STEM 1: Concepts of Engineering Syllabus

Sunnyvale High School, 2016-2017

General Information

Instructor- Melissa Bennett

Location- Sunnyvale HS, Room 217

Tutoring Hours- Tuesday and Thursday 3:15-4:00PM OR by appointment

Course Description

Concepts of Engineering is the first course in the STEM pathway. This course will introduce students to basic concepts of engineering and will allow them to explore a variety of engineering disciplines. This course will provide students with the necessary foundation for success in future STEM courses and careers. Students will learn: how to work with a variety of measuring tools, how to compile and document data and processes, how to work with and collaborate within project teams, how to investigate with purpose, how to enhance research and products through inquiry, testing, and observation, and last but not least, how to utilize the engineering design cycle, from beginning to end.

Program Goals

• Ignite the student's passion for learning
• Create an environment where students can take risk
• Grow students as independent thinkers and researchers
• Promote teamwork, problem solving, and critical thinking
• Provide meaningful learning experiences through: challenges, project-based learning units, competitions, hands-on activities, and real world applications
• Build the students' expertise in areas related to Science, Technology, Engineering, and Mathematics
• Provide opportunities for students to explore concepts and make connections to other courses
• Improve student writing and communication skills
• Prepare and motivate students to enter a post-secondary STEM related field, through college or technical training
Curriculum and Major Course Topics

TEKS: Science, Technology, Engineering, and Mathematics Courses

http://ritter.tea.state.tx.us/rules/tac/chapter130/

Curriculum Year-at-a-Glance

http://cte.unt.edu/stem/concepts-engineering-technology

Topics

- Basics of Mechanical, Electrical, Civil, and Chemical Engineering
- Technical Drawings: 3D Printing
- Dragsters and Kinematics: Vectors/Scalers, Velocity, Acceleration, Aerodynamics, Force, Motion, and Momentum
- Environmental Sciences and Engineering- High Altitude Weather Balloons and Navigation

Expectations

- Students should adhere to classroom/campus safety guidelines both on and off campus.
- Students should be willing to take a risk and think outside the box.
- Students should be patient and helpful to teammates.
- Students should manage their time and project calendars.
- Students should respect their teachers and classmates.
- Students should take an active role in their class projects and activities.
- Students should do their best on all assignments and presentations.
- Students should document and justify their work and processes.
- Students should follow all acceptable use policies and adhere to the Code of Conduct.
- Provide opportunities for students to explore concepts and make connections to other courses
- Improve student writing and communication skills
- Prepare and motivate students to enter a post-secondary STEM related field, through college or technical training
- Get students involved
- Encourage student creativity and innovation
Resources

Curriculum and instructional materials will be in the students online Google Classroom. Students will be given a code at the beginning of the year to access the digital classroom.

Potential Course Certifications *(contingent on funding and availability)*

- OSHA-Construction
- HAM-Amateur Radio License
- Inventor- Design Software

Potential Competitions *(contingent on funding)*

- Global Space Balloon Challenge -

  This is a high altitude balloon challenge that will be embedded in the course during the spring semester. To find out more information see:

  https://www.balloonchallenge.org/

- Google Science Fair-

  If time permits, students will be able to participate in the Google Science Fair Project. To find out more about this completion see: https://www.googlesciencefair.com/en/

Grading

- At least 3 major grades will be given each quarter.
- 50% Major Grades (Tests/Projects)
- 30% Quizzes/Labs/Intermediate Grades
- 20% Minor Grades
Course Communication

There are a variety of modes of communication for this course. I encourage students and parents to utilize the resources below to stay informed throughout the year.

Teacher Website

This site will be updated weekly and will provide you with information on upcoming topics, assignments, and events. It is the frontline communication that will be used.

See: http://www.sunnyvaleisd.com/Page/2637

Remind 101

This is a text/email alert system that is used to send out reminders and important information. Information on how students can sign up for Remind 101 alerts will be listed on the teacher website.

Twitter

Twitter will be used to celebrate successes with STEM and SHS, and it will be used to share interesting STEM information and current events.

See: https://twitter.com/MelBennett14

Google Classroom

This site will house assignments and resources for our class. Students will be given a code to access this online classroom.

Teacher Email

If there are specific questions, concerns, or information that needs to be shared privately with me, feel free to email me. If you would like to set-up a conference or meeting, it is best to send me an email to set-up a face-to-face or phone conference.