



STEM Student Handbook 2021-2022

STEM MISSION STATEMENT

The Glassboro High School STEM Academy's Mission is to provide a rigorous and technologically enhanced curriculum through participation in specialized classes at the high school and at Rowan University that will promote science, technology, engineering, mathematics; and inspire creative, critical and analytical thinking to prepare students for post-secondary study and the 21st century workforce.

We are excited that you will be joining the Glassboro Science, Technology, Engineering and Math Academy. This handbook provides information regarding the STEM Academy.

The Glassboro School District staff members overseeing the STEM Academy are:

Dr. Monique Stowman-Burke – GHS Principal – ext. 1101
Ms. Robin Boyd – Guidance – ext. 1212
Mrs. Susan Powers – Science Dept. – ext. 8227
Mr. Rich Morrison – Math Dept.
Mr. Paul Albert – Science Dept.
Mrs. Barbara Jones – Technology Dept.
Mr. Robert Hemmes – Technology Dept.
Ms. Suzanne Carson – GIS
Ms. Denise Barr – GIS
Ms. Lisa Montana – GIS
Mr. Tim Hagerty – GIS
Ms. Mary Aruffo - Bowe

The Glassboro Science, Technology, Engineering and Math Academy is for students with a serious interest in the STEM areas and who are planning to major in a STEM-related field at the college level. The programs prepare students for their experience as a STEM major in college.

The focus of the Academy is:

- To provide a foundation in a specialty area (science, technology, engineering or math).
- To advance in mathematics which is the fundamental language of science, technology and engineering.
- To provide academy students the opportunity to take undergraduate courses at Rowan University in their Junior and Senior year*.
- To provide students with the opportunity to earn college credit while attending high school if School Choice funding still exists.
- To engage students in an exciting, project-based, technology-rich learning environment where expectations are high to promote student success.

*Opportunities may vary depending on available funding and student performance. ALL academy students in good standing who have met the curricular/academic prerequisites may register for Rowan courses in their Junior and Senior year. Due to funding constraints, some students may be required to contribute one third of tuition costs. See below for details.

Each of the four to six years in the program, STEM students will have the following courses:

Grades 7-10:

Algebra 1, Honors Algebra 2, Honors Geometry, Honors Pre-Calculus, AP Calculus, Honors Biology, Honors Physics, Honors Chemistry, Introduction into Computer Programming and the MOUS program

Grades 11 & 12:

Intro to Programming for the Technology students,
Project Engineering for the Engineering students,
AP Biology, AP Chemistry for the Science students
AP Calculus for any of the STEM majors

STEM courses at Rowan University (one in the fall and one in the spring **if School Choice Funding still exists and if the student is academically eligible***)

***Rowan Coursework Eligibility and Funding Guidelines:**

Students who have met the academic prerequisites of both Rowan and the STEM Academy will be eligible to register for undergraduate classes at Rowan in their Junior and Senior years. Funding for Rowan coursework is provided through the School Choice Program. Since the available funding from that program varies from year to year, it is possible that not every academically qualified in-district Academy student will have their Rowan coursework fully funded. In the event of such a funding shortage, students will be awarded full funding through a selective process overseen by the STEM committee. Selection will be based on a full profile of each student's performance to date within the STEM Academy program. Selection criteria will include academic achievement in the STEM coursework completed to date, participation and involvement in STEM-related extra-curricular activities such as Science Club, Engineering Club, Science Fair, local/regional/national STEM competitions, etc. Remaining students who are not selected for full funding can still attend Rowan by assuming one third of tuition costs.

Eligibility for Rowan is contingent on academic performance and must be maintained in order to continue undergraduate coursework. As such, eligibility is subject to review at the completion of each semester. (*See **Grades** below for more details.*)

One of the following **extracurricular activities** is required of each STEM academy participant. Failure to join one of the following and attend meetings could result in probation or expulsion from the Academy program.

- Participation in the BEAM Club
- Participation in the Engineering Club for the Engineering students
- Participation in the GHS Science Club

In addition, all STEM academy students will participate in the district science fair. You can enter as a group of up to 4 students.

Students are accepted into the Academy after:

- Filling out STEM Academy application and appropriate DOE forms
- Evaluation of test scores, grades and essays by Glassboro STEM faculty and/or Rowan faculty

Communication:

Your success in the Academy program is our goal. In order to achieve this, communication is of utmost importance. **This includes communication with your Rowan Professor regarding courses**, with guidance regarding scheduling, and with Mrs. Powers regarding requirements. It will be absolutely necessary to communicate via e-mail. It is your responsibility to supply a current e-mail address to Rowan Professors, Ms. Boyd and Mrs. Powers in order to be contacted and confirm courses and other important information. All other communication will be via Schoology. Please check your messages and set up notifications.

On the Web:

Information is located on Glassboro STEM Academy website. To get there, go to www.glassboroschools.us, and then select "Glassboro High School". On the upper right side of this page, you will find a link to the "Academies". Scroll down to "Science, Technology, Engineering and Math". Here you will find dates, brochures, applications and deadlines along with many other items.

Science Fair:

Held in mid to late April, the Science Fair allows students the opportunity to demonstrate scientific skills and compete. Academy students are encouraged to enter an experiment as an individual or a team.

Scheduling:

STEM students in 7th to 10th grades will take the GIS/GHS Honors Math and Science classes. All courses at GHS, must be exhausted, before taking Rowan courses in either 11th or 12th grade. GHS courses include Pre-Calculus for all STEM majors, AP Biology or AP Chemistry for Science majors, and Intro to Programming for Computer Science majors. Exceptions, may be made, only with the approval of the STEM staff. Rowan courses will only be scheduled in 11th and 12th grades, **pending your math and science courses and grades, in addition to your overall GPA and available School Choice Funding.**

Academy Grading:

Students receive credit and grades on report cards for Glassboro High School classes. In addition, grades are issued for dual credit courses such as AP Calculus, AP Statistics, AP Biology and AP Chemistry.

Rowan University classes are graded by Rowan faculty using their grading criteria, and the grade is transferred to the high school but **not included** in the GPA.

Grades:

Since this is a rigorous academy program with college study as its goal, it is necessary for students to maintain satisfactory grades, attendance and discipline record. The most important thing is for participants to learn and experience math, science and engineering as much as possible and to learn as much as possible in their other subjects as well. This helps to develop their enjoyment of their specialty and prepares them for their future. In order to continue as an academy member, it is important to maintain an overall GPA of 80 or higher and receive at least an 85 in all their STEM courses. Students must not fail any academic classes. A student who does not meet this minimum or has failed a class will go on probation and have one marking period to remedy the

problem. If the minimum requirements are still not met after the grace period, they will be dropped from the academy program and their seat will be given to the next student on the waiting list. These grade requirements are a minimum which students are expected to far surpass. For success in college or the job market, it is necessary to achieve the highest level possible – hopefully, much better than these minimums.

Students must maintain a 3.0 GPA at Rowan in order to retain eligibility to take Rowan classes. Any student whose Rowan GPA falls below a 3.0 will have their Rowan eligibility placed on a probationary status. Additionally, students who earn a D+ or lower in a Rowan class will automatically be placed on probation. Funding will not be provided for Rowan coursework while on probation.

Criteria for reinstatement to full eligibility status will be determined by the STEM Committee on a case by case basis, but could possibly entail retaking a class at the student's expense.

Academy students who do not meet the academic requirements will be informed by letter of their probationary status in the program. If a student does not meet the academic requirements at the end of their probationary marking period, they will be notified by mail that they are being dropped from the Academy. Individual Rowan classes will be dropped. Students will still be able to take any regularly scheduled GHS courses. Academy students who are not Glassboro residents may opt to stay in the Glassboro school district.

Any student who is dropped from the Academy will have the opportunity to re-apply to the Academy after a six month waiting period. During this time, the student should work to improve their grades, and seek additional help and/or instruction in their specialty area.

Discipline:

Any discipline infraction is grounds for probation. Academy students who do not meet the discipline requirements will be informed by letter of their probationary status in the program. If a student does not meet the discipline requirements at the end of their probationary marking period, they will be notified by mail that they are being dropped from the Academy. A second discipline infraction is grounds for removal. Academy students are expected to demonstrate exceptional academics along with exceptional character.

Appendix A

NATIONAL ENGINEERING STANDARDS:

1. An ability to apply knowledge of mathematics, science and engineering
2. An ability to design and conduct experiments, as well as to interpret data
3. An ability to design a system, component, or component to meet desired needs
4. An ability to function on multi-disciplinary teams
5. An ability to identify, formulate and solve engineering problems
6. An understanding of professional and ethical responsibility
7. An ability to communicate effectively
8. The broad education necessary to understand the impact of engineering in global and social contexts
9. A recognition of the need for and an ability to engage in life-long learning
10. A knowledge of contemporary issues
11. An ability to use the techniques, skills and modern engineering tools necessary for engineering practice

NATIONAL MATHEMATICS STANDARDS:

1. Numbers and operations
 - A. Understand numbers, ways of representing numbers, relationship among numbers and number systems
 - B. Understand meanings of operations and how they relate to one another
 - C. Compute fluently and make reasonable estimates
2. Algebra
 - A. Understand patterns, relations, and functions
 - B. Represent and analyze mathematical situations and structures using algebraic symbols
 - C. Use mathematical models to represent and understand quantitative relationships
 - D. Analyze change in various contexts
3. Geometry
 - A. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships
 - B. Specify locations and describe spatial relationships using coordinate geometry and other representational systems
 - C. Apply transformations and use symmetry to analyze mathematical situations
 - D. Use visualization, spatial reasoning and geometric modeling to solve problems
4. Measurement
 - A. Understand measurable attributes of objects and the units, systems and processes of measurement
 - B. Apply appropriate techniques, tools and formulas to determine measurements
5. Data analysis and probability
 - A. Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them
 - B. Select and use appropriate statistical methods to analyze data
 - C. Develop and evaluate inferences and predictions that are based on data
 - D. Understand and apply basic concepts of probability
6. Problem solving
 - A. Build new mathematical knowledge through problem solving
 - B. Solve problems that arise in mathematics and in other contexts
 - C. Apply and adapt a variety of appropriate strategies to solve problems
 - D. Monitor and reflect on the process of mathematical problem solving
7. Reasoning and proof
 - A. Recognize reasoning and proof as fundamental aspects of mathematics
 - B. Make and investigate mathematical conjectures
 - C. Develop and evaluate mathematical arguments and proofs
 - D. Select and use various types of reasoning and methods of proof
8. Communication
 - A. Organize and consolidate mathematical thinking through communication
 - B. Communicate mathematical thinking coherently and clearly to peers, teachers and others
 - C. Analyze and evaluate the mathematical thinking and strategies of others
 - D. Use the language of mathematics to express mathematical ideas precisely

NATIONAL SCIENCE STANDARDS:

A. Science as inquiry

1. Identify questions and concepts that guide scientific investigations
2. Design and conduct scientific investigations
3. Use technology and mathematics to improve investigations and communications
4. Formulate and revise scientific explanations and models using logic and evidence
5. Recognize and analyze alternative explanations and models
6. Communicate and defend a scientific argument

B. Physical science

1. Structure of atoms
2. Structure and properties of matter
3. Chemical reactions
4. Motions and forces
5. Conservation of energy and the increase in disorder
6. Interactions of energy and matter

C. Life science

1. The cell
2. The molecular basis of heredity
3. Biological evolution
4. The interdependence of organisms
5. Matter, energy, and organization in living systems
6. The behavior of organisms

D. Earth and space science

1. Energy in the earth system
2. Geochemical cycles
3. The origin and evolution of the earth system
4. The origin and evolution of the universe

E. Science and technology

1. Abilities of technological design
2. Understandings about science and technology
3. Implement a proposed solution
4. Evaluate the solution and its consequences
5. Communicate the problem, process and solution

F. Science in personal and social perspective

1. Personal and community health
2. Population growth
3. Natural resources
4. Environmental quality
5. Natural and human-induced hazards
6. Science and technology (local, national and global)

G. History and nature of science

1. Science as a human endeavor
2. Nature of scientific knowledge
3. Historical perspectives

NATIONAL TECHNOLOGY STANDARDS:

1. Students will develop an understanding of the characteristics and scope of technology.
2. Students will develop an understanding of the core concepts of technology.
3. Students will develop an understanding of the relationships among technologies and the connections between technologies and other fields of study.
4. Students will develop an understanding of the cultural, social, economic, and political aspects of technology.
5. Students will develop an understanding of the effects of technology on the environment.
6. Students will develop an understanding of the role of society in the development and use of technology.
7. Students will develop an understanding of the influence of technology on history.
8. Students will develop an understanding of the attributes of design.
9. Students will develop an understanding of the engineering design.
10. Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.
11. Students will develop the abilities to apply the design process.
12. Students will develop the abilities to use and maintain technological products and systems.
13. Students will develop the abilities to assess the impact of products and systems.
14. Students will develop an understanding of and be able to select and use medical technologies.
15. Students will develop an understanding of and be able to select and use agricultural and related biotechnologies.
16. Students will develop an understanding of and be able to select and use energy and power technologies.
17. Students will develop an understanding of and be able to select and use information and communication technologies.
18. Students will develop an understanding of and be able to select and use transportation technologies.
19. Students will develop an understanding of and be able to select and use manufacturing technologies.
- 20. Students will develop an understanding of and be able to select and use construction technologies.**

Students, please sign this document [here](#)

Parents, please sign this document [here](#)

I have read the STEM Academy Handbook and agree to abide by all the rules and procedures described therein.

Parent Signature

Date

Student Signature

Date

Current Phone Number:

Current E-Mail Address:
