Reagan High School Technology and Engineering Course Syllabus

Instructor: Richard Platt
Ronald Wilson Reagan High School – Pfafftown, North Carolina USA

SYLLABUS:
This syllabus can be found online at richardplatt.net/engineering-syllabus.pdf.

LEARNING THROUGH COMPETITIVE PROJECTS:
Student participation in Career and Technical Student Organization (CTSO) through Technology Student Association (tsaweb.org) as authorized by the North Carolina Department of Public Instruction (https://center.ncsu.edu/nccte-cms/) is highly encouraged. TSA competitions are intra-curricular classes and extracurricular activities. *Students are not required to compete in extracurricular TSA competitions* but will compete in those competitions during normal school and class hours. Students can receive class awards for the top 3 winning projects. Students will be encouraged to participate in these exciting, enriching experiences and travel outside of class if they have the time and interest.

For extracurricular participating students, they will compete in competitive projects, community service, and leadership activities that additionally provide the opportunity to apply essential standards and workplace readiness skills through authentic experiences. Opportunities for leadership development, critical and creative thinking, decision-making, problem-solving, teamwork, technology, and work-based learning are provided. The NC Career Development curriculum is based on the National Career Development Guidelines and National Standards for School Counseling Programs, endorsed by the North Carolina State Board of Education.

THE REAGAN ADVANTAGE:
The ADVANTAGE and goal of the Reagan High School Engineering Program is to introduce students to the world of engineering through hands-on creative projects and competitions that cover the variety and breadth of the engineering and technology world. Students will learn the fields of engineering, the terms, vocabulary of engineering/technology, tools, and how to use them through keeping a detailed notebook and engineering portfolio, just like Leonardo Da Vinci, Thomas Edison and the Wright Brothers.

PURPOSE:
This syllabus covers all engineering and technology courses. Each course builds upon each other. Each course continues to increase the students' depth of ***knowledge/fun*** through competitive technology experiences and skills that will be documented in the student's notebook and engineering portfolio binder. Students will learn advanced skills using high technology software design tools and computer driven machines that manufacture their projects. The skills students will learn is how to design, operate and manufacture with:

- SHOP SAFETY - ***BEING THE MOST IMPORTANT!!***
- A traditional ruler and 30-60-90 triangle creating Orthographic & Isometric drawings
- AutoCAD - 2D computer aided design software creating their own ruler and 30-60-90 triangle
- Fusion 360 cloud based 3D solid modeling software for Lasers, 3D Printing and 3D Milling,
- Laser cutter and engraving machines
- Coding with Microprocessors and web design
- 3D Scanner - for scanning physical parts into digital 3D models

- Fused Deposition Modeling (FDM) 3D printer for producing plastic parts
- SLA (stereolithography) Resin 3D Printer for producing extremely accurate hard resin parts
- Computer Numerical Control Milling Machine - for cutting/milling parts out of wood, plastic and aluminum, known as subtractive manufacturing
- Airbrush for painting beautiful unique designs for their projects
- Computer driven vinyl and cardstock cutting machines
- Sewing Machines for part and board displays
- Micro Processors (Arduino & ESP32), soldering irons, volt meters and electronic sensors, motors, sound, and led light.
- Drone fabrication with motors, sensors, FPV cameras/video transmitters, electronic speed controllers, and additional microprocessors
- Standard Tools - wrenches, handsaws, hammers & hand power tools, glue guns, drill presses, scroll saws, bandsaws, etc.

COURSE OUTCOMES:
Students will build astonishing and powerful engineering portfolios and resumes through TSA competitive class competitions and leadership roles. **Students' engineering portfolios, leadership roles and resumes will be used for college essays, college interviews, internships and job interviews.** Students Leadership skills will be learned through class, regional, state and national team based competitive projects. Students will be encouraged to pursue chapter, regional, state and national leadership officer positions. Students growing in maturity, confidence, how to be a good teammate, leadership and advanced technical skills will be outcomes for the course(s). Students being more than work and college ready before and upon graduation is the goal of these courses.

INSTRUCTOR:
Richard Platt has worked in the high technology and engineering world since leaving high school in 1977. Mr. Platt has worked as a draftsman and Computer Aided Designer (CAD) on the Space Shuttle at NASA. He worked as a systems engineer, implementing multi-million CAD systems throughout North America. He worked as a Sales Account Executive selling and marketing over $33M of 3D CAD systems, Supercomputers, and CAD software development systems. This is Mr. Platt's twentieth year teaching engineering, where in Florida he built an internationally recognized successful and competitive engineering program. His students competed and won in STEM competitions at the regional, state, national and international competitions through TSA. Mr. Platt served on the Florida TSA Board of Directors and as Chairman for many years. Finally, Mr. Platt is an accomplished artist who sells and paints our beautiful North Carolina; see his work at https://www.richardplatt.net/art-paintings.html

Sincerely,
Richard Platt – Engineering Teacher – Reagan High School

Student Name: _____ **Date**: _____

Parent/Guardian: _____ **Date**: _____