STEM.ORG ACCREDITED EDUCATIONAL PROGRAM

MASTERY CODING

COURSE CATALOG '26-27

YOUR STUDENTS,
FUTURE READY, NOW

We provide **award winning courses** for:

- Elementary School
- Middle School
- High School
- Educators

MASTERY
— CODING —

OUR **PHILOSOPHY**

Mastery Coding™ empowers students to meet the challenges of tomorrow through intelligent technology education. We provide industry-leading courses in Computational Literacy, Computer Science, Web & Game Development, and Academic Esports. We provide schools, teachers, and students a pathway to tap into the power of cross-disciplinary, standards-based, efficacious computer science and academic esports curricula through live, remote, or hybrid instruction.

Our courses empower students with the skills they need to become industry certified for high-skill, high-need, and high-paying workforce opportunities. By using gaming as a gateway, we build career readiness. Mastery Coding™ is on a mission to **turn student gamers into makers**.

FINALIST
EdTech Cool Tool Awards
2024

FINALIST
EdTech Trendsetter Awards
2023

TOP STEM SOLUTION PROVIDERS
Education Technology Insights
2022

STEM.ORG ACCREDITED EDUCATIONAL PROGRAM

WINNER
EdTech Trendsetter Awards
2021

TABLE OF CONTENTS

Channel your students' passion for gaming into career and college readiness

MASTERY
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AP Computer Science Principles with Python

Computer Science Principles with Python teaches students the fundamentals of computer science and computer programming while preparing them for the AP Computer Science Principles exam and three different Python programming certification exams.

Grades: 9-12 **Python**

Course Objectives

- Learn Python basics, including syntax, variables, and data types, setting a foundation for programming.
- Explore control structures, loops, and basic algorithms, enhancing problem-solving skills.
- Understand data structures and file I/O operations, crucial for practical Python applications.
- Learn how to use Python for data science and data analysis.
- Learn how Python is used to build artificial intelligence.

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Topics and Technologies

- Python Syntax and Basic API
- Variables and Data Types
- Basic Algorithms and Problem Solving
- Data Structures: Lists, Dictionaries
- Data Collection and Analysis Techniques
- File I/O: Reading and Writing Data
- Functions and Object-Oriented Programming
- Control Structures: Conditional Logic, Loops
- Modules in Python: Usage and Applications

Course Outcomes

AP Computer Science Principles

This course teaches the topics and skills covered in the AP Computer Science Principles exam using project-based lessons in Python, preparing students for success in taking the exam.

Certifications

This course prepares students for the following certifications:

- Certiport IT Specialist Python
- Knowledge Pillars Python Coding Apprentice
- PCEP Certified Entry-Level Python Programmer
- ICT Programming and logic Essentials

Project Portfolio

Students will build various coding projects, resulting in a solid portfolio demonstrating their skills and experience.

Technical Requirements

Students will use a **web-based code editor**, eliminating the need for extensive software installations. However, it is essential to have a system that can run a modern browser efficiently.

Operating System

- Chromebook: Chrome OS 100.0 or later
- Windows: 7, 8, 8.1, 10 or later
- Mac: OS X El Capitan 10.11 or later
- Linux: 64-bit Ubuntu 18.04+, Debian 10+, openSUSE 15.2+, or Fedora Linux 32+

Hardware Specifications

- RAM: 4 GB minimum (8 GB recommended)
- Peripherals: Keyboard and mouse

Software Installed

- Google Chrome

All Mastery Coding courses come with year-round professional development and comprehensive teacher support

MASTERY
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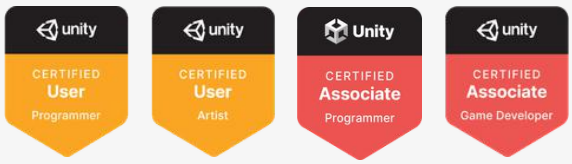
Game and App Certification Pathway

Mastery Coding's flagship Game and App Certification pathway uses engaging, cross-disciplinary, project-based modules to teach core coding skills and offer a direct path to the industry-recognized Unity certifications. Seize the power of Game-and-Make™!

Grades: 9-12 **Unity | C# | Blender**

Certifications

- Unity User: Programmer (Year 1)
- Unity User: Artist (Year 1)
- Unity Certified Associate: Programmer (Year 2)
- Unity Certified Associate: Game Developer (Year 2)



Course Objectives

Learn the fundamentals of Object-Oriented C# programming.

Use Unity, an industry-leading game engine, to create playable games and interactive applications.

Publish games and coding projects to a digital career portfolio.

Create 3D art assets using Blender, an open-source 3D modeling and animation software.

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Technical Requirements

Software Installed

- Google Chrome
- Unity Hub + Unity 2021 LTS
- Blender 3.1 or later
- Microsoft Visual Studio Code

Operating System

- 64-bit Windows 10 or later
- macOS 11 or later

Portfolio Projects

Alchemy Lab

Students model an alchemy laboratory from scratch and write logic for first person interactions with the environment.

3D art, UX, geometry, lighting, interaction design

Castle Siege

Students combine physics with C# scripting to create a challenging platformer.

3D vector arithmetic, Newton's laws, level design

Stars and Cars

Students design a city where players drive around collecting stars in a race against the clock.

Animation, Particle Systems, Physics and Collision Detection

STEAM Connections

S Apply physics principles including Newton's laws of motion to predict and simulate projectile motion.

T Dive deep into computer science topics by writing C# code to create full-featured games and applications

E Become familiar with the engineering design process through managing and completing software projects.

A Produce original game art, assets, and 3D models to implement in games and applications

M Utilize 2D and 3D vector arithmetic to position and move game objects.

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AP Cybersecurity

AP Cybersecurity (CYS1) introduces foundational cybersecurity concepts through a hands-on curriculum. Students learn about threats and human factors, progressing through security knowledge in physical spaces, networks, devices, applications, and data. The course balances conceptual understanding with practical skills, including design thinking and technical implementation, and follows the "defense-in-depth" model, encouraging students to adopt both attacker and defender perspectives.

Grades: 9-12

Course Objectives

In this course, students learn to:

- Recognize and counter social engineering, psychological manipulation, and AI-driven deception.
- Protect applications and data integrity via encryption, malware detection, and injection prevention.
- Secure network infrastructure through segmentation, firewalls, and automated intrusion detection.
- Assess vulnerabilities to implement defense-in-depth and physical security protocols.
- Harden endpoints and manage identity through MFA and access control.
- Classify threat actors and analyze the phases of the attack lifecycle.

Topics and Technologies

- Defense-in-Depth
- Risk Assessment
- Social Engineering
- Physical & Wireless Security
- Network Security
- Cryptography
- Access Control Models (RBAC, DAC, MAC)
- Application Attacks (SQL Injection, XSS)
- Log Analysis

Course Outcomes

Certifications

This course prepares students for the AP Cybersecurity Exam.

AP Cybersecurity Exam & Credential

Technical Requirements

Operating System

- Chromebook: Chrome OS 100.0 or later
- Windows: 7, 8, 8.1, 10 or later
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Software Installed

- Google Chrome

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Computer Science Foundations

Computer Science Foundations is a comprehensive introduction to computer science and programming, designed for middle school and high school students. Through engaging projects and clear, step-by-step guidance, students will learn to code in Python while exploring the exciting world of computer science.

Grades: 6-10 **Python**

Course Objectives

- Learn the foundations of programming in Python, including syntax, variables, and data types.
- Enhance problem-solving skills through exploration of control structures, loops, and basic algorithms.
- Understand crucial components of practical Python applications such as data structures and file I/O operations.
- Advance coding proficiency by delving into functions, object-oriented programming, and Python modules.
- Study the history and societal impacts of computing, along with fundamental software design principles.

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Topics and Technologies

- Python Syntax and Basic API
- Variables and Data Types
- Control Structures: Conditional Logic, Loops
- Basic Algorithms and Problem Solving
- Data Structures: Lists, Dictionaries
- File I/O: Reading and Writing Data
- Functions and Object-Oriented Programming
- Modules in Python: Usage and Applications
- Data Collection and Analysis Techniques

Course Outcomes

Certifications

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- Mac: OS X El Capitan 10.11 or later
- Linux: 64-bit Ubuntu 18.04+, Debian 10+, openSUSE 15.2+, or Fedora Linux 32+

Hardware Specifications

- RAM: 4 GB minimum (8 GB recommended)
- Peripherals: Keyboard and mouse

Software Installed

- Google Chrome

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Game Development Foundations

Students create actual games using JavaScript and Phaser. Throughout the process, they explore JavaScript concepts such as variables, functions, objects, arrays, input, physics, and events while also delving into game design, debugging, and documentation. As they progress, students complete four projects of increasing complexity, applying new tools and techniques along the way.

Grades: 6-8 **JavaScript**

Course Objectives

Game Design & Scoping: Analyze the societal impact and engagement mechanics of games to storyboard and scope achievable, original game concepts.

Programming Fundamentals: Develop structured code using variables, operators, and control flow, while organizing logic through functions, arrays, and object-oriented principles.

Engine Integration: Navigate technical documentation to implement game states and core features using browser and Phaser engine APIs.

Physics & Mechanics: Apply interactive systems—including arcade physics, collision detection, and dynamic scoring—to create functional gameplay loops.

Testing & Debugging: Employ systematic debugging strategies to identify, troubleshoot, and resolve logic errors within interactive environments.

Course Outcomes

Certifications

This course prepares students for the following certifications:

- ICT Programming and logic Essentials
- TOSA JavaScript Exam Productive Level

Project Portfolio

Students will build various coding projects, resulting in a solid portfolio demonstrating their skills and experience.

Topics and Technologies

- JavaScript
- Pixel Art with Piskel
- Game design
- Game Physics
- User Input
- Spritesheet Animations
- Debugging and Testing

Technical Requirements

Students will use a **web-based code editor**, eliminating the need for extensive software installations. However, it is essential to have a system that can run a modern browser efficiently.

Operating System

- Chromebook: Chrome OS 100.0 or later
- Windows: 7, 8, 8.1, 10 or later
- Mac: OS X El Capitan 10.11 or later
- Linux: 64-bit Ubuntu 18.04+, Debian 10+, openSUSE 15.2+, or Fedora Linux 32+

Software Installed

- Google Chrome

Hardware Specifications

- RAM: 4 GB minimum (8 GB recommended)
- Peripherals: Keyboard and mouse

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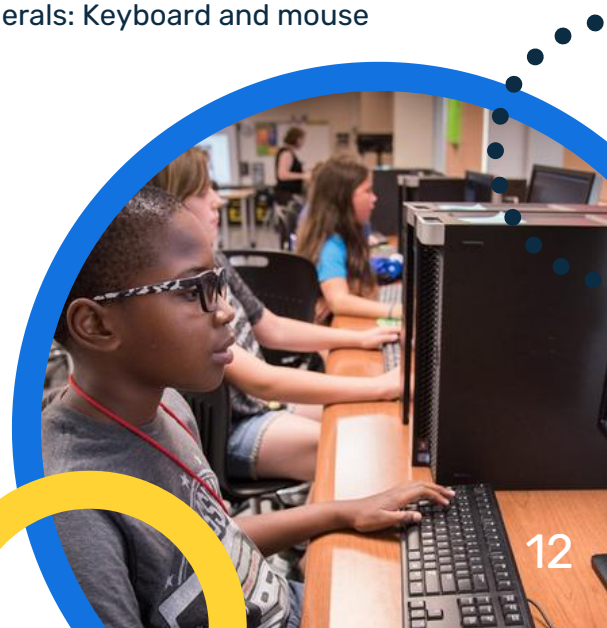

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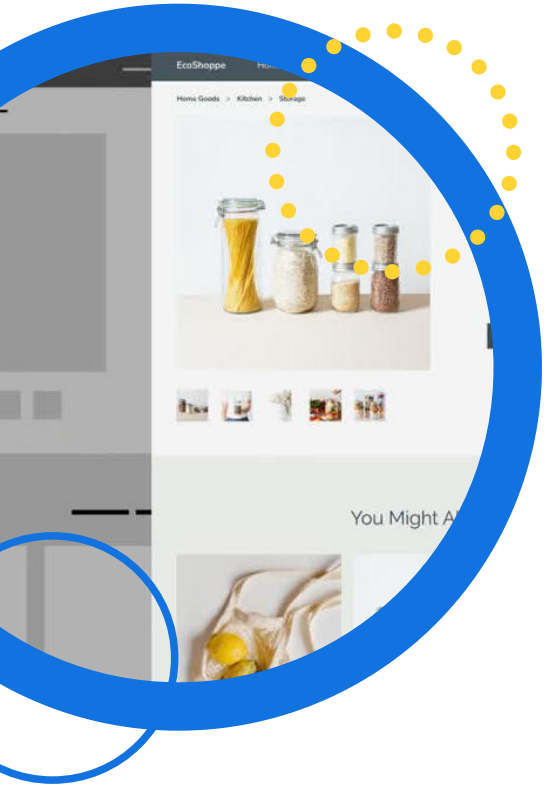
Web Development Foundations

Web Development Foundations (WDF) explores Internet history, coding principles, and languages. WDF teaches HTML, CSS, and JavaScript so students can design, create, and breathe life into visually appealing web pages. Upon completion of this course, students will have a solid understanding of computer science principles and the ability to code interactive web pages from scratch.

Grades: 6-10 **HTML | CSS | JavaScript**



Course Objectives

- Learn the historical context of how computers, code, and the web came to be and use HTML to write and code their own informational document.
- Understand and implement design concepts of unity, color theory, white space, and typography to create a professional-looking web page.
- Understand and apply computer science concepts including sequencing, selection, looping, and state management by coding in JavaScript.
- Use event-driven development to create interactive web applications.

Technical Requirements

Operating System

- Chromebook: Chrome OS 100.0 or later
- Windows: 7, 8, 8.1, 10 or later
- Mac: OS X El Capitan 10.11 or later
- Linux: 64-bit Ubuntu 18.04+, Debian 10+, openSUSE 15.2+, or Fedora Linux 32+

Software Installed

- Google Chrome

Course Outcomes

Certifications

This course prepares students for the following certifications:

- Knowledge Pillars HTML & CSS Coding Specialist
- Certiport IT Specialist - HTML and CSS Certification

Project Portfolio

Students will build a variety of websites and web applications. By the end of the course, students will have the experience designing and building their own web pages, resulting in a strong portfolio of their own individual projects to prove their knowledge and skill.

STEAM Connections

S Students dive into ecology topics including conservation, restoration, and succession as they incorporate such topics into their projects.

T Students learn about the history and development of computers and the Internet and become familiar with computer science principles using JavaScript.

E Students explore emerging technologies to see the progress, possibilities, and problems these technologies present.

A Students learn and apply design principles, including color, typography, layout, and composition, to create visually appealing web pages and web applications.

M Students use arithmetic and logical operations in their code to achieve desired results.

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GamerMath™

This supplemental math curriculum uses today's most popular video games as a vehicle for standards-based math instruction.

5 Core Principles of GamerMath™

Culturally responsive teaching

Increase engagement by incorporating relevant cultural examples and contexts into math lessons.

Teach conceptual understanding

Demonstrate why mathematical procedures work rather than relying on memorization.

Promote comprehension through visual representation

Use gaming visuals to make math more exciting and to help students "see" the math.

Scaffolded learning

Break down complex concepts into smaller, more manageable steps and gradually increase the complexity.

Incorporating real-world applications

Connect math to practical applications in everyday life to help students see the value of math.

Technical Requirements

Operating System

- Chromebook: Chrome OS 100.0 or later
- Windows: 7, 8, 8.1, 10 or later
- Mac: OS X El Capitan 10.11 or later
- Linux: 64-bit Ubuntu 18.04+, Debian 10+, openSUSE 15.2+, or Fedora Linux 32+

Software Installed

- Google Chrome

Program includes:

- 60 hours of content
- Self-grading assessments
- Video-based instruction
- Comprehensive data and reporting
- Professional development and ongoing support

Teach math using the games your students know and love

Minecraft, NBA 2K, EA Sports Madden NFL, Rocket League, Mario Kart, Pokémon, EA Sports FIFA, Super Smash Bros., Fall Guys

Elementary Aligned Topics

- Lines and Angles
- Multiplication
- Time and Money
- Addition and Subtraction
- Fractions

Middle School Aligned Topics

- Statistics & Probability
- Ratios
- Percentages
- The Number System
- Lines and Angles
- Geometry
- Fractions and Decimals

MASTERY
— CODING —

Computer Science Essentials

From learning what code is and how it works to learn how to keep their information and online activity protected, private and secure, this program teaches the essential introductory computer science knowledge students need to be successful and safe in today's technological world.

Grades: 3-5

Course Objectives

- Have a better understanding of the history and use of code and what career options are available to them
- Understand the foundations of computer science logic, code, and how computers work
- Learn to interact online with kindness and respect
- Understand how to safely use the internet

Technical Requirements

Operating System

- Chromebook: Chrome OS 100.0 or later
- Windows: 7, 8, 8.1, 10 or later
- Mac: OS X El Capitan 10.11 or later
- Linux: 64-bit Ubuntu 18.04+, Debian 10+, openSUSE 15.2+, or Fedora Linux 32+

Software Installed

- Google Chrome

STEAM Connections

S Students will learn about the functions and foundational principles of sequencing, algorithms, loops, and if- statements.

T Students will be taught the rules of safe digital interaction, and the core principles of cybersecurity, online safety, and digital citizenship.

E Students will learn about the basic hardware and software makeup of computers and the impact of each component on the larger system.

A Students will understand the concepts 'copyright' and 'plagiarism' to not only protect their content online but to also give credit to artists and creators when credit is due.

M The program will have students apply core math concepts including pattern recognition, estimation, and calculating percentages.

SEL Connections

Self-Awareness: Students will be given the chance to recognize where they can begin setting goals in order to successfully organize and reach objectives.

Self-Management: Students will develop their time management skills by having a mixture of "explore time" and "assignment time" where they will be required to learn and practice along with the instructor.

Social Awareness: Students will develop their social skills by working together with their teammates as they learn the core principles of teamwork and effective communication.

Responsible Decision Making: An exceptionally important skill in school, the workplace, and at home students will see and learn the value teamwork brings to their lives.

Relationship Skills: Students build and maintain healthy relationships with other players through community, cooperation, trade, and peacefully resolving conflict.

* **All Mastery Coding courses come with year-round professional development and comprehensive teacher support**

MASTERY
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Academic Esports™ Camps & Clubs

The Extended Learning Curriculum you Need Aligned to Federal Funding Guidelines

Our camps and clubs allow students to follow their passion for gaming down productive STEM pathways while emphasizing social-emotional learning and good ol' fashioned FUN!

Grades: 3-12

Camp and Club Offerings

- Academic Esports™ Minecraft Camp and Club
- Academic Esports™ Among Us Camp and Club
- Academic Esports™ Rocket League Camp and Club
- Academic Esports™ Fortnite Camp and Club
- Academic Esports™ Super Smash Bros. Camp and Club
- Academic Esports™ FIFA Camp and Club
- Academic Esports™ Overwatch Camp and Club
- Artificial Intelligence in Esports Camp and Club

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Implementation

Academic Esports™ Clubs

- 1-hour sessions
- Multi-week implementation

Game-and-Learn™ Camps

- 3-hour sessions
- Single week implementation

Technical Requirements

- A computer/console for each student
- Has access to Zoom meetings
- Runs the required game
- Can connect & play online
- Headsets recommended

MASTERY
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AI in Esports

Camp and Club

Elevate your students' understanding of AI with a unique afterschool experience that combines the excitement of academic esports with hands-on learning.

Grades: 6-12

Program Objectives

- Students explore the evolution of AI in gaming, from simple NPCs in early arcade games to today's advanced, lifelike characters, highlighting how technology has shaped game design over time.
- Students discuss AI's ethical challenges in gaming, such as cheating, data privacy, and bias - and consider the responsibility of developers to create fair and transparent AI systems.
- Students examine how machine learning enhances game design and esports by creating smarter AI, improving gameplay analysis, and boosting training tools for competitive players.
- Students learn how AI is used to create dynamic gameplay and intelligent NPCs, focusing on techniques like pathfinding and procedural generation that make games more interactive and responsive.

MASTERY
— CODING —

Artificial Intelligence Essentials

Introduce students to the world of Artificial Intelligence as they explore foundational AI concepts, such as neural networks, machine learning, and ethical considerations through a hands-on approach.

Grades: 8-12

Course Objectives

- Understand AI concepts such as neural networks, machine learning, and tokenization.
- Recognize biases in AI training data and outputs.
- Identify ethical considerations of AI implementations.
- Create text-based and image-based AI outputs using generative AI tools.
- Develop critical thinking skills to assess AI-generated content for accuracy and bias.

Technical Requirements

Operating System

- Chromebook: Chrome OS 100.0 or later
- Windows: 7, 8, 8.1, 10 or later
- Mac: OS X El Capitan 10.11 or later
- Linux: 64-bit Ubuntu 18.04+, Debian 10+, openSUSE 15.2+, or Fedora Linux 32+

Hardware Specifications

- RAM: 4 GB minimum
  - (8 GB recommended)
- Peripherals: Keyboard and mouse

Software Installed

- Google Chrome

Topics and Technologies

- Artificial Neural Networks
- Large Language Models (LLMs)
- AI Image Generation
- Fairness and Bias in AI
- Ethical AI and the Alignment Problem
- AI-Generated Misinformation Detection
- Supervised, Unsupervised, and Reinforcement Learning

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MASTERY
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AI Essentials for Educators

Equip teachers and school district personnel with a foundational AI literacy that enables them to understand how AI works and how to engage productively and responsibly with AI technologies.

Self-Paced Course for Educators

Course Objectives

- Gain a foundational AI literacy that enables productive and responsible engagement with AI technologies
- Become equipped with practical tools and ethical guidelines to guide and enhance their teaching in the Age of AI
- Gain a toolkit of strategies to detect and deter AI-assisted cheating
- Prepare to lead students into a future where AI is an integral part of learning and innovation

Get Certified

Upon completing this course, learners will be prepared to earn the **Artificial Intelligence Certified Educator I certification**, powered by KnowledgePillars.

Technical Requirements

Hardware

- Ram: 4GB or more
- CPU: Pentium 5 or later

Software Installed

- Google Chrome

MASTERY
— CODING —

US Academic Esports League

Channel your students' passion for gaming into college and career readiness. Combining academic curriculum and a competitive league, the USAEL will help you level up your esports program.

Grades: 3-12

Curriculum

Pathway Esports: A Comprehensive Toolkit
Grades 3-12 | 90hrs

Esports Broadcasting
Grades 6-12 | 45hrs

Esports Business
Grades 6-12 | 12hrs

Career Explorations in Esports
Grades 6-12 | 45hrs

AI in Esports
Grades 6-12 | 8hrs

Introduction to Game Development
Grades 6-10 | 30hrs

Introduction to Web Development
Grades 6-10 | 30hrs

Through the Ages with Minecraft
Grades 3-5 | 30-45hrs

Computer Science Essentials
Grades 3-5 | 30hrs

GamerMath™ (elementary and middle school aligned options)
Grades 3-8 | 60hrs combined

Competition | League Play

Put team practice to the test in regular inter-school esports competitions. League play is available to all students from participating schools.

Official League Titles 2024-2025

FALL 2024

- Rocket League
- Super Smash Bros
- Fortnite

SPRING 2025

- Rocket League
- Mario Kart
- Fortnite

What's Included?

- Unlimited participation
- Annual league with multiple entry points
- Weekly scrims with similarly skilled opponents
- Weekly official matches
- Prizes available for top teams

Community

Community Nights

One-off casual gaming events where schools compete in various game titles.

Coaches Clinics

Help coaches enhance their esports coaching skills by learning best practices.

Watch Parties

Students watch replays and analyses of competitive gaming matches and engage in discussions.

The USAEL comes with year-round professional development and comprehensive teacher support

TURN YOUR GAMERS INTO MAKERS

SCAN ME

Where critical thinking meets project-based fun

STEM ACCREDITED EDUCATIONAL PROGRAM

www.masterycoding.com

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