Texas Education Agency

Approved Innovative Course

- *Districts must have local board approval to implement innovative courses*
- *Innovative courses may meet state elective credit only*
- *CTE Innovative courses may not be the final course in a coherent sequence for an endorsement*
- *Course requirements must be met without modification*

Course: PLTW Gateway
PEIMS Code: N1303756, N1303757, N1303758, N1303759
Abbreviation: GTT1, GTT2, GTT3, GTT4
Grade Level(s): 9-12
Number of Credits: 0.5

Course description:

PLTW Gateway students are provided opportunities to investigate problems and apply a problem-solving or design process to creatively identify solutions. Students are introduced to problems and are asked to make connections throughout the lessons. Students learn and use methods for communicating design ideas through sketches, solid models, mathematical, and computerized models. Students work in teams to identify design requirements, research the topic, and engage stakeholders.

Gateway is divided into ten independent units. School districts may teach any two units in any order for one-half credit. Students may repeat the course up to four times using different units for a total of two credits.

***Unit 1: Design and Modeling**: Students design a toy or game for a child with cerebral palsy, fabricate and test it, and make necessary modifications to optimize their design solution.*

***Unit 2: Automation and Robotics**: Students trace the history, development, and influence of automation and robotics as they learn about mechanical systems, energy transfer, machine automation, and computer-control systems. Students use robotics to design, build, and program real-world objects such as traffic lights, toll booths, and robotic arms.*

***Unit 3: App Creators**: This unit introduces students to computer science by computationally analyzing and developing solutions to authentic problems through mobile app development as well as the impacts of computer science to other disciplines and society.*

***Unit 4: Computer Science for Innovators and Makers**: Students discover computer science concepts and skills by creating personally relevant, tangible, and shareable projects. Throughout the unit, students will learn about programing for the physical world by blending hardware design and software development. They will design and develop a physical computing device, interactive art installation, or wearable technology, and plan and develop code for microcontrollers that bring their physical designs to life.*

***Unit 5: Magic of Electrons**: Through hands-on projects, students will explore the science of electricity, behavior and parts of atoms, and sensing devices. Students will acquire knowledge and skills in basic circuit design and examine the impact of electricity on our lives.*

***Unit 6: Science of Technology**: In this unit, students explore how science impacts the technology of yesterday, today, and the future. Students apply the concepts of physics, chemistry, and nanotechnology to STEM activities and projects, including making ice cream, cleaning up an oil spill, and discovering the properties of nanomaterials.*

***Unit 7: Energy and the Environment**: In this unit, students are challenged to think big and look toward the future as they explore sustainable solutions to our energy needs and investigate the impact of energy on our lives and the world. They design and model alternative energy sources and evaluate options for reducing energy consumption.*

***Unit 8: Flight and Space**: The exciting world of aerospace comes alive through this unit. Students explore the science behind aeronautics and use their knowledge to design, prototype, and test model rockets and gliders. Custom-built simulation software allows students to experience space travel.*

***Unit 9: Green Architecture**: In this unit, students learn how to apply the concept of "green" choices to the fields of architecture and construction by exploring dimensioning, measuring, and how architectural sustainability as they design affordable housing units using CAD software.*

***Unit 10: Medical Detectives**: In the Medical Detectives unit, students play the role of real-life medical detectives as they analyze genetic testing results to diagnose diseases and study DNA evidence found at a "crime scene." They solve medical mysteries through hands-on projects and labs, investigate how to measure and interpret vital signs, and learn how the systems of the human body work together to maintain health.*

Teacher qualifications:

An assignment for Gateway is allowed with one of the following certificates as well as successful completion of the Project Lead The Way's Core Training requirements for Gateway.

PLTW Core Training:

PLTW's Core Training requires approximately 90 hours of instruction led by PLTW approved Master Teachers. Course mastery is demonstrated by the submission and approval of a course

portfolio that meet's PLTW's requirements. After successful completion of Core Training, teachers receive access to the National PLTW Engineering Professional Learning Community, course-specific student and classroom instructional resources, and Ongoing Training resources through the PLTW Content Management System.

- Master Science Teacher (Grades 8-12).
- Mathematics/Physical Science/Engineering: Grades 6-12.
- Mathematics/Physical Science/Engineering: Grades 8-12.
- Physical Science: Grades 6-12.
- Physical Science: Grades 8-12.
- Physics/Mathematics: Grades 7-12.
- Physics/Mathematics: Grades 8-12.
- Science: Grades 7-12.
- Science: Grades 8-12.
- Science, Technology, Engineering, and Mathematics: Grades 6-12.
- Secondary Industrial Arts (Grades 6-12).
- Secondary Industrial Technology (Grades 6-12).
- Secondary Physics (Grades 6-12).
- Secondary Science (Grades 6-12).
- Secondary Science, Composite (Grades 6-12).
- Technology Education: Grades 6-12.
- Master Mathematics Teacher (Grades 8-12).
- Mathematics: Grades 7-12.
- Mathematics: Grades 8-12.
- Secondary Mathematics: Grades 6-12
- Chemistry: Grades 7-12
- Chemistry: Grades 8-12
- Health Science Technology Education: Grades 8-12.
- Health Science: Grades 6-12.
- Secondary Chemistry: Grades 6-12
- Vocational Health Occupations.
- Vocational Health Science Technology.
- Secondary Physical Science (Grades 6-12)
- Technology Applications: Grades EC-12
- Technology Applications: Grades 8-12
- Secondary Computer Information System (Grades 6-12)
- Computer Science: Grades 8-12.
- Junior High School (Grades 9-10 only) or High School--Computer Information Systems.
- Trade and Industrial Education: Grades 6-12. This assignment requires appropriate work approval.

Approved Innovative Course

- *Districts must have local board approval to implement innovative courses*
- *Innovative courses may meet state elective credit only*
- *CTE Innovative courses may not be the final course in a coherent sequence for an endorsement*
- *Course requirements must be met without modification*

- Trade and Industrial Education: Grades 8-12. This assignment requires appropriate work approval.
- Vocational Trades and Industry (Grades 6-12). This assignment requires appropriate work approval.
- Vocational Trades and Industry Pre-Employment Laboratory (Grades 6-12). This assignment requires appropriate work approval.
- Vocational Trades and Industry Co-op (Grades 6-12). This assignment requires appropriate work approval.

Additional information:

Districts may use these courses only with the approval of Project Lead The Way. All requirements of Project Lead The Way must be met. Please contact Project Lead The Way directly for these requirements:

Project Lead The Way
Solution Center
Toll Free: 877.335.PLTW (7589)
solutioncenter@pltw.org