

# STEM CERTIFICATE OF DISTINCTION PROGRAM

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.

The following are the components that must be achieved and the criteria that must be met in order to obtain a Certificate of Global Distinction. All necessary forms, as well as an Approved Travel Program List are available in the Upper School Office or on the MPA website.

## WHO?

All MPA Upper School students are eligible to work toward a single certificate of distinction, including a STEM Certificate of Distinction (SCD).

## WHEN?

We encourage you to explore as many courses 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. Since all requirements must be met by spring of senior year to receive a certificate, you must make a decision to pursue the certificate by the fall of your junior year. Portfolio building may begin after ninth grade.

## HOW?

If you are interested in pursuing a SCD, you should first discuss your plans with a science or mathematics faculty member 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 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 SCD Committee in the spring of senior year. Additionally, the committee will meet twice a year to check the work in progress of any student who requests a review.

## RECOGNITION

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.

NOTE: Students enrolled in advanced study in an approved program outside of MPA such as the University of Minnesota Talented Youth Mathematics Project (UMTYMP) or Minnesota Post-Secondary Enrollment Options (PSEO) may be exempt from part of the academic coursework requirement. 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><b>Science</b> 4 years of science including:</p> <p>Honors Biology Honors Chemistry Honors Physics</p> <p>Additionally, depending upon the student's area of interest, students should also choose AP Biology, Environmental Science, or Anatomy, or Malone courses.</p>	<p><b>Math</b> 4 years of math including:</p> <p>Honors Pre-Calculus AP Calculus OR AP Statistics</p>	<p><b>Design</b> Students must complete at least 2 of the following courses:</p> <p>Studio 2D Advanced Ceramics Photography II Graphic Marketing Maker Space classes</p>	<p><b>Technology/Engineering</b> Students must complete either the Robotics course or participate on the Robotics team for at least one year.</p> <p>Additionally, students are encouraged to join the tech crew for at least one of the Drama Department's major productions.</p>
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## 2. 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. You may also include extended work done for the MPA Public Policy course (not the work done for the course itself) if your project is STEM related, for example lobbying for streetlights that do not cause light pollution.

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.

# REQUIREMENTS

## 3. STEM Enrichment Activities

The SCD 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 individual activities with the approval of the SCD Committee.

You need to earn 100 hours by the end of the senior year, spread over three areas: STEM in the Community, STEM in Media./Professional Speakers, and 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 - 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.

## 4. SCD Portfolio and Reflection Project

Upon completion of the SCD requirements (spring of senior year), you will present your portfolios 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 Service Form
- Completed SCD Résumé (see format and sample in packet)
- Completed SCD Enrichment Activities Form and essay (250-500 words)
- Completed and approved SCD Project Request Form
- Completed SCD Reflective Essay (250–500 words)
- Completed and approved SCD Academic Exception Form (if applicable)
- Transcript
- Oral Presentation
- SCD Checklist

Portfolios reviews are available (but not required) as you progress. They are available twice a year:

Portfolios submitted by September 15 will be reviewed by October 1.

Portfolios submitted by February 15 will be reviewed by March 1.

### Final portfolios are evaluated once a year, in the spring:

**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.**

# SCD SERVICE REQUEST FORM

<b>Student:</b>	<b>Year of Graduation:</b>
	<b>Date of Application:</b>
<b>Parent/Guardian:</b>	<b>Parent/Guardian:</b>

<b>Date(s) of Proposed Project and approximate number of hours:</b>	<b>Location of Project:</b>
<b>STEM Mentor Name and title or position: STEM Mentor Email:</b>	
<b>Give a brief description of what the service project entails:</b>	

<b>Describe how the activity will contribute to your STEM competence and understanding:</b>
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<b>SCD Review Board Approval</b> Yes No Date: ____ / ____ / ____	<b>US Director Signature</b>
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# STEM CERTIFICATE OF DISTINCTION CHECKLIST

**Name:**

**Year of Graduation:**

**Date:**

**Your Completed Portfolio Must Include:**

- Completed and approved SCD STEM Service Form
- Completed SCD Résumé
- Completed SCD Enrichment Activities Form and essay (250–500 words)
- Completed SCD Reflective Essay (250–500 words)
- Completed and approved SCD Academic Exception Form (if applicable)
- Transcript
- Oral Presentation
- This 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 FACD 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.**

# SCD ENRICHMENT ACTIVITIES FORM

The SCD Enrichment Activities requirement is intended to encourage you to explore areas of interest involving science, technology, engineering, mathematics, and design. Although the requirement is fairly open ended, the activities must be outside of your academic experiences and be dispersed in three categories: STEM in the Community, STEM in Media/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 three areas: STEM in the Community, Media Arts/Professional Speakers, and Skills. 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 SCD Portfolio.

Final portfolios must be completed and turned in by May 15 and will be evaluated by June 1.

# ENRICHMENT LOG

## STEM in the Community

Date and Time	What	Where	Hours

TOTAL HOURS \_\_\_\_\_

Notes:



# ENRICHMENT LOG

## STEM in Media/Professional Speakers

Date and Time	What	Where	Hours

TOTAL HOURS \_\_\_\_\_

Notes:

# ENRICHMENT LOG

## STEM Skills

Date and Time	What	Where	Hours

TOTAL HOURS \_\_\_\_\_

Notes:

# SCD SERVICE FORM

<b>Student:</b>	<b>Year of Graduation:</b>
	<b>Date of Application:</b>
<b>Parent/Guardian:</b>	<b>Parent/Guardian:</b>

Expected Start Date: Expected End Date: Expected Number of Hours:  Project Description:	<b>Name of Group/Organization:</b>  <b>Address:</b>
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Describe how your project will contribute to the development of a more just, sustainable world:

Describe how your project will help you better understand how STEM skills and knowledge can impact issues of social importance:

<b>SCD Committee Approval</b> Yes   No   Date: ____/____/____	<b>US Director Signature</b>
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# STEM CERTIFICATE OF DISTINCTION RÉSUMÉ (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, including self-study work you completed such as Code or Khan Academy)

### **STEM Service**

Project's Focus/Title

Organization

Location

Dates:

In 2-3 sentences, explain your service project.

### **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

### **Additional STEM Activities**

List any additional significant activities that you participated in (e.g. arts-focused school clubs, programs you attended outside of school, etc.). Include dates.

# STEM CERTIFICATE OF DISTINCTION RÉSUMÉ (SAMPLE)

Gertrude McBertrude

1555 White Bear Ave, Saint Paul, MN 55109      651-777-2555  
gmcbertude14@moundsparkacademy.org

## STEM Academic Study

### Science Study

- Honors Biology (2014-2015)
- Honors Chemistry (2015-2016)
- Honors Physics (2016-2017)
- Environmental Science and Anatomy (2017-2018)

### Mathematics Study

- Honors Algebra (2014-2015)
- Honors Algebra II (2015-2016)
- Honors Pre-Calculus (2016-2017)
- AP Statistics (2017-2018)
- AP Calculus (2018-2019)

### Design Study

- Studio 2D (2016-2017)
- Photography II (2017-2018)

### Technology and Engineering Study

- Engineering (2016-2017)
- Robotics Team (2015-2017)
- Basic Coding through 50 hours of study through Code Academy

## STEM Service

### Frog and Toad Calling Survey

Minnesota Department of Natural Resources  
615 1st Ave NE #500 Minneapolis, MN 55413  
Sept. 2017 – April 2018

Working with the Minnesota Department of Natural Resources (DNR), I helped collect and record information regarding the calls of frog and toad species on specified 10-stop routes. The results of this ongoing study will provide information on where species are located throughout the state, and how their populations change in abundance and distribution. Through this work, I learned a lot about native frog and toad populations in the state as well as the challenges and importance of surveying.

# STEM CERTIFICATE OF DISTINCTION RÉSUMÉ (SAMPLE-CONTINUED)

**Gertrude McBertrude**

1555 White Bear Ave, Saint Paul, MN 55109      651-777-2555  
gmbertrude14@moundsparkacademy.org

## STEM Enrichment

STEM in the Community: African Americans in Science, January 18 2017, Science Museum of Minnesota

STEM in Media/Professional Speaker: Anna Mazzucato, Oct. 31 2014, University of MN

STEM Skills: Study of frog populations, Sept 2017 – April 2018

## Additional STEM Activities

Environmental Club, member 2014–2017

Habitat for Humanity member 2015–2016