Dayton Regional STEM School
Grades 9-12
Course Descriptions

Our Mission

The Mission of the Dayton Regional STEM School is to prepare students with the skills necessary to compete in the global economy while nurturing in our young people the same enthusiasm for discovery, invention, and application that launched the vision for powered flight.

This Mission is inspired by the Dayton region's history, and is aimed at ensuring our community's future success.

Project Based Learning

At DRSS, we focus on using Project Based Learning in our curriculum. This teaching practice involves students learning through projects that address real-world problems and challenges. Throughout their education at DRSS, students will routinely learn the content through the process of completing projects. We rely on our large group of local partners to assist in providing authentic problems to allow our students the opportunity to give back to the community.

Five Qualities

In addition to our regular instruction, we teach, practice, model and assess the following “five important qualities” at the Dayton Regional STEM School:

PERSISTENCE – INQUIRY – COMMUNICATION – CREATIVITY – COLLABORATION

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Minimum Graduation Requirements

In order to receive a diploma from the Dayton Regional STEM School, students must earn a total of 24 credits as described below.

4 credits of mathematics
4 credits of laboratory sciences
4 credits of language arts
3 credits of social studies
3 credits of foreign language
1 credit of fine arts
½ credit of wellness
½ credit of fitness
½ credit of internship
3 ½ credits of electives

24 Total Credits

**30 hours of community service required during the senior year*

9th Grade Courses

Math:

Algebra 1 (1 credit)

Students closely examine a variety of functions in this course, and study methods for solving problems involving those functions. These functions include linear, quadratic, and exponential. Students study connections between the graphical, numerical (table), and symbolic (equation) representations of each of these functions. Students apply representations to real life situations to solve problems about the situations. They use data to create models to solve problems and predict outcomes. Students often work in cooperative groups to participate in inquiry learning. Students are given carefully created problems and work together to explore the underlying mathematics.

Geometry/Honors Geometry (1 credit)

Geometry is the second course in a sequence of college preparatory mathematics courses. Key concepts addressed in the course are: transformations and symmetry; relationships between figures (such as similarity and congruence); properties of plane figures (such as equal or perpendicular sides or diagonals); measurements of plane figures (such as area, perimeter, and angle measure); measurements of three-dimensional shapes; tools for analyzing an measuring shapes (such as the Pythagorean Theorem, trigonometric ratios, and coordinate geometry); investigation and proof; geometric construction; algebra; and probability. The course is structured around problems and investigations that build spatial visualization skills, conceptual understanding of geometry topics, and an awareness of connections between different ideas. Students often work in cooperative groups to participate in inquiry learning. Students are given carefully created problems and work together to explore the underlying mathematics. Honors Geometry students will cover the same topics but will look more deeply at many of these topics. Honors students will be expected to write and use mathematical arguments at a higher level of rigor.

Science:

Engineering Design/Honors Engineering Design (1 credit)

Engineering Design (ED) is a high school level course that is appropriate for students who are interested in design and engineering. The major focus of the ED course is to expose students to design process, research and analysis, teamwork, communication methods, global and human impacts, engineering and manufacturing standards, and technical

documentation. ED gives students the opportunity to develop skills and understanding of course concepts through activity-, problem-, and project-based learning. Students will employ engineering and scientific concepts in the solution of engineering design problems. In addition, students use Autodesk Inventor 3D solid modeling design software package to help them design solutions to solve proposed problems. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges that increase in difficulty throughout the course. Students will also learn how to document their work in an engineering notebook, and communicate their solutions to their peers and members of the professional community. In addition, students will learn the fundamentals of 3D printing, as well as laser cutting and vinyl laser printing. They will propose various solutions to problems or issues in their lives, and print or laser cut solutions after a thorough use and practice of the design process.
Students in Honors Engineering Design engage in all the standard curriculum, but also participate in the Science Fair process. The student chooses their topic in whatever scientific discipline they like, and with the help of a mentor design and conduct an experiment, or do an engineering project. All data is collected by the end of the first semester, and students begin preparing for the school science fair in February.

Language Arts:

Language Arts 9 (1 credit)

The ninth-grade integrated language arts course is a series of units that incorporate the six components of language arts – reading, writing, speaking, listening, viewing, and visual representation. In this course, students will read classic and contemporary literature written by a variety of authors. Students will also read and analyze non-fiction text and/or media that complement the literature being analyzed. Critical reading, thinking, and listening are central and are developed through whole class discussions as well as small group discussions, and Socratic seminars. Writing is used for personal reflection as well as demonstration of learning. Student writing is taken through the various stages of the writing process – initial drafting, revising, peer review, editing, and proofreading/polishing – for craftsmanship and possible publication. During the writing process, vocabulary, grammar, and syntax will also be addressed.

Social Studies:

US History (1 credit)

United States History is taught through a thematic approach while using the Social Studies standards of Ohio as a guide. Within each theme (Women's History, Political and Economic History, African American History, Wars and Conflicts, Technology and Inventions and Social Change), students examine the past, but also make concrete connections to present-day events. This approach allows students to learn the significance of history by journeying from past to present several times throughout the course. Resources from universities and other institutions, as well as supplemental materials such as books, periodicals, the Internet, videos and other media are used. Teaching 21st century skills by incorporating technology and primary source analysis is a focus.

Foreign Language:

Chinese I (1 credit)

This course is the first year of the four years of Chinese courses offered at DRSS. It is designed for students with no previous knowledge of the Chinese language. This course introduces the official Chinese language, Mandarin. The class emphasizes building a solid foundation in the Pinyin system of pronunciation, vocabulary, and sentence patterns in daily life communicative contexts. Students will acquire their language skills to carry on simple conversations in Chinese. Reading and writing will be developed in conjunction with speaking and listening skills. Along with learning the language, students will also explore culture highlights throughout the year.

Fine Arts:

Art (1 credit)

The DRSS Art program offers students a range of experiences in making, responding to, and presenting artwork. Exploring and expanding students' personal voices through various media, design process thinking, and decision-making, are cornerstones of the program. Curriculum is structured to be inter-disciplinary and collaborative in nature. This allows students to experience connections between arts and the creative process across disciplines and to recognize applications in professional and daily life.

General Elective:

Career Connections (1/4 credit)

Students will be shown how classroom learning translates into marketable skills. Through hands-on learning and local business involvement, students will engage in career-related experiences to acquire basic skills in various career fields. Students are provided with tangible experiences to begin career decision making.

10th Grade Courses

Math:

Geometry (1 credit)

Geometry is the second course in a sequence of college preparatory mathematics courses. Key concepts addressed in the course are: transformations and symmetry; relationships between figures (such as similarity and congruence); properties of plane figures (such as equal or perpendicular sides or diagonals); measurements of plane figures (such as area, perimeter, and angle measure); measurements of three-dimensional shapes; tools for analyzing an measuring shapes (such as the Pythagorean Theorem, trigonometric ratios, and coordinate geometry); investigation and proof; geometric construction; algebra; and probability. The course is structured around problems and investigations that build spatial visualization skills, conceptual understanding of geometry topics, and an awareness of connections between different ideas. Students often work in cooperative groups to participate in inquiry learning. Students are given carefully created problems and work together to explore the underlying mathematics.

Algebra 2/Honors Algebra 2 (1 credit*)

Full year course, ½ credit per semester

The focus of the Algebra 2 course will be problem solving, particularly using algebraic equations. The course will introduce new Algebra 2 concepts with frequent steps back to reinforce vital Algebra I concepts needed to move forward in math. Algebra topics include: solving equations and problems involving linear, quadratic and exponential functions, polynomial and rational expressions, irrational and complex numbers, logarithmic functions and inverses. Specific Algebra 2 topics to be addressed include solving systems of equations, matrices, sequences and series, and basic counting theory including combinations and permutations, which will lead to a section on probability. In the latter half of the year trigonometry will be introduced, as it is certainly fundamental to many real-world problems. Basic trigonometry functions will be defined, and the coursework will focus on the right triangle, solving for general triangles, the unit circle, and trig identities. Concepts covered throughout the year will be reinforced with STEM word problems, which illustrate the application of these concepts. In addition, special puzzles and projects will instill the importance of persistence in solving hard problems.

Science:

Biology/Honors Biology (1 credit)

In this course, students investigate the composition, diversity, complexity, and interconnectedness of life. Project and inquiry based units engage students in an in-depth study of the four unifying themes of biology: Heredity, Evolution, Diversity and Interdependence of Life, and Cells. Students will engage in investigations to understand and explain the behavior of living things in a variety of scenarios that emphasize scientific practices. An emphasis will be placed on investigations involving the human body and various health conditions.

Language Arts:

Language Arts 10 (1 credit)

In this course, students explore our interconnected world through reading and writing a variety of texts. Students read fiction and non-fiction that addresses topics they are learning in their other courses, such as World History and Biology. Students engage in the writing process, including prewriting and generation of ideas, writing a rough draft, peer critique, revision, editing, and final draft production. Emphasis is on developing organizational skills for writing longer pieces and on adapting one's writing "voice" to appeal to a specific target audience. Larger written projects are often interdisciplinary and have a "real-world" audience; all writing is made public in some way. Students also learn various resources to support individual research, with a focus on finding credible and reliable sources of information. Students study basic grammar and language usage both as readers and as writers, discovering more complex sentence structures and advanced punctuation skills. Students regularly participate in formal and informal presentations of their work, culminating in a team debate at the end of the fourth quarter. Finally, throughout the year, students learn the definitions of over 300 Greek and Latin roots to improve their word identification and problem-solving skills.

Social Studies:

Modern World History (1 credit)

History is the story of humans struggling to balance their unprecedented skills of innovation and destruction. This course unpacks the best and worst humanity had to offer throughout the 20th century, and poses this driving question to its students: "Was the 20th Century one of progress or decline?" We cover 5 major themes that defined our last century: *The*

World Wars, Imperial Rule, Conflict and Genocide, The Red States, and *Globalization*. Students conduct research, analyze historical documents, discuss controversial events and issues, role play first hand experiences, and participate in immersive activities and projects. They are placed in the shoes of prominent leaders, trenches full of young soldiers, streets packed with vigilant revolutionaries, and the minds of ruthless killers. At the end of the year, students recall on everything they will have learned to debate the course's driving question. Students will walk away with historical knowledge, interpersonal skills, and an understanding of global issues we still wrestle with today.

Foreign Language:

Chinese 2 (1 credit)

Prerequisites: Chinese 1

In this class, students will practice the four language skills of listening, speaking, reading, and writing in meaningful contexts. Students will further build up their Chinese vocabulary and syntactic knowledge through topics such as making an appointment, school life, and transportation. Through the year, students will learn through different tasks and projects and are also exposed to various aspects of Chinese cultures involving in the different units. At the end of third quarter, students will review the previous knowledge with an integrated project "Chinese Comic Project" with Social Study class introducing events and people of Modern China. The course offers an essential foundation for students who are interested in further studying the Chinese language in their junior year (Chinese 3).

CC+ Chinese 2A & 2B (WSU CHI 1010/1020) (1 credit*)

Full year course, ½ credit per semester

Prerequisites: Chinese 1

CC+: Wright State University, 3 semester hours per semester (6 total)

This is the 1st year College Credit Plus Chinese course offered by Wright State University. Although this course is originally designed for students with no knowledge of the Chinese language at WSU, it is offered to DRSS students who already take Chinese 1 course during their high school freshman year.

In a more Chinese immersed environment, students will continue developing their four language skills based on their fundamental knowledge acquired in Chinese 1. In addition to reviewing and reinforcing the Pinyin phonetic system, students will expand vocabulary and learn additional grammatical structures. Along with learning the language,

students will also explore culture highlights after each lesson. The course offers a solid foundation for students who are interested in further studying the Chinese language in their junior (CCP Chinese 3) and senior years (WSU CH3010).

Wellness and Fitness:

Wellness and Fitness (1 credit)

In this course, students will study the impact of behavioral choices on the health of individuals, families, and the community through project-based learning. Students will learn and demonstrate health-enhancing behaviors and work towards achieving personal wellness goals. Topics to be studied include stress management, mental health disorders, nutrition, substance abuse, family life and human sexuality, and disease development and prevention. In addition, the course will integrate concepts covered in biology to help students better understand how the body functions and how diseases develop. Students in this course will also participate in a variety of team and individual physical activities in order to improve their level of fitness. By the end of the course, students will have developed lifelong fitness skills.

11th Grade Courses

Math:

Algebra 2 (1 credit*)

Full year course, ½ credit per semester

The focus of the Algebra 2 course will be problem solving, particularly using algebraic equations. The course will introduce new Algebra 2 concepts with frequent steps back to reinforce vital Algebra I concepts needed to move forward in math. Algebra topics include: solving equations and problems involving linear, quadratic and exponential functions, polynomial and rational expressions, irrational and complex numbers, logarithmic functions and inverses. Specific Algebra 2 topics to be addressed include solving systems of equations, matrices, sequences and series, and basic counting theory including combinations and permutations, which will lead to a section on probability. In the latter half of the year trigonometry will be introduced, as it is certainly fundamental to many real-world problems. Basic trigonometry functions will be defined, and the coursework will focus on the right triangle, solving for general triangles, the unit circle, and trig identities. Concepts covered throughout the year will be reinforced with STEM word problems, which illustrate the application of these concepts. In addition, special puzzles and projects will instill the importance of persistence in solving hard problems.

Honors Algebra 2/Trigonometry (1 credit*)

Full year course, ½ credit per semester

In this course, it is expected that students will be able to identify and justify mathematical relationships, formally and informally. Topics will include linear functions and equations, quadratic and polynomial equations with real and complex solutions, exponential and logarithmic equations and functions, transformations, rational expressions, systems of equations, matrices, probability including permutations and combinations, sequences and series, conics, and trigonometry through advanced trigonometric identities. An emphasis is placed on mathematical modeling and applying skills to solve word problems. The student will need access to a graphing calculator on a regular basis. A TI-84 series-graphing calculator is strongly recommended. The Honors Algebra II/Trigonometry course covers topics in greater depth and breadth than Algebra II. This is a fast-paced class that combines the concept of both Pre-Calculus and Algebra 2 concepts.

Science:

Chemistry (1 credit)

Students learn chemical and physical principles by exploring a specific focus area in which chemistry is *relevant to societal issues or technological advancements.* They will apply the methods of science through experiments and learn to communicate scientific and quantitative information. The focus area will vary from among topics such as art, food and nutrition, the environment, forensic science, the material world, and others. The course develops scientific thinking and helps students understand important interdisciplinary connections. Topics of study include: structure of matter, states of matter, reactions, descriptive chemistry, chemical calculations, atomic theory, stoichiometry, electrochemistry, chemical bonding, thermochemistry, periodicity, and solution chemistry.

Language Arts:

Technical Reading and Writing (1 credit)

The purpose of Technical Reading & Writing is to help students understand the elements of technical and professional writing and communication by completing written assignments, workshops, oral presentations, collaborative research projects, daily group work, and peer-review. Students will learn to read and analyze business and technical materials, gaining an understanding of how to model and prepare workplace documents, resumes, cover letters, instructions, usability tests, reports, proposals, and science manuscripts. Because this course is the 11th grade language arts class at DRSS, during one quarter, students will compose a creative narrative piece that incorporates science and/or math. This course will ultimately guide students in technical reading and writing for their other STEM classes, including effective note-taking skills, reading strategies, considering the rhetorical situation when writing, as well as editing & proofreading for errors in mechanics, usage, grammar, and spelling (M.U.G.S.). Additionally, students will practice skills that will be useful for taking the SAT and ACT.

Social Studies:

Economics (1/2 Credit)

During this semester course, students learn how individual and societal decisions allocate the world's scarce resources. Recognizing that we live in an interdependent world, the goal for this course will be to prepare students for living in a truly global economy by giving them the tools necessary to make informed decisions about micro- and macro-economic issues. This will be accomplished by studying economic models, historic

and contemporary economic thought, contemporary national and global issues, and personal finance. Special emphasis will be placed on making rational economic decisions using sound reasoning and good research.

Government (1/2 Credit)
This semester course will use a wide variety of pedagogical approaches to understand the function and process of government by investigating the role of government, rules and laws, and how decisions made by those in government affect our daily lives. These lessons will be taught through an extensive study of the practical application of the United States Constitution. Topics studied will include, but are not limited to, the U.S. Constitution, major U.S. legislation, political parties, checks and balances, special interest groups, the media's role in public policy, major Supreme Court cases, citizenship, the media and Ohio and local governments.

Foreign Language:
Chinese 3 (1 credit*)
Full year course, ½ credit per semester
In this course, students continue to develop language skills in listening, speaking, reading, and writing. They will expand their vocabulary and review the basic grammatical structures through their everyday life conversations. This course is designed for students to carry on conversations and express themselves by speaking and writing in Chinese, to accomplish tasks, interpret and exchange information, and to communicate in a culturally appropriate manner. Task-based language teaching using authentic materials will be emphasized in this course throughout the year.

CC+ Chinese 3A & 3B (WSU Chinese 2010/2020) (1 credit*)
Full year course, ½ credit per semester
Prerequisites: CC+ Chinese 2A & 2B (WSU Chinese 1010/1020)
CC+: Wright State University, 3 semester hours per semester (6 total)
This is the 2nd year of College Credit Plus Chinese courses offered by Wright State University. Students will develop more sophisticated skills in communication, expand vocabulary and learn more complex grammatical structures in a language immersion environment. While the course further increases the students' vocabulary and reading ability, it will also place more emphasis on listening and speaking. The course continues to introduce necessary culture, customs, philosophy, and history along with other relevant topics. The course offers a solid foundation for students who are interested in further studying the Chinese language in their senior years at WSU (CH3010).

Spanish 1 (1 credit*)

Full year course, ½ credit per semester

Spanish 1 will introduce students to the Spanish language using the four basic communication skills: reading, writing, listening, and speaking. Students will be provided with instruction that teaches a basic understanding of Spanish culture, vocabulary, and grammatical concepts.

12th Grade Courses

Math:

Pre-calculus (1 credit*)

Full year course, ½ credit per semester

This course is based on the premise that in order to succeed in future math courses, students must understand the idea that variables really *vary*, not simply stand for unknown constants. To achieve this knowledge, students use functions as mathematical models of real-world phenomena. For example, they will find the best-fitting logistic function from a set of data on restrained population growth and then use the function to predict the population at various times and the times to reach various populations. In triangle trigonometry, students investigate the distance between two planets as the angle of the Sun varies. Students continue to make connections between various representations of functions (graphs, equations, tables, and situations) for quadratic, exponential, polynomial, rational, and periodic functions.

CC+ Calculus/AP Calculus (WSU MTH 2300) (1 credit*)

Full year course, ½ credit per semester

CC+: Wright State University, 4 semester hours

The Calculus course aligns with Wright State University's Calculus I course. In Calculus, students work individually and cooperatively to develop a conceptual understanding of derivatives, integrals, and the relationship between the two. Students express concepts, problems, and solutions geometrically, numerically, analytically, in written form and verbally. Students work in cooperative groups and independently to explore concepts through inquiry learning, and use technology appropriately to explore concepts, confirm results, and produce models.

Statistics (1 credit*)

Full year course, ½ credit per semester

Students will work with probability, data collection, descriptive and inferential statistics, probability, and technological tools to analyze statistics. The main foci of the course will be exploring data, planning a study, producing models using probability theory, and making statistical inferences. Students will work with statistical measures of centrality and spread, methods of data collection, methods of determining probability, binomial and normal distributions, hypothesis testing, and confidence intervals. Students will use multiple representations to present data including written descriptions, numerical statistics, formulas, and graphs.

Students who desire to take the AP exam at the end of the year will need to do extension work to prepare for the test.

Science:

Anatomy and Physiology (1 credit*)

Full year course, ½ credit per semester

Anatomy and Physiology is a yearlong course that provides students an opportunity to explore the intricate and sophisticated relationship between structure and function in the human body. This course offers students an environment in which they may probe topics such as homeostasis, anatomical and physiological disorders, medical diagnosis and treatment, biochemistry, cytology, histology, and a survey of the many body systems that comprise the human body. Laboratory activities and projects will reinforce concepts and principles presented in this course. Students may also participate in a field trip to the Human Anatomy and Physiology Lab at Wright State University.

Material Science (1 credit*)

Full year course, ½ credit per semester

Prerequisites: Chemistry

This year long interdisciplinary curriculum is focused on studying the properties and capacities of manufacturing materials of ceramics, metals, polymers and composites through the lens of Chemistry and Art. In the Chemistry lab students learn about the chemical and physical properties of these materials and in the Art studio students manipulate the materials creatively. Students are introduced to practical and contemporary manufacturing applications of materials and are exposed to related careers in manufacturing, design and advanced manufacturing. This interdisciplinary approach serves as an introduction to the capacities and potentials of manufacturing materials. The course is co-taught by the Art and Chemistry instructors and can be designated as either an art or chemistry credit. Chemistry is a pre-requisite.

Physics (1 credit*)

Full year course, ½ credit per semester

It is a rigorous, algebra-based class that will provide students with an opportunity to study the major concepts of physics through application, investigation, and problem solving. The first semester will focus on mechanics and will include such topics as laws of motion, work and energy, momentum, circular and rotational motion, gravity, fluids, mechanical waves and thermodynamics. The second semester will focus on electricity and magnetism, optics, and circuits. Topics will include

fundamentals of charge, electric and magnetic fields, circuitry, electromagnetic waves, geometric and wave optics, and optical instruments.

Language Arts:

English 12 College Prep (1 credit*)

Full year course, ½ credit per semester

This course is a yearlong (non-college credit) course designed to introduce students to the principles needed to be successful in the college classroom. The course will be writing-intensive with a focus on developing skills in critical reading, effective written communication, research, self-assessment, as well as use of technology that will aid students in their future academic endeavors. Students will generate a variety of writing pieces; they will research, draft, revise, edit and proofread. Students will be expected to use the accepted conventions for specific genres, tasks, and audiences. In addition to academic writing assignments, students will also develop their college application essays, activities list, and update their resumes.

CC+ English 1101: English Composition I (SCC ENG 1101) (1 credit*)

Full year course, ½ credit per semester

CC+: Sinclair Community College, 3 semester hours

In English Composition I students learn reflective, analytical and argumentative writing strategies, incorporating sources and personal experience. Students will negotiate between public and private rhetorical situations and purposes to achieve academic literacy. They will write multiple drafts using a recursive writing process as they work toward fluency in style and mechanics.

11th/12th Grade Electives

Math:

CC+ Engineering Math (SCC Math 1111) (1/2 credit)

CC+: Sinclair Community College, 3 semester hours

Prepares students for critical thinking, analytical reasoning and problem solving. Students will apply math to typical engineering technology problems from a variety of fields.

Science:

Principles of Engineering (1 credit*)

Full year course, ½ credit per semester

Principles of Engineering (POE) is a high school-level survey course of engineering. The course exposes students to some of the major concepts that they will encounter in a post-secondary engineering course of study. Students have an opportunity to investigate engineering and high tech careers. POE gives students the opportunity to develop skills and understanding of course concepts through activity-, problem-, and project- based learning. Many of the projects are group collaborations, so students will continually hone their interpersonal skills, creative abilities, and problem solving skills based upon engineering concepts. It also allows students to develop strategies to enable and direct their own learning, which is the ultimate goal of education. Students will employ engineering and scientific concepts in the solution of engineering design problems. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges. Students will learn software programming (RobotC), and work with Vex robotics parts, motors and sensors to solve various challenges. Students will also learn how to document their work and communicate their solutions to their peers and members of the professional community. Additionally, students will apply the principles of physics to define and calculate the forces present in truss systems, as well as ballistics, and statics. This course is one of the most challenging of the PLTW survey courses, and will challenge students of all levels.

Digital Electronics (1 credit*)

Full year course, ½ credit per semester

Digital Electronics (DE) is the study of electronic circuits that are used to process and control digital signals, which are represented by two discrete voltages or logic levels. The major focus of the DE course is to expose students to the design process of combinational and sequential logic design, teamwork, communication methods, engineering standards, and

technical documentation. Utilizing the activity-project-problem-based (APB) teaching and learning pedagogy, students will analyze, design, and build digital electronic circuits. While implementing these designs, students will continually hone their professional skills, creative abilities, and understanding of the circuit design process. Students will keep engineering notebooks as documentation that will be graded throughout the year.

Environmental Sustainability (1 credit*)

Full year course, ½ credit per semester

Environmental Sustainability (ES) is an interdisciplinary engineering course in which students investigate and design solutions to solve real-world challenges related to clean and abundant drinking water, food supply enhancement, and renewable energy. This course has the potential to bring together a diverse group of students with interests in biology, chemistry, and/or environmental studies, and it gives students the opportunity to lead their own learning, collaborate, and gain skills needed to communicate their creative solutions. Students also gain insights into the future career opportunities that exist in the areas they are exploring. Through real-world activities, students explore a variety of disciplines like chemistry, molecular biology, and environmental science. Discussing perspectives, forming opinions, and participating in frequent democratic discussions are all emphasized in this course when sensitive material is covered. Students will keep engineering notebooks as documentation that will be graded throughout the year.

Computer Hardware (1 credit*)

Full year course, ½ credit per semester

Students will learn to install, repair, and troubleshoot computer hardware systems. They will perform preventative maintenance practices and learn techniques for maintaining computer hardware security. Communication skills and professionalism in troubleshooting situations will be emphasized.

Computer Programming (1 credit*)

Full year course, ½ credit per semester

In this course, students will learn the basics of building simple interactive applications. Students will learn the basic units of logic: sequence, selection, and loop. Students will apply algorithmic solutions to problem-domain scenarios. Students will gain experience in using commercial and open source languages, programs, and applications.

Networking I: Introduction to Networking (1 credit*)

Full year course, ½ credit per semester

Students will install, configure, and troubleshoot network hardware and peripherals. Students will learn networking by exploring the OSI model, network topologies, and cabling. Students will design simple networks, know how to select physical devices, and be able to configure the equipment. Knowledge and skills relating to the operation and usage of network protocols will be developed.

Networking II: Network Security (1 credit*)

Full year course, ½ credit per semester

Prerequisites: Networking I: Introduction to Networking

This course will address securing networks and operating systems. Students will learn to secure network communications, computer hardware, and network software. Topics included are network security theory, cryptography, security architecture, firewalls, VPNs, IP Security, and methods of protection.

Operating Systems (1 credit*)

Full year course, ½ credit per semester

In this IT course students will perform desktop client administrator duties by providing support for users in various work environments including professional offices, small businesses, work groups, departments, and/or corporate information services (IS). Students will learn to install, configure, and update commercial and open source network operating systems. Students will also learn cybersecurity strategies.

Language Arts:

Film Studies (1 credit*)

Full year course, ½ credit per semester

Mandatory Class Requirement: Parent signature giving permission for student to view films and take this course. Movies utilized in this course are carefully selected to provoke thoughtful discussion.

Film Studies will introduce students to the film industry and history of cinema through the study of classic and contemporary films. Emphasis will be placed on exposing the class to a wide variety of styles and genres as well as formulating and justifying criticisms of the works. Emphasis will also be placed on the role of movies within society. Units include screenwriting, cinematography, visual effects, animation, and more. Hands-on projects, written analyses and participation in class discussions will be requirements for successful completion of the course.

Social Studies:

CC+ Psychology (SCC PSY 1100 taught by Sinclair faculty) (1/2 credit)

CC+: Sinclair Community College, 3 semester hours

This is a university-parallel course covering history and systems of psychology, behavioral research methods, physiology of behavior, sensation, perception, learning, memory, consciousness, cognition, personality, lifespan development, gender, social psychology, motivation, emotion, stress, mental disorders and therapies.

CC+ Sociology (SCC SOC 1101 taught by Sinclair faculty) (1/2 credit)

CC+: Sinclair Community College, 3 semester hours

A critical analysis of contemporary American society with review of major sociological theories, research methods, culture, socialization, groups, social structure, social institutions, deviance, socialine qualities, social processes and social change.

Foreign Language Credit:

Chinese 4 (1 credit*)

Full year course, ½ credit per semester

Prerequisites: Chinese 3 or equivalent

In this course, students continue to develop language skills in listening, speaking, reading, and writing. Students will expand their vocabulary and review the grammatical structures through not only their daily life conversations but also broader topics in the community. This course is designed for students to carry on deeper conversations and express themselves better by speaking and writing in Chinese, to accomplish tasks, interpret and exchange information, and to communicate in a culturally appropriate manner. Task-based teaching using authentic materials will be emphasized in this course throughout the year.

CC+ Chinese 4 – Course taught at Wright State University (1 credit*) (WSU Chinese 3010/3020)

Full year course, ½ credit per semester

CC+: Wright State University, 3 semester hours per semester (6 total)

Prerequisites: CC+ Chinese 2A & 2B (WSU Chinese 1010/1020) **AND**
CC+ Chinese 3A & 3B (WSU Chinese 2010/2020)

Wright State University's third year of college level of Chinese.

Spanish 1 (1 credit*)

Full year course, ½ credit per semester

Spanish 1 will introduce students to the Spanish language using the four basic communication skills: reading, writing, listening, and speaking. Students will be provided with instruction that teaches a basic understanding of Spanish culture, vocabulary, and grammatical concepts.

Spanish 2 (1 credit)

Prerequisites: Spanish 1

Spanish 2 will further expand upon basic concepts of grammar, speech, and vocabulary learned in Spanish 1. Students will learn more advanced techniques to further their Spanish communication skills, with a strong focus in reading, writing, and speaking abilities. While reviewing former topics and introducing new topics, this course will serve as a prep class for entry into Spanish courses at the collegiate level.

Fine Arts:

Architecture and Design (1 credit*)

Full year course, ½ credit per semester

This course serves as an introduction to architecture with a focus on design. Starting with drawing as a foundation, students move through a series of design exercises focusing on principles of design as applied to space and structure while referencing examples of historical and contemporary architects and architecture. Finally, students learn professional approaches to architectural design including the design process and building physical as well as virtual models.

Several field trips enrich student's experience of the built environment and students have an opportunity to participate in AIA Dayton's Annual Student Design Competition and compete for scholarships.

Fitness:

Fitness Evaluation and Assessment (1/2 credit)

Students will complete comprehensive fitness evaluations and develop individualized training programs. Students will administer lab and field tests of cardiovascular endurance, body composition, joint flexibility and muscular strength, power, and endurance. Emphasis is placed on assessing body composition, neuromuscular flexibility, agility, balance, coordination, and proprioception. Additionally, students will identify components of physical fitness and communicate how physical activity impact health and wellness.

General Elective:

Experiential Learning (credits earned will be based on scheduled hours)

Experiential learning provides the student with research, teaching, and service learning experiences in community organizations, businesses and industry that will enable them to discover and develop confidence in their ability to engage in productive and significant work. This experience may be a continuation of the student's internship. Students must submit a proposal that provides the location, hours and the type of work that will be completed. A DRSS mentor will be provided and weekly logs will need to be submitted to document the time spent in experiential learning.

College Credit Plus (CC+) Details

There is no guarantee that CC+ credits will transfer to your chosen university/college. Students must contact each organization to determine whether the credits will count toward their chosen major.

The Dayton Regional STEM School has developed a 15- and a 30-credit option for students wishing to pursue college credit while in high school. The details are listed in the table below.

Students may begin to take courses for college credit during their sophomore year (Chinese only). All college credit courses are open as options during the junior and senior years.

Grades for CC+ courses will become a part of a student's permanent high school and college transcript. Students are advised to use caution when deciding to take college level classes. College tuition will be charged for any courses that are failed.

15+ Credit Option			
Course Option	**Course Name**	**Grade Level**	**Credit Total**
MTH 2300	Calculus 1 (WSU)	12	4
MTH 1111	Engineering Math (SCC)	11&12	3
ENG 1100	English Composition (SCC)	12	3
PSY 1100	Psychology (SCC)	11&12	3
SOC 1101	Sociology (SCC)	11&12	3

30+ Credit Option			
Course Option	**Course Name**	**Grade Level**	**Credit Total**
MTH 1111	Engineering Math (SCC)	11&12	3
ENG 1100	English Composition (SCC)	12	3
PSY 1100	Psychology (SCC)	11&12	3
SOC 1101	Sociology (SCC)	11&12	3
MATH 2300	Calculus 1 (WSU)	12	4
CHI 1010/1020	Chinese 2A & 2B (WSU)	10	6
CHI 2010/2020	Chinese 3A & 3B (WSU)	10	6
CHI 3010/3020	Chinese 4 at WSU	12	6

Additional college credit options are available as indicated in the high school course description document (i.e. Chinese, Engineering Math, etc.)

CC+ Pre-Requisites

English and Social Sciences – *Must meet one of the following requirements*

- Completion of two units of College Prep English/Language Arts with a minimum of a B average
- ACT sub-score of 23 in English
- Achieve a college ready score on the institution's academic readiness test

Science and Math – *Must meet one of the following requirements*

- Completion of Algebra II or its equivalent with a minimum of a B average
- ACT sub-score of 22 in Math
- Achieve a college ready score on the institution's academic readiness test

IMPORTANT DEADLINES

April 1 – intent to participate form must be submitted to DRSS
May 1 – university application deadline
July 1 – deadline to finish all required preliminary testing


The Dayton Regional
STEM
School
daytonstemschool.org