Local Implementation Considerations:

Students completing two or more courses for two or more credits within a program of study earn concentrator status for Perkins V federal accountability reporting.

Proposed Indicator: Students finishing three or more courses for four or more credits with one course from a TEA recognized capstone course (in bold) within a program of study earn completer status for federal accountability reporting.
The Biomedical Science program of study focuses on the study of biology and medicine in order to introduce students to the knowledge and skills necessary to be successful in the healthcare field, such as researching and diagnosing diseases, pre-existing conditions, or other determinants of health. Students may also practice patient care and communication.

The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster focuses on planning, managing, and providing, scientific research and professional and technical services, including laboratory and testing services, and research and development services.

Successful completion of the Biomedical Science program of study will fulfill requirements of the Public Service Endorsement or STEM Endorsement, dependent upon courses chosen. Approved Statewide Program of Study - September 2019
<table>
<thead>
<tr>
<th>COURSE NUMBER/ COURSE NAME</th>
<th>SERVICE ID/CREDITS</th>
<th>PREREQUISITES (PREQ) RECOMMENDED PREREQUISITES (RPREQ)</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>8H780 MST PLTW Principles of Biomedical Science</td>
<td>N1302092 (1 credit)</td>
<td>None</td>
<td>9-10</td>
</tr>
<tr>
<td>8H790 MST PLTW Human Body Systems</td>
<td>N1302093 (1 credit)</td>
<td>PREQ: PLTW Principles of Bioscience</td>
<td>10-11</td>
</tr>
<tr>
<td>8O790 MST Biotechnology I</td>
<td>13036400 (1 credit)</td>
<td>PREQ: Biology</td>
<td>11-12</td>
</tr>
<tr>
<td>8H740 MST Medical Microbiology</td>
<td>13020700 (1 credit)</td>
<td>PREQ: Biology and Chemistry</td>
<td>11-12</td>
</tr>
<tr>
<td>8H792 MST PLTW Medical Interventions</td>
<td>N1302094 (1 credit)</td>
<td>PREQ: PLTW Human Body Systems</td>
<td>11-12</td>
</tr>
<tr>
<td>8H770 MST Pathophysiology</td>
<td>13020800 (1 credit)</td>
<td>PREQ: Biology and Chemistry</td>
<td>11-12</td>
</tr>
<tr>
<td>8H794 MST PLTW Biomedical Innovation</td>
<td>N1302095 (1 credit)</td>
<td>PREQ: PLTW Medical Interventions</td>
<td>11-12</td>
</tr>
<tr>
<td>8O713 MST MST Scientific Research and Design</td>
<td>13037200 (1 credit)</td>
<td>PREQ: Algebra I, Geometry, IPC or Physics</td>
<td>12</td>
</tr>
</tbody>
</table>
The Cybersecurity program of study includes the occupations and educational opportunities related to planning, implementing, upgrading, or monitoring security measure for the protection of computer networks and information. This program of study may also include exploration into responding to computer security breaches and virus and administering network security measures.

The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster focuses on planning, managing, and providing, scientific research and professional and technical services, including laboratory and testing services, and research and development services.

Successful completion of the Cybersecurity program of study will fulfill requirements of a STEM Endorsement.

Approved Statewide Program of Study - September 2019
<table>
<thead>
<tr>
<th>COURSE NUMBER/ COURSE NAME</th>
<th>SERVICE ID/CREDITS</th>
<th>PREREQUISITES (PREQ)</th>
<th>RECOMMENDED PREREQUISITE (RPREQ)</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>95004S (Middle School) Fundamentals of Computer Science</td>
<td>03580140 (.5 credit)</td>
<td>None</td>
<td></td>
<td>7-8</td>
</tr>
<tr>
<td>8K100, 8K105 DC Principles of Information Technology</td>
<td>13027200 (1 credit)</td>
<td>None</td>
<td></td>
<td>9-10</td>
</tr>
<tr>
<td>9O110 Foundations of Cybersecurity</td>
<td>03580850 (1 credit)</td>
<td>None</td>
<td></td>
<td>9-10</td>
</tr>
<tr>
<td>91820 H Computer Science I</td>
<td>03580200 (1 credit)</td>
<td>PREQ: Algebra I</td>
<td></td>
<td>9-12</td>
</tr>
<tr>
<td>91822 AP Computer Science Principles</td>
<td>A3580300 (1 credit)</td>
<td>PREQ: Algebra I</td>
<td></td>
<td>9-12</td>
</tr>
<tr>
<td>8K930, 8K935DC GRCTC Networking</td>
<td>13027400 (1 credit)</td>
<td>RPREQ: Principles of Info. Technology, Comp. Maint., and/or Comp. Maint./Lab</td>
<td></td>
<td>11-12</td>
</tr>
<tr>
<td>9O980, 9O985 DC GRCTC Cybersecurity Capstone</td>
<td>03580855 (1 credit)</td>
<td>RPREQ: Principles of IT and/or Foundations of Cybersecurity</td>
<td></td>
<td>11-12</td>
</tr>
<tr>
<td>8O986, 8O988 DC GRCTC Practicum in Information Technology - Cybersecurity</td>
<td>13028000 (2 credits)</td>
<td>PREQ: a minimum of two high school information technology courses</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>
The Engineering program of study focuses on the design, development, and use of engines, machines, and structures. Students will learn how to apply science, mathematical methods, and empirical evidence to the innovation, design, construction, operation, and maintenance of different manufacturing systems.

The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster® focuses on planning, managing, and providing scientific research and professional and technical services, including laboratory and testing services, and research and development services.

Successful completion of the Engineering program of study will fulfill requirements of the Business and Industry or STEM Endorsement.

Approved Statewide Program of Study - September 2019
The Engineering program of study focuses on the design, development, and use of engines, machines, and structures. Students will learn how to apply science, mathematical methods, and empirical evidence to the innovation, design, construction, operation, and maintenance of different manufacturing systems.
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The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster® focuses on planning, managing, and providing scientific research and professional and technical services, including laboratory and testing services, and research and development services.

Successful completion of the Engineering program of study will fulfill requirements of the Business and Industry or STEM Endorsement. Approved Statewide Program of Study - September 2019
# COURSE INFORMATION: ENGINEERING

<table>
<thead>
<tr>
<th>COURSE NUMBER/COURSE NAME</th>
<th>SERVICE ID / CREDIT</th>
<th>PREREQUISITES (PREQ) RECOMMENDED PREREQUISITES (RPREQ)</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>8O100/ 8O700 MST Principles of Applied Engineering</td>
<td>13036200 (1 credit)</td>
<td>None</td>
<td>7-10</td>
</tr>
<tr>
<td>8O740 MST PLTW Introduction to Engineering Design</td>
<td>N1303742 (1 credit)</td>
<td>None</td>
<td>9-10</td>
</tr>
<tr>
<td>8O230/8O710 MST Engineering Design &amp; Presentation I</td>
<td>13036500 (1 credit)</td>
<td>PREQ: Algebra I</td>
<td>10-12</td>
</tr>
<tr>
<td>8O770 MST Computer Integrated Manufacturing (PLTW)</td>
<td>N1303748 (1 credit)</td>
<td>PREQ: PLTW IED or Engineering Design</td>
<td>10-12</td>
</tr>
<tr>
<td>8O750 MST Civil Engineering &amp; Architecture (PLTW)</td>
<td>N1303749 (1 credit)</td>
<td>PREQ: PLTW IED or Engineering Design</td>
<td>10-12</td>
</tr>
<tr>
<td>8O230 /8O710 MST Engineering Design &amp; Problem Solving</td>
<td>13037300 (1 credit)</td>
<td>PREQ: Algebra I and Geometry</td>
<td>11-12</td>
</tr>
<tr>
<td>8O760 MST Aerospace Engineering (PLTW)</td>
<td>N1303745 (1 credit)</td>
<td>PREQ: PLTW IED or Engineering Design</td>
<td>11-12</td>
</tr>
<tr>
<td>8O738 MST MST Digital Electronics</td>
<td>13037600 (1 credit)</td>
<td>PREQ: Algebra I and Geometry</td>
<td>10-12</td>
</tr>
<tr>
<td>8O930S GRCTC Engineering Science</td>
<td>13037500 (1 credit)</td>
<td>PREQ: Algebra I and Biology Chemistry, Integrated Physics, and Chemistry (IPC), or Physics</td>
<td>11-12</td>
</tr>
<tr>
<td>8O700 MST/ 8O705 DC MST/ 8O960 (GRCTC) Engineering Design and Presentation II</td>
<td>13036600 (2 credits)</td>
<td>PREQ: Engineering Design &amp; Presentation I</td>
<td>11-12</td>
</tr>
<tr>
<td>8O340 Scientific Research &amp; Design</td>
<td>13037200 (1 credit)</td>
<td>PREQ: Algebra I and Biology Chemistry, Integrated Physics, and Chemistry (IPC), or Physics</td>
<td>11-12</td>
</tr>
<tr>
<td>8O310, 8O780 MST MST Engineering Design &amp; Development (PLTW)</td>
<td>N1303749 (1 credit)</td>
<td>PLTW IED or Engineering Design</td>
<td>11-12</td>
</tr>
<tr>
<td>8O970 GRCTC Practicum in STEM or 8O972 Practicum in STEM</td>
<td>13037405 (3 credits) 13037400 (2 credits)</td>
<td>PREQ: Algebra I and Geometry</td>
<td>11-12</td>
</tr>
<tr>
<td>8O340, 8O713 MST MST Scientific Research and Design</td>
<td>13037200 (1 credit)</td>
<td>PREQ: Algebra I, Geometry, IPC or Physics</td>
<td>11-12</td>
</tr>
</tbody>
</table>
The programming and Software Development program of study explores the occupations and education opportunities associated with researching, designing, developing, and testing operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computer applications. This program of study may also include exploration into creating, modifying, and testing the codes, forms, and script that allow computer applications to run.

The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster focuses on planning, managing, and providing, scientific research and professional and technical services, including laboratory and testing services, and research and development services.

Successful completion of the Programming and Software Development program of study will fulfill requirements of STEM Endorsement.

Approved Statewide Program of Study - September 2019
<table>
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<tr>
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<tbody>
<tr>
<td>95004S (Middle School) Fundamentals of Computer Science</td>
<td>03580140 (.5 credit)</td>
<td>None</td>
<td>7-8</td>
</tr>
<tr>
<td>91822 AP Computer Science Principles</td>
<td>A3580300 (1 credit)</td>
<td>PREQ: Algebra I</td>
<td>9-12</td>
</tr>
<tr>
<td>91820 (H) Computer Science I</td>
<td>03580200 (1 credit)</td>
<td>PREQ: Algebra I</td>
<td>10-12</td>
</tr>
<tr>
<td>92821 AP Computer Science A</td>
<td>A3580110 (2 credits)</td>
<td>PREQ: Computer Science I</td>
<td>10-12</td>
</tr>
<tr>
<td>91824 (H) Computer Science III</td>
<td>03580350 (1 credit)</td>
<td>PREQ: AP Computer Science A</td>
<td>11-12</td>
</tr>
<tr>
<td>91838 Mobile Application Development</td>
<td>03580390 (1 credit)</td>
<td>PREQ: Algebra I</td>
<td>10-12</td>
</tr>
</tbody>
</table>
The Renewable Energy program of study helps students discover to assemble, inspect, maintain, and repair different equipment required for renewable energy. It introduces students to solar photovoltaic equipment and wind turbines, the systems and processes used to maintain and manage these types of equipment, and helps students develop the skills needed to do so.

The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster focuses on planning, managing, and providing, scientific research and professional and technical services, including laboratory and testing services, and research and development services.

Successful completion of the Renewable Energy program of study will fulfill requirements of the Business and Industry or STEM endorsement. Statewide Approved Program of Study - September 2019
<table>
<thead>
<tr>
<th>COURSE NUMBER/ COURSE NAME</th>
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<th>PREREQUISITES (PREQ)</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>8O100 Principles of Applied Engineering</td>
<td>13036200 (1 credit)</td>
<td>None</td>
<td>9-12</td>
</tr>
<tr>
<td>8O250/8O255 DC AC/DC Electronics</td>
<td>13036800 (1 credit)</td>
<td>PREQ: Principles of Applied Engineering</td>
<td>10-12</td>
</tr>
<tr>
<td>8O380/8O385 DC Solid State Electronics</td>
<td>13036900 (1 credit)</td>
<td>PREQ: AC/DC Electronics</td>
<td>11-12</td>
</tr>
<tr>
<td>8O370/8O375 DC Digital Electronics</td>
<td>13037600 (1 credit)</td>
<td>PREQ: Algebra 1 &amp; Geometry</td>
<td>10-12</td>
</tr>
<tr>
<td>8O410 Practicum in STEM</td>
<td>13037400 (2 credits) 13037405 (3 credits)</td>
<td>PREQ: Algebra I &amp; Geometry</td>
<td>12</td>
</tr>
</tbody>
</table>
Science, Technology, Engineering & Mathematics

**Fundamentals of Computer Science (HS credit)**
95004 (Middle School)
TSDS PEIMS Code: 03580140
Grade Placement: 7-8, Credit: 0.5
Prerequisite: None

Fundamentals of Computer Science is intended as a first course for those students just beginning the study of computer science. Students will learn about the computing tools that are used every day. Students will foster their creativity and innovation through opportunities to design, implement, and present solutions to real-world problems. Students will collaborate and use computer science concepts to access, analyze, and evaluate information needed to solve problems. Students will learn the problem-solving and reasoning skills that are the foundation of computer science. Knowledge and skills support the work of individuals and groups in solving problems. Students will select the technology appropriate for the task, synthesize knowledge, create solutions, and evaluate the results. Students will learn digital citizenship by researching current laws and regulations and by practicing integrity and respect.

**Principles of Applied Engineering**
80100
TSDS PEIMS Code: 13036200 (PRAPPENG)
Grade Placement: 7–10 Credit: 1
Prerequisite: None.

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 understand 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.

**MST Project Lead the Way – Principles of Biomedical Science**
8H780
TSDS PEIMS Code: N1302092 (PRBIOSCI)
Grade Placement: 9-10, Credit: 1
Prerequisite: None

Description: The Principles of the Biomedical Science course is divided into eight units designed to introduce students to the study of the human body and human medicine. Students investigate various health conditions including heart disease, diabetes, sickle-cell disease, hypercholesterolemia and infectious diseases. They determine the factor that led to the death of a fictional person, and investigate lifestyle choices and medical treatments that might have prolonged the person’s life. The activities and projects introduce students to human physiology, medicine, and research processes.

**Principles of Information Technology**
8K100, 8K105, 8K700 MST
TSDS PEIMS Code: 13027200 (PRINIT)
Grade Placement: 9–10, Credit: 1
Prerequisites: None

In Principles of Information Technology, students will develop computer literacy skills to adapt to emerging technologies used in the global marketplace. Students will implement personal and interpersonal skills to prepare for a rapidly evolving workplace environment. Students will enhance reading, writing, computing, communication, and reasoning skills and apply them to the information technology environment.

**Foundations of Cybersecurity**
9O110
TSDS PEIMS Code: A3580850
Grade Placement: 9–10, Credit: 1
Prerequisites: None

In the Foundations of Cybersecurity course, students will develop the knowledge and skills needed to explore fundamental concepts related to the ethics, laws, and operations of cybersecurity. Students will examine trends and operations of cyberattacks, threats, and vulnerabilities. Students will review and explore security policies designed to mitigate risks. The skills obtained in this course prepare students for additional study in cybersecurity. A variety of courses are available to students interested in this field. Foundation of Cybersecurity may serve as an introductory course in this field of study.
Science, Technology, Engineering & Mathematics

**MST Project Lead the Way – Introduction to Engineering Design**
80730 MST
TSDS PEIMS Code: N1303742
Grade Placement: 9-10, Credit: 1
Prerequisite: None
Description: This foundation course major focus is the design process and its application. Through hands-on projects, students apply engineering standards and document their work. Students use industry standard 3D modeling software to help them design solutions to solve proposed problems, document their work using an engineer’s notebook, and communicate solutions to peers and members of the professional community.

**Computer Science I**
91820
TSDS PEIMS Code: A3580100
Grade Placement: 9–10, Credit: 2
Prerequisites: Algebra I
Computer Science I will foster students’ creativity and innovation by presenting opportunities to design, implement, and present meaningful programs through a variety of media. Students will collaborate with one another, their instructor, and various electronic communities to solve the problems presented throughout the course. Through data analysis, students will identify task requirements, plan search strategies, and use computer science concepts to access, analyze, and evaluate information needed to solve problems. By using computer science knowledge and skills that support the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create solutions, and evaluate the results. Students will learn digital citizenship by researching current laws and regulations and by practicing integrity and respect. Students will gain an understanding of the principles of computer science through the study of technology operations, systems, and concepts.

**AP Computer Science Principles**
91822
TSDS PEIMS Code: A3580300
Grade Placement: 10 –11, Credit: 1
Prerequisites: None
Prerequisites: Algebra I
AP Computer Science Principles introduces students to the central ideas of computer science, instilling the ideas and practices of computational thinking and inviting students to understand how computing changes the world. The rigorous course promotes deep learning of computational content, develops computational thinking skills, and engages students in the creative aspects of the field. The course is unique in its focus on fostering students’ creativity. Students are encouraged to apply creative processes when developing computational artifacts and to think creatively while using simulations to explore questions that interest them. Rather than teaching a particular programming language or tool, the course focuses on using technology and programming as a means to solve computational problems and create exciting and personally relevant artifacts. Students design and implement innovative solutions using an iterative process similar to what artists, writers, computer scientists, and engineers use to bring ideas to life.

**AP Computer Science A**
92821
TSDS PEIMS Code: A3580110
Grade Placement: 10 –12, Credit: 2
Prerequisites: Computer Science I
This college-level course reinforces and increases the depth of understanding of the basic concepts and covers advanced programming concepts which are useful in preparation for the Computer Science Advanced Placement tests. The AP Computer Science II emphasizes object-oriented programming methodology with a concentration on problem solving and algorithm development and is meant to be the equivalent of a first-semester college-level course in Computer Science. The Java programming language is currently taught in this course. Students will learn to become responsible digital citizens by researching current laws and regulations and by practicing integrity and respect throughout the AP Computer Science II course. *AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance. Upon successful completion of the course, students will earn one credit of math and one credit of LOTE.*
MST Project Lead the Way – Human Body Systems
8H790
TSDS PEIMS Code: N1302093 (HUMBODSY)
Grade Placement: 10–11, Credit: 1
Prerequisite: PLTW Principles of Biomedical Sciences
Description: Students examine the interactions of human body systems as they explore identity, power, movement, protection, and homeostasis. Exploring science in action, students build organs and tissues on a skeletal Manikin; use data acquisition software to monitor body functions such as muscle movement, reflex and voluntary action, and respiration; and take on the roles of biomedical professionals to solve real-world medical cases.

MST Project Lead the Way – Computer Integrated Manufacturing
8O770 MST
TSDS PEIMS Code: N1303748
Grade Placement: 10–11, Credit: 1
Prerequisite: PLTW Introduction to Engineering Design or Engineering Design
Description: Open doors in any career with computer science! In CSE, students create apps for mobile devices, automate tasks in a variety of languages, and find patterns in data. Students collaborate to create and present solutions that can improve people’s lives, and weigh the ethical and societal issues of how computing and connectivity are changing the world. This course aligns with the AP Computer Science Principles course.

Engineering Design and Presentation I
8O230
TSDS PEIMS Code: 13036500 (ENGDSPR1
Grade Placement: 10–12, Credit: 1
Prerequisite: Algebra I
Recommended Prerequisite: Principles of Applied Engineering.
Engineering Design and Presentation I is a continuation of knowledge and skills learned in Principles of Applied Engineering. Students enrolled in this course will demonstrate knowledge and skills of the design process as it applies to engineering fields using multiple software applications and tools necessary to produce and present working drawings, solid model renderings, and prototypes. Students will use a variety of computer hardware and software applications to complete assignments and projects. Through implementation of the design process, students will transfer advanced academic skills to component designs. Additionally, students explore career opportunities in engineering, technology, and drafting and what is required to gain and maintain employment in these areas.

Mobile Application Development
91838
TSDS PEIMS Code: 03580390
Grade Placement: 10–12, Credit: 1
Prerequisite: Algebra I
Mobile Application Development will foster students' creativity and innovation by presenting opportunities to design, implement, and deliver meaningful projects using mobile computing devices. Students will collaborate with one another, their instructor, and various electronic communities to solve problems presented throughout the course. Through data analysis, students will identify task requirements, plan search strategies, and use software development concepts to access, analyze, and evaluate information needed to program mobile devices. By using software design knowledge and skills that support the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create solutions, and evaluate the results. Students will learn digital citizenship by researching current laws and regulations and by practicing integrity and respect. Students will gain an understanding of the principles of mobile application development through the study of development platforms, programming languages, and software design standards.
Science, Technology, Engineering & Mathematics

Engineering Design and Presentation I
8O230
TSDS PEIMS Code: 13036500 (ENGDSPR1)
Grade Placement: 10–12 Credit: 1
Prerequisite: Algebra I.
Recommended Prerequisite: Principles of Applied Engineering.
Engineering Design and Presentation I is a continuation of knowledge and skills learned in Principles of Applied Engineering. Students enrolled in this course will demonstrate knowledge and skills of the design process as it applies to engineering fields using multiple software applications and tools necessary to produce and present working drawings, solid model renderings, and prototypes. Students will use a variety of computer hardware and software applications to complete assignments and projects. Through implementation of the design process, students will transfer advanced academic skills to component designs. Additionally, students explore career opportunities in engineering, technology, and drafting and what is required to gain and maintain employment in these areas.

MST Biotechnology I
8O790
TSDS PEIMS Code: 13036400 (BIOTECH1)
Grade Placement: 10–12, Credit: 1
Prerequisite: Biology.
Recommended Prerequisites: Principles of Biosciences and Chemistry.
In Biotechnology I, students will apply advanced academic knowledge and skills to the emerging fields of biotechnology such as agricultural, medical, regulatory, and forensics. Students will have the opportunity to use sophisticated laboratory equipment, perform statistical analysis, and practice quality-control techniques. Students will conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students in Biotechnology I will study a variety of topics that include structures and functions of cells, nucleic acids, proteins, and genetics. Students must meet the 40% laboratory and fieldwork requirement. This course satisfies a high school science graduation requirement. Note: This course satisfies a science credit requirement for students on the Foundation High School Program.

Networking
8K930, 8K935 DC
TSDS PEIMS Code: 13027400 (NETWRK)
Grade Placement: 10–12, Credit: 1
Prerequisite: None.
Recommended Prerequisites: Principles of Information Technology, Computer Maintenance, and Computer Maintenance Lab.
In Networking, students will develop knowledge of the concepts and skills related to data networking technologies and practices to apply them to personal or career development. To prepare for success, students will have opportunities to reinforce, apply, and transfer knowledge and skills to a variety of settings and problems.

Engineering Design and Presentation II
8O700
TSDS PEIMS Code: 13036600 (ENGDSPR2)
Grade Placement: 11–12 Credit: 2
Prerequisites: Algebra I and Geometry, Principles of Applied Engineering or Engineering Design and Presentation I.
Engineering Design and Presentation II is a continuation of knowledge and skills learned in Engineering Design and Presentation I. Students enrolled in this course will demonstrate knowledge and skills of the design process as it applies to engineering fields using multiple software applications and tools necessary to produce and present working drawings, solid model renderings, and prototypes. Students will use a variety of computer hardware and software applications to complete assignments and projects. Through implementation of the design process, students will transfer advanced academic skills to component designs. Emphasis will be placed on using skills from ideation through prototyping.
Science, Technology, Engineering & Mathematics

Engineering Design and Problem Solving
8O710
TSDS PEIMS Code: 13037300 (ENGDPRS)
Grade Placement: 11–12, Credit: 1
Prerequisites: Algebra I and Geometry.
Recommended Prerequisites: two Science, Technology, Engineering, and Mathematics Career Cluster credits.
The Engineering Design and Problem-Solving course is the creative process of solving problems by identifying needs and then devising solutions. The solution may be a product, technique, structure, or process depending on the problem. Science aims to understand the natural world, while engineering seeks to shape this world to meet human needs and wants. Engineering design takes into consideration limiting factors or "design under constraint." Various engineering disciplines address a broad spectrum of design problems using specific concepts from the sciences and mathematics to derive a solution. The design process and problem solving are inherent to all engineering disciplines. This course satisfies a high school science graduation requirement. Students shall be awarded one credit for successful completion of this course.
Note: This course satisfies a science credit requirement for students on the Foundation High School Program.

Solid State Electronics
TSDS PEIMS Code: 13036900 (SOSTELEC)
Grade Placement: 11–12 Credit: 1
Prerequisite: AC/DC Electronics.
In Solid State Electronics, students will demonstrate knowledge and applications of advanced circuits, electrical measurement, and electrical implementation used in the electronics and computer industries. Students will transfer advanced academic skills to apply engineering principles and technical skills to troubleshoot, repair, and modify electronic components, equipment, and power electronic systems in a project-based environment. Additionally, students will explore career opportunities, employer expectations, and educational needs in the electronics industry. Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.

Digital Electronics
8O370/8O375 DC
TSDS PEIMS Code: 13037600 (DIGELC)
Grade Placement: 11–12, Credit: 1
Prerequisites: Algebra I and Geometry.
Digital Electronics is the study of electronic circuits that are used to process and control digital signals. In contrast to analog electronics, where information is represented by a continuously varying voltage, digital signals are represented by two discreet voltages or logic levels. This distinction allows for greater signal speed and storage capabilities and has revolutionized the world of electronics. Digital electronics is the foundation of modern electronic devices such as cellular phones, digital audio players, laptop computers, digital cameras, and high-definition televisions. The primary focus of Digital Electronics is to expose students to the design process of combinational and sequential logic design, teamwork, communication methods, engineering standards, and technical documentation. Note: This course satisfies a math credit requirement for students on the Foundation High School Program.
MST Project Lead the Way – Medical Intervention
8H792
TSDS PEIMS Code: N1302094 (MEDINT)
Grade Placement: 11-12, Credit: 1
Prerequisite: PLTW Principles of Biomedical Sciences and PLTW Human Body Systems
Description: Investigation of interventions involved in the prevention, diagnosis and treatment of
disease. Students follow the life of a fictitious family as they investigate how to prevent, diagnose,
and treat disease. Students explore how to detect and fight infection: screen and evaluate the
code in human DNA; evaluate cancer treatment options; and prevail when the organs of the body
begin to fail. Through real-world cases, students are exposed to a range of interventions related to
immunology, surgery, genetics, pharmacology, medical devices, and diagnostics.

MST Medical Microbiology
8H740 MST
TSDS PEIMS Code: 13020700 (MICRO)
Grade Placement: 11-12, Credit: 1
Prerequisites: Biology, Chemistry and Principles of Health Science
The Medical Microbiology course is designed to explore the microbial world, studying topics such
as pathogenic and non-pathogenic microorganisms, laboratory procedures, identifying
microorganisms, drug resistant organisms, and emerging diseases. Students must meet the 40%
laboratory and fieldwork requirement. This course satisfies a high school science graduation
requirement.
Note: This course satisfies a science credit requirement for students on the Foundation High
School Program.

MST Pathophysiology
8H770/8H775 DCMST
TSDS PEIMS Code: 13020800 (PATHO)
Grade Placement: 11-12, Credit: 1
Prerequisites: Biology, Chemistry and Principles of Health Science
The Pathophysiology course is designed for students to conduct laboratory and field
investigations, use scientific methods during investigations, and make informed decisions using
critical thinking and scientific problem solving. Students in Pathophysiology will study disease
processes and how humans are affected. Emphasis is placed on prevention and treatment of
disease. Students will differentiate between normal and abnormal physiology. Students should
know that some questions are outside the realm of science because they deal with phenomena
that are not scientifically testable. Note: This course satisfies a science credit requirement for
students on the Foundation High School Program.

MST Scientific Research & Design
8O713
TSDS PEIMS Code: 13037200 (SCIRD)
Grade Placement: 11-12, Credit: 1
Prerequisite: Biology, Chemistry, and IPC or Physics.
Scientific Research and Design is a broad-based course designed to allow districts and schools
considerable flexibility to develop local curriculum to supplement any program of study or coherent
sequence. The course has the components of any rigorous scientific or engineering program of
study from the problem identification, investigation design, data collection, data analysis,
formulation, and presentation of the conclusions. These components are integrated with the career
and technical education emphasis of helping students gain entry-level employment in high-skill,
high-wage jobs and/or continue their education. Students must meet the 40% laboratory and
fieldwork requirement. This course satisfies a high school science graduation requirement.
Students may take this course with different course content for a maximum of three credits. Note:
This course satisfies a science credit requirement for students on the Foundation High
School Program.
Science, Technology, Engineering & Mathematics

MST Project Lead the Way - Civil Engineering and Architecture
8O750 MST
TSDS PEIMS Code: N1303740
Grade Placement: 11–12, Credit: 1
Prerequisite: PLTW Principles of Engineering
Description: Students learn about various aspects of civil engineering and architecture and apply their knowledge to the design and development of residential and commercial properties and structures. In addition, students use 3D design software to design and document solutions for major course projects. Students communicate and present solutions to their peers and members of a professional community of engineers and architects.

MST Project Lead the Way – Aerospace Engineering
8O760 MST
TSDS PEIMS Code: N1303745
Grade Placement: 11–12, Credit: 1
Prerequisite: PLTW Introduction to Engineering Design
Description: This course propels students’ learning in the fundamentals of atmospheric and space flight. As they explore the physics of flight, students bring the concepts to life by designing an airfoil, propulsion system, and rockets. They learn basic orbital mechanics using industry-standard software. They also explore robot systems through projects such as remotely operated vehicles.

Cybersecurity Capstone
9O980, 8K982 DC GRCTC
TSDS PEIMS Code: 03580855
Grade Placement: 11–12, Credit: 1
Recommended Prerequisite: Principles of IT and/or Foundations of Cybersecurity
In the Cybersecurity Capstone course, students will develop the knowledge and skills needed to explore advanced concepts related to the ethics, laws, and operations of cybersecurity. Students will examine trends and operations of cyberattacks, threats, and vulnerabilities. Students will develop security policies to mitigate risks. The skills obtained in this course prepare students for additional study toward industry certification. A variety of courses are available to students interested in the cybersecurity field. Cybersecurity Capstone may serve as a culminating course in this field of study.

Engineering Design and Problem Solving
8O310/8O710 MST
TSDS PEIMS Code: 13037300 (ENGDPRS
Grade Placement: 11–12, Credit: 1
Prerequisites: Algebra I and Geometry.
Recommended Prerequisites: two Science, Technology, Engineering, and Mathematics Career Cluster credits.
The Engineering Design and Problem-Solving course is the creative process of solving problems by identifying needs and then devising solutions. The solution may be a product, technique, structure, or process depending on the problem. Science aims to understand the natural world, while engineering seeks to shape this world to meet human needs and wants. Engineering design takes into consideration limiting factors or “design under constraint.” Various engineering disciplines address a broad spectrum of design problems using specific concepts from the sciences and mathematics to derive a solution. The design process and problem solving are inherent to all engineering disciplines. This course satisfies a high school science graduation requirement. Students shall be awarded one credit for successful completion of this course. Note: This course satisfies a science credit requirement for students on the Foundation High School Program.
Computer Science III
91824 (H)
TSDS PEIMS Code: 03580350
Grade Placement: 11-12, Credit: 1
Prerequisite: AP Computer Science A
Computer Science III will foster students’ creativity and innovation by presenting opportunities to design, implement, and present meaningful programs through a variety of media. Through data analysis, students will identify task requirements, plan search strategies, and use computer science concepts to access, analyze, and evaluate information needed to solve problems. By using computer science knowledge and skills that support the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create solutions, and evaluate the results. Students will gain an understanding of advanced computer science data structures through the study of technology operations, systems, and concepts in a collaborative learning environment.

Scientific Research and Design
TSDS PEIMS Code: 13037200 (SCRID)
Grade Placement: 11–12, Credit: 1
Prerequisite: Biology, Chemistry, Integrated Physics, and Chemistry (IPC), or Physics. Scientific Research and Design is a broad-based course designed to allow districts and schools considerable flexibility to develop local curriculum to supplement any program of study or coherent sequence. The course has the components of any rigorous scientific or engineering program of study from the problem identification, investigation design, data collection, data analysis, formulation, and presentation of the conclusions. These components are integrated with the career and technical education emphasis of helping students gain entry-level employment in high-skill, high-wage jobs and/or continue their education. Students must meet the 40% laboratory and fieldwork requirement. This course satisfies a high school science graduation requirement. Students may take this course with different course content for a maximum of three credits.
Note: This course satisfies a science credit requirement for students on the Foundation High School Program.

MST Project Lead the Way – Biomedical Innovations
8H794 MST
TSDS PEIMS Code: N1302095
Grade Placement: 11-12, Credit: 1
Prerequisite: PLTW Principles of Biomedical Sciences, PLTW Human Body Systems, and PLTW Medical Interventions
Description: This is the final course of the PLTW Biomedical Science sequence, students build on the knowledge and skills gained from previous courses to design innovative solutions for the most pressing health challenges of the 21st century. Students address topics ranging from public health and biomedical engineering to clinical medicine and physiology. They have the opportunity to work on an independent project with a mentor or advisor from a university, medical facility or research institution.

MST Project Lead the Way – Engineering Design & Development
8O780 MST
TSDS PEIMS Code: N1303749
Grade Placement:11-12, Credit:1
Prerequisite: PLTW Principles of Engineering
Description: The knowledge and skills students acquire throughout PLTW Engineering come together in EDD as they identify an issue and then research, design, and test a solution, ultimately presenting their solution to a panel of engineers. Students apply the professional skills they have developed to document a design process to standards, completing EDD ready to take on any post-secondary program or career.
Science, Technology, Engineering & Mathematics

Practicum in Information Technology – Cybersecurity
8O986, 8O988 DC GRCTC
TSDS PEIMS Code: 13028000 (PRACIT1)
Grade Placement: 11-12, Credit: 2
Prerequisite: A minimum of two high school information technology (IT) courses.
In the Practicum in Information Technology, students will gain advanced knowledge and skills in the application, design, production, implementation, maintenance, evaluation, and assessment of products, services, and systems. Knowledge and skills in the proper use of analytical skills and application of IT concepts and standards are essential to prepare students for success in a technology-driven society. Critical thinking, IT experience, and product development may be conducted in a classroom setting with an industry mentor, as an unpaid or paid internship, as part of a capstone project, or as career preparation.

Practicum in Science, Technology, Engineering, and Mathematics
8O410 SGHS
TSDS PEIMS Code:13037405 (EXPRSTEM1) 1
Grade Placement: 11-12, Credit: 2
Prerequisites: Algebra I and Geometry.
Recommended Prerequisites: two Science, Technology, Engineering, and Mathematics (STEM) Career Cluster credits.
Practicum in STEM is designed to give students supervised practical application of previously studied knowledge and skills. Practicum experiences can occur in a variety of locations appropriate to the nature and level of experience.

Practicum in Science, Technology, Engineering, and Mathematics - Engineering or Extended Practicum in STEM
8O970/8O972 Extended GRCTC
TSDS PEIMS Code: 13037400 (2 credit) or 13037405 (3 credit)
Grade Placement: 11-12, Credit: 2 or 3
Prerequisites: Algebra I and Geometry.
Recommended Prerequisites: two Science, Technology, Engineering, and Mathematics (STEM Career Cluster credits.
Extended Practicum in STEM is designed to give students supervised practical application of previously studied knowledge and skills. Practicum experiences can occur in a variety of locations appropriate to the nature and level of experience. Students shall be awarded one credit for successful completion of this course.