

# MATA Course Descriptions

Monroe Advanced Technical Academy Courses

All MATA courses are electives

Courses are part of the Loudoun Governor's STEM Academy



## ***MATA Administration of Justice I SEM H***

**Course Code 887308**

**Grade(s): 11-12**

**1.5 Credits**

This course is the first semester course in the MATA Administration of Justice sequence. This course prepares students for entry-level employment in the law enforcement and criminal justice field as well as entrance into institutions of higher learning in the related fields of criminal justice, political science, and law. Topics include, but are not limited to criminal justice professions, ethics, communication skills, report writing, interpreting criminal and civil laws, use of force, emergency response, traffic control, vehicle stops, crime prevention, patrol functions, community policing, criminal investigation, search and seizure, arrest and court procedures, corrections, the juvenile justice system, crime scene investigation, Civics and the Constitution, and crime prevention. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

## ***MATA Administration of Justice II SEM H***

**Course Code 887408**

**Grade(s): 11-12**

**1.5 Credits**

**Prerequisite(s): MATA Administration of Justice I H SEM**

This course is the second semester course in the MATA Administration of Justice sequence. This course prepares students for entry-level employment in the law enforcement and criminal justice system as well as entrance into institutions of higher learning in the related fields of criminal justice, political science, and law. The course explores career opportunities in the criminal justice community, understanding the constitution, substantive law, procedural law, and due process of law, and its impact on interviews and interrogations, developing probable cause, preparing search and arrest warrants, organized crime and criminal activities associated with those type of investigations, federal taskforces; complex criminal investigation, investigative techniques, the use of informants, wire intercepts, international terrorism and counterterrorism strategies, as well as advanced crime scene investigation. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

## ***MATA Auto Collision Repair Technology I SEM***

**Course Code 867701**

**Grade(s): 11-12**

**1.5 Credits**

This course is the first semester course in the MATA Auto Collision Repair Technology sequence. This first semester course provides the basic knowledge of the construction of the automobile and skills in the use of body shop materials, equipment, tools, and procedures in the collision and refinishing fields. Basic welding, dent and plastic repair, bolt on parts replacement, and estimating are among the skills taught in this course. Students will identify and follow safe working procedures and gain experience through theory and hands-on shop projects. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$40.00*

### ***MATA Auto Collision Repair Technology II SEM***

**Course Code 867702**

**Grade(s): 11-12**

**1.5 Credits**

**Prerequisite: MATA Auto Collision Repair Technology I SEM**

This second semester course gives students the opportunity to develop their skills through applied theory and hands on shop projects using knowledge gained in Collision Repair Technology I. Instructional topics include preparing vehicles for painting, mixing and applying automotive paints, identifying paint related defects and their removal, and paint detailing. Students explore career options such as collision repair technician, refinish technician, automotive parts specialist, glass technician, detailer, estimator, and insurance adjuster. Upon successful completion of this course, students are prepared to perform many aspects of collision repair and may qualify for sponsored apprenticeship programs. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

### ***MATA Auto Servicing Technology I SEM***

**Course Code 862401**

**Grade(s): 11**

**1.5 Credits**

This course is the first semester course in the MATA Auto Servicing Technology sequence. This program provides the opportunity for students to develop the skills needed to follow environmental and safety practices and inspect, diagnose, adjust, and repair the systems of the modern technological automobile. An industry standard curriculum, master-certified, credentialed by the Automotive Service Excellence (ASE) and National Automotive Technician Educational Foundation (NATEF), provides the student the training format to proceed from the basic to advanced level technician in in brakes, steering and suspension, engine repair, and heating ventilation & air conditioning (HVAC). Students may obtain ASE certification. Internship programs are available to students meeting certain criteria. Students can work with selected mentors at local dealerships or other auto servicing businesses. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$30.00*

### ***MATA Auto Servicing Technology II SEM***

**Course Code 862402****Grade(s): 11****1.5 Credits****Prerequisite: MATA Auto Servicing Technology I SEM**

This course is the second semester course in the MATA Auto Servicing Technology sequence, and covers environmental and safety practices and inspections, diagnosing, adjusting, and repairing the systems of the modern technological automobile. An industry standard curriculum, master-certified by ASE (Automotive Service Excellence) and NATEF (National Automotive Technician Educational Foundation), provides the student the training format to proceed from the basic- to advanced-level technician in Electricity, Manual Drive train and Axle, Engine Performance, and Automatic Transmission. Students may obtain ASE certification in these areas. Internship programs are available to students meeting certain criteria. Students can work with selected mentors at local dealerships or other auto servicing businesses. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

**MATA Auto Servicing Technology III****Course code 862600****Grade(s): 12****3 Credits****Prerequisite: MATA Auto Servicing Technology II SEM**

This course is the third course in the MATA Auto Servicing Technology sequence and covers the full second year of instruction. An industry standard curriculum, master-certified by ASE (Automotive Service Excellence) and NATEF (National Automotive Technician Educational Foundation), provides the student the training format to proceed from the basic- to advanced-level technician in Electricity, Manual Drive train and Axle, Engine Performance, and Automatic Transmission. Students may obtain ASE certification in these areas. Internship programs are available to students meeting certain criteria. Students can work with selected mentors at local dealerships or other auto servicing businesses. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$30.00*

**MATA Biomedical Technology I DE****Course Code 885306****Grade(s): 11****3 Credits****Prerequisite: None**

This first-year course in the 2-year pathway focuses on various Biomedical techniques ranging from Bioprocessing and DNA analysis, to medicine, biomechanical systems, and the environment. Students completing the 2-year sequence gain foundational knowledge and skills appropriate for a variety of medical-related career paths in the field of biotechnology. They are introduced to laboratory procedures that support bioscience research and practice, and they investigate safety, quality assurance, and the ethical

concerns associated with the field of biomedical technology. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$50.00*

***MATA Biomedical Technology II***

**Course Code 885302**

**Grade(s): 12**

**3 Credits**

**Prerequisite: MATA Biomedical Technology I DE**

This second-year course in the 2-year pathway focuses on human body systems and examines their interactions. Exploration of science in action takes place while students are building organs and testing their movements with data acquisition software. A fictitious family is monitored and followed and students investigate how to prevent, diagnose, and treat disease. Students explore how to detect and fight infection and screen and evaluate the code in human DNA. Students take on the roles of biomedical professionals to solve real-world medical cases. Students are exposed to a range of interventions related to immunology, surgery, genetics, pharmacology, medical devices, and diagnostics. Using knowledge gained throughout the two-year program, students will develop a research project to design innovative solutions for pressing health challenges, or research and compete in HOSA (future health professionals) in categories from public health and biomedical engineering to clinical medicine and physiology. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$50.00*

***MATA Biotechnology***

**Course Code 885200**

**Grade(s): 11-12**

**3 Credits**

**Prerequisite: None**

This one-year course introduces students to the world of biotechnology which includes the study of living organisms or their products to modify human health and the human environment. Students explore the main areas of biotechnology, medical, industrial, agricultural, marine and bioinformatics. Topics include plant-based pharmaceuticals and applications, bioethics, forensics, health and medical applications, agriculture, and environmental management. Through extensive lab experiences, students use a variety of laboratory equipment and become involved in research and technical writing. Students are required to complete an independent research project. This course is part of the Loudoun Governor's STEM Academy.

*Lab fee: \$30.00*

***MATA Building Construction I SEM***

**Course Code 865701**

**Grades 11-12**

**1.5 Credits**

This course is the first semester course in the MATA Building Construction sequence. Students acquire basic understanding of residential construction and the carpentry trade. The program also provides instruction on plan reading and comprehension. Units of instruction include the completion of an Occupational Safety and Health Administration (OSHA) certification program and the study of structural components with emphasis on how they relate to each other, code, and to the finished product. This includes foundation work, floor and wall framing, interior and exterior finishes, and the construction and installation of cabinetry. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$30.00*

### **MATA Building Construction II SEM**

**Course Code 865702**

**Grade(s): 11-12**

**1.5 Credits**

**Prerequisite: MATA Building Construction I SEM**

This course is the second semester course in the MATA Building Construction sequence. Students expand their knowledge base with advanced skills, frequently working independently. Students earn their OSHA 10 Card Certification and complete more in-depth work. Upon successful completion of this program, students may be prepared to perform many aspects of building construction and are eligible for sponsored apprenticeship programs. The graduating students receive professional accreditation from the National Center for Construction Education and Research (NCCER) for their course work. The graduating students receive professional certification from the SkillsUSA Carpentry Test. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

### **MATA CISCO I DE QTR**

**Course Code 895106**

**Grade(s): 11-12**

**0.75 Credit**

This first-quarter course covers the fundamentals of computer and mobile device hardware and software, and advanced concepts such as networking, security, networking concepts, design, implementation, management and operation at an introductory and advanced level. Students who complete this course will be able to assemble a computer system, install operating systems, connect devices to the Internet, and share resources in a networked environment. This course helps prepare students for the CompTIA A+ certification exam and serves as an introduction to topics covered in the Cisco II-IV courses. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

### **MATA CISCO II DE QTR**

**Course Code 895206**

**Grades 11-12**

**0.75 Credit****Prerequisite: MATA CISCO I DE**

This second-quarter course builds upon the topics presented in CISCO I. A significant portion of the curriculum is drawn from Cisco Networking Academy CCNAv7 courses, which will help students develop workforce readiness skills and build a foundation for success in networking-related careers and degree programs. Students achieve a basic understanding of how networks operate and how to build simple local area networks (LANs), perform basic configurations for router and switches, and implement Internet Protocol (IP). Upon completion of all three Cisco CCNAv7 courses, students will be prepared to take the Cisco Certified Network Associate (CCNA) certification exam. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

**MATA CISCO III DE QTR****Course Code 895306****Grade(s): 11-12****0.75 Credit****Prerequisite: MATA CISCO II DE**

This third-quarter course builds upon the topics presented in CISCO I & II and will help students take the basic networking skills learned in the Cisco I course, and progress to more complex enterprise and theoretical networking models. This course covers the architecture, components, and operations of routers and switches in small networks and introduces wireless local area networks (WLANs) and network security. Students learn to configure and troubleshoot routers and switches for advanced functionality using security best practices and resolve common issues with protocols and IPv4/IPv6 networks. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

**MATA CISCO IV DE QTR****Course Code 895406****Grade(s): 11-12****0.75 Credit****Prerequisite: MATA CISCO III DE**

This final course in the CISCO sequence builds upon the topics covered in CISCO I, II, and III. This course prepares students to learn, apply, and practice CCNA knowledge and skills through a series of in-depth hands-on experiences and simulated activities that reinforce their learning. This course describes the architecture, components, operations and security for large, complex networks, including wide area network (WAN) technologies. This course emphasizes network security concepts and introduces network virtualization and automation. Upon completion of this course, students will be prepared to take the Cisco CCNA certification exam. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee(s): This course does not have a lab fee.*

**MATA Computer & Digital Animation I H**

**Course Code 839100****Grade(s): 11****3 Credits**

This is the first-year course in the MATA Computer & Digital Animation sequence. Computer & Digital Animation I is an introductory course into 2-D animation. Students gain experiences related to computer animation by using graphics and design concepts. Students solve problems involving 2-D computer programs, storyboarding, motion graphics, animation principles, and environmental geometry. Students create a variety of animations that reflect real-world applications and are introduced 3-D animation software. Software covered include: Adobe Photoshop, Adobe Illustrator, Adobe InDesign, Adobe After Effects, Adobe Animate, Toon Boom Harmony Pro, Toon Boom Storyboard and 3dsmax. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

**MATA Computer & Digital Animation II****Course Code 839006****Grade(s): 12****3 Credits****Prerequisite: Computer & Digital Animation I**

This is the second-year course in the MATA Computer & Digital Animation sequence. Computer & Digital Animation II is an introductory course to 3-D animation. Students solve problems with 3-D object manipulation, storyboarding, texturing/mapping, lighting concepts, and environmental geometry. Students will learn about production and media by participating in the school's film festival. Students will demonstrate knowledge in creating proposals, budgets, and executing their ideas. Software covered include: Adobe Creative Cloud, Toon Boom Products, 3dsMax, and Blender. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

**MATA Computer Integrated Engineering & Design (CIED) I H****Course Code 898501****Grade(s): 11**

This is the first-year CIED course and provides students with a foundation of skills needed for manufacturing and engineering design in today's STEM workplace. The course focus is hands-on, task-based activities where students learn and practice industrial design and engineering skills. Students gain foundational knowledge in the fundamentals of the engineering design process. Students explore topics in engineering areas including: Aerospace, Chemical, Civil, Computer Science/Programming, Electrical, Engineering Technology, Manufacturing Technology and Mechanical. Students are introduced to 2D and 3D CAD/CAM software and digital fabrication technologies. Typical projects incorporate 3D printing, laser cutting, CNC milling, micro-controllers and robotics. This course gives students a jump-start to pursue careers in engineering technology. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$30.00*

***MATA Computer Integrated Engineering & Design (CIED) II H***

**Course Code 898602**

**Grade(s): 12**

**3 Credits**

**Prerequisite: Computer Integrated Engineering & Design I**

This is the second-year course in the MATA CIED sequence. MATA CIED II extends the foundational topics covered and developed in MATA CIED I, and students develop proficiency in CAD/CAM software and digital fabrication. Students develop an engineering design-related project throughout this course. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$30.00*

***MATA Cosmetology I SEM***

**Course Code 873701**

**Grade(s): 11**

**1.5 Credits**

The first semester of Cosmetology introduces students to the basics of shampooing and hairstyling, scalp treatments, hair cutting, finger waving, pin curling, roller techniques, chemical relaxing, permanent waving, hair coloring, facials, make-up, wig care, and manicuring. Related subjects include public health, personal hygiene, bacteriology, and salon management. Students are required to purchase a cosmetology kit which includes items needed for the two-year program. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$280.00*

***MATA Cosmetology II SEM***

**Course Code 874702**

**Grade(s): 11**

**1.5 Credits**

**Prerequisite: MATA Cosmetology I SEM**

In this second semester course, students are taught the skills necessary to develop job entry requirements as a cosmetologist by performing the services expected in a professional salon environment. Advanced skills include hair cutting, chemical texture services, hair coloring, lightening, special effects hair color services and color removal application hairstyling, thermal waving and pressing, artificial nail applications, and waxing services. Students also attain training in salesmanship, salon management and ownership, product knowledge, and public relations. Human anatomy and physiology, chemistry and electricity, diseases and disorders of the scalp, skin, and nails are also covered. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

***MATA Cosmetology III***

**Course Code 874500**



**Grade(s): 12**

**3 Credits**

**Prerequisite: MATA Cosmetology II SEM**

This course is the full second year in the MATA Cosmetology sequence. In this advanced course, students build on their theoretical foundation of general sciences and practices in cosmetology to increase proficiency in hair cutting and styling on live models, with attention to professionalism, client consultation, safety, and infection control. Students are trained in safe chemical processes related to chemical texture services and advanced hair coloring techniques. They also develop artistic skills with wigs and hair additions. In addition, students learn to care for skin, hands, and feet, developing experience in providing facials, manicures, pedicures, and nail enhancements. An advanced business management unit focuses on managing the salon. Competency completion prepares the student for the Virginia State Licensing Exam. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$15.00*

***MATA Culinary Arts I SEM***

**Course Code 875701**

**Grade(s): 11-12**

**1.5 Credits**

This course is the first semester in the MATA Culinary Arts sequence. This program is designed to prepare students for employment in the culinary industry or to continue with post-secondary training in such areas as culinary arts, baking and pastry, or restaurant management. Students complete units in the history of hospitality, safety, sanitation, equipment use, recipe calculation and production, management, and professionalism. Commercial methods of food storage, preparation, and handling are practiced. Skills are developed in the preparation of appetizers, soups, salads, meats, fruits, vegetables, breads, garnishes, and desserts. Students are visited by top Culinary schools to expand their knowledge of post-secondary school opportunities. Visits from the placement department are arranged to aid the students with resume development. Employment and interviewing skills will be practiced. Students participate in both on-site and off-site catering events and have many opportunities to use their creativity as they design and prepare food for service and display. Participation in culinary competitions is offered and encouraged. Students will take an OSHA exam. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$50.00*

***MATA Culinary Arts II SEM***

**Course Code 875702**

**Grades 11-12**

**1.5 Credits**

**Prerequisite: MATA Culinary Arts I SEM**

This course is the second semester in the MATA Culinary Arts sequence. Students will learn advanced production and service skills used in the culinary industry. Nutrition, management skills, marketing, sustainability, and exploration of ethnic cuisines are emphasized. Students will demonstrate knowledge of applying advanced food

preparation and baking techniques. Visits from leaders in the local restaurant industry are arranged for students. Technology is utilized to conduct nutritional analysis, menu planning, costing, and inventory control. Students will practice serving guests and dining room set up. Students will use business and math techniques to develop menus. Collaboration with other MATA courses is encouraged through menu design, restaurant design, molecular gastronomy, and off-site catering. Students will complete Workplace Readiness Testing. Students will complete the ServSafe Industry test. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

### ***MATA Cybersecurity I DE SEM***

**Course Code 894201**

**Grade 11-12**

**1.5 Credits**

In this first-semester course of the MATA Cybersecurity program, students enter the world of computer technology and gain practical experience in assembling a computer system. Students will install, configure, and secure various operating systems. Students will troubleshoot computers and peripherals and use system tools and diagnostic software. They develop skills in computer networking and resource sharing. In addition, students explore the relationships between internal and external computer components. Upon successful completion of the course, students may qualify to take the CompTIA A+ certification exam. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

### ***MATA Cybersecurity II DE SEM***

**Course Code 894202**

**Grade 11-12**

**1.5 Credits**

**Prerequisite: MATA Cybersecurity I DE SEM**

In this second-semester course of the MATA Cybersecurity program, students continue work in the world of computer technology. Students develop advanced skills in computer networking and resource sharing. Upon successful completion of the course, students may be qualified to take the CompTIA A+, Network +, and/or Security + certification exam. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

### ***MATA Emergency Medical Technician (EMT) I H SEM***

**Course Code 859507**

**Grades 11-12**

**1.5 Credits**

The EMT program is designed to provide training to individuals in order to function independently in a medical emergency and serve as a vital link in the chain of the health care team. This course includes all skills necessary to provide emergency medical care to a patient who has experienced a traumatic injury. Other skills covered include CPR,

basic patient assessment, taking vitals, and Mass Casualty Incident Command. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$90.00*

***MATA Emergency Medical Technician (EMT) II H SEM***

**Course Code 859508**

**Grade(s): 11-12**

**1.5 Credits**

**Prerequisite: MATA Emergency Medical Technician (EMT) I**

This second semester course builds upon the topics covered in MATA Emergency Medical Technician I. The tasks for this course represent the National Emergency Medical Services Educational Standards. Students build on their knowledge and skills for providing basic life support by focusing on the areas of emergency medical services (EMS) operations, medical emergencies, and management of special patient populations. Supervised field experience outside of school hours is required. Successful completion of this second course in the sequence will earn the student CTE completer status. Successful completion of all course requirements and instructor endorsement may lead to eligibility to take the Virginia State Psychomotor Exam and the National Registry EMT cognitive exam. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

***MATA Environmental Plant Science I DE SEM***

**Course Code 885101**

**Grade(s): 11-12**

**1.5 Credits**

This one-year pathway focuses on plants as related to environmental responsibility. Topics in this first semester include introduction to horticulture, forestry, natural resource management, plant botany and physiology, sustainable landscaping practices, woody plants, soil science and best business practices. Students completing both semesters enter a variety of college fields including horticultural and environmental sciences, agricultural technology, forestry, natural resource management, conservation, agronomy, biology, plant breeding and genetics, landscape design and management, golf course management, floral design and marine sciences and agricultural education. Additionally, industry certification may be acquired in the following: Virginia Nursery and Landscape Association as a Certified Horticulturist; Virginia Flower Growers Association as a Certified Greenhouse Operator; Virginia Department of Agriculture and Consumer Service as a Pesticide Technician. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$35.00*

***MATA Environmental Plant Sciences II DE SEM***

**Course Code 885102**

**Grades 11-12**

**1.5 Credits**

**Prerequisite: MATA Environmental Plant Science I DE SEM**

The second semester of this pathway focuses on plant propagation and genetics, fertilization practices, plant growth and development, greenhouse systems and production, plant diagnostics and pest management, environmental conservation and sustainable agricultural practices. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: none*

**MATA Graphic Communications I****Course Code 879400****Grade(s): 11****3 Credits**

This course is the first course in the MATA Graphic Communications sequence and covers an introduction and investigation of variable topics in graphic design, computer graphics and visual communication principles, theory and practice. Various fundamental design philosophies and applications are examined as students work individually and collaborate in teams to design digital projects. Emphasis on concept driven projects include aspects of designs related to digital techniques of layout, typography and digital image/photo manipulation, digital illustration, layout, animation, and web design. Construction and composition of finished work is created using a variety of interactive productivity software programs, books and various learning resources. Students utilize interactive software to develop and compose a comprehensive professional portfolio. The course includes safety standards related to equipment used, research, writing, text reading, discussions, oral presentations, lectures, specific project assignments, and design concept development in a time-based context. In addition, students learn workplace readiness skills of corporate, client-based and public service-based interactive design strategies. Students compete in annual design/print competitive association activities and are given the opportunity to obtain PrintEd certifications. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$75.00*

**MATA Graphic Communications II****Course Code 879500****Grade(s): 12****3 Credits****Prerequisite: MATA Graphic Communications I**

This is the second course in the MATA Graphic Communications sequence. This course covers advanced concepts and techniques of design utilizing interactive software to develop and compose a comprehensive professional portfolio. Curriculum includes contracts, copyright issues, interviewing skills, resume and cover letter writing, design briefs and proposals, freelance business issues, as well as portfolio preparation and presentation. Portfolio presentation includes concepts learned in MATA Graphic Communications I. Under the guidance and supervision of faculty, students learn first-hand how to establish and run a creative design firm by working directly with clients, establishing and forecasting budgets and working within those budgets. In addition, students work with printers and press runs to meet real working deadlines. Students

compete in annual design/print competitive association activities and are given the opportunity to obtain PrintEd certifications. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$75.00*

### ***MATA Health Informatics***

**Course Code 861100**

**Grade(s): 11-12**

**3 Credits**

This MATA 1-year pathway explores aspects of Health Informatics to include the history of health information technology (IT), application of data to healthcare, medical terminology (terms, organ systems, pathological conditions, and procedures), the Electronic Health Record (EHR), ethical and privacy issues, and cybersecurity and data breaches. Students will explore workflow and clinical decision support. Students will be introduced to the various technology and trends that affect the healthcare industry. Simulation of an Electronic Health Record program will provide the student with hands on learning. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a fee.*

### ***MATA Heating, Ventilation, & Air Conditioning (HVAC) I SEM***

**Course Code 881701**

**Grade(s): 11-12**

**1.5 Credits**

This course is the first semester course in the MATA Heating, Ventilation, & Air Conditioning (HVAC) sequence. This course provides basic knowledge and skills in residential and commercial air conditioning, refrigeration, and heating. Instruction includes basic electricity, safety, the physics of the refrigeration process, soldering and silver brazing, electrical components and controls, wiring diagrams, basic plumbing, sheet metal fabrication, and duct installation. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

### ***MATA Heating, Ventilation, & Air Conditioning (HVAC) II SEM***

**Course Code 881702**

**Grade(s): 11-12**

**1.5 Credits**

**Prerequisite: MATA Heating, Ventilation, & Air Conditioning (HVAC) I SEM**

This course is the second semester course in the MATA Heating, Ventilation, & Air Conditioning (HVAC) sequence. Students are provided advanced skills in residential and commercial air conditioning, refrigeration, and heating. The students learn to install, maintain, and repair heating and cooling equipment. Instruction includes air distribution and ventilation systems, refrigeration equipment, oil, gas, electric and heat pump systems, residential plumbing, and electrical layout and installation. Upon successful completion of this course, students are prepared to perform most aspects of HVAC and

qualify for sponsored apprenticeship programs. Students may be eligible to take the Environmental Protection Agency (EPA) Certification Exam, the Universal R-410 A Certification Exam, any or all of the 12 HVAC Excellence Exams, and the National Construction Career Test (NCCT). This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a fee.*

### ***MATA Introduction to Health and Medical Sciences DE***

**Course Code 861006**

**Grade(s): 10**

**3 Credits**

This course introduces students to a vast array of careers within the health and medical professions. Students learn basic medical skills necessary to function safely and efficiently within the medical community. Career exploration allows students to make informed choices within related professions while preparing for future educational requirements. Students are exposed to medical terminology; pharmacology; anatomy and physiology; and therapeutic and diagnostic interventions. Instruction also emphasizes professionalism, legal/ethical issues, and communication skills. Students rotate through various medical settings for observational opportunities, connecting classroom knowledge with real-life experiences. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$70.00*

### ***MATA Masonry I SEM***

**Course Code 898701**

**Grades 11-12**

**1.5 Credits**

This course is the first course in the MATA Masonry sequence. This course familiarizes students with various materials, tools, equipment, and practices of the masonry trade. The program helps students develop the skills and technical knowledge to lay concrete, block, brick, and ceramic tile. Students also study blueprint reading and do labor and material estimates for residential and commercial projects. Students are eligible to obtain an OSHA-10 certificate. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

### ***MATA Masonry II SEM***

**Course Code 898702**

**Grades 11-12**

**1.5 Credits**

**Prerequisite: MATA Masonry I SEM**

This course is the second course in the MATA Masonry sequence. Students advance their skills with concrete, block, brick, and ceramic tile. They complete various projects such as chimneys, fireplaces, sidewalks, and arches. They also learn repair and renovation work. Stone masonry is included and prepares students to design and repair

stone walls, fireplaces, sidewalks, and entryways. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

***MATA Medical Laboratory Technology I DE***

**Course Code 861206**

**Grade(s): 11**

**3 Credits**

**Prerequisite: None**

The first-year course in Medical Laboratory Technology presents is designed to provide student foundational knowledge and skills appropriate for a variety of medical-related career paths in the field of medical laboratory science. Students are introduced to diagnostic laboratory procedures that support medical practice and research, and they investigate safety, quality assurance, and ethical concerns associated with the field of laboratory medicine. Medical laboratory disciplines covered include: Clinical Chemistry, Urinalysis, Microscopy, Clinical Hematology, and Phlebotomy. Laboratories stress actual student performance of the routine tests normally seen in the clinical setting. Students may have the opportunity to participate in organized field experiences. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a fee.*

***MATA Medical Laboratory Technology II DE***

**Course Code 861706**

**Grade(s): 12**

**3 Credits**

**Prerequisite: MATA Medical Laboratory Technology I DE**

Students build on the foundational knowledge and skills obtained in Medical Laboratory Technology I. The student uses the basic principles and skills necessary to continue their studies in these additional medical laboratory disciplines: Clinical Microbiology, Immunohematology, Coagulation/Hemostasis, and Clinical Laboratory Biotechnology techniques. Competencies includes performing the technique correctly, understanding the theory of the procedures, and the proper interpretation of results. Laboratories stress actual student performance of the routine tests normally seen in the clinical setting. Students may have the opportunity to participate in organized field experiences. This course is part of the Loudoun Governor's STEM Academy.

*This course does not have a lab fee.*

***MATA Nurse Aide I SEM DE***

**Course Code 889703**

**Grade 11-12**

**1.5 Credits**

The MATA Nurse Aide pathway is regulated under the Virginia Board of Nursing. Students study growth and development across the lifespan, anatomy and physiology, and medical terminology. Students are introduced to concepts of infection prevention and disease processes, as well as careers in nursing, health professions, and STEMH

professions. Entry level skills include communication; measuring and recording of vital signs; cardiopulmonary resuscitation; and general patient care. The course emphasizes care for the acute medical-surgical patient, the chronically ill, and the elderly. A forty-hour clinical rotation at a long-term care facility is a required component of the course. Students are prepared to take the National Nurse Aide Assessment Program (NNAAP) exam to become a Certified Nurse Aide. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$70.00*

### **MATA Nurse Aide II SEM DE**

**Course Code 889704**

**Grade 11-12**

**1.5 Credits**

**Prerequisite: MATA Nurse Aide I SEM DE**

This is the second semester of the Nurse Aide sequence, and builds upon the concepts of MATA Nurse Aide I SEM DE. A forty-hour clinical rotation at a long-term care facility is a required component of the course. Students successfully completing the course will take the National Nurse Aide Assessment Program (NNAAP) exam to become a Certified Nurse Aide. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

### **MATA Pharmacy Technology I H**

**Course Code 861303**

**Grade(s): 11**

**3 Credits**

**Prerequisite(s): Health Care Providers' Current Immunization Record, Current (within last 3 months) 2-step PPD test, and Medical Insurance (private or school-purchased).**

This certificate program is designed to provide students with the basic skills and knowledge to begin work as a pharmacy technician. The coursework will fulfill the requirements of the Board of Pharmacy and prepare students to take either the state examination or the national examination administered by the Pharmacy Technician Certification Board. Trained, experienced pharmacy technicians who can demonstrate the right skills and knowledge should be able to pursue many exciting and respected career options or postsecondary study in the pharmacy field. Students have the opportunity to shadow in a professional setting as well as participate in organized field experiences. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$70.00*

### **MATA Pharmacy Technology II H**

**Course Code 862304**

**Grade(s): 12**

**3 Credits**

**Prerequisite: MATA Pharmacy Technology I H**

This second year of the certificate program is designed to provide students with the basic skills and knowledge to begin work as a pharmacy technician. The coursework



fulfills the requirements of the Board of Pharmacy and prepares students to take either the state examination or the national examination administered by the Pharmacy Technician Certification Board. Emphasis is placed on clinical field experiences and/or coordinated work-experiences. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

### ***MATA Radiology Technology I DE***

**Course Code 861406**

**Grade(s): 11**

**3 Credits**

The course informs students early in their study of what they can expect from a career in radiologic technology, requirements for certification, options for advancement, and what is required of them as allied healthcare workers. The student develops an understanding of the radiographer as a central member of the health care team and a valuable assistant to the radiologist. This curriculum is designed to prepare the student to understand the anatomy and physiology assessed in diagnostic images of the human body. The student develops an understanding of the safe use of radiation within the medical field. Additional topics of study include the history of the radiological profession, medical ethics, concepts of imaging, radiobiology, radiation protection, human diseases, medical terminology and the future of radiologic technology careers. This course is part of the Loudoun Governor's STEM Academy.

Lab Fee: This course does not have a lab fee.

### ***MATA Radiology Technology II H***

**Course Code 861402**

**Grade(s): 12**

**3 Credits**

**Prerequisite: MATA Radiology Technology I DE**

This course builds upon the topics covered in MATA Radiology Technology I. As part of the course content, students are encouraged to engage in volunteer practices within a healthcare setting. Students develop an understanding of the biological and technical factors involved in medical imaging. Emphasis is on extensive anatomy and physiology, disease processes, the physics of medical imaging equipment, and the effect of medical radiation on biologic tissue. Students learn to apply radiation protection procedures for patients and medical imaging personnel. In addition, students expand their understanding of patient care within the radiology department to include assessment of vital signs, immobilization techniques for imaging, safe use of oxygen and pharmacologic during imaging procedures, use of sterile techniques, and evaluation of medical emergencies. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

### ***MATA Television Production & Digital Moviemaking I SEM***

**Course Code 893701**

**Grade(s): 11-12**

### **1.5 Credits**

This performance-based course is a rigorous, highly creative pathway designed to help students interested in movies and television shows to become acclimated with the technical, entry-level aspects of scripted and live production. This first semester covers an introduction to scriptwriting, storyboarding, camera operation, non-linear editing, lighting and audio production techniques, and studio control room operations for various types of single-camera scripted film and television productions. Students are introduced to a wide range of professional equipment and techniques, and receive instruction through a combination of lecture, theory and hands-on application. Students create major and minor projects for an ePortfolio that includes an individually produced, script-to-screen television commercial. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$40.00*

### ***MATA Television Production & Digital Moviemaking II SEM***

**Course Code 893702**

**Grade(s): 11-12**

**1.5 Credits**

**Prerequisite: MATA Television Production & Digital Moviemaking I SEM**

The second semester course builds upon prior knowledge and develops students toward more complex, multicamera media productions. In addition to writing and planning for various types of live or look-live film and television programs, students learn to direct, mix and edit a multicamera studio production from the control room. Students work individually and in teams, using a wide range of professional equipment to produce their projects and add to the ePortfolio to include a completed, live, in-studio television segment. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee*

### ***MATA Veterinary Science I SEM***

**Course Code 885401**

**Grades 11-12**

**1.5 Credits**

This is the first semester course of the MATA Veterinary Science program. This course orients the student to Veterinary Science, covering topics such as anatomy and physiology, terminology, safety and sanitation, parasitology, posology, animal nutrition, breeds, professional conduct, office management, and emerging technologies in animal agriculture. Students are involved in performing clinical exams, conducting laboratory and hospital procedures and handling animals coordinated with area veterinary clinics and hospitals. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$75.00.*

### ***MATA Veterinary Science II SEM***

**Course Code 885402**

**Grades 11-12**

**1.5 Credits**

**Prerequisite: MATA Veterinary Science I SEM**

This is the second semester course of the Veterinary Science program. Students expand their knowledge of animal science and the care of animals, including animal structure and function, microbes and disease prevention, parasitology, and genetics and breeding. Students develop more advanced skills and techniques for assisting the veterinarian/technician in the following areas: performing first aid and surgery, applying aseptic techniques, performing technical functions, administering medication, handling death and dying, working with wildlife, and performing office functions. On-the-job clinical instruction coordinated by the instructor may be included in veterinary offices or animal clinics. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

**MATA Welding I DE SEM****Course Code 896701****Grade(s): 11****1.5 Credits**

This first semester course consists of instruction in the set up and safe operation of Oxy-fuel Welding and Cutting, Plasma Arc cutting, Shielded Metal Arc and beginning GMAW welding processes. Students are trained in welding, cutting, and brazing. Class activities provide instruction in art and ornamental welding, preparation for the American Welding Society (AWS) Test, and construction and repair of metal projects. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$30.00*

**MATA Welding II DE SEM****Course Code 896702****Grade 11****1.5 Credits****Prerequisite: MATA Welding I DE SEM**

Emphasis in this course is on Shielded Metal Arc Welding in the horizontal, in all position, and pipe. Students have the opportunity to practice for the AWS's Limited and Unlimited Welding Thickness Test. Welding certification options are available.

Advanced work on the MIG and TIG processes is included. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: This course does not have a lab fee.*

**MATA Welding III DE****Course Code 896306****Grade(s): 12****3 Credits****Prerequisite: MATA Welding II DE SEM**

This welding capstone course teaches the industry's emerging technologies and how to demonstrate Gas Tungsten Arc Welding (GTAW) and Shielded Metal Arc Welding (SMAW) pipe tests. Students are prepared to earn relevant industry credentials toward employment in production or manufacturing facilities. This course counts as an elective credit. This course is part of the Loudoun Governor's STEM Academy.

*Lab Fee: \$30.00*

