GREAT PLAINS TECHNOLOGY CENTER
COURSE OF STUDY

Career Cluster: Science, Technology, Engineering and Mathematics (SC)

Career Pathway: Engineering and Technology

State Program: Pre-Engineering Program (SC0016001)

Local Program: PLTW Pre-Engineering (SC0040013)

Program Hours: Secondary Students: 480 Hours

Instructors:

Name	Office	E-Mail
Alanna Prater	(580) 250-5615	aprater@greatplains.edu

Credits: Secondary Students: 3 high school credits per year – *OK Promise credit

Program Description:
This one-year program focuses on building a solid academic and engineering foundation, equipping students with the skills needed to succeed in post-secondary engineering programs. Through the Project Lead the Way curriculum, students will explore pre-engineering concepts and principles with a strong emphasis on problem-solving. This program offers a comprehensive introduction to engineering, preparing students to excel in further studies and career pathways.

Program Goals:
This program challenges students to use mathematical, scientific, and technological principles in solving real-world problems.
Upon achieving the goals of this program, students will:

- View technology as a tool for identifying, supporting, and addressing challenges
- Understand problem solving in engineering and the application of technology to academic and real-world challenges
- Be prepared for the rigor of a college level program in engineering or engineering technology
- Understand technological systems in analyzing and solving challenges
- Use mathematical principles to solve problems and demonstrate clear logical solution pathways
- Communicate effectively through reading, writing, listening, and speaking
- Contribute constructively to a team solution

Career Opportunities:
- Scientific research and discovery
- Technology evolution and design
- Mathematics research and development
- Engineering process, design, and solution
- Laboratory, testing and investigative services

Program Objectives:
After successful completion of this program, the student will be able to:
- Understand how the skills learned in the classroom can be applied in everyday life
- Increase cooperative learning and higher order thinking skills
- Develop strategies to direct and motivate independent learning
- Make connections to problems in context and see the value in the learning
- Synthesize and construct knowledge to grapple with the complexities of problems
- Communicate information and solutions in recognized, methodical oral and written forms
- Identify safety issues in engineering and describe possible solutions

DESCRIPTION OF COURSES

Course # Course Name	HST	HSL	Total

ST00024 Principles of Engineering (8710*)   **72**   **48**   **120**

Principles of Engineering helps students understand the field of engineering/engineering technology. Students explore various technology systems and manufacturing processes helping them learn how engineers and technicians use math, science, and technology in an engineering problem solving process to benefit people. This course also includes concerns about social and political consequences of technological change. This course is approved for Computer Science/Computer Technology credit and is Oklahoma Promise approved.

ST00021 Digital Electronics (8711*)   **72**   **48**   **120**

Digital Electronics is a course in applied logic that encompasses the application of electronic circuits and devices. Computer simulation software is used to design and test digital circuitry prior to the actual construction of circuits and devices

ST00019 PLTW Civil Engineering and Architecture (8713*)   **72**   **48**   **120**

This course provides an overview of the fields of Civil Engineering and Architecture, while emphasizing the interrelationship and dependence of both fields on each other. Students use state of the art software to solve real world problems and communicate solutions to hands-on projects and activities. This course covers topics such as: The Roles of Civil Engineers and Architects, Project Planning, Site Planning, Building Design, and Project Documentation and Presentation.

ST00022 PLTW Capstone (8716)   **48**   **72**   **120**

This PLTW Capstone course allows students to apply their knowledge and skills to solve real-world challenges through hands-on projects that incorporate teamwork, research, design, prototyping, and presentation. This course emphasizes critical thinking, problem-solving, and professionalism, preparing students for college, careers, and certifications.

Program Total: 480 Hours
High School Theory: 264 hours
High School Lab: 216 hours

Evaluation Policy:

Independent Work (25% of final grade)
Students are expected to complete all practice exercises whether assigned in class or for homework. Knowledge assignments will include, but not limited to, vocabulary, notes, supplemental problems, quizzes, and tests.

Employability Grades (10% of Final Grade)
The employability skills grade is based on 20 points per day (which may include: attitude, attendance, safety, punctuality, cooperation, participation, clean-up, class preparation, school/classroom rules, and time management). Points will be deducted if these responsibilities are not met at the instructor's discretion. Students will be allowed to make up unearned employability points for **excused** absences only. Full credit will be given for assignments/tests that have been made up due to excused absences only (see Student Handbook).

Lab Activities (65% of final grade)
The performance and assessment portion of your grade will be based on how well you can effectively demonstrate your understanding of skills and concepts through projects, labs, various activities and communication skills. You will also be required to develop a portfolio of your work and maintain your unit notes in an organized, standard form. The instructor will provide guidelines on how to develop your portfolio as well as how to maintain organization of unit notes.

Final Grade (Semester)
Semester grade will be calculated by averaging grades in each category and summing each category according to their assigned weight. Progress reports will be sent to home schools at six and twelve-week intervals each semester as required or requested. Grades are accessible on-line at http://sonisweb.greatplains.edu/studsect.cfm

Grading Scale:
The grading scale as adopted by the Board of Education is as follows:

A	=	90 – 100	S	=	Satisfactory
B	=	80 – 89	W	=	Withdrawn
C	=	70 – 79	I	=	Incomplete
D	=	60 – 69	N	=	No Grade
F	=	Below 60			

Make-Up Work Policy:
All Make-Up Work Is the Responsibility of The Student. Make-up work will be handled as specified in the Student Handbook. Please be sure to read and understand all student policies, especially make-up of assignments, tests, and employability due to absences. Students should always arrange for any make-up work with the instructor as per the Student Handbook. Students should keep track of his or her progress and grades.

Safety Precautions:
Computers, printers, graphing calculators, measurement tools (compasses, etc.), and all other equipment are for educational purposes only! Students should not attempt to "fix", tamper or play with any school property. The instructor should be informed immediately of any problems with equipment.

Attendance Policy:
For specific information related to attendance and tardiness refer to the Student Handbook.

Program Requirements and Expectations:
The general course requirements and expectations include:
- Training methods will consist of lecture, individualized instruction, and practical application.
- All students must adhere to policies and procedures in the GPTC student handbook.
- TSA is the student organization for Pre-Engineering. This student organization offers an outstanding opportunity to develop leadership and social skills. Students are highly encouraged to participate.

Student Behavior Includes:
- Students should enter the engineering classroom as a young professional.
- Employability skills are EXPECTED behaviors.
- Students not riding school buses should be in the classroom by 8:00 a.m. and 11:50 p.m. to be punctual.

NOTE: For additional information or questions regarding the GPTC School policies and procedures, please refer to the Student Handbook and/or the instructor.

Accountability Measures and Assessments:
- End of course assessment administered through Project Lead the Way (PLTW) for Principles of Engineering, Digital Electronics, and Civil Engineering and Architecture

Industry Alignment
- International Technology and Engineering Educators Association (ITEEA): Courses connect ITEEA standards, promoting technological literacy and engineering competencies.
- Next Generation Science Standards (NGSS): Courses in PLTW incorporate NGSS to enhance students' understanding of scientific concepts and practices.

CIP & SOC:
- CIP: 14.0101 – Engineering, General
- SOC: 17-2199.00 – Engineers, All Other

OCAS program codes:
- 9862 – Pre-Engineering Program

OCAS course codes:
- 8711 – PLTW Digital Electronics
- 8710 – PLTW Principles of Engineering
- 8713 – PLTW Civil Engineering & Architecture

Instructional Materials and Supplies:
Students are not required to purchase textbooks or supplemental materials.

eLearning Curricula:
Project Lead the Way, Inc." PLTW Curriculum." *pltw.org*. Project Lead the Way, Aug 2021. Web.
    <http://www.pltw.org>