Carnegie Mellon University

Master's Student Handbook

Academic Year 2026 - 2027

College of Engineering

Civil and Environmental Engineering

CMU Online Student Handbook

AI Engineering: Digital Twins & Analytics

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Note - this handbook is based on an Office of Graduate Affairs template. Information that is not applicable to online students has been removed so the numbering may not be sequential.

Section 1: Welcome & Introduction

Welcome to the 2026-2027 academic year! We are excited about the year ahead and look forward to working with you to make your CMU journey a memorable experience.

As a member of the CMU community, you have both rights and responsibilities. This handbook provides important and valuable information for your academic experience at Carnegie Mellon University. The first part of the handbook covers the academic policies that govern this program. These policies were developed with a goal of fostering an atmosphere of intellectual growth and discovery. They are intended to both support your academic experience and maintain the integrity of the program. The second part of the handbook provides details of CMU policies and procedures relating to the graduate student experience. These policies apply to all graduate students at CMU and are designed to support your CMU experience.

Please read this handbook carefully. You should be familiar with the contents of this handbook and use it as a first resource for academic questions or concerns that may arise during the academic year. Your program specialist can help you if you have any questions about any portion of this handbook.

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:

- University-Wide Graduate Student Handbook (Office of Graduate & Postdoctoral Affairs)
- Carnegie Mellon Student Handbook

We wish you an exciting and successful academic year!

Gregory Lowry
Department Head, Hamerschlag University Professor, Civil and Environmental Engineering

Section 2: Program Overview

Digital twin technology has evolved into sophisticated systems that use sensors and the power of AI to generate, analyze and simulate scenarios, make predictions, and proactively manage a facility's life cycle. By collecting large amounts of data and using the right tools to process and interpret that data, engineers can identify problems before they occur and make more informed decisions for their organizations and society at large.

After successfully completing the online Graduate Certificate in AI Engineering - Digital Twins & Analytics, you should be able to make a strong business case for using digital twins in your organization and learn how to lead the implementation of this cutting-edge technology.

Section 3: Degrees Offered

Online Graduate Certificates

- AI Engineering - Digital Twins & Analytics

Section 4: Important Contacts

The AI Engineering - Digital Twins & Analytics program is housed in the Civil and Environmental Engineering Department in the College of Engineering.

Program leadership includes:

- Gregory Lowery, Department Head, Hamerschlag University Professor, Civil and Environmental Engineering
- Mario Berges, Professor, Civil and Environmental Engineering
- Melissa Ritchie, Manager of MS Programs

Online Student Support/Advising

In addition, your program specialist is also your primary advisor and your first point of contact for all program-related questions. If they cannot assist you, they will refer you to the appropriate department or individual.

- Marlene Lynch, Program Specialist, marlenel@andrew.cmu.edu, +1 412-501-2150

Section 5: Resources

5.1: CMU Online Technical Support

See below for resources should you encounter technical difficulties during the program:

General Technical Issues: Mon - Fri from 9 a.m. - 5 p.m. (ET)

Contact your Program Specialist at 412-501-2142 or apply@online.cmu.edu.

First Week of Class: Mon - Thurs from 5:30 p.m. - 8:30 p.m. (ET)

During the first week of class, we will have *extended support* from our CMU Online help desk should you have difficulty accessing a course for the first time.

Email cmuonline-help@andrew.cmu.edu for assistance, and we will respond right away.

Specific Course Related Content

If you have difficulty with course material or content, contact your instructor directly for assistance.

Note that there is no coverage during University Observed Holidays (e.g., Labor Day)

5.2: Academic Calendar

CMU Online follows the university calendar for the fall and spring semesters. For programs with summer classes, CMU Online follows a different calendar than campus, which can be found here.

Section 6: Academic Advising

6.1: Advisor Role & Resources

Students in online graduate certificates follow a predetermined curriculum with limited options for course planning or changes to the academic program.

In the event that a student is having academic difficulties, they should reach out to the faculty teaching the course to discuss ways to address any challenges they are experiencing in the course.

If they are unable to resolve any academic difficulties after talking to the faculty, they should reach out to their advisor (program specialist) to discuss resources and enrollment options available to them (course drop, leave of absence, withdrawal).

Finally, if a student has any other questions about the program, they should contact their advisor (program specialist), who can assist or refer to the appropriate resource.

6.3: Review/Redress of Academic Issues

In the event that a student is seeking resolution for a grade, academic action, disciplinary action, community standards violation, misconduct, suspension, required withdrawal, or general grievances, students should follow the policies found in the university-wide graduate student handbook.

Generally, graduate students are expected to seek informal resolution of all concerns within the applicable department, unit, or program before invoking formal processes. When an informal resolution cannot be reached, however, a graduate student who seeks further review of the matter is to follow these formal procedures.

Section 7: Online Graduate Certificates Requirements

7.2 Registration

7.2.1: Registration Process

The CMU Online team registers students for their courses. All students enrolled in the online graduate certificate program have a “hold” on their account that precludes self-registration. Any questions regarding registration can be directed to your program specialist.

Not all classes are available every semester. If a required course is not available, the student will need to take a leave of absence to return in the term the course is scheduled.

7.2.2 Audit Policy

Auditing courses is not permitted for graduate certificate students.

7.3: Required Units for Certificate

Students must complete 24 units of required coursework to be eligible for the AI Engineering: Digital Twins & Analytics certificate.

7.4: Required Courses

Course	Course #	Pre-Req	Units
Principles of Digital Twins	12-830	N/A	12
Digital Twins and AI for Predictive Analytics	12-831	12-830	12

7.4.1 Previously Taken Courses

Students who have previously completed courses that are part of the certificate requirements must either retake or, when possible, take an alternative course in its place in order to earn a minimum of 24 units to earn the certificate.

7.5: Program Learning Outcomes

Students who successfully complete the AI Engineering: Digital Twins & Analytics certificate will have the skills and competencies to:

- Describe components, requirements, and functions of digital twins (DT) across domains
- Explain the role of automated decision making in DTs
- Identifying deployment considerations to be made when adopting DTs, e.g., ethics, maintenance, sustainability, and business procedures
- Select and configure DT components for various use cases
- Leverage machine learning in DTs

- Prototype a DT application using a tiny system, e.g., a tiny house
- Describe sensing/information flow within DTs
- Make a business case for DTs
- Engage stakeholders by visualizing digital twins

7.8: Policy for Courses Outside the Certificate

Students enrolled in the online graduate certificates are only permitted to take the courses associated with the certificate(s) they have been admitted to and in which they are enrolled.

7.10: Transfer Credit

Transfer credit is not allowed for online graduate certificate programs.

Section 8: Policies & Protocols

8.1: Program Enrollment Status Changes

8.1.1: Admission Deferral

Students may defer their admission for up to three semesters (or one calendar year). For example, if a student is admitted for Fall 2026, they may defer up to Fall 2027. If they do not enroll within three semesters, students need to reapply.

8.1.2: Leave of Absence

Students in the online graduate certificate program take a “pause” instead of a leave of absence. Both are taken when a student needs to leave the University temporarily, with the firm and stated intention of returning.

Students should discuss their plans to leave the University with their program specialist, who will refer them to the appropriate resource to develop a plan for completion.

A leave of absence can be taken for up to two consecutive semesters. If a student does not return by the start of the third consecutive semester, they will be automatically withdrawn from the program.

Not all courses are available every semester. If an eligible course is not offered when the student intends to return, then the leave will be extended until an eligible course is available. However, if the student does not return when an eligible course is available, and more than two semesters of leave have passed, the student will be withdrawn from the program.

Students who are automatically withdrawn and wish to return to the program in the future must reapply and will be considered under the current admissions and scholarship policies.

University policy on leaves: https://www.cmu.edu/hub/registrar/leaves-and-withdrawals/

8.1.3 Program Withdrawal

Students may withdraw from the program at any time by notifying their program specialist in

writing. If enrolled in a course, they will be subject to the course withdrawal and tuition adjustment policies.

University policy on withdrawal: https://www.cmu.edu/hub/registrar/leaves-and-withdrawals/

8.2 Course Enrollment Changes

Students taking graduate-level courses must follow the procedures and deadlines for adding, dropping, or withdrawing from courses as identified on the academic calendar.

Students considering dropping, adding, or withdrawing from courses should contact their program specialist.

Note: Certificate-only students are not eligible for course vouchers.

University policy on course enrollment:
https://www.cmu.edu/hub/registrar/course-changes/index.html

8.4 "Grandfather" Policy

When policies change because the department believes new rules offer an improvement; changes that affect currently enrolled students will be communicated.

Currently enrolled students impacted by a change in policy may choose to be governed by the older policy that was in place at the time of their matriculation.

Should certificate requirements change and certain courses no longer be offered, the department will find alternative courses that allow those students to satisfy the original requirements.

8.6: Other Policies and Protocols

8.6.1 Statute of Limitations

Students must complete all requirements for a graduate certificate within nine semesters (Fall, Spring, Summer) of first enrolling in the certificate program.

Under extraordinary circumstances, such as leave of absence, military or public service, family or parental leave, or temporary disability, a school or college may, upon the relevant department's recommendation and with the written approval of the dean (or designate), defer the lapse for a period commensurate with the duration of that interruption.

Section 9: Grading & Evaluation

9.1: Grading Scale/System

Grade	Quality Points
A	4.0
A-	3.67
B+	3.33
B	3.0

B-	2.67	
C+	2.33	
C	2.0	
C-	1.67	
D+	1.33	
D-	1.0	
R	0.0	Failure
W	Non-factorable	Withdrawal
I	Non-factorable	Incomplete

The general grading policy is described on the University's grading policy website: https://www.cmu.edu/policies/student-and-student-life/grading.html.

This policy offers details concerning the University's grading principles for students taking courses and covers the specifics of assigning and changing grades, grading options, drops/withdrawals, and course repeats. It also outlines graduate grading standards.

9.1.1 Course Grade Requirements

Students must earn at least a C in courses for them to count towards certificate requirements. Courses with a grade of a C- or lower will need to be retaken to earn the certificate.

9.2: Policy on Retaking a Course

Students may retake a course only once and are responsible for all tuition and fees related to retaken courses.

Both the original grade earned and the grade earned in the retaken course will be factored into the cumulative QPA.

9.3: Pass/Fail Policy

Courses must be taken for a letter grade as opposed to pass/fail (often called pass/no-pass).

9.4: Incomplete Policy

Students are expected to complete a course during the academic semester in which the course was taken. However, if the instructor agrees, a grade of "I" (Incomplete) may be given when a student, for reasons beyond their control, has been unable to complete the coursework, but the work completed to date is of passing quality and the grade of incomplete provides no undue advantage to that student over other students.

When awarding an "I" grade, the instructor must specify the requirements for completing the work and designate a default letter grade where no further work is submitted.

Students must complete the required coursework no later than the end of the following academic semester, or sooner if required by prior agreement. The instructor must record the permanent grade by the last day of the examination period of the following semester, or the default grade will automatically be assigned.

An “I” grade should only be assigned if a student has completed at least 75% of the coursework, not 75% of the assessments, and only due to unforeseen circumstances, not due to “trouble keeping up” or maintaining balance with other coursework. The student should be completing the same work as everyone else in the course as outlined in a written agreement with the faculty that includes deadlines for completion.

Students are responsible for monitoring grade status and taking steps to remove incomplete grades from their academic records. Incomplete grades will prevent certificate completion.

9.6: GPA Requirements and QPA Requirements for Completion

Students must have a cumulative grade point average (QPA) of at least 3.0 in all required coursework and total units for the certificate in order to be eligible to earn the certificate.

If at any point it becomes mathematically impossible for the student to earn a 3.0, they may be withdrawn from the program.

9.7: Satisfactory Academic Standing

Good academic standing is defined as having a QPA of at least 3.0.

A student with a QPA below 3.0 at the conclusion of a semester will receive written notice that they do not meet the minimum QPA requirement. Students are responsible for consulting with their advisor to discuss a plan for returning to good academic standing. Students with more than one term below a 3.0 may be subject to academic actions.

A student can be in good academic standing and on student conduct probation at the same time due to incidents unrelated to their academic performance.

9.8: Course Failure

Students must retake for credit any required courses they fail and must pass the course on the second attempt. Students who do not pass a required course on their second attempt will be dismissed from the program.

Section 10: Tuition & Scholarships

10.1: Scholarship Policy

Scholarships are awarded at the time of admission and are not reconsidered after enrollment.

Scholarships are awarded by course and are not transferable between courses or semesters. If a course isn’t taken, or a student withdraws from the program, the associated scholarship is forfeited.

10.3: Course-Related Fees

You may be responsible for course-related fees that support the services, platforms, and resources provided in that course. Fees will be assessed in S3 and are subject to university payment deadlines.

All current fees are outlined here: https://www.cmu.edu/online/welcome/tuition/index.html

Please review this page regularly, as fees are subject to change from term to term.

10.11: Tuition Billing & Payment

Tuition is set each spring for the following academic year (fall, spring, summer terms).

Tuition will be charged at the current per-unit rate for each course the student is enrolled in. Students who take a leave of absence will be charged at the academic year rate of the program they rejoin upon return.

In the event that a student drops a course and takes a leave of absence or withdrawal, tuition will be subject to the tuition adjustment policy.

For questions about tuition, contact your program specialist.

10.12: Sponsored Billing & Third-Party Payments

If an outside entity, government, or a third party is paying for all or part of your educational expenses, you should participate in the University's Sponsored Billing Process.

10.13: Student Financial Obligation & Past Due Accounts

Students are subject to, and must be aware of, the Carnegie Mellon policy regarding student financial obligation: https://www.cmu.edu/sfs/billing/sfo.html.

10.14: Course Drop for Non-Payment

Students should either pay their account balance in full or have an approved payment plan (Nelnet, sponsored billing arrangement, VA benefits) in place by the published payment due dates each term.

If that deadline is not met, all account balances must be resolved by the day before the semester add/drop deadline (per the CMU Online Calendar) of the current term to remain enrolled in their courses.

If a student does not complete payment by the add/drop deadline of each term:

- The student will be dropped from all enrolled courses for that term.
- The student will be placed on a leave of absence or deferred to the next available term or withdrawn from the program, depending on the situation.

Students with extenuating circumstances are encouraged to reach out to their program specialist before the deadline to discuss options available to them.