

# UTPB

## STEM Academy

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High School  
Planning Packet

2018—2019

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# UTPB STEM Academy High School Course Plan

Core Discipline	Distinguished Level of Achievement with STEM Endorsement - 26 Credits
<b>English</b> 4 credits	<b>Four credits must consist of:</b> <ul style="list-style-type: none"> <li>• English I</li> <li>• English II</li> <li>• English III or Dual Credit equivalent 1301 &amp; 1302</li> <li>• Advanced English Course- English IV or Dual Credit course equivalent 2322 &amp; 2323</li> </ul>
<b>Mathematics</b> 4 credits	<b>Four credits must consist of:</b> <ul style="list-style-type: none"> <li>• Algebra I</li> <li>• Geometry</li> <li>• Algebra II</li> <li>• Financial Math or</li> <li>• Pre-Calculus or Dual Credit course equivalent 2412 &amp; 2413</li> <li>• Dual Credit course equivalent based on degree plan</li> </ul>
<b>Science</b> 4 credits	<b>Four credits must consist of:</b> <ul style="list-style-type: none"> <li>• Biology</li> <li>• Chemistry</li> <li>• Physics or <b>Principals of Technology</b></li> <li>• Local Science course such as Earth and Space or Astronomy</li> <li>• Dual Credit course equivalent based on degree plan</li> </ul>
<b>Social Studies &amp; Economics</b> 3-4 credits	<b>Three credits must consist of:</b> <ul style="list-style-type: none"> <li>• World Geography</li> <li>• World History</li> <li>• US History or Dual Credit course equivalent 1301 &amp; 1302</li> </ul> <b>Two one-half credits must consist of:</b> <ul style="list-style-type: none"> <li>• US Government or Dual Credit course equivalent PoliSci 2305 &amp; 2306</li> <li>• Economics</li> </ul>
<b>Physical Education</b> 1 credit	<b>One credit from the following:</b> <ul style="list-style-type: none"> <li>• Team or Individual Sports PE</li> <li>• Dual credit course equivalent through <b>Odessa College Kin 1106 &amp; Kin 1164</b></li> </ul>
<b>Language Other Than English (LOTE)</b> 2-3 credits	<b>Two-Three credits must consist of:</b> <ul style="list-style-type: none"> <li>• Computer Science 1</li> <li>• Computer Science 2</li> <li>• Computer Science 3 * Performance Acknowledgement</li> </ul>
<b>Elective/Endorsement</b> 7	<b>Seven from the following:</b> <ul style="list-style-type: none"> <li>• Engineering</li> <li>• Biomedical Science</li> <li>• Computer Science</li> <li>• Gateway PLTW</li> <li>• Gifted &amp; Talented Interdisciplinary Studies/Mentor Seminar</li> <li>• Gifted &amp; Talented Independent Study Mentorship</li> <li>• Sports</li> <li>• Fine Arts or Dual Credit course equivalent 1301</li> <li>• Dual Credit course equivalent (Soc, Leadership, Psych, PoliSci, Speech)</li> </ul>
<b>Endorsements</b>	<b>Students entering 9<sup>th</sup> grade must choose and complete curriculum requirements from one of the following endorsements:</b> <ul style="list-style-type: none"> <li>• STEM</li> <li>• Multidisciplinary Studies</li> </ul>
<b>State Assessment Requirements For Graduation</b>	<b>Students must satisfactorily pass following STAAR End-of-Course assessment (EOC).</b> <ul style="list-style-type: none"> <li>• English I</li> <li>• English II</li> <li>• Algebra I</li> </ul>

	<ul style="list-style-type: none"> <li>• Biology</li> <li>• US History</li> </ul>
<b>Performance Acknowledgements</b>	<p><b>Outstanding Performance in</b></p> <ol style="list-style-type: none"> <li>1. Dual Credit</li> <li>2. Bilingualism</li> <li>3. PSAT, ACT or SAT</li> <li>4. Business or industry certificate</li> </ol> <p>* see Performance Acknowledgement Criteria</p>

## Foundation Graduation Program

Foundation High School Program – 22 Credits	Foundation High School Program + Endorsements – 26 Credits
<b>4 English Credits: ELA, I, II, III, one advanced English course</b>	<b>4 English Credits:</b> ELA, I, II, III, one advanced English course
<b>3 Math Credits: Algebra I, Geometry, one credit in any authorized math course</b>	<b>4 Math Credits:</b> Algebra I, Geometry, two credits in any authorized advanced math course
<b>3 Science Credits: Biology, two credits in any authorized advanced science course</b>	<b>3 or 4 Science Credits:</b> Biology, Chemistry, Physics, Additional science credit
<b>3 Social Studies Credits: World Geography or World History, U.S. History, Government, Economics</b>	<b>4 Social Studies Credits:</b> World Geography or World History, U.S. History, Government, Economics
<b>2 World Language or Computer Programming Credits</b>	<b>2 or 3 World Language or Computer Programming Credits</b>
<b>1 Physical Education Credit</b>	<b>1 Physical Education Credit</b>
<b>1 Fine Arts Credit</b>	<b>1 Fine Arts Credit</b>
<b>5 Elective Credits</b>	<b>7 Elective Credits</b>

## STEM (Science, Technology, Engineering and Math)

**Students may earn a STEM endorsement by selecting and completing the requirements from among these 5 options.**

*Note: Algebra II, Chemistry and Physics are required for the STEM endorsement regardless of the option the student selects from below.*

### **Option 1: Computer Science**

Students take 4 computer science courses

- CS1 (CTE)
- CS2
- Robotics 1 (CTE) or Advanced Computer Science 1 DC
- Robotics 2 (CTE) or Advanced Computer Science 1 DC or Computer Science 2 DC

### **Option 2: CTE Courses (PLTW or Engineering Your World)**

Students earn four CTE credits by taking at least two courses in the same cluster

- Biomedical (PLTW)– four courses (see course descriptions)
- Engineering (Engineering your world)– four courses (see course descriptions)

### **Option 3: Math**

Students take five math courses

- Algebra I
- Geometry
- Algebra II
- Two upper level courses

### **Option 4: Science**

Students take five science courses

- Biology
- Chemistry
- Physics
- Two upper level courses through DC

### **Option 5: Combination**

## Multidisciplinary Studies

**Students may earn a Multidisciplinary Studies endorsement by selecting and completing the requirements from among these options.**

**Option 1: Four by Four**

**Option 2: Dual Credit**

**Option 3: CTE**

## Dual Credit Program

# Admittance Requirements

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### Step 1: TSI Student Requirement

Reading	351
Math	350
Writing	5 on essay OR 4 with a 340 on multiple choice

(R/W for all non-math courses; M for all math courses)

### Score Exemptions

ACT	SAT*	STAAR (EOC)
23 COMPOSITE	480 EBRW**	4000 English II
19 English	530 Math	4000 Algebra I
19 Math	*Must meet both sections	
*Must meet all 3 sections	**English Based Reading/Writing	

Counselors must submit all required documentation below before applications are processed:

1. TSI (or exemption) scores
2. High school transcript



## Dual Credit


Area	Core Curriculum Course Option	Aligned High School Courses
<b>English</b>	*ENGL 1301 : Composition I	Eng 3 part 1
	*ENGL 1302: Composition II	Eng 3 part 2
	*ENGL 2322: British Literature to 1800	Advanced English part 1
	*ENGL 2323: British Literature since 1800	Advanced English part 2
	*ENGL 2327: American Literature to 1865	Advanced English part 1
	ENGL 2328: American Literature since 1865	Advanced English part 2
<b>History</b>	*HIST 1301: US to 1877	US History part 1
	*HIST 1302: US since 1877	US History part 2
	PLSC 2305 American National Politics	Government
	PLSC 2306 State and Local Politics	Electives
<b>Fine Arts</b>	*MUSC 1301: Jazz, Pop, and Rock	Fine Arts
	ART 1301: Art Appreciation	Fine Arts
<b>Social/Behavioral</b>	*PSYC 1301: Intro to Psychology	Elective
	*SOC 1301: Intro to Sociology	Elective
	CRIM 2336: Intro to Criminology	Elective
<b>Speech</b>	COMM 1315: Intro to Public Speaking	Elective
<b>Mathematics</b>	MATH 1314: College Algebra	Adv Math
	MATH 2412: Pre-Calculus	Adv Math
	MATH 2413: Calculus I	Adv Math
<b>Language Other Than English</b>	SPAN 1411: Beginning Spanish I	LOTE part 1
	SPAN 1412: Beginning Spanish II	LOTE part 2
	SPAN 2311: Second Year Spanish I	Adv LOTE part 1
	SPAN 2312: Second Year Spanish II	Adv LOTE part 2
	ENGR 1322: Engineering Design & Problem Solving	Elective

## STEM 4-Year Plan

Grade	8 <sup>th</sup>	Freshman 9 <sup>th</sup>	Sophomore 10 <sup>th</sup>	Junior 11 <sup>th</sup>	Senior 12 <sup>th</sup>
<b>English</b>	8 <sup>th</sup> ELA →  English I	English I → or English II	English II or DC 1301 & 1302	English III or DC 1301 & 1302 or DC 2322 & 2323	Advanced English or DC 1301 & 1302 or DC 2322 & 2323
<b>Mathematics</b>	8 <sup>th</sup> Math  Algebra I	Algebra I or Geometry	Geometry or Algebra II	Algebra II or PreCal or DC 2312 & 2313	Financial Mathematics or PreCal or DC 2412 & 2313 or DC based on degree plan
<b>Science</b>	8 <sup>th</sup> Grade Science	Biology	Chemistry	Physics	Local Science- Earth and Space or Astronomy  Or



					DC based on degree plan
<b>Social Studies</b>	U.S. History	W Geography	W. History	U.S. History or DC US History 1301 & 1302	Government & Economics  Or Economics & DC PLSC 2305
<b>Physical Ed</b>	PE	Individual Sports  or DC equivalent OC Kin 1106 & Kin 1164			
<b>LOTE</b>		Comp Sci I  or Comp Sci II	Comp Sci II  or Comp Sci III	Comp Sci III  or DC CS 1	
<b>Fine Arts</b>		DC Music 1301  or Art			
<b>Electives/ Endorsements</b>	Med Det				
<b>Computer Science</b>	Flight & Space	Comp Sci 1	Comp Sci 2	Robotics 1 or DC CS 1	Robotics 2  or

	Science of Tech				DC CS1 or DC SC2
<b>Engineering</b>	Envir Science				
	Auto & Rob	Engineering Your World 1	Engineering Your World 2	Engineering Your World 3	Engineering Your World 4
<b>Biomedical Sciences</b>	Des & Mod	Principals of Biomed Science	Human Body Systems	Medical Interventions	Biomedical Innovation
<b>Speech (elective)</b>		DC COMM 1315			
<b>Optional</b>				DC courses based on degree plan or Industry Internships	DC courses based on degree plan or Industry Internships
<b>Total Earned</b>	0-3				



## Sample STEM Occupations by Emphasis

Below are sample occupations under the STEM endorsement. Not all STEM-related occupations are included here (there are hundreds), and some of those listed below may fall under other endorsements as well. Talk to your school Counselor for more information.

Science		
Astronomers	Biochemists/Biophysicists	BioMedical Researcher
Cellular Biologists	Chemists	Environmental Scientists
Food Scientists	Forensic Scientists	Foresters
Geneticists	Hydrologists	Meteorologists
Technology		
App Developers	Computer Engineers	Computer Hardware Engineer
Computer Network Architects	Computer Network Specialists	Computer Programmers
Computer Research Scientists	Computer Systems Analyst	Database Administrators
Graphic Designers	Information Security Analyst	Multi-Media Animators
Engineering		
Aerospace Engineers	Automotive Engineers	Chemical Engineers
Civil Engineers	Drafters	Electrical Engineers
Industrial Engineers	Marine Architects	Mechanical Engineers
Mining Engineers	Nuclear Engineers	Petroleum Engineers
Mathematics		
Accountant	Actuaries	Auditors
Biostatisticians	Budget Analysts	Cartographers
Credit Analysts	Economists	Financial Managers
Loan Officers	Mathematical Technicians	Mathematicians
Health Science		
Anesthesiologists	Chiropractors	Dental Hygienists
Family Practitioner	Health Service Manager	Medical Lab Technician
Medical Records Technician	Medical Sonographers	Nutritionists
Optometrists	Pharmacists	Physical Therapists

## **UTPB STEM GPA SCALES**

	Core Subjects	PLTW	Dual Credit
Numeric	4.0 Scale	5.0 Scale	6.0 Scale
97-100	4.0	5.0	6.0
93-96	3.75	4.75	6.0
90-92	3.5	4.5	6.0
85-89	3.25	4.25	5.0
80-84	3.0	4.0	5.0
75-79	2.5	3.5	4.0
70-74	2.0	3.0	4.0
65-69	1.5	2.5	3.0
60-64	1.0	2.0	3.0
0-59	0.0	0.0	0.0

### Example (High School Transcript):

COURSE	NUMERIC	UNWEIGHTED GRADE POINTS FROM ABOVE	WEIGHTED GRADE POINTS FROM ABOVE	CREDITS	UNWEIGHTED GRADE POINTS X CREDITS	WEIGHTED GRADE POINTS X CREDITS
Algebra I	98	4.0	4.0	1	4.0	4.0
World History	89	3.25	3.25	1	3.25	3.25
Biology	90	3.5	3.5	1	3.5	3.5
English	78	2.5	2.5	1	2.5	2.5
Computer Science (CSP)	80	3.0	4.0	1	3.0	4.0
Intro to Engineering (IED)	85	3.25	4.25	1	3.25	4.25
Dual Credit Art	B	3.0	5.0	1	3.0	5.0
<b>TOTALS</b>				<b>7</b>	<b>22.5</b>	<b>26.5</b>

22.5

7

3.21

Total Unweighted Grade Points / Total Credit Hours = Unweighted GPA

26.5

7

3.79

Total Weighted Grade Points / Total Credit Hours = Weighted GPA

# Course Description

## English I

**Offered in: 8-9**

**Credits: 1**

**Prerequisite: 8<sup>th</sup> Grade Reading STAAR**

The English Language Arts and Reading Texas Essential Knowledge and Skills (TEKS) are organized into the following strands: Reading, where students read and understand a wide variety of literary and informational texts; Writing, where students compose a variety of written texts with a clear controlling idea, coherent organization, and sufficient detail; Research, where students are expected to know how to locate a range of relevant sources and evaluate, synthesize, and present ideas and information; Listening and Speaking, where students listen and respond to the ideas of others while contributing their own ideas in conversations and in groups; and Oral and Written Conventions, where students learn how to use the oral and written conventions of the English language in speaking and writing. The standards are cumulative--students will continue to address earlier standards as needed while they attend to standards for their grade. In English I, students will engage in activities that build on their prior knowledge and skills in order to strengthen their reading, writing, and oral language skills. Students should read and write on a daily basis.

## English II

**Offered in: 9-10**

**Credits: 1**

**Prerequisite: English I**

The English Language Arts and Reading Texas Essential Knowledge and Skills (TEKS) are organized into the following strands: Reading, where students read and understand a wide variety of literary and informational texts; Writing, where students compose a variety of written texts with a clear controlling idea, coherent organization, and sufficient detail; Research, where students are expected to know how to locate a range of relevant sources and evaluate, synthesize, and present ideas and information; Listening and Speaking, where students listen and respond to the ideas of others while contributing their own ideas in conversations and in groups; and Oral and Written Conventions, where students learn how to use the oral and written conventions of the English language in speaking and writing. The standards are cumulative--students will continue to address earlier standards as needed while they attend to standards for their grade. In English II, students will engage in activities that build on their prior knowledge and skills in order to strengthen their reading, writing, and oral language skills. Students should read and write on a daily basis.

### **English III**

**Offered in: 10-11**

**Credits: 1**

**Prerequisite: English II**

The English Language Arts and Reading Texas Essential Knowledge and Skills (TEKS) are organized into the following strands: Reading, where students read and understand a wide variety of literary and informational texts; Writing, where students compose a variety of written texts with a clear controlling idea, coherent organization, and sufficient detail; Research, where students are expected to know how to locate a range of relevant sources and evaluate, synthesize, and present ideas and information; Listening and Speaking, where students listen and respond to the ideas of others while contributing their own ideas in conversations and in groups; and Oral and Written Conventions, where students learn how to use the oral and written conventions of the English language in speaking and writing. The standards are cumulative--students will continue to address earlier standards as needed while they attend to standards for their grade. In English III, students will engage in activities that build on their prior knowledge and skills in order to strengthen their reading, writing, and oral language skills. Students should read and write on a daily basis.

### **English IV**

**Offered in: 11-12**

**Credits: 1**

**Prerequisite: English III**

The English Language Arts and Reading Texas Essential Knowledge and Skills (TEKS) are organized into the following strands: Reading, where students read and understand a wide variety of literary and informational texts; Writing, where students compose a variety of written texts with a clear controlling idea, coherent organization, and sufficient detail; Research, where students are expected to know how to locate a range of relevant sources and evaluate, synthesize, and present ideas and information; Listening and Speaking, where students listen and respond to the ideas of others while contributing their own ideas in conversations and in groups; and Oral and Written Conventions, where students learn how to use the oral and written conventions of the English language in speaking and writing. The standards are cumulative--students will continue to address earlier standards as needed while they attend to standards for their grade. In English IV, students will engage in activities that build on their prior knowledge and skills in order to strengthen their reading, writing, and oral language skills. Students should read and write on a daily basis.

### **Algebra 1**

**Offered in: 8-9**

**Credits: 1**

**Prerequisite: Grade 8 Mathematics**

In Algebra I, students will build on the knowledge and skills for mathematics in Grades 6-8, which provide a foundation in linear relationships, number and operations, and proportionality. Students will study linear, quadratic, and exponential functions and their related transformations, equations, and associated solutions. Students will connect functions and their associated solutions in both

mathematical and real-world situations. Students will use technology to collect and explore data and analyze statistical relationships. In addition, students will study polynomials of degree one and two, radical expressions, sequences, and laws of exponents. Students will generate and solve linear systems with two equations and two variables and will create new functions through transformations.

## **Geometry**

**Offered in: 9-10**

**Credits: 1**

**Prerequisite: Algebra 1**

In Geometry, students will build on the knowledge and skills for mathematics in Kindergarten-Grade 8 and Algebra I to strengthen their mathematical reasoning skills in geometric contexts. Within the course, students will begin to focus on more precise terminology, symbolic representations, and the development of proofs. Students will explore concepts covering coordinate and transformational geometry; logical argument and constructions; proof and congruence; similarity, proof, and trigonometry; two- and three-dimensional figures; circles; and probability. Students will connect previous knowledge from Algebra I to Geometry through the coordinate and transformational geometry strand. In the logical arguments and constructions strand, students are expected to create formal constructions using a straight edge and compass. Though this course is primarily Euclidean geometry, students should complete the course with an understanding that non-Euclidean geometries exist. In proof and congruence, students will use deductive reasoning to justify, prove and apply theorems about geometric figures. Throughout the standards, the term "prove" means a formal proof to be shown in a paragraph, a flow chart, or two-column formats. Proportionality is the unifying component of the similarity, proof, and trigonometry strand. Students will use their proportional reasoning skills to prove and apply theorems and solve problems in this strand. The two- and three-dimensional figure strand focuses on the application of formulas in multi-step situations since students have developed background knowledge in two- and three-dimensional figures. Using patterns to identify geometric properties, students will apply theorems about circles to determine relationships between special segments and angles in circles. Due to the emphasis of probability and statistics in the college and career readiness standards, standards dealing with probability have been added to the geometry curriculum to ensure students have proper exposure to these topics before pursuing their post-secondary education.

## **Algebra II**

**Offered in: 10-11**

**Credits: 1**

**Prerequisite: Algebra 1**

In Algebra II, students will build on the knowledge and skills for mathematics in Kindergarten-Grade 8 and Algebra I. Students will broaden their knowledge of quadratic functions, exponential functions, and systems of equations. Students will study logarithmic, square root, cubic, cube root, absolute value, rational functions, and their related equations. Students will connect functions to their inverses and associated equations and solutions in both mathematical and real-world situations. In addition, students will extend their knowledge of data analysis and numeric and algebraic methods.



## **Precalculus**

**Offered in: 11-12**

**Credits: 1**

**Prerequisite: Algebra I, Geometry, and Algebra II**

Precalculus is the preparation for calculus. The course approaches topics from a function point of view, where appropriate, and is designed to strengthen and enhance conceptual understanding and mathematical reasoning used when modeling and solving mathematical and real-world problems. Students systematically work with functions and their multiple representations. The study of Precalculus deepens students' mathematical understanding and fluency with algebra and trigonometry and extends their ability to make connections and apply concepts and procedures at higher levels. Students investigate and explore mathematical ideas, develop multiple strategies for analyzing complex situations, and use technology to build understanding, make connections between representations, and provide support in solving problems.

## **Biology**

**Offered in: 9**

**Credits: 1**

**Prerequisite: none**

In Biology, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students in Biology study a variety of topics that include: structures and functions of cells and viruses; growth and development of organisms; cells, tissues, and organs; nucleic acids and genetics; biological evolution; taxonomy; metabolism and energy transfers in living organisms; living systems; homeostasis; and ecosystems and the environment.

## **Chemistry**

**Offered in: 10**

**Credits: 1**

**Prerequisite: one unit of high school science and Algebra I**

In Chemistry, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study a variety of topics that include characteristics of matter, use of the Periodic Table, development of atomic theory and chemical bonding, chemical stoichiometry, gas laws, solution chemistry, thermochemistry, and nuclear chemistry. Students will investigate how chemistry is an integral part of our daily lives.

## **Physics**

**Offered in: 11**

**Credits: 1**

**Prerequisite:**

In Physics, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study a variety of topics that include: laws of motion; changes within physical systems and conservation of energy and momentum; forces; thermodynamics; characteristics and behavior of waves; and atomic, nuclear, and quantum physics. Students who successfully complete Physics will acquire factual knowledge within a conceptual framework, practice experimental design and interpretation, work collaboratively with colleagues, and develop critical thinking skills.

**World Geography****Offered in: 9****Credits: 1****Prerequisite: none**

In World Geography Studies, students examine people, places, and environments at local, regional, national, and international scales from the spatial and ecological perspectives of geography. Students describe the influence of geography on events of the past and present with emphasis on contemporary issues. A significant portion of the course centers around the physical processes that shape patterns in the physical environment; the characteristics of major landforms, climates, and ecosystems and their interrelationships; the political, economic, and social processes that shape cultural patterns of regions; types and patterns of settlement; the distribution and movement of the world population; relationships among people, places, and environments; and the concept of region. Students analyze how location affects economic activities in different economic systems. Students identify the processes that influence political divisions of the planet and analyze how different points of view affect the development of public policies. Students compare how components of culture shape the characteristics of regions and analyze the impact of technology and human modifications on the physical environment. Students use problem-solving and decision-making skills to ask and answer geographic questions.

**US History****Offered in: 10****Credits: 1****Prerequisite:**

In United States History Studies Since 1877, which is the second part of a two-year study that begins in Grade 8, students study the history of the United States from 1877 to the present. The course content is based on the founding documents of the U.S. government, which provide a framework for its heritage. Historical content focuses on the political, economic, and social events and issues related to industrialization and urbanization, major wars, domestic and foreign policies, and reform movements, including civil rights. Students examine the impact of geographic factors on major events and eras and analyze their causes and effects. Students examine the impact of constitutional issues on American society, evaluate the dynamic relationship of the three branches of the federal government, and analyze efforts to expand the democratic process. Students describe the relationship between the arts and popular culture and the times during which they were created. Students analyze the impact of technological innovations on American life. Students use critical-thinking skills and a variety of primary and secondary source material to explain and apply

different methods that historians use to understand and interpret the past, including multiple points of view and historical context.

## **World History**

**Offered in: 10-11**

**Credits: 1**

### **Prerequisite: none**

World History Studies is a survey of the history of humankind. Due to the expanse of world history and the time limitations of the school year, the scope of this course should focus on "essential" concepts and skills that can be applied to various eras, events, and people within the standards in subsection (c) of this section. The major emphasis is on the study of significant people, events, and issues from the earliest times to the present. Traditional historical points of reference in world history are identified as students analyze important events and issues in western civilization as well as in civilizations in other parts of the world. Students evaluate the causes and effects of political and economic imperialism and of major political revolutions since the 17th century. Students examine the impact of geographic factors on major historic events and identify the historic origins of contemporary economic systems. Students analyze the process by which constitutional governments evolved as well as the ideas from historic documents that influenced that process. Students trace the historical development of important legal and political concepts. Students examine the history and impact of major religious and philosophical traditions. Students analyze the connections between major developments in science and technology and the growth of industrial economies, and they use the process of historical inquiry to research, interpret, and use multiple sources of evidence.

## **Government**

**Offered in: 11**

**Credits: 1**

### **Prerequisite:**

In United States Government, the focus is on the principles and beliefs upon which the United States was founded and on the structure, functions, and powers of government at the national, state, and local levels. This course is the culmination of the civic and governmental content and concepts studied from Kindergarten through required secondary courses. Students learn major political ideas and forms of government in history. A significant focus of the course is on the U.S. Constitution, its underlying principles and ideas, and the form of government it created. Students analyze major concepts of republicanism, federalism, checks and balances, separation of powers, popular sovereignty, and individual rights and compare the U.S. system of government with other political systems. Students identify the role of government in the U.S. free enterprise system and examine the strategic importance of places to the United States. Students analyze the impact of individuals, political parties, interest groups, and the media on the American political system, evaluate the importance of voluntary individual participation in a constitutional republic, and analyze the rights guaranteed by the U.S. Constitution. Students examine the relationship between governmental policies and the culture of the United States. Students identify examples of government policies that encourage scientific research and use critical-thinking skills to create a product on a contemporary government issue.

## **Sociology**

**Offered in: 10**

**Credits: 1**

**Prerequisite: none**

Sociology, an elective course, is an introductory study in social behavior and organization of human society. This course will describe the development of the field as a social science by identifying methods and strategies of research leading to an understanding of how the individual relates to society and the ever changing world. Students will also learn the importance and role of culture, social structure, socialization, and social change in today's society.

**PE**

**Offered in: 9-12**

**Credits: 1**

**Prerequisite: none**

Physical Education, students acquire movement knowledge and skills that provide the foundation for enjoyment, continued social development through physical activity, and access to a physically-active lifestyle. The student exhibits a physically-active lifestyle and understands the relationship between physical activity and health throughout the lifespan. Students in Individual Sports are expected to participate in a wide range of individual sports that can be pursued for a lifetime. The continued development of health-related fitness and the selection of individual sport activities that are enjoyable is a major objective of this course.

**Computer Science I**

**Offered in: 8 or 9**

**Credits: 1**

**Prerequisite: Algebra 1**

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.

## **Computer Science II**

**Offered in: 9 or 10**

**Credits: 1**

**Prerequisite: Algebra I and Computer Science I**

Computer Science II 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 computer science through the study of technology operations, systems, and concepts.

## **Computer Science II**

**Offered in: 10 or 11**

**Credits: 1**

**Prerequisite: Algebra I and Computer Science II**

Computer Science III 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 advanced computer science data structures through the study of technology operations, systems, and concepts.

## **Public Speaking**

**Offered in: 10 or 11**

**Credits: 1**

**Prerequisite: none**

In order to have full participation in the civic process, students must have a good understanding of public dialogue. Students must learn the concepts and skills related to preparing and presenting public messages and to analyzing and evaluating the messages of others. Within this process,

students will gain skills in reading, writing, speaking, listening, and thinking and will examine areas such as invention, organization, style, memory, and delivery.

### **Principles of Biomedical Sciences**

**Offered in: 9**

**Credits: 1**

**Prerequisite: none**

In the introductory course of the PLTW Biomedical Science program, students explore concepts of biology and medicine to determine factors that led to the death of a fictional person. While investigating the case, students examine autopsy reports, investigate medical history, and explore medical treatments that might have prolonged the person's life. The activities and projects introduce students to human physiology, basic biology, medicine, and research processes while allowing them to design their own experiments to solve problems.

### **Human Body Systems**

**Offered in: 10**

**Credits: 1**

**Prerequisite: Principles of Biomedical**

Students examine the interactions of human body systems as they explore identity, power, movement, protection, and homeostasis in the body. Exploring science in action, students build organs and tissues on a skeletal Maniken®; 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.

### **Medical Interventions**

**Offered in: 11**

**Credits: 1**

**Prerequisite: Human Body Systems**

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.

## **Medical Innovation**

**Offered in: 12**

**Credits: 1**

**Prerequisite: Medical Interventions**

In 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.