McDowell STEM Certificate Program

The MTSD Science, Technology, Engineering, and Math (STEM) certificate recognizes students who have demonstrated their success as a critical thinker and problem solver and are prepared to reach their fullest potential in a STEM-related field. Through their coursework and extracurricular activities, STEM-certificated students have dedicated themselves to preparing for the challenges of a dynamic world. Students completing these tasks will receive STEM certification in conjunction with their diploma from McDowell upon graduation.

Requirements = Coursework A or B plus STEM Category 1 and Category 2

Coursework A

CAREER & TECHNICAL SCHOOL STUDIES:
ECTS students involved in any of the identified labs earning a B or better. **I will be completing one of the programs at ECTS.** (Any ECTS students completing these programs automatically qualify.)

One program earning a B or better
____Automotive Technologies
____Computer Networking
____Computer Programming
____Drafting & Design Engineering
____Electrical Engineering
____Graphic Media Design
____Health Assistant
____Metal Fabrication
____Precision Machining

Coursework B

DIVERSE HIGH SCHOOL STEM COURSES:
McDowell students, not attending ECTS, must earn a B or better in at least 4 separate areas within this category to qualify for STEM.

Advanced Business/Computer Science
One or more earning a B or better
____AP® Computer Science A
____AP® Computer Science Principles
____Computer Applications: Manipulate It
____Foundations of Comp Programming 1
____Foundations of Comp Programming 2
____Entrepreneurship
____Game Development & Programming
____Web Design 1
____Web Design 2-Mobile App Dev

Advanced Creativity and Innovation
One or more earning a B or better
____Video Production
____Animation
____Sports and News Broadcast Journalism
____Digital Technology in Art
____Graphics

Advanced English
One or more earning a B or better
____Exploring Writing
____Honors or AP® English 11
____Honors or AP® English 12

Advanced Math
One or more earning a B or better
____AP® Calculus AB
____AP® Calculus BC
____AP® Statistics
____Honors Algebra 2
____Honors Calculus
____Honors PreCalc/Trig
____Honors Probability & Statistics

Advanced Science
One or more earning a B or better
____Aerospace Science 2
____AP® Biology
____AP® Chemistry
____AP® Environmental Science
____AP® Physics 1
____AP® Physics C—Mechanics
____CSI Forensic Science
____Honors Anatomy & Physiology
____Honors Chemistry
____Mechanical Science
____Honors Organic Chemistry
____Honors Physics

Advanced Technology
One or more earning a B or better
____Advanced Computer Design & Mfg
____Architectural Design
____CNC Manufacturing
____Graphics Technology 2
____Introduction to Applied Engineering
____Metal Technology 2
____Robotics 2
____Building Trades 2
____Building Trades 3

Global Awareness/Citizenship
One or more earning a B or better
____AP® Comparative Govt. & Politics
____AP® Human Geography
____AP® Psychology
____AP® U.S. Government & Politics
____Hon. French 3, German 3, or Spanish 3
____Hon. French 4, German 4, or Spanish 4
____Honors Spanish 5
____International Business and Ethics
____Justice Education

STEM Category 1 & Category 2 -
Students must be able to check both categories to qualify and complete the required verification forms. Category 2 requires at least two approved STEM activities that are indicated on the STEM Approved Activities page.

Category 1: STEM-related and preapproved work experiences
____AP® Research
____Independent Study related to STEM fields
____Internship
____McDowell Manufacturing
____Part-time employment in a STEM-related job
____STEM Camp or After School Program
____Two pre-approved STEM Field Trip Options
____Volunteer Work

Category 2: STEM-related and approved extracurricular activity during high school. Students must be involved in at least 2 approved activities prior to graduation. This can be either 2 consecutive years of the same activity or 1 year in 2 different activities. See STEM Approved Activities page for more details.
____Biology Club
____Computer Science Club
____Cyber Patriot (ROTC)
____FIRST Robotics
____Garden Club
____Math Club
____PJAS
____Sports Medicine
____TEAMS
____United States Academic Decathlon
____Youth in Med
____Other:_____

Note: Students must meet with Guidance before the 2nd semester of their Senior year to verify all requirements completed.

STEM—APPROVED ACTIVITIES

SCIENCE—TECHNOLOGY—ENGINEERING—MATH

Students who wish to earn a STEM certificate must meet several requirements as listed below (coursework—scheduling time, job shadowing, internship, or summer camp, and two or more STEM activities prior to graduation). Current activities which are STEM approved are listed on this page.

BIOLOGY CLUB

Mr. Gilroy—McD gilroy@mtsd.org

The Computer Science Club provides an environment for students interested in the field of computer science to further explore their knowledge with peers at McDowell. Annual projects completed by the Computer Science Club are designed to better the community and grow members' knowledge of computer science.

COMPUTER SCIENCE CLUB

Mr. Palmer—McD palmer@mtsd.org

The Computer Science Club provides an environment for students interested in the field of computer science to further explore their knowledge with peers at McDowell. Annual projects completed by the Computer Science Club are designed to better the community and grow members' knowledge of computer science.

CYBER PATRIOT (ROTC)

Chief Holmes—MIHS holmes@mtsd.org

Air Force Association's (AFA) Cyber Patriot is the nation's premier youth cyber education program, featuring the National Youth Cyber Defense Competition. The competition is open to all high schools and middle schools in the nation, as well as all JROTC units, Civil Air Patrol or cadet squadrons, and Naval Sea Cadets Corps units. Students learn the importance of cybersecurity and skills that can be valuable in cyber careers. Registration of teams occurs in early October and online rounds occur through the winter months. The National Finals Competition occurs in Washington D.C. in March. If teams do not qualify for the national level, then they compete at state and regional recognition rounds.

FIRST ROBOTICS (For Inspiration and Recognition of Science and Technology)

Mr. Bucholtz—McD bucholtz@mtsd.org

This is a varsity sport for the mind, FIRST Robotics Competition combines the excitement of sport with the rigors of science and technology. Under strict rules, limited resources, and time limits, teams of 25 students or more are challenged to raise funds, design a team "brand", hone teamwork skills, and build and program robots to perform prescribed tasks against a field of competitors. It's as close to "real-world engineering" as a student can get. Volunteer professional mentors lend their time and talents to guide each team.

GARDEN CLUB

Mrs. Taylor—MIHS jtaylor@mtsd.org

The Garden Club will continue to develop and maintain the flower garden outside the Little Theatre, focusing on pollinator plants. We will meet to plan and to work in the greenhouse planting seeds and propagating plants during the colder months. There will be opportunities to complete service hours after school and during the summer to maintain the garden. Students may choose to attend tutorial meetings, after-school work sessions, or both.

MCDOWELL MATH CLUB

Ms. Testa—McD testa@mtsd.org

This club is for students that enjoy doing math and want to look at the history of mathematicians, higher-level math problems and how they relate to what we do in math class, math activities for all levels (k-12), and math competitions.

PJAS: Pennsylvania Junior Academy of Science

Mrs. Allaman—MIHS allaman@mtsd.org

Students research a science topic, design an experiment, and analyze the results. They then present their results at a regional competition at Penn State Behrend in March. They may move on to the state competition in May. Students must sign up in September to register on time.

SPORTS MEDICINE

Ms. Kelly Bruce—McD bruce@mtsd.org

Students learn about CPR, First-Aid, catastrophic injury management, concussion management, injury prevention, acute injury care, basic rehabilitation exercises, hydration, field/ court game, and practice set up. Students do travel with some teams to away games. In addition to working with McDowell teams, there are opportunities to visit and shadow various settings including PT/ Sports Medicine Clinics, Orthopedic Surgeon's offices, and even observe Orthopedic Surgeries. Also, coordinate campus visits to colleges and university Sports Medicine and Athletic Training programs. The SAT's come to the Athletic Training Room located below Paul Goll Gymnasium on a daily basis to assist with each day's activities.

TEAMS (Test of Engineering Aptitude, Mathematics, and Science)

Mr. Bucholtz—McD bucholtz@mtsd.org

This is an annual competition for high school students designed to help them discover their potential for engineering. During this one-day competition, students apply math and science knowledge in practical, creative ways to solve real-world engineering challenges.

USAD (United States Academic Decathlon)

Mr. Andrzejczak—McD andrzejczak@mtsd.org

USAD was formerly known as ASL and is the country's premier academic competition. USAD competitions test your knowledge of the information found in economics, art, music, language and literature, **math**, **science**, and social science research packets with a common theme. Each Packet is over 150 pages. Each Decathlete spends hours looking over the research, studying, creating personal study guides, playing review games, and finally competing against schools from across the state and country.

YOUTH IN MED

Ms. Moyer—McD moyer@mtsd.org

Youth in Med is a med club intended to provide students with resources that engage them in the medical field. Opportunities included are becoming CPR & First Aid Certified, splinting, and dissections. The club also features guest speakers of diverse medical professions, career exploring , practice medical case studies, and science-based activities/ projects (biology & anatomy).