional readers, if required by the program, need only program approval.)
5. **Accepted Course Level Towards Graduate Degree**
 - *A. For students who started their graduate program / or were accepted into a combined bachelor's / master's status prior to the fall 2021 semester:*
 - i. All courses applied to the master's degree must be at the 400-level or higher. At their discretion, individual graduate programs may institute a higher course level as the minimum for their own students.* *Graduate students typically should enroll primarily in graduate-level courses (typically 600-level or above).*
 - *B. For all students starting a graduate program / or were accepted into a combined bachelor's / master's status starting in the Fall 2021 or beyond:*
 - i. *All courses applied to a WSE graduate degree must be at the 600-level or higher. With departmental permission, bachelor's / master's students may count courses at the 400 or 500-level towards their graduate degree, following all double counting rules, etc.*
 - *Notes for all WSE graduate students: If a 400 or 500-level course is not yet offered at the 600-level and is required to satisfy degree requirements, any graduate student may count the course with prior department approval. Approvals must be marked clearly on all degree audits / checklists.*
6. **Maximum Time to Degree:** Every student must earn the master's degree within five consecutive academic years (10 semesters). Only semesters during which a student has a university-approved leave of absence are exempt from the ten-semester limit; otherwise, all semesters from the beginning of the student's graduate studies—whether the student is resident or not—count toward the ten-semester limit.*
7. Every graduate student must receive a passing grade in academic ethics.
8. Every graduate student must complete training on the responsible and ethical conduct of research, if applicable. (Please see the [WSE Policy on the Responsible Conduct of Research](#).)

Graduate Student Transfer Course Policy

For students who earned an undergraduate degree outside of the Whiting School of Engineering or the Krieger School of Arts and Sciences, two courses completed before their undergraduate degree was conferred can be applied to a Whiting School of Engineering master's degree only if evidence is

provided by the undergraduate degree-granting institution that the course was not applied to the undergraduate degree, and with JHU advisor/department approval. Students are encouraged to secure permission to transfer a course as early as possible in their time at JHU to avoid issues.

WSE graduate students may transfer in up to two graduate-level courses from another institution which were completed after the undergraduate degree was conferred, if evidence is provided that the course was not applied to any previous degree, and with JHU advisor/department approval. Students are encouraged to secure permission from their WSE master's/PhD program faculty advisor to transfer a course as early as possible in their time at JHU to avoid issues, and a transcript from the relevant academic institution must be included with conferral completion paperwork submitted to the academic affairs office. EXCEPTION: WSE master's students in a department-approved study abroad program can transfer in additional coursework (i.e., beyond two courses), but in total, at least half of the courses/credits applied to the WSE master's degree must be taken/earned at Johns Hopkins. Individual graduate programs reserve the right to enforce stricter policies.

NOTE: This policy is effective for students beginning a WSE master's/PhD degree program in Spring 2008 or later.

Double Counting

The Whiting School of Engineering has established the following policies on double-counting coursework for all students in the full-time (Homewood) programs and the part-time Engineering for Professionals (EP) programs. If an individual program adopts double-counting policies that are stricter than these, the program's policies override the school-wide policies. Students are encouraged to refer to individual program policies.

With bachelor's/master's and master's-/master's double-counting, across any number of degree programs, a student can reduce the number of master's courses required by up to two (with approval of the programs involved). Beyond that, the remaining courses must be unique to the degree program. With a 10-course master's degree program, for example, eight of those courses must be unique to the program and not applied to a different degree at any level. A student can double-count any number of undergraduate courses toward various master's degrees (but at most, two to each master's program) and they can double-count the same course across any number of degrees pursued (with the approval of the programs involved).

Bachelor's Master's Double Counting

Coursework applied to a bachelor's degree: Students either in a WSE combined (bachelor's/master's) program or seeking a WSE master's degree after having earned a WSE or Krieger School of Arts and Sciences bachelor's degree, may double-count two courses (400-level or higher) to both programs with the permission of the master's faculty advisor. WSE master's degree candidates may not double-count courses applied to a bachelor's degree earned at a different institution. Individual graduate programs reserve the right to enforce stricter policies.

Coursework not applied to a bachelor's degree: For students who are either in a WSE combined bachelor's/master's degree program or have already earned a Whiting School of Engineering or Krieger School of Arts and Sciences bachelor's degree and are seeking a WSE master's degree, graduate-level coursework (as defined by the WSE graduate program) not applied to the undergraduate degree may be applied to the graduate degree, regardless of when that course was taken (i.e., before or after the undergraduate degree was conferred) with the permission of the master's faculty advisor.

For students who earned an undergraduate degree outside of the Whiting School of Engineering or the Krieger School of Arts and Sciences, two courses completed before the undergraduate degree was conferred can only be applied to a Whiting School of Engineering master's degree if evidence is provided by the degree-granting institution that the course was not applied to the undergraduate degree, and with advisor approval.

Master's-Master's Double Counting

Coursework applied to a master's degree: Students pursuing (1) a WSE master's and a master's from any JHU school simultaneously or (2) a WSE master's after having earned a master's from any JHU school may double-count either two semester-length courses or three quarter-length courses across two master's programs, as long as the courses are equivalent to ones that are 400-level or higher in WSE full-time graduate programs. The student must receive approval from both master's degree program faculty advisors if both sets of degree requirements will be completed at the same time. For a student to double-count coursework from two master's degrees, whose requirements are met at different times, the student must obtain only the approval of the faculty advisor in the program to be finished second. Individual graduate programs reserve the right to enforce stricter policies.

Timing and Ramifications for Current Students: This policy will be applied to all students entering a WSE master's program in Fall 2007 and beyond. Any student who has entered a WSE master's program before then will be exempt from this policy and should follow the course arrangement made with his/her advisor provided it is in compliance with departmental, school, and university requirements.

Declaration of Double-Counted Course: WSE master's students wishing to double-count courses must submit these courses to the WSE master's program for approval. If it is discovered that a student has double-counted a course for the WSE master's degree without permission of the WSE master's program, the program reserves the right to revoke the degree.

Below are links to additional important policies and procedures for Homewood-based full-time students. The CS Department has the right to enforce stricter policies. Contact either the Academic Program Manager or the Director of Graduate Studies if you need clarification regarding if and/or how a policy may apply to you.

- [Academic Policies and Procedures](#)
- [General Graduate Student Policies](#)
- [Graduation Guide](#)
- [Enrollment Status Changes](#)