



Academic Year 2026-2027

**Master of Science in Advanced Analytics and
AI Systems (MSA3IS)**

Degree Programs Covered by This Handbook:
MSA3IS

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1. Introduction

This handbook provides specific information on the curriculum and program requirements for the Master of Science in Advanced Analytics and AI Systems (MSA3IS) program. The Heinz College also publishes a separate handbook which details College-wide policies and procedures pertaining to educational planning, program committee, teaching, scheduling and course credit, performance standards, academic standing, ethics and discipline, student privacy rights and major forms and deadlines.

While this handbook is specific to your academic experience in the department, it is just one element of the Graduate Student Handbook Suite. There are several other resources within the suite that you should consult when needed:

- [The Heinz College Handbook](#)
- [University-Wide Graduate Student Handbook](#) (Office of Graduate & Postdoctoral Affairs)
- [The Carnegie Mellon Student Handbook](#)

2. MSA3IS Mission Statement

The mission of the Master of Science in Advanced Analytics and AI Systems (MSA3IS) program is to prepare analytical and AI-driven practitioners to engineer solutions using technical innovation, operational resources, and tactical strategy. Trained to solve complex problems in the Carnegie Mellon interdisciplinary tradition, our graduates will develop, deploy, and optimize advanced analytic and AI-enabled systems that empower and create strategic advantage for their organizations.

Upon completion of the MSA3IS, graduates will be able to:

- Demonstrate the ability to apply machine learning, deep learning, and advanced analytical methods to develop solutions to complex problems using structured and unstructured data.
- Demonstrate the ability to design, evaluate and implement AI-enabled systems, leveraging modern data infrastructure and emerging AI technologies in operational environments.
- Demonstrate the ability to apply analytical reasoning, experimentation and quantitative methods to support decision-making in complex and uncertain environments.
- Demonstrate the ability to communicate technical concepts and analytical findings to diverse stakeholders and lead the responsible implementation of AI capabilities within organizations.

3. Department Personnel

The staff listed below are directly associated with the MSA3IS programs. There is a robust team at Heinz College, SCS, and CMU available to help you navigate your education, from financial aid and student services to disability services and more.

Sara Moussawi	Senior Associate Dean, Academic Programs	smoussaw@andrew.cmu.edu
David Garlan	Associate Dean, SCS Masters Programs	garlan@cs.cmu.edu
Sean Beggs	Director of the MSA3IS Program	sbeggs@cmu.edu
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Annie Julian	Director of Student Experience	ajulian@cmu.edu

4. Master of Science in Advanced Analytics and AI Systems (MSA3IS) Curriculum

It is the student's responsibility to know and understand the policies contained in this MSA3IS Handbook Addendum, the [Heinz College Handbook](#), and the [CMU Graduate Student Handbook](#). All three combined cover CMU university policies and procedures along with specific Heinz College policies.

As a full-time graduate student, you will normally complete the MSA3IS program in three semesters. Note, the MSA3IS program is not offered part-time. Students will complete 162 units in three semesters.

The MSA3IS curriculum is structured with required analytic courses, required AI systems courses, and required selective courses.

In order to successfully complete the MSA3IS program, you must complete the following:

- all required courses (unless you exempt them);
- all other standards for graduation, including meeting the minimum cumulative grade point average of 3.0, and meeting the minimum total number of units taken over three semesters.

4.1. Required Courses

The following table lists all the required core courses MSA3IS students must complete.

MSA3IS (120 core + 42 selective = 162 total units)		
<i>Course Number</i>	<i>Course Title</i>	<i>Units</i>
10-601	Introduction to Machine Learning	12
10-605	ML with Large Datasets	12
11-685	Intro to Deep Learning	12
94-739	Capstone Project	12
94-804	AI Strategy	6
95-710	Economic Analysis	6
95-717	Communicating AI Solutions	6
95-760	Decision Making Under Uncertainty	6
95-796	Statistics for IT Managers	6
95-815	Data Engineering	6
95-819	A/B Testing	6
95-828	Machine Learning for Problem Solving	12
95-865	Unstructured Data Analytics	6
95-896	Python for Software Development	12
95-843	ISM Professional Seminar	0
XX-XXX	Heinz College / SCS Selectives	42

4.2. SCS Selective Courses

MSA3IS students take selective courses from SCS (School of Computer Science). Several SCS courses will satisfy this requirement. Generally, all graduate-level SCS courses can be considered as selective coursework. Students must meet with their Academic Advisor to discuss the type of SCS coursework they're considering. The Academic Advisor will help determine if students meet the prerequisite requirements for SCS selectives.

4.3. Heinz College Selective Courses

The following is a list of selective courses offered by Heinz College. Please review the [Heinz College Course Catalog](#) for additional details.

90-769	Critical AI Studies for Public Policy	6 units
94-703	Demystifying AI	6 units
94-717	Systems Thinking & Discrete Event Simulation	6 units
94-815	Agentic Technologies	6 units
94-816	Generative AI	6 units
94-829	Advanced AI and Business Strategy	6 units
94-830	AI, Ethics and Humanity	6 units
94-844	Generative AI Lab	6 units
94-866	Design Strategy	6 units
94-879	Fundamentals of Operationalizing AI	6 units
94-881	Managing Analytics Projects	6 units
94-885	Responsible AI	6 units
94-888	Tech Strategy	6 units
94-889	Machine Learning in Practice	12 units
94-894	AI & Emerging Economies	12 units
95-747	Security Data Analytics	6 units
95-767	Cybersecurity for Artificial Intelligence & Machine Learning	6 units
95-820	Applications of NL(X) and LLM	6 units
95-851	Data Science for Product Managers	6 units
95-891	Introduction to AI	12 units

To fulfill the selective requirements for graduation, you may take relevant graduate-level courses from Heinz College and SCS. **42 units** of selective courses may be counted towards the MSA3IS degree requirements. Of the 42 units, at least 24 units must be from SCS.

Language (Spanish, French, etc.), Music (piano, violin, voice, etc.), and Physical Education (golf, dance, etc.) coursework does not count towards the MSA3IS degree requirements.

5. Number of Units per Semester

5.1. Normal Courseload Expectation for MSA3IS Students

Students typically take 54 units per semester. For the MSA3IS program, completing 54 units per semester meets the degree requirement of 162 units total.

5.2. Unit Increase Policy

Students who feel prepared to take on additional academic challenges beyond the standard course load may request a unit increase. They can do so by submitting a [General Petition Form](#), available on the Heinz College Current Student Website, to their Academic Advisor.

5.2.1. Requirements

Students demonstrating strong academic performance with a **3.5 Cumulative Quality Point Average (CQPA)** or higher may request for advisor approval to increase to 60 units. Any increase requests above 60 units will require additional approvals and are not guaranteed. Please contact your Academic Advisor.

Students who need to retake a course may be approved for a unit increase in order to make up the course and stay on track for graduation, regardless of their CQPA.

5.2.2. Unit Increase Timeline

First-semester students may request a unit increase only if they apply for and are selected to participate in 90-700 Heinz Journal, which is worth 3 units.

Unit increases for a student's second semester will only be processed after their first mini grades are posted and the students have achieved the 3.5 CQPA requirement.

For future semesters, students who are at or above a CQPA of 3.5 can have their unit increase approved after their mini grades are posted and the increase will go into effect the week after registration.

6. Internship Requirement

MSA3IS students starting in the 16-month track are required to hold a summer internship after completing two semesters of the program. The completion of an internship is a graduation requirement.

Minimally, the internship requires 300 hours of full-time employment that has formal supervision, is professional in nature, includes work that is of importance to the organization, and has significant educational value.

- Students must attend an internship information session in the Spring semester hosted by Career Services to learn more about specific internship requirements and support given by Career Services.
- The internship duration is a minimum of 300 hours and is to be completed in the Summer between your first and second year only.
- Students may only report one internship unless otherwise approved by Career Services
- Internship must be reported no later than the last business day of June.
- Students must complete the Heinz Internship Extension Course administered by Career Services via Canvas. Students will be automatically enrolled and there will be associated modules with assignments in which completion of these modules is a requirement to pass the Internship Course.

Before beginning the internship, students must complete the online [Career Services Internship Reporting Form](#) for approval.

The internship will be verified with the students' supervisors and then approved. Students must notify their Career Advisor of any significant changes in their internships, such as length, location, hours of work, etc. Alternative experiential assignments may be approved when consistent with program objectives and Army requirements.

Once the internship has been approved, students will be registered for the zero-unit internship course. Students will not receive academic credit for the internship, but it will be reflected on their transcript as a course with P/F grade. At the end of your internship your [Career Services Advisor](#) will request that your supervisor complete an evaluation form about your internship performance. You are also required to complete an evaluation survey. If you do not successfully complete an eligible internship, you will not fulfill your internship requirement necessary for graduation.

6.1. Securing an Internship

If you are required to complete an internship, you will be responsible for securing a suitable internship. Career Services will provide assistance through counseling, workshops on resume preparation and interview skills, and listings of potential internships. You can make an

appointment to discuss your situation and you are encouraged to come to workshops that cover the essential skills for finding the right internship.

7. IS Project Courses

Project courses are organized around significant analytic and AI system problems, the solution of which requires a mix of technological, organizational, and social skills. As opposed to the traditional classroom setting, project courses are organized as a group exercise in problem solving. Students are divided into teams guided by university department faculty.

8. Professional Seminar Course

Full-time Heinz College students in their first academic year will take a program specific Professional Seminar. This seminar is intended to equip the next generation of leaders in Public Policy and Information Systems with a comprehensive professional toolkit. By bridging academic rigor with strategic career development, this seminar empowers students to navigate the complex intersection of people, policy, and technology. Through active engagement and self-reflection, students will craft a unique professional narrative that prepares them to drive impact in the public, private, and non-profit sectors.

Students will receive impactful guidance from the academic advising and career advising teams, blended with sessions led by program directors, providing a holistic approach to student professional development.