



## Masters in STEM Teaching



### **Graduate Student Handbook**

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## Program Overview

The College of Arts and Sciences offers a master's degree for students seeking a science, technology, engineering, and/or mathematics (STEM) career path that involves teaching through the Masters in STEM Teaching (MST) program. A typical candidate plans to become a faculty member or teacher, whether a tenure-track professor or lecturer at a four-year college or university, an instructor at a two-year college, or even a K-12 teacher. Through required coursework and teaching internships, the program offers an opportunity to STEM undergraduate and graduate students to become exceptionally qualified teachers at either the secondary or post-secondary level.

MST is a non-thesis master's program, designed to extend and deepen the science background of its students through graduate coursework in their STEM disciplinary content areas (e.g., biology, chemistry, engineering, geoscience, mathematics, physics), as well as provide strong preparation in the pedagogical aspects of STEM teaching and learning, including high-quality, extended teaching internships. The program builds upon a strong partnership between the College of Arts and Sciences and the College of Education to provide the best experiences for students in the content (STEM) and teaching (education) areas, working with Tallahassee Community College, FSU STEM Departments, and local secondary schools to provide internship experiences for all students.

Typical students fit into one of two categories: (1) those pursuing MST as a stand-alone MS program after completion of a BS degree in a STEM discipline, or (2) those pursuing MST concurrently with a graduate degree in one of Florida State University's STEM departments with the permission of both programs.

## Program History

Building upon a strong partnership between the College of Arts and Sciences and the College of Education to provide the best experiences for students in the content (STEM) and teaching (education) areas, the Masters in STEM Teaching (MST) program was developed in 2004 to extend and deepen the STEM background of its students through graduate coursework in their STEM content areas, as well as to provide strong preparation in the pedagogical aspects of STEM teaching and learning, including high-quality, extended teaching internships. The original implementation of the program focused on certification for secondary teaching, through the Secondary Science Teaching major. In 2013, an additional track was approved to prepare students to become post-secondary instructors, the Community College Science Teaching major. The secondary track was suspended in Summer 2016 and the current and only major name has been changed to College STEM Teaching, to both reflect the fact that our graduates go on to teach within various post-secondary settings (both 2-year and 4-year) and that we offer training for all STEM disciplines.

## Admissions Requirements

Prospective students are advised to contact the MST program director to express interest and get more information before applying. The process differs for those pursuing MST as a stand-alone M.S. program than for those pursuing MST concurrently with a graduate degree in one of FSU's STEM departments with the permission of both programs.

### Summary of General Requirements

Candidates must be willing to be physically present in Tallahassee and maintain flexible schedules that can accommodate in-person classes and internship experiences. Students must have a strong background in a STEM disciplinary field (e.g., undergraduate major with 3.0 GPA or higher in content area and/or some graduate-level work in content area), a demonstrated interest in learning to employ evidence-based teaching practices, and evidence of spoken English competency for international students (a score of 26 on the spoken part of the IBTOEFL or a score of 50 on the SPEAK test administered by the FSU Center for Intensive English Studies).

### Stand-Alone M.S. Students

***For students who are finishing or who have previously completed a B.S. degree in a STEM discipline AND are not currently enrolled as graduate students at FSU...***

When ready to apply, visit the [Graduate Application Portal](#) and make sure that you **meet all Graduate School requirements for admission**, including:

- Bachelor's degree from a regionally accredited U.S. institution or a comparable degree from an international institution.
- Upper-division undergraduate GPA of 3.0 or higher on a 4.0-scale.
- Scores on the GRE or comparable standardized graduate admissions exam that is acceptable to The Graduate School. While there is not currently a minimum score, the candidate must have taken such an exam and must show evidence of strong undergraduate work or other evidence of academic success if test scores are low.

### Dual-Enrolling Students

***For students who are currently enrolled as graduate students at FSU...***

Please **DO NOT** attempt to apply through the Graduate Application Portal!

If you would like to add MST as a secondary degree, you must work with the MST Program Director and your disciplinary major professor or advisor to complete the Dual Enrollment Request Form. See The Graduate School's guide to [Dual Degree Programs](#) for more information.

If you would like to change majors, potentially bringing some of your current credit hours with you to count toward an M.S. in STEM Teaching, you must work with the MST Program Director and your disciplinary major professor or advisor to complete the [Graduate Major Change Form](#).

## Program Information

The Program Director works with each student to create a Course of Studies to suit their unique goals, preferences, and interests. Examples of templates are shown below, but note that there is some flexibility in pace and we are able to accommodate milestones within the primary program for students who are dual-enrolled in another graduate program.

### Summary of General Requirements

All students must complete graduate-level coursework in both their chosen discipline (e.g., biology, chemistry, engineering, geoscience, physics, mathematics) and in pedagogical disciplines. The mix between the two and the total number of credit hours required to complete the degree differs depending on each student's disciplinary background experience and educational career goals.

Students must also make plans to complete teaching assistant (TA) Certification through the Program for Instructional Excellence (PIE) before the start of their internships or by the end of their first year in the program, whichever comes first.

Because MST is a course-based M.S. program, there is no formal thesis defense. In lieu of a master's thesis, students in this program complete a "Teacher Work Sample" (TWS) within their Half-Time Teaching Internship. Students must maintain a 3.0 GPA or higher to remain in good academic standing.

A summary of the coursework for this program is provided below:

- **Pedagogical Core Coursework**
  - SMT 5305 Classroom Interactions -or- ISC 5295 College Science Teaching and Learning
  - Additional 2-4 approved SCE 5xxx courses and/or other education electives
- **Apprentice Teaching**
  - Note on eligibility to enroll in Teaching Internships:
    - **International students** must demonstrate spoken English competency by obtaining a score of 26 or higher on the spoken part of the IBTOEFL and/or passing the SPEAK test with a score of 50 or better before registering for internships
    - **All students** must complete 18 approved graduate credit hours in content area (e.g., biology) and/or an in-field master's degree before registering for their Full-Time Internship
  - Students complete two teaching internships at the college level (typically at Tallahassee Community College) along with co-requisite seminar courses:
    - Half-Time Teaching Internship (ISC 5946 and ISC 5944): Each student shadows an experienced instructor in their content area for a semester and teaches one unit of instruction.

- During their Half-Time Teaching Internship, students will complete a Teacher Work Sample focused on preparing for their unit of instruction and analyzing their own teaching practices.
  - Full-Time Teaching Internship (ISC 5945 and ISC 5098): Each student teaches a lecture and lab section, or two lecture sections, of a course in their content area.
- **Graduate Content Coursework**
    - Students must complete a minimum of 18 graduate credit hours and/or a master's degree in content area (e.g., biology).
    - If going the credit based direction (i.e., not earning an M.S. or Ph.D. in the discipline before the full-time internship), students must earn letter grades of B- or higher in the content area courses and verify the courses count toward credentialing at the institution at which the internship will take place. If students earn lower grades or choose courses that do not count toward credentialing, their internship and thereby graduation may be postponed.

### Stand-Alone M.S. Students

Students who are pursuing MST as a stand-alone M.S. program after completion of a B.S. degree in a STEM discipline typically follow the below template (Fall Start shown; adjusted if beginning in another semester).

Content Area Total: 18 graded graduate credit hours.

Pedagogical Total: 23 graduate credit hours, 14 graded.

Grand Total: 41 graduate credit hours, 32 graded.

Semester	Course #	Course Title	Discipline	Credit Hours	Graded Hours
Fall 1		Education Elective Course	Education	3	3
Fall 1		STEM Content Course	STEM	3	3
Fall 1		STEM Content Course	STEM	3	3
Spring 1	ISC 5295	College Science Teaching and Learning	Education	3	3
Spring 1		STEM Research or Content Course	STEM	3	3
Spring 1		STEM Content Course	STEM	3	3
Summer 1	ISC 5946	Half-Time Teaching Internship	Education	3	0
Summer 1	ISC 5944	Ethics, School Law, and Management of Science Classrooms	Education	3	3
Fall 2		Education Elective Course	Education	3	3
Fall 2		STEM Content Course	STEM	3	3
Fall 2		STEM Content Course	STEM	3	3
Spring 2	ISC 5945	Full-Time Internship	Education	6	0
Spring 2	ISC 5098	Reflective Science Teaching	Education	2	2

## Dual-Enrolling Students

Students who pursue MST concurrently with a graduate degree in one of FSU's STEM departments with the permission of both programs follow the below template (Fall Start shown; adjusted if beginning in another semester). The Program Advisor will determine whether a STEM Content Course or an Education Elective will best serve the individual student.

Content Area Total: at least 3 graded graduate credit hours.

Pedagogical Total: up to 29 graduate credit hours, up to 20 graded.

Grand Total: 32 graduate credit hours, 23 graded.

Semester	Course #	Course Title	Discipline	Credit Hours	Graded Hours
Fall 1		Education Elective Course	Education	3	3
Fall 1		STEM Content Course	STEM	3	3
Spring 1	ISC 5295	College Science Teaching and Learning	Education	3	3
Spring 1		Education Elective Course	Education	3	3
Summer 1	ISC 5946	Half-Time Teaching Internship	Education	3	0
Summer 1	ISC 5944	Ethics, School Law, and Management of Science Classrooms	Education	3	3
Fall 2		Education Elective Course	Education	3	3
Fall 2		Education Elective or STEM Content Course		3	3
Spring 2	ISC 5945	Full-Time Internship	Education	6	0
Spring 2	ISC 5098	Reflective Science Teaching	Education	2	2

## English Competency Requirements

The program recognizes a score of 50 on the SPEAK test or a score of 26 on the spoken part of the IBTOEFL as certifying spoken English competency for international students. The SPEAK test (administered by the Center for Intensive English Studies) is to be taken by all international students from countries where English is not the native language when they first arrive on campus, normally in the week before classes. International students will have one calendar year from the time they enter the program to pass the SPEAK test with a 50 or better.

International students will be ineligible to complete their teaching internships until they pass the SPEAK test, and as internships are a requirement of graduation, will be unable to complete their degree. Petitions for exceptions must be approved by the Program Director in consultation with the teaching internship host institution. The Center for Intensive English Studies offers courses in spoken English for students requiring remediation. Students who have not passed their SPEAK test will be required to take spoken English courses every semester until they pass or are certified (e.g., EAP 4830 Spoken English for International TAs, EAP 4831 Advanced Spoken English for ITAs, or EAP 4832 Pronunciation for ITAs).

## TA Certification Requirements

To assure all students meet relevant accrediting body requirements to serve as Teaching Assistants (TAs) and/or Instructors of Record (IORs) for assistantship appointments and/or teaching internships, all MST students must complete FSU's Program for Instructional Excellence (PIE) Training (<https://pie.fsu.edu/>). Students are responsible for signing up for and attending the required two-day teaching conference, available in Spring and Fall semesters (not Summer).

More information on the current University-Wide TA Standards can be found on The Graduate School website: <https://policy.gradschool.fsu.edu/students>

## Program Costs

The number of credit hours required to complete the program ranges from as low as 32 for a student dual-enrolled in a content area graduate degree program, up to 43 for a student pursuing MST as a stand-alone program.

In general, most MST students self-fund or apply funding from their disciplinary program, but occasionally students secure assistantships on a case-by-case basis. Graduate students may be eligible to apply for Teaching Assistantships through their associated disciplinary department or the Science Education or Math Education Departments, which could come with the potential for tuition waivers and stipends, but funding is not guaranteed. Most MST students are paid as adjuncts during their Full-Time Teaching Internship.

More information about tuition rates and financial assistance is included below:

- Florida/Non-Florida residents per credit hour and total estimates
  - [Tuition Rates](#)
- Financial assistance
  - [FSU's Financial Aid Website](#)
  - [Graduate Scholarships](#)
  - [Fellowships and Grants](#)

## Program Faculty

MST is coordinated by Drs. Ellen Granger and Erica Staehling in the Office of STEM Teaching Activities (OSTA). As the Director of the OSTA, Dr. Granger oversees overarching programmatic and budgetary decisions, and instructs in program courses as needed. As Assistant Director of the OSTA and Director of MST, Dr. Staehling handles day-to-day administration of the MST program, instructs in program courses, advises students, and supervises internships. While Drs. Erica Staehling and Ellen Granger are the core faculty for the Masters in STEM Teaching



Program, MST students also have the opportunity to work with faculty members from across Florida State University, including within their STEM Disciplines and the College of Education.

**Erica Staehling** is the Associate Director of the Office of STEM Teaching Activities at Florida State University, Director of FSU's Masters in STEM Teaching Program, Co-Director of FSU's Young Scholars Program, and Co-Lead of Aspire's Florida Regional Collaborative. Through her work with the Masters in STEM Teaching Program, Dr. Staehling mentors graduate students pursuing careers in College STEM Teaching, instructs graduate-level courses in STEM Teaching, and coordinates and monitors teaching internship placements. Dr. Staehling also assists STEM faculty members in developing their Broader Impact agendas and works with a wide range of K-16 STEM outreach programs. Dr. Staehling has an M.S. in Science Education with a concentration in Physics Teaching, a Ph.D. in Atmospheric and Oceanic Sciences, and a B.S. in Physics and Mathematics.

**Ellen Granger** earned her doctorate in neuroscience and has been a practicing scientist and science educator since then. She has worked in teacher professional learning for almost 20 years with both preservice and inservice teachers. She is the Director of the Office of STEM Teaching Activities in the College of Arts & Sciences at Florida State University and the Co-Director of the FSU-Teach program for preparing secondary science and mathematics teachers. She has published over 40 scholarly articles in peer-reviewed journals in science education and science and has held over 35 research and education grants. Her research interests include teacher professional development, 3-Dimensional learning in the classroom, and maximizing student science understanding. In November of 2013, she was named a Fellow of the American Association for the Advancement of Science (AAAS) for "distinguished contribution, service, and leadership in advancing knowledge and classroom practices in science education."

## Contact Us

For inquiries about the Masters in STEM Teaching (MST) program, reach out to the Director:

### **Dr. Erica Staehling**

**Email:** [estaehling@fsu.edu](mailto:estaehling@fsu.edu) (preferred)

**Phone:** (850) 644-6747

**Fax:** (850) 644-0643

**Office:** 1062F King Life Sciences Building

**Mail Code:** 4295