GTT: Gateway to Technology Syllabus

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https://sites.google.com/greenvilleschools.us/hands-on-science-exploratory/home

Course Description

Gateway to Technology (GTT) provides students opportunities to apply the design process to creatively solve problems. Students are introduced to the unit problem in the first activity and are asked to make connections to the problem throughout the lessons in the unit. Students learn and utilize methods for communicating design ideas through sketches, solid models, and mathematical models. Students will understand how models can be simulated to represent an authentic situation and generate data for further analysis and observations. Students work in teams to identify design requirements, research the topic, and engage stakeholders. Teams design a toy or game for a child with cerebral palsy, fabricate and test it, and make necessary modifications to optimize the design solution.

Supplies Required: Graph paper, masking tape, clear tape, pencils, hot glue sticks, disposable cups Chromebook,

Grade Rationale	Grading Scale	
Projects/Engineering Notebook	90% - 100%	= A
	80% - 89%	= B
Labs/Daily Work/Participation	70% - 79%	= C
	60% - 69%	= D
	Below 60%	= F

Classroom Expectations
Students are expected to participate in all curriculum activities, including collaborative group projects for problem-based learning. Students are to be prepared for class, which includes class supplies. Behavior rules are posted in the classroom, and the discipline policy will be used in the classroom.

Assignments
All assignments will be completed in the engineering notebooks or Google Classroom.

***Units of study and Learning objectives for each unit are listed below.

Students will use knowledge and skills to:
- LO1.1A: Describe and/or analyze moments within a problem-solving process where persistence, iteration, and the positive role of failure played an important role in gaining understanding about a problem or unexpected observation.

- LO1.2A: Apply an iterative process to solve a problem or create an opportunity that can be justified.
- LO1.2B: Analyze and describe design functionality by observation of an artifact.
- LO2.1D: Create a physical model or prototype.
- LO2.2A: Measure and present values appropriate to standards of accuracy and precision.
- LO2.3A: Translate and interoperate between 2D and 3D design representations.
- LO2.3B: Sketch and/or interpret perspective, isometric, and multiview drawings with adequate attention to standards and critical annotations.
- LO3.1A: Collaborate effectively on a diverse and multi-disciplinary team.
- LO3.2A: Communicate effectively for specific purposes and settings.
- LO3.2B: Document a process according to professional standards.
- LO3.4B: Describe the role, connections between disciplines, and impact of engineering, biomedical science, and computer science on society.
- LO1.1A: Describe and/or analyze moments within a process where persistence, iteration, and the positive aspect of failure played an important role in gaining understanding about a problem or unexpected observation.
- LO1.1C: Analyze problems or artifacts when developing solutions.
- LO1.1E: Recognize that models are used to make predictions and/or learn about a phenomenon, situation, or design.
- LO1.2A: Apply an iterative process to solve a problem or create an opportunity that can be justified.
- LO1.3A: Apply computational thinking to solve problems.
- LO2.1A: Apply a mathematical model to represent an authentic situation.
- LO2.1C: Construct a computer-generated solid model.
- LO2.1D: Create a physical model or prototype.
- LO2.2A: Measure and present values appropriate to standards of accuracy and precision.
- LO2.3A: Translate and interoperate between 2D and 3D design representations.
- LO2.3B: Sketch and/or interpret perspective, isometric, and multiview drawings with adequate attention to standards and critical annotations.
- LO2.4A: Select and apply tools and technology appropriately to develop solutions, create artifacts, and/or conduct investigations to engineering, biomedical science, and computational problems/needs.
- LO3.1A: Collaborate effectively on a diverse and multi-disciplinary team.
- LO3.2A: Communicate effectively for specific purposes and settings.
- LO3.2C: Construct and communicate informed decisions supported by evidence
- LO1.1A: Describe and/or analyze moments within a process where persistence, iteration, and the positive aspect of failure played an important role in gaining understanding about a problem or unexpected observation.
- LO1.1B: Demonstrate creativity and courage to take risks in proposing designs and describe the value of unique attributes or approaches.
- LO1.1C: Analyze problems or artifacts when developing solutions.

- LO1.1E: Recognize that models are used to make predictions and/or learn about a phenomenon, situation, or design.
- LO1.1F: Identify ethical considerations that must be considered within design requirements, an experimental setup, and/or a process.
- LO1.2A: Apply an iterative process to solve a problem or create an opportunity that can be justified.
- LO1.2B: Analyze and describe design functionality by observation of an artifact.
- LO1.3A: Apply computational thinking to solve problems.
- LO1.3B: Organize, process, and analyze data to understand a real-world situation.
- LO2.1B: Use computer models and simulations to study an authentic system.
- LO2.1C: Construct a computer-generated solid model.
- LO2.1D: Create a physical model or prototype.
- LO2.2A: Measure and present values appropriate to standards of accuracy and precision.
- LO2.3A: Translate and interoperate between 2D and 3D design representations.
- LO2.3B: Sketch and/or interpret perspective, isometric, and multiview drawings with adequate attention to standards and critical annotations.
- LO2.4A: Select and apply tools and technology appropriately to develop solutions, create artifacts, and/or conduct investigations to engineering, biomedical science, and computational problems/needs.
- LO3.1A: Collaborate effectively on a diverse and multi-disciplinary team.
- LO3.2A: Communicate effectively for specific purposes and settings.
- LO3.2B: Document a process according to professional standards.
- LO3.2C: Construct and communicate informed decisions supported by evidence.
- LO3.3A: Demonstrate the ability to manage multiple resources throughout a project.
- LO3.3B: Justify decisions and provide rationales when making trade-offs between resources.
- LO3.4B: Describe the role, connections between disciplines, and impact of engineering, biomedical science, and computer science on society.