COURSE DETAILS

INFORMATION TECHNOLOGY

Computer I - Multimedia and Robotics

Course Description:
This course introduces students to the exciting world of multimedia creation and robotics. Students will explore digital storytelling and video production using Adobe Premiere Pro, mastering essential editing skills such as trimming, transitions, audio syncing, and visual effects. They will also dive into Adobe After Effects to enhance their videos with motion graphics, animation, and dynamic visual effects. In the robotics component, students will engage hands-on with VEX IQ Robotics, learning fundamental engineering concepts, coding with VEXcode IQ, and building robots to solve real-world challenges. This course builds both creative and computational thinking skills, preparing students for a future in digital media and STEM fields.

Course Objectives:
Multimedia (Adobe Premiere Pro & Adobe After Effects)
1. Demonstrate proficiency in video editing using Adobe Premiere Pro, including cutting, trimming, transitions, audio mixing, and applying basic visual effects.
2. Organize and manage digital media assets for efficient video production workflows.
3. Create motion graphics and animation using Adobe After Effects to enhance storytelling and visual communication.
4. Design and produce a short multimedia project from concept to final export, incorporating video, sound, text, and animation elements.
5. Apply principles of visual storytelling, composition, and timing to effectively communicate a message through video.

Robotics (VEX IQ)
1. Identify and categorize VEX IQ parts and explain their functions in building a robot.
2. Build and modify VEX IQ robot structures using engineering design principles.
3. Program VEX IQ robots using VEXcode IQ, including movement, sensor input, and basic automation.
4. Collaborate in teams to solve challenges using VEX IQ robotics and apply problem-solving strategies through hands-on activities.

- 5. Participate in basic robotics competitions and challenges that emphasize speed, precision, and creativity.

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COURSE DETAILS

INFORMATION TECHNOLOGY

Computer II - Python and Robotics

Course Description:
This course is a hands-on, project-based course designed to develop students' computational thinking and problem-solving skills through two key components: Python programming and VEX IQ Robotics. In the first part of the course, students are introduced to the fundamentals of Python, including variables, conditionals, loops, functions, and basic data structures, using real-world examples and interactive coding exercises. In the second part, students apply their programming knowledge to build, and program VEX IQ robots, engaging in STEM challenges that emphasize teamwork, design thinking, and creativity. This course prepares students for more advanced programming and engineering courses, while nurturing critical 21st-century skills.
Course Objectives:
Python Programming Objectives:
1. Understand and apply fundamental programming concepts including variables, data types, conditionals, loops, and functions.
2. Write and debug Python code to solve structured and real-world problems.
3. Use logical reasoning and algorithmic thinking to develop efficient solutions.
4. Work with basic data structures, such as lists and dictionaries, to organize and manipulate data.
5. Develop interactive programs using input/output and simple control structures.
6. Apply problem-solving strategies in designing small-scale Python projects.

VEX IQ Robotics Objectives:
1. Identify and categorize VEX IQ parts and components, including sensors, motors, and structural elements.
2. Build and modify robots using the engineering design process: plan, build, test, and iterate.
3. Program VEX IQ robots using VEX code IQ to perform tasks autonomously or via driver control.
4. Use sensor inputs (e.g., touch, distance, gyro, color) to enhance robot performance and behavior.
5. Collaborate in teams to complete design challenges and competitions, demonstrating teamwork and communication skills.
6. Analyze robot performance and make data-driven decisions to improve functionality and task completion.

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COURSE DETAILS

INFORMATION TECHNOLOGY

Computer III – Web Development and Robotics

Course Description:
This course provides students with an integrated foundation in modern web development and robotics. Students will explore core web technologies including HTML, CSS, and JavaScript to design and build responsive websites. They will also develop dynamic web applications using SQL and PHP and gain hands-on experience with Content Management Systems (CMS) such as WordPress.
In the robotics component, students will explore VEX V5 Robotics, engaging in engineering design, mechanical construction, and autonomous programming using VEX code. This integrated course equips students with practical skills in coding, problem-solving, and logical thinking, preparing them for future studies in computer science, engineering, or IT.
Course Objectives:
Web Development Objectives:
1. Understand and apply the fundamental building blocks of web development using HTML for content structure, CSS for styling, and JavaScript for interactivity.
2. Design and develop responsive, user-friendly web pages and websites using modern development practices.
3. Implement dynamic websites by integrating PHP and SQL for server-side scripting and database management.
4. Explore and utilize Content Management Systems (CMS) such as WordPress to build and manage web content effectively.
5. Apply full-stack development principles in creating and presenting a capstone web development project.

Robotics Objectives:
1. Assemble and configure VEX V5 robotic systems, understanding the function and integration of various mechanical and electronic components.
2. Write and debug code for robot automation using VEXcode to control movement, sensors, and logic-based actions.
3. Analyze and solve problems through robotics challenges that require engineering design thinking and iterative testing.
4. Demonstrate teamwork and collaboration by participating in group builds, challenges, and competitions simulating real-world engineering tasks.
5. Document and present robotics projects, including design process, code, challenges faced, and improvements made.

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COURSE DETAILS

INFORMATION TECHNOLOGY

Computer IV - Computer Programming

Course Description:
Computer IV is an advanced-level course designed to deepen students' understanding of computer programming through two powerful languages: C++ and Python. This course emphasizes real-world applications, algorithmic thinking, and hardware interaction. Students will explore C++ programming through hands-on projects using Arduino educational kits, bringing code to life by interacting with sensors, LEDs, motors, and other components. In parallel, students will advance their Python programming skills through modules in Object-Oriented Programming (OOP), file handling, libraries, and problem-solving techniques applicable to real-world scenarios.
Course Objectives:
• Apply advanced concepts in Python programming including OOP, file I/O, exception handling, and working with APIs and libraries.
• Develop proficiency in C++ syntax, logic, and structure through project-based learning.
• Utilize Arduino kits to connect software with hardware using C++, focusing on input/output, sensors, actuators, and circuit logic.
• Design and implement interactive and embedded systems projects.

- Foster creativity, critical thinking, and problem-solving through coding and electronics integration.

AP Computer Science Principles

This advanced program delves into the core principles of Computer Science, providing students with a comprehensive understanding of computational thinking, programming, and system design. Students will explore topics such as algorithms, data structures, software development, and cybersecurity. They will engage in hands-on projects and collaborative problem-solving, applying theoretical concepts to real-world scenarios. This course emphasizes critical thinking and innovation, prepares students for higher education in Computer Science and technology-driven careers. Through rigorous coursework and practical experience, students will gain the skills and knowledge necessary to excel in the dynamic field of Computer Science.

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