



A student guide to the InSciTE certificate

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What to expect in InSciTE courses

To earn your 15-credit InSciTE certificate, you need to take 5 classes:

- SCI 115 – InSciTE 1: offered Spring semesters on Fridays 1-4pm.
- SCI 215WI – InSciTE 2: offered Spring semesters on Tu/Th 12:30-1:45pm
- SCI 315QR – InSciTE 3: offered Spring semesters on Mon/Wed 2-3:15pm
- SCI 415WI – InSciTE 4: Capstone part 1: offered Fall semesters on Tu/Th 8-8:50am
- SCI 416 – InSciTE 5: Capstone part 2: offered Spring semesters on Tu/Th 8-8:50am

Students typically join in their first year at CMU and take 1 course each Spring until their senior year. During their senior year, they take the capstone courses (one in the Fall, one in the Spring). Students can take 2 InSciTE courses at once if they join as transfer students or if they would like to complete the certificate in less than 4 years. Some courses double-count for the university Gen Ed program or for different programs (Honors, Leadership Institute, Writing Intensive, UP II-A, degree-specific capstone).

All courses follow the same general model:

- **Courses cover skills:** InSciTE courses do not cover STEM content (math, physics, biology, etc), so they do not replace your major. Instead, InSciTE courses cover skills (communication, collaboration, project management, data handling skills). Because of this, InSciTE courses are taught differently and are project-based with no lectures or exams.
- **All InSciTE courses are team-based:** To learn collaboration, you will complete InSciTE courses 1, 2 and 3 in teams. Teams are determined by instructors before the start of the semester and are created to spread all diversities. It is therefore unlikely that you will work with students in your major, for example. Teamwork is essential to InSciTE, in part because it is one of the objectives that you learn how to be part of a successful team. How to work in successful teams is introduced in InSciTE 1 and reinforced in all InSciTE courses.
- **All courses are project-based:** As a student, you will complete 1 or 2 projects during each InSciTE course. Each project will conclude in **deliverables** (or end-results) that you can use in your resume or digital portfolios. Each course will have different types of deliverables (for example, presentation, poster, prototype, video).
- **Progress reports:** To successfully complete projects, each course has weekly progress reports that you submit as a team. In general, progress reports will ask what you did the previous week for your project, what you're planning to do the following week on your project, if you have any questions or problems.
- **Co-teaching model:** Courses are co-taught with several instructors from different STEM departments always present in the room.

InSciTE program mission, values and learning objectives

InSciTE stands for “Integration of Science, Technology and Engineering”.

In InSciTE, our mission is to create an equitable student-driven environment for undergraduate students to develop skills on interdisciplinary communication, collaboration and real-world problem solving to become culturally competent and effective leaders.

To achieve our mission, we adhere to the **core values** of equity, collaboration, relevance to real-world problems, being learner-centered and supporting creative problem solving.

As a program, we are committed to 5 student learning objectives. In InSciTE you will learn to:

1. **Collaborate successfully:** Students develop professional relationships and work together in diverse teams to achieve a common goal.
2. **Communicate effectively:** Students express ideas effectively to both technical and general audiences through oral, written and visual media, and students listen actively to provide and receive constructive criticism
3. **Employ processes to achieve desired outcomes:** Students decompose a problem to explore, design, and implement creative solutions, continuously evaluate progress, navigate uncertainty.
4. **Develop scientific habits of the mind:** Students apply scientific contents from diverse fields in order to appropriately design experiments, gather and manage data, analyze and draw conclusions.
5. **Develop personal and professional identities:** Students reflect upon their experiences to further their sense of self in order to become confident career-ready leaders.

SCI 115 – InSciTE 1; offered Spring semesters on Fridays 1-4pm.

Typical class size: 60-70 students in 16 groups; co-taught by 3 instructors that are all present during class time.

This class sets the tone for the certificate and teaches 3 core aspects:

- Collaboration skills
- How to do STEM research
- How to speak comfortably about STEM topics to others.

As a student, you will work in teams of 3-5 students; teams are formed by instructors before the course starts. As a team, you will learn to work with each other to maximize each student's strengths. You will receive training in conflict prevention and resolution. As a team, you will complete 2 STEM projects of your choice during the semester where you collect your own data.

The course is centered on two deliverables:

1. The first project will conclude with an **oral presentation** given to the rest of the class.
2. The second project will conclude with a **printed poster** presented to the College of Science and Engineering in a public format.

SCI 215WI – InSciTE 2; offered Spring semesters on Tu/Th 12:30-1:45pm

This course fulfills one of the Writing Intensive (WI) course requirements for the university. It is also a University Program II-A course (Descriptive Science Gen Ed requirement).

Typical class size: 50-60 students in groups; co-taught by 3 instructors that are all present during class time.

This class consolidates all aspects learned in InSciTE 1 about collaboration and teaches 3 core aspects:

- Writing skills in STEM, including how to do a literature review
- How to collaboratively write a scientific review paper
- How to communicate information to a general audience using audio/visual media

As a student, you will work in teams of 3-4 students; teams are formed by instructors before the course starts. As a team, you will complete a review paper on the topic of your choice, and you will share the research project with two deliverables:

1. **A review article for the scientific community** (that you write as a team)
2. **A 5-minute video or podcast for the general public.**

You do not collect your own data for this course but rely on other researchers' data – the objective of the deliverables is to review a set of scientific literature and present what you learned about it.

SCI 315QR – InSciTE 3 – offered Spring semesters Mon/Wed 2-3:15pm

This course fulfills the requirements for a Quantitative Reasoning (QR) course.

Typical class size: 50 students in groups; co-taught by 2-3 instructors that are all present during class time.

This class reinforces what was learned in InSciTE 1 and 2 courses and teaches 3 core aspects:

- Data skills in STEM, incl. processing, analysis and interpretation
- How to manage a large database and analyze data
- How to present data results to a general audience

As a student, you will work in teams of 3-4 students; teams are formed by instructors before the course starts. As a team, you will explore a database of your choice to determine trends in the data. You will share what you find in this database with 2 deliverables:

1. An **oral presentation** to the rest of your class about your findings on the database
2. A **data report**, emailed to the database providers

You do not collect your own data for this course but rely on existing external databases.

SCI 415WI – InSciTE 4 – offered Fall semesters Tu/Th 8-8:50am

This course fulfills one of the Writing Intensive (WI) course requirements for the university.

This capstone course can count for other programs' capstone experiences. In the same way, other programs' capstones experiences can count towards this experience. This is determined by conversation between students and program directors/chairs.

Typical class size: 40-50 students; co-taught by 2 instructors that are all present during class time.

This course is the first course in the InSciTE capstone experience. In this capstone experience, you get to pick a topic of your choice and explore it for 2 semesters to complete a capstone project. You have a lot of freedom in the capstone to decide what your topic can be and how you'd like to work on it. For example, you can decide to work in a team and choose your team, but you can also choose to work on a project alone.

Capstone projects typically fall under a few categories:

- **A “traditional” STEM research experience** where you join a faculty member's research lab and work under their guidance on a project.
- **A passion project:** if there's a project that you're really passionate about that is STEM-related, we can help you make it your capstone project. This can be, for instance, a children's book about bats, an art installation representing climate change, creating a peer-reviewed journal for the college or leading a speaker series.
- **A competition:** there are a number of STEM competitions that you can enter as a team that can be a capstone project (such as the New Venture competition on campus, Aquahacking, or the national WERC competition).
- **A case study** for an external company: we are partnering with local community professionals, who are providing us with briefs on their specific STEM problems. Students can pick any of these briefs as the challenge to accomplish throughout the semester. For example, Case Systems (a manufacturing company based in Midland) is providing a problem they face, the constraints they have for this problem, and are hoping for a creative solution given a specific budget.

Some students start the course with no clear directions about their capstone and spend the beginning of the course figuring out what to do. Some students start this capstone course knowing what they want to do and under whose mentorship. Some students start working in their capstone before their senior year. All options are fine and instructors will help you define a successful capstone project.

The deliverables for the course consist of:

- 1. An oral pitch of the project**
- 2. A formal project proposal**
- 3. a social media post about your project**

Additional optional deliverables include grant proposals and conference proposals.

SCI 416 – InSciTE 5 – offered Spring semesters Tu/Th 8-8:50am

This course can fulfill other programs' capstone experiences based on prior agreements between programs.

Typical class size: 40-50 students; co-taught by 2 instructors that are always in the room.

This course is the continuation of the InSciTE capstone experience. In this course, you continue the work you started in InSciTE 4.

The deliverables for this course consist of:

1. **A formal project report**
2. **A poster or oral presentation of this project to a conference** (either CMU's SCREE conference in April, or an external conference decided with your mentors and instructors).
3. **Social media posts about your project**

InSciTE beyond the classroom

InSciTE is a holistic program, which means we expect to see you not only during class but also outside of class. InSciTE offers a number of opportunities to get involved, help your career development and support you as a whole person. We will constantly provide opportunities for you to participate in activities and we love to see you in as many as you can. Some examples of InSciTE activities are:

1. Peer-mentoring program:

For new InSciTE students (mentees): All students in InSciTE have a peer-mentor assigned when they join the program. The peer-mentor is typically a student in the cohort(s) ahead by one or two years, and usually in a STEM field similar to the mentee. The students get to meet each other in January during our mentor-mentee launch. Once the mentorship is started, it's up to the mentor and mentee to determine how the mentorship will work (how often they meet, where do they meet, what topics to cover, what activities to do together etc.)

Once students are in the program for one year, they are assigned a mentee to mentor after receiving a brief training on how to be a good mentor.

In the peer-mentoring program, all students get to experience first, having a mentor (that they can keep for up to 3 years) and then, having a mentee (that they also can help for up to three years).

2. Networking events:

InSciTE offers regular networking events throughout each semester (anywhere from 2 to 6 depending on the semester). These events typically take place on campus (usually at Ponders coffee shop on the main floor of CMU's library, but sometimes in ET or Biosciences). The program covers any costs associated with these events (coffee / beverage / meal).

For any given networking event, InSciTE invites 1-3 leaders to join you. We provide the list of folks that will be present before the event, as well as a few tips and a short training on what to do at a networking event.

During networking events, which typically lasts 40 to 50 minutes, you have an opportunity to interact with the guest(s), get to know them, ask them questions regarding their career pathways, etc.

3. Community-building events: socials, game nights, parade float

We have some community-building events in InSciTE that are highly dependent on our student's requests. In other words, if you'd like something to happen, ask away and we'll try to make it happen!

Otherwise, InSciTE hosts regular social events (at least once a semester, sometimes more, depending on students' requests) that include all cohorts. Some semesters we have students that organize game nights or theme nights. We also have many InSciTE students that gather at the STEM maker space in EHS 134 during the open-make time (Thursdays 7-9pm every week).

For CMU homecoming, we have a float that you can ride on to give out candy during the parade. The float was made by students and can continue to be improved or modified. Additionally, during homecoming week, InSciTE students have asked the upper administration (CMU President/Provost/Dean) to ride in an InSciTE-built cardboard boat during the Engineering cardboard boat race. This happened the last few years and can be a tradition we continue.

4. **Professional development:**

We want to help each student identify, prepare for and land their dream job, whatever that may be (and including grad school, med school, law school). For this, we support a lot of professional development, which is a fancy term for all-things-career oriented.

- a. Student advising: InSciTE director Dr. Wiline Pangle and all InSciTE faculty are dedicated to our students and are always available to meet with students 1-on-1 and discuss career choices, strategies, CV/resumes, applications, etc.
- b. Retreat on Beaver Island: We take all students that have just completed InSciTE 1 to Beaver Island for a 3-day retreat during Labor Day weekend. All expenses are covered. During this time, we have a lot of career conversations along with cohort-building activities. All InSciTE faculty join during this retreat to provide support, advice, and get to know you all.
- c. Workshops on internships or other topics: upon requests, we have hosted a number of workshops throughout the years on specific topics like building resumes or applying to internships.

5. **Scholarships** are offered to all InSciTE students to cover the costs of their InSciTE course credits (\$1,500/course). Scholarships are awarded entirely based on financial needs, which is determined by the office of Financial Aid. There are now a number of InSciTE scholarship lines (because we have a number of donors), but they are all reviewed by the same committee. Applications for all scholarships are through Scholarship Universe.

6. **Surveys**: We collect a lot of information in InSciTE so that we can obtain funding for the program. As a student, you'll receive a survey when you join InSciTE, then you get to complete it again at the end of each InSciTE course as part of the end-of-the-semester tasks.

7. **Feedback**: We are a student-centered program, which means we take student requests seriously. Please share your ideas for events, workshops, how to improve courses, etc. There are multiple opportunities for feedback:

- We have a **suggestion box** in the InSciTE room that's both confidential and anonymous.
- There are 2 notebooks in the InSciTE room: the **grievance notebook** and the **gratitude notebook** where you can leave your feelings for all to see.
- Talk directly to Dr. Wiline Pangle and/or any of the InSciTE faculty.

Helpful links:

- **Main website:** se.cmich.edu/InSciTE
- **Instagram :** [InSciTE_cmu](https://www.instagram.com/InSciTE_cmu)
- **LinkedIn :** [linkedin.com/in/wiline-pangle](https://www.linkedin.com/in/wiline-pangle)
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- **Blackboard InSciTE-wide site:** We share all the opportunities that we hear (internships, competitions, jobs, trainings) on our program-wide Blackboard page. New students are added to the site when they join InSciTE 1. Because it's a multi-year site, it's typically buried at the bottom of your Blackboard list. We suggest starring it so that it always shows up on top. This Blackboard site contains a wealth of information, including regarding scholarships, trainings, resume/CV assistance, but also all InSciTE student rosters and past InSciTE projects as a large depository. We use this site to communicate with our students and add opportunities on the site almost daily.

Helpful contact information:

InSciTE director: Dr. Wiline Pangle. Office Biosciences 2409. Office hours: Tuesdays 1-3pm.

All InSciTE faculty office hours and contact information is available on the InSciTE Blackboard.

The InSciTE lounge

InSciTE lounge in ET 224: We provide a common space for you to meet, hang out, and study. This room is meant to have all the resources that you may need. This includes printers, screens, a conference room, and also games, puzzles, coloring. You also have resources that are free and available to you if you need them. These resources include coffee, quick microwaveable meals, toiletries, T-shirts, socks, menstrual products, and safe-sex products. Feel free to take resources as you need and let us know if you would like us to add something in the room.

Frequently Asked Questions

1. What if I'm at CMU for only 2 or 3 years?

That's not a problem for most students – we are flexible enough in InSciTE to figure out how to best fit the 5 courses in your schedule so that it wouldn't slow your graduation. This is helped a lot by the fact that many InSciTE courses double-count for required courses. InSciTE director Wiline Pangle meets with all transfer students 1-on-1 to create degree maps that work for your degree.

2. What if my schedule conflicts with an InSciTE course?

Contact the program director Wiline Pangle to set up a meeting with her. We are always able to figure out solutions that work for all students, partly because the program is very flexible. For instance, we might suggest that you take InSciTE courses in a different order.

3. What if I decide to leave InSciTE?

You can always choose to leave InSciTE at any time! We will miss your voice but we are strong believers in students having choices and being in the driver's seat of their education. To remove the certificate from your degree progress, contact the program director Wiline Pangle and she will work with the Registrar's office to have your certificate removed.

4. Can I keep my team for next year's class?

Sometimes you will be in an InSciTE team that you just love and want to keep for other InSciTE courses. While you will not be with the same folks for InSciTE courses 1, 2 and 3, you can absolutely choose to work with that team again during your InSciTE capstone (InSciTE 4 and 5 courses).

5. Can I switch team during a course?

Unfortunately, no. In InSciTE, we are teaching collaboration skills that mirror what you'll need in the workplace. Most of the time in everyday work, we do not get to pick who we work with – sometimes we have great teammates, sometimes not. In InSciTE, we teach skills to collaborate with all students, regardless of whether you get along with them. That being said, InSciTE students have overwhelmingly positive group experiences (96% of students report really enjoying their team). If you are in a team that has some conflicts, you will not be alone: your instructors will step in and help model how to deal with team conflicts with grace and accountability using established norms.

6. How heavy are InSciTE courses in terms of the amount of work?

All InSciTE courses aim to be “average” STEM courses in their amounts of work, in other words not the lightest STEM courses where there's no work, but not a heavy STEM course that dominates your schedule. Realistically, this looks like 1-3 hours of work outside of class time during a given week. That being said, most InSciTE students report that InSciTE classes feel lighter in load than their other STEM courses. We believe this is

because students have a large agency in our InSciTE courses: not only do students always get to pick the topic of all of the projects they work in during InSciTE courses, but they also have a lot of choices on when to allocate work time.

7. What are some of students' favorite things about InSciTE?

We hear a lot about how our students love the community that is created in InSciTE and all the people in InSciTE, including their faculty. We also hear how much our students enjoy the interdisciplinary aspects of InSciTE, with students from all STEM majors having opportunities to get to know each other and interact. Students mention as a program highlight the 3-day retreat to Beaver Island, but also all the opportunities. We also hear a lot about our InSciTE lounge being a great space to hang out.