



STEM Graduate Certificate of Distinction

From delivering clean water or developing future energy resources to innovating for our global economy, the profound problems facing our world in the 21st century will require a critical eye and an adventurous spirit. Students in our STEM Certificate of Distinction program challenge themselves to understand how technology and design merge in unexpected ways to shape solutions to these and other problems.

All students at MPA receive an education that prepares them for the fast-paced, ever-changing world—including the ability to think independently, communicate effectively, and contribute responsibly. They are curious and able to evaluate information critically from various sources and perspectives. Students in the STEM Certificate of Distinction program are particularly prepared and encouraged to imagine themselves as designers of a future where their specialized knowledge will effect positive change in the world.

All MPA Upper School students are eligible to work toward a single certificate of distinction, including a STEM Certificate of Distinction (SCD). We encourage you to explore as many courses as possible in a variety of areas in ninth and tenth grades. This is a time to discover new interests and skills that may lead to a focused passion.

If you are interested in pursuing a SCD, you should first discuss your plans with the STEM GCD advisor who will be able to provide feedback and guidance with the process. From there, you may download a SCD packet from the MPA website. The packet includes all requirements, forms, and information to guide you through the process of achieving a STEM Certificate of Distinction. You must submit the STEM GCD letter of intent found in this packet by December 1st of your junior year. Since all requirements must be met by spring of senior year to receive a certificate, you must decide to pursue the certificate by the fall of your junior year. Portfolio building may begin starting in tenth grade.

You are responsible for obtaining the necessary approvals and maintaining your portfolio throughout your Upper School career. Students who complete all requirements submit their portfolio for review to the GCD Committee in the spring of senior year. Additionally, the committee will meet twice a year to check the work in progress of any student working towards a GCD. While the primary goal of the program is for students to gain skills and knowledge in science, technology, engineering, and math, students who complete the program will also receive a certificate and academic distinction. While in the process, your transcript will note "STEM Scholar Candidate."

REQUIREMENTS

1. ACADEMIC

To earn this certificate, you must maintain an overall 3.5 grade average and complete coursework or demonstrate proficiency in each area of science, technology, mathematics, engineering, and design. The following courses are required. If you believe you have a notable exception, you must submit a request to customize the academic requirements through the SCD Academic Exception Form and gain approval from the STEM Certificate committee. You must include the completed and approved SCD Academic Exception Form in your SCD Portfolio.

<p>Science 4.5 years or more of science including at least one year of Physics, Biology, and Chemistry.</p> <p>Additionally, depending upon the student's area of interest, students should also maximize the number of MPA science electives they pursue and consider MOSN opportunities.</p>	<p>Math 4 years of math including but not limited to:</p> <p>Honors Pre-Calculus AP Calculus or AP Statistics</p>	<p>Design/Engineering/Technology Students must complete at least 3 courses with a design or technical component from the following:</p> <ul style="list-style-type: none"> • Engineering and Design • Robotics • Makerspace • Computer Science • Stagecraft • Visual Arts Courses with a Design Component • Music Courses with a Design Component <p>Students must take a selection of courses from across this area and STEM GCD candidates are encouraged to maximize their exposure to engineering design, making, coding, and visual arts with the understanding that each of these disciplines defines and applies design in different ways, all valuable to a STEM GCD candidate. Most candidates will exceed the 3-course requirement.</p>
---	--	---

2. STEM EXTRACURRICULAR

You must participate in a STEM extracurricular or club at MPA. Options include but are not limited to: Robotics, Math League, eClub, STEMED Club, Technical Theater, or HOSA.

3. **STEM SERVICE**

Your senior service project (30 hours) must have a STEM focus. Examples include tutoring in STEM-related subjects, developing apps or working on software or a website for a non-profit, working with Habitat for Humanity to build a house, etc. It's important that this service project be an authentic act of service that contributes to your STEM experience and education AND has a significant impact on others. **Complete and submit the SCD STEM Service Form to the SCD Committee before you start your service for pre-approval. You must include the completed and approved SCD STEM Service Form in your SCD Portfolio.**

4. **STEM Experience Project (Volunteering, Design Project, or Internship)**

For this component, you must complete an experience such as a research project in a local lab, STEM camp, design project, volunteer position, internship, etc. related to your STEM focus. This experience should extend and deepen your STEM learning experience. The experience will be chosen in consultation with a STEM mentor who will oversee the work. Complete and submit the SCD Project Request Form to the SCD Committee before you start your work for approval. You must include the completed and approved SCD Project Request Form in your SCD Portfolio

5. **STEM Enrichment Activities (100 hours)**

The STEM GCD Enrichment Activities requirement is intended to encourage students to explore areas of interest involving STEM beyond the curriculum and outside of the student's academic experiences. Throughout grades 10–12, you should attend STEM related symposiums, conferences, lectures, events, etc. A longer summer camp or experience may substitute for some of the individual activities with the approval of the SCD Committee.

You need to earn 100 hours by December of the senior year, spread over four areas:

- **STEM in the Community**
- **STEM Professional Speakers**
- **STEM in Media**
- **STEM Skills**

Each area must have at least 10 hours. On the SCD Enrichment Activities Form, you must keep track of all activities including event, date, and description. When completed, a double-spaced, 250-to-500-word essay, synthesizing what you have learned from these activities and how they contributed to your interest and growth in science, technology, engineering, and mathematics, must be submitted as part of your SCD Portfolio.

The Greater Twin Cities Area, with its colleges, museums, and corporations, is host to many STEM events and opportunities, including lectures, exhibits, summer experiences, and more. The SCD Committee will provide updates on STEM related opportunities to help you find a wide range of authentic opportunities that deepens your STEM experience.

6. **SCD Portfolio and Reflection Project**

Upon completion of the SCD requirements (spring of senior year), you will present your portfolio to the SCD committee during an oral presentation (15 minutes) that summarizes and reflects upon your wide range of SCD experiences. In addition to the documentation listed earlier in this document, you must also complete a reflective essay (250–500 words) that briefly describes the most important points of your process and journey and what you gained from the overall experience.

The final Portfolio must include:

- Completed and approved SCD STEM Letter of Intent
- Completed and approved SCD STEM Service Form
- Completed and approved STEM GCD STEM Experience Form
- Completed STEM GCD Résumé
- Completed STEM GCD Enrichment Activities Log and Essay (250–500 words)
- Completed STEM GCD Reflective Essay (250–500 words)
- Completed and approved SCD Academic Exception Form (if applicable)
- Transcript
- Oral Presentation
- STEM GCD Checklist

Portfolios reviews are required twice yearly as you progress. Portfolios must be submitted by September 15 to be reviewed by October 1 and again submitted by February 15 will be reviewed by March 1. Final portfolios must be submitted by May 1 of your senior year and will be evaluated by May 15. May 1 is the final deadline for submissions.

7. **Attendance at STEM GCD Meeting and Annual STEM GCD Presentations**

The STEM GCD advisor may call meetings occasionally to share information or opportunities and review work towards the GCD. Attendance at these meeting is required for all STEM GCD Candidates. GCD candidates are also required to attend the annual GCD presentations. Students in 10th and 11th grade who are pursuing a STEM GCD must be present at the STEM GCD senior presentations. Seniors receiving a STEM GCD must be present at the GCD presentations of other Seniors in all GCD candidates



STEM GCD Letter of Intent

Student:	Year of Graduation
Parent/Guardian:	Date:

Submission Deadline: December 1st of Junior Year

Please read over the STEM GCD requirements carefully briefly answer the following questions in a letter to the STEM GCD Advisor. Attached this signed and completed form to that letter and place a copy in your STEM GCD binder.

1. Why do you intend to pursue a STEM GCD?
2. How will you meet the course requirements? What courses have you completed, are currently enrolled in, or plan to enroll in to complete the requirements?
3. What STEM extracurriculars are you participating in?
4. What are your ideas for a STEM service project?
5. What are your ideas for a STEM experience? Or describe one you have already completed.
6. How do you intend to meet the 100 hours of enrichment requirement? Consider the four areas in your response.

STEM GCD Committee Approval Yes No Date: ____/____/____	US Director Signature:
--	------------------------



STEM GCD Service Project Proposal Form

Student:	Year of Graduation
Parent/Guardian Signature:	Date:

Dates of Proposed Project:	Name of Group/Organization:
Approximate Number of Hours:	Address:

STEM Mentor Name and Title/Position:

STEM Mentor Email:

Project Description:

Describe how your project will help you better understand the impact that STEM skills and knowledge can have on areas of social importance:

STEM GCD Committee Approval Yes No Date: ____/____/____	US Director Signature:
--	------------------------



STEM GCD STEM Experience Form

Student:	Year of Graduation
Parent/Guardian Signature:	Date:

Dates of Proposed Experience:	Name of Group/Organization:
Approximate Number of Hours:	Address:

STEM Mentor Name and Title/Position:

STEM Mentor Email:

Give a brief description of what the experience will entail:

STEM GCD Committee Approval Yes No Date: ____/____/____	US Director Signature:
--	------------------------



STEM GCD Enrichment Activities

The STEM GCD Enrichment Activities requirement is intended to encourage you to explore areas of interest involving science, technology, engineering, mathematics, and design and to reward you for the exploration you are already doing. Although the requirement is fairly open ended, the activities must be outside of your academic experiences and be dispersed in four categories: STEM in the Community, STEM in Media, STEM Professional Speakers, and STEM Skills. The activities should also meaningfully enhance your STEM understanding and appreciation.

You must earn 100 hours of outside experience spread over the four areas. Each area must have at least 10 hours and can include such diverse opportunities as presentations, books, Ted Talks, documentaries, galleries, lectures, camps, informational interviews, and more.

Use this form to keep track of your activities, and, upon completion, write a double-spaced, 250–500-word essay, synthesizing what you have learned from these activities and how they contributed to your overall STEM understanding and appreciation. This form and the essay must be submitted as part of the STEM GCD Portfolio.

The 100 enrichment hours should be completed, and logs and essay should be submitted by December 1st of your senior.



STEM GCD Enrichment Log

STEM in the Community

Date/Time	What	Where	Hours

Total Hours: _____

Notes:



STEM GCD Enrichment Log

STEM Professional Speakers

Date/Time	What	Where	Hours

Total Hours: _____

Notes:



STEM GCD Enrichment Log

STEM in Media

Date/Time	What	Where	Hours

Total Hours: _____

Notes:



STEM GCD Enrichment Log

STEM Skills

Date/Time	What	Where	Hours

Total Hours: _____

Notes:



STEM GCD Resume Template

Student Name

Student Address, Phone Number, & Email

STEM Academic Study

Science Classes (list courses and the years you complete them)

Mathematics Classes (list courses and the years you complete them)

Design Classes (list courses and the years you complete them)

Technology and Engineering (list courses and the years you complete them)

Include self-study, MSON classes, online courses etc.

STEM Service

Project's Focus/Title Organization

Location

Dates:

In 2-3 sentences, explain your service project.

STEM Experience

Project's Focus/Title Organization

Location

Dates:

In 2-3 sentences, explain your STEM experience

Additional STEM Activities

List any additional significant activities that you participated in (science-focused school clubs, programs you attended out- side of school, etc.). Include dates.

STEM Enrichment

List up to ten of the most meaningful enrichment activities you participated in. Make sure to have items from each category.

Category: Event, date, location (if pertinent)

Short phrase or sentence, bullet pointed



STEM Certificate of Distinction Checklist

Name:

Year of Graduation:

Date:

Your Completed Portfolio Must Include:

- Completed and approved SCD STEM Letter of Intent
- Completed and approved SCD STEM Service Form
- Completed and approved STEM GCD STEM Experience Form
- Completed STEM GCD Résumé
- Completed STEM GCD Enrichment Activities Log and Essay (250–500 words)
- Completed STEM GCD Reflective Essay (250–500 words)
- Completed and approved SCD Academic Exception Form (if applicable)
- Transcript
- Oral Presentation
- STEM GCD Checklist

Important Information Regarding Portfolio Submission

Final portfolios must be completed and turned in by May 1 and will be evaluated by June 1.

Reviews for portfolios in process will be available on two cycles:

1. Portfolios submitted by September 15 will be reviewed by October 1.
2. Portfolios submitted by February 15 will be reviewed by March 1.

Case-by-case approval for the following will be reviewed by the GCD Committee on a quarterly basis:

1. Alternative approaches to satisfying the SCD academic requirement

Completed SCD Portfolios are to be put in a three-ring binder and brought to the SCD Advisor. Students are advised to keep a copy of their completed portfolio for their own records.



STEM GCD Academic Exception Form

Student:	Year of Graduation
Parent/Guardian Signature:	Date:

STEM GCD Requirement:

Requested Exception or Substitution:

Describe why this exception is required or how the requirement is met in other ways:

STEM GCD Committee Approval Yes No Date: ____/____/____	US Director Signature:
--	------------------------

