Webpage QR Code:

Principles of Applied Engineering

1 Credit (Highschool)
2025 – 2026 School Year
Forbes Middle School, RM B129

Mr. B, GISD Career Technology Education
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Tutoring Times (Come by during these times for help with the course): SOAR, 4th Period, Before and After School Tutorials (By appointment)

TEKS Course Description

Career and technical education instruction provides content aligned with challenging academic standards, industry-relevant technical knowledge, and college and career readiness skills for students to further their education and succeed in current and emerging professions.

Full Course Description

Principles of Applied Engineering provides an overview of the various fields of science, technology, engineering, and mathematics and their interrelationships. Students will develop engineering communication skills, which include computer graphics, modeling, and presentations, by using a variety of computer hardware and software applications to complete assignments and projects. Upon completing this course, students will have an understanding of the various fields of engineering and will be able to make informed career decisions. Further, students will have worked on a design team to develop a product or system. Students will use multiple software applications to prepare and present course assignments.

Course Learning Outcomes

After successful completion of this course, you will be able to:

- Demonstrate professional standards/employability skills as required by business and industry.
- Investigate the components of engineering and technology systems.
- Present conclusions, research findings, and designs using a variety of media.
- Use appropriate tools and demonstrates safe work habits.
- Describes the factors that affect the progression of technology and the potential intended and unintended consequences of technological advances.
- Think critically and apply fundamental principles of system modeling and design to multiple design projects.
- Understand the opportunities and careers in fields related to robotics, process control, and automation systems.
- Understand the opportunities and careers in fields related to electrical and mechanical systems.
- Demonstrate the ability to function as a team member while completing a comprehensive project.

- Demonstrates a knowledge of drafting by completing a series of drawings that can be published by various media.

Instructional Methods

This course will use a variety of instructional methods, including lectures, group projects, and oral presentations, supported by discussion and hands-on work. Most lessons will begin with direct instruction, then shift to either class discussion, hands-on-design or group engineering projects. We'll also incorporate class design debrief sessions to model problem solving, alongside opportunities for students to work independently and apply new skills.

Students are expected to maintain an engineering notebook for daily warm-ups, exit tickets, and notes. In my experience, students who take organized notes tend to perform better in complex subjects like engineering.

Course Communication and Feedback

All grades and assignments will be posted in Google Classroom and Skyward. The best way to reach me is by stopping by before or after school. I generally respond to emails within 24 hours during the school day and return feedback on assignments within 72 hours.

You're welcome to post course-related questions in the comments section of any Google Classroom assignment. I'll reply there as soon as I can. If you're struggling with anything in the course, please email me so we can talk about how to get you back on track.

Class announcements will be made both in person and in Google Classroom. Major projects and milestone deadlines will always be posted in Google Classroom and on my page on the Forbes Middle School website.

Required & Recommended Materials

Required:

- **Notebook or composition book** for warm-ups, exit tickets, and daily notes (provided in class)
- **Pencils or pens**
- **Google Classroom access** (students should check this daily for assignments and announcements)
- **Assigned desktop computer** will be provided during class

Recommended:

- **Personal mouse** (optional, for students who prefer it over the standard school mouse)
- **Folder or binder** if you want to organize printed handouts or rubrics

Assignments and Assessments

1. General Assignment Information

This course uses a mix of daily practice, weekly challenges, quizzes, and major assessments to help students build and demonstrate their engineering and technology skills. Grades follow the district grading policy and are divided as follows:

- Major Assessments – 70%

- Homework and Practice – 30%

2. **Daily Journals**
   Students are expected to write in their journals every class period. Journals include warm-ups, exit tickets, engineering notes, and self-reflection. Journals are checked every Friday for completeness and effort.

3. **Homework Assignments**
   Assigned every Monday, Wednesday, and Friday. These are short tasks designed to reinforce recent concepts and prepare students for upcoming assessments or challenges.

4. **Quizzes**

There are three quizzes grades taken during each grading period. These quizzes cover recent material or skills and are weighted as **half the value of a major grade**.

5. **Tests**
   There are **two major tests** per grading period. Each test covers cumulative knowledge and engineering problem-solving skills, aligned with course TEKS. Most tests include:
   - 20 - 40 multiple choice questions
   - 0 – 3 Short Answer Engineering prompts

Project

Each grading period includes a major project grade. These assignments take several weeks and synthesize course skills. During the **Third Nine Weeks**, this will be the **Nine Weeks Project**, completed in small groups. That project will span the entire grading period and focus on collaboration, planning, and execution of a shared goal.

Grading Policy

Grades in this class are based on your demonstration of mastery of skills and concepts throughout the course. In alignment with GISD's grading policy, your grade will be calculated using the following breakdown:

- **Major Assessments – 70% of your grade**
  Includes tests, projects, and quizzes (quizzes count as half the value of a major grade)
- **Homework and Practice – 30% of your grade**
  Includes daily journals, homework assignments, and weekly design or problem-solving challenges

1. **Grading Scale**
   - **90–100** = A
   - **80–89** = B
   - **70–79** = C
   - **Below 70** = F (failing)

2. Late Work Policy

- **-10 points** for one day late
- **-20 points** for two days late
- **-30 points** for three days late
- **0** if not submitted by the fourth day

These penalties apply only to work that is turned in late while the student is present. Absences are handled under the GISD makeup work policy.

3. Retake/Redo Policy

Students who fail a major test (score below 70) are allowed one opportunity to retake it for a maximum grade of **70**. To be eligible for a retest:

- You must request the retest within **5 school days** of receiving your grade
- You may be required to attend a tutorial session first
- Retakes are not available for projects or semester exams

Attendance Policy

Being present and engaged in class is one of the most important parts of your success. Every time you're here and participating, you're building skills and helping our class run smoothly.

1. Attendance Expectations

- Be here, on time, and ready to learn.
- If you are absent for an excused reason (like illness, family emergency, school event, or religious holiday), you may make up your work without a grade penalty.
- It's your responsibility to check Google Classroom and talk to me about what you missed.

Planned Absences (school trips, family events, etc.):

- Tell me ahead of time (the earlier the better).
- We'll work together on a plan for making up assignments.

Unplanned Absences (sick, emergency, etc.):

- Let the front office or a parent/guardian contact the school.
- Check Google Classroom and talk to me the day you return so we can set deadlines for your makeup work.

2. Warm-Ups, Exit Tickets, and Journals

- **Every day starts with a** warm-up **and ends with an** exit ticket**.**
- You are expected to record both in your **journal**.
- Journals are graded **every Friday** for completeness and effort.
- Missing warm-ups or exit tickets because of being late, leaving early, or being absent without making them up will lower your weekly journal grade.

3. Fairness & Consistency

Everyone will be held to the same expectations. If you need accommodations due to health, learning needs, or other circumstances, we will follow GISD policies and work together to find solutions.

4. **Questions or Concerns**
   If you feel your attendance is incorrect, talk to me so we can review it together.

Academic Integrity Statement

As a partner in your learning, it is important to both of us that any assignment submission is a pure reflection of your work and understanding. Suspicions of alleged violations of Cheating – defined as "unauthorized assistance in connection with any academic work" and/or Falsification, which includes "Misrepresenting or misleading others with respect to academic work or misrepresenting facts for an academic advantage" – will be referred to the Principal Vogler.

You are expected to practice the highest possible standards of academic integrity. Any deviation from this expectation will result in a minimum academic penalty of your failing the assignment and will result in additional disciplinary measures. This includes improper citation of sources, using another student's work, and any other form of academic misrepresentation.

Plagiarism

Using the words or ideas of another as if they were your own is a serious form of academic dishonesty. If another person's complete sentence, syntax, key words, or specific or unique ideas and information are used, you must give that person credit through proper citation.

Generative Artificial Intelligence (GenAI) Policy

No use of generative AI tools permitted

All assignments should be fully prepared by the student. Developing strong competencies in the skills associated with this course, from student-based brainstorming to project development, will prepare you for success in your future academic pursuits and, ultimately, a competitive career. Therefore, the use of generative AI tools to complete any aspect of assignments for this course is not permitted and will be treated as plagiarism. If you have questions about what constitutes a violation of this statement, please contact me.

Expectations for Classroom Behavior

Professionalism is always expected. Because our classroom is a space designed for learning and collaboration, we must show respect for one another in all interactions. We will show respect for one another by exhibiting patience and courtesy in our exchanges. Appropriate language and restraint from verbal attacks upon those whose perspectives differ from your own is a minimum requirement. Courtesy and kindness are the norm for those who participate in my class.

Expectations of the Instructor

I am expected to facilitate a supportive and productive learning environment, answer questions appropriately, be fair and objective in grading, provide timely and useful feedback on assignments, maintain adequate office hours, and treat you as I would like to be treated.

Academic Success Statement

Academic success is built on a foundation of proactive habits and skills. Tips for success include:

- Avoiding procrastination
- Engaging thoughtfully in discussions

- Communicating effectively, both in writing and verbally
- Becoming self-motivated, disciplined, and committed to learning
- Developing strong critical thinking and decision-making skills
- Managing time effectively to stay on track
- Developing good help-seeking behaviors to overcome challenges

Guidelines for Success

In this class, success comes from more than just grades — it's about habits, attitude, and effort. We follow these five guiding principles:

1. **Be Curious** – Ask questions and explore new ideas.
2. **Show Kindness & Respect** – Treat others as you would want to be treated.
3. **Take Time to Understand** – Don't rush; work to fully understand new concepts.
4. **Learn from Mistakes** – Mistakes are opportunities to grow — keep trying.
5. **Think & Reflect** – Consider what you've learned and how you can improve.

We will revisit these throughout the year in discussions, activities, and projects.

Classroom Rules

Our rules ensure a safe, productive, and respectful learning environment:

- Follow all instructions the first time they are given.
- No food or gum in the classroom.
- Keep hands, feet, and objects to yourself.
- Ask to leave only when there is no active instruction.
- Use school devices responsibly — no inappropriate media.
- No drinks near computers.
- Log off computers and put away tools when finished.
- Phones are not allowed in school during instructional hours under Texas law. Your phone must be *turned off and stored in your bag* at all times.
    - If your phone is seen or taken up during class, it will result in an automatic referral to the office, and you will need to pick it up at the end of the school day.
- Hats, hoods, and other non-religious head coverings are not allowed to be worn in class.
- Store your supplies under your desk or on the back of your chair when not in use. Keep aisles and walkways clear.
- All work must be submitted according to the stated method for that assignment whether that is Google Classroom, physical inbox, or another designated location. Work not submitted to the correct place by the deadline is considered late.

Attention Signal

When I use an attention signal, all students should:

- Stop talking (Volume Level 0).
- Make eye contact with me.
- Raise your hand only if prompted for questions.
- Listen for next steps or instructions.

You'll hear signals like:

- "Good Morning/Afternoon Everyone, Let's Dive In!"
- "Eyes Up, Ears Open, Voices Off"
- "Hey Class!" / "Hey what?"

Daily Procedures

Entering the Classroom

- Conversation Level 1 (quiet).
- Pick up your journal and check the warm-up on the board.
- Stay in your seat and begin the warm-up.
- Upon arrival, check the board for *all* posted instructions, including warm-ups, announcements, and any other directions for the day. This is your responsibility each day without reminders.

During Class

- **Direct Instruction** – Volume 0, take notes, ask questions when prompted.
- **Group Work** – Volume 2, stay in assigned area, contribute equally.
- **Independent Work** – Volume 1, work quietly and stay on task.
- **Computer Work** – Volume 1, focus on the assigned task, move only if necessary for group work.

Exiting the Classroom

- Volume Level 0.
- Turn in assignments in the Inbox or in Google Classroom.
- Complete exit ticket if assigned.
- Wait for dismissal with your space neat and organized.
    - Ensure your table and chair are returned to their original location and aligned with the floor tape.
    - Gather all personal belongings and store them appropriately.
    - The classroom must be left neat and organized for the next class.

Rewards & Motivation

- Earn **tokens** for: on-time homework, helping others, modeling positive behavior, and consistent effort.
- Tokens can be exchanged for: small 3D printed prizes, homework extensions, or extra credit.
- Class rewards include: special technology access, guest speakers, or unique projects — available as long as class expectations are met.

Consequences

Consequences are consistent, fair, and intended to help you get back on track:

1. Verbal or nonverbal redirection.
2. Stay after class or loss of token.
3. Lunch detention with me.
4. Parent contact (call or meeting).
5. Official detention or referral, if needed.

Course Schedule

First Nine Weeks
We'll begin by building the foundation for success in engineering. You'll learn what it means to be professional, how to keep an engineering notebook, and how to work safely in a lab. We'll explore the engineering design process, take measurements, and investigate STEM careers. Along the way, we'll look at the history of engineering and important innovations. By the end of the quarter, you'll start applying your skills to basic electromechanical systems, computer-aided design (CAD), safety testing, and introductory electronics.

Second Nine Weeks
We'll continue developing technical skills through hands-on projects. You'll deepen your CAD abilities, learn more about material properties, and work with electronic circuits. You'll use problem-solving and design thinking to build and test small engineering solutions. Collaboration will be key as you work with others to apply your skills in creative and practical ways.

Third Nine Weeks
This quarter is all about teamwork, robotics, and design challenges. You'll work with a group to tackle engineering problems, design and prototype solutions, and document your process. Projects may include building mousetrap cars or creating motorized cranes with compound pulleys. You'll also learn how to analyze the impact of technology on society and how to adapt designs based on testing and feedback.

Fourth Nine Weeks
We'll finish the year with a major capstone project that brings together everything you've learned. You'll identify a real-world engineering problem, research it, design a solution, and create a prototype. You'll test and refine your design, then present your work in a professional format. This quarter will challenge you to think critically, manage resources, and collaborate effectively.