**Electronics and Robotics**

2025 Spring CTE Elective

**Meet the Teacher:**

Hi! I’m Montessa Young and I’m employed by the Malheur Education Service District’s Frontier STEM Hub with the goal to further computer science education in Malheur county. I am at Nyssa High School for 6th period, 7th period, advisory, and after school. In the fall of 2023 I returned to public school teaching after spending several years in the technology industry as a curriculum developer, Salesforce consultant, and technical writer for Salesforce Health Cloud. I was inspired to return to teaching to offer students the opportunity to learn about technology careers that can offer economic prosperity, location independence, and creative outlets for students.

Preferred Name: Mrs. Young

Email: [myoung@nyssasd.org](mailto:myoung@nyssasd.org)

Phone: 541-212-0537 (cell phone, okay to text)

Room: Nyssa Makerspace (old art building in NMS parking lot)

**About the Course:**

The electronics and robotics course is designed to provide an introduction of mechanical constructions and electronics working together. This is a project based course focused on building working prototypes and following engineering design processes.

Components of the Course:

1. Electricity - A fundamental understanding of power and circuitry is required to work on electronics. We will use physical components, tinkerCAD and voltmeters to learn to design circuits in parallel and series. We will learn how to power and control motors, servos, switches and sensors.
2. Humanoid Robot - We will use a humanoid robot called “Marty the Robot” to incorporate coding and robotics to solve human problems. Starting with block based coding we will learn Marty’s capabilities and then switch into Python to have him complete real world tasks.
3. Mechatronics- We will invite in Brian Bond, a mechanical engineer and ESD teacher, to assist with learning Process Logic Controllers and designing pneumatic and electronics circuits to control industrial machines. This is an introduction to a career path for working in modern factories.
4. Arduino- We will complete projects with a microcomputer and cloud interface in an introduction to “Internet of Things”. Everything from your refrigerator to your thermostat now talk to the internet and we will learn about the sensors and infrastructure that make this possible.
5. Makers Faire- We will create an interactive art display for the Ontario Maker’s Faire on April 5th that combines LED lights, music, and 3-D Design
6. Final Project- Build a physical item with a circuit and programming component
7. BattleBots - Build and battle a small 3-D printed robot

**Course Outline:**

| Unit Name | Topics | Timeline |
| --- | --- | --- |
| Electricity  (8 days) | CTE Portfolio  Voltmeters  Circuit Design | *Jan 13 - Jan 24* |
| Humanoid Robot  (12 days) | Marty the Robot Block Coding  Marty the Robot Python  Marty Barista Simulation | *Jan 27 - Feb 13* |
| Mechatronics  (8 days) | Programmable Logic Controllers  Ladder Logic  Automation | *Feb 18 - Feb 27* |
| Arduino  (4 days) | Microcomputer Sensors and Coding | *Mar 3 - Mar 6* |
| Makers Faire  (11 days) | LED Lights  Electronic Music  CAD | *Mar 10- April 5* |
| Arduino  (12 days) | Internet of Things  Cloud Interfaces | *April 7 - April 24* |
| Final Project  (12 days) | A mechanical, electrical, and programming project selected from a list | *April 28 - May 8th* |
| Battle Bots  (8-11 days) | Small radio controlled robots fight it out in an arena | *May 12th - May 29th* |

**Structure of Course:**

* **Project Based** - This is a project based course and you will be graded on your active participation, teamwork, attitude, completion of activities on time, and meeting the requirements of the projects.The projects are based on the units of the Create with Code Unity tutorial. They will be graded on creating all the features shown in the tutorial and having working code.
* **Group Work** - You will work collaboratively on projects and will be graded on your ability to delegate work, meet group deadlines, and communicate clearly. Grades will be earned individually, so if you contribute less than your peers you will receive a lower grade then other members of the group.
* **No homework** - This course will not have planned homework assignments. If you are absent or not using their time wisely in class, they may need to complete work at home.
* **No tests** - This course does not have an end of unit test or formative assessments. Learning will be assessed through the end of unit project completion. Quizzes may be utilized to check for student understanding.

**Grading Plan:**

| **Assignments** | Daily assignments and small projects | **70% of grade** |
| --- | --- | --- |
| **CTE Portfolio** | Additions of project descriptions, photos, and videos to portfolio | **10% of grade** |
| **Maker Faire Project** | This is an interactive art display using motion, sensors, music, led lights | **10% of grade** |
| **Final Project** | This is your individual project related to your future career that involves a mechanical project with an electrical circuit and programming | **10% of grade** |

**Course Start and End:**

This course runs during 6th period from 12:55 pm to 1:44 pm (49 minutes). My goal is to have 45 minutes of instructional time and provide some buffer time for students to walk to and from the building located in the middle school parking lot. Students not in their seats at 12:57 pm will be marked tardy. Class will be released at 1:42 pm.

**Late Policy:**

This course will follow the school handbook policy - work will be expected after the length of the absence plus 1 day. (Example: if 4 school days were missed, then all work would be due at the end of the 5th school day after returning).

Group project work will be transferred to individual work to prevent negatively affecting the group’s progress and completion.

**Technology Policy:**

We will adhere to the Nyssa Student Handbook Technology Policy and the District Acceptable Use Policy. Violating any portion of these policies will result in reduced or no access to computer resources. This will make completing a computer science course very difficult.

The school cell phone policy will be enforced.