

*Carpe Scientiam*

# COURSE CATALOG 2016-17



*Chapter 1*

# GENERAL INFORMATION





# General Information

## L&N STEM Academy

### ADMINISTRATION

Becky Ashe, Founding Principal  
James Allen, Assistant Principal  
Tim Childers, Assistant Principal

Main Office: (865) 329-8440  
Main Fax: (865) 329-8457

### SCHOOL COUNSELING DEPARTMENT

Elishia Basner (K-Z), School Counselor  
Lori Morrell (A-J), School Counselor  
Lyn Johnson, Administrative Assistant  
Sarah Salerno, Testing Coordinator

*Empower. Inspire. Impact.*

**Carpe Scientium**

**KCS Mission Statement**

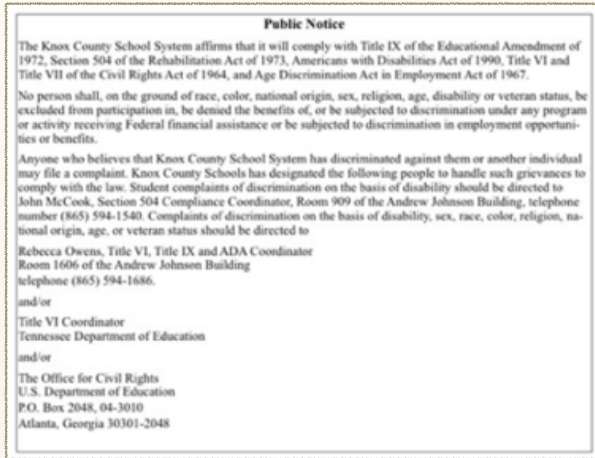
Knox County Schools will enable all students to achieve academic success based on established performance standards and students’ individual needs and abilities, by providing highly trained teachers, a nurturing environment, and by partnering with parents and the community to ensure that a commitment to education continues outside the classroom.

**School Board’s Mission**

The Knox County Board of Education, as the governing body for the school system, evaluates needs, sets policy, allocates resources, and implements strategies to ensure all students have access to a quality education.

**School Board’s Vision**

The entire community working together to attain the highest quality of life for all the people of Knox County.



The L&N STEM Academy is an agent of transformational change in STEM education where all students achieve at their highest levels. Design principles are the hallmark of our school in learning, teaching, and leading. Universal high standards, individualized learning plans, and community partnerships ensure that every student has equitable access to challenging coursework, exceptional instruction, and empowering relationships with mentors.

Students experience a rich integrated curriculum aligned and focused towards STEM disciplines. Faculty deliver inquiry-based instruction, challenging students to solve real world problems and develop critical



thinking skills. We equip our students with the skills and dispositions that will prepare them for post-secondary learning opportunities, rewarding careers, meaningful roles in the American democracy, and enlightened and fulfilling lives.

As a platform school, we partner to expand the capacity of STEM teaching and learning with collaborating schools, districts, and industry.

In short, we envision a future where we achieve academic excellence for all of our students and for our region. To achieve this vision, we are establishing priorities and practices designed to foster a school culture of universal aspiration towards excellence, social justice, and shared responsibility of outcomes.

The students of the L&N STEM Academy practice the habits of Inquiry, Design, Professionalism, Innovation, Critical Thinking, and Collaboration. These six habits are infused through all content and curricula, as they are essential 21st Century skills, allowing students to be successful collegiate scholars and community members once they graduate from the L&N STEM Academy.

Students at the L&N STEM Academy will experience a rigorous and challenging academic experience. All levels of learners are welcome, but a focused, devoted effort is required to be successful.

Students will take eight courses simultaneously on a rotating block schedule. Four classes are taken on an “L” day, while four additional classes are taken on “N” days. All courses are a year long. Each class period is approximately 90-minutes long.



All incoming students will complete at least 2 years of Latin beginning their Freshman year. After completing Latin 2 during Sophomore year, students will be able to take additional foreign language options or continue studying Latin at higher levels.

Students are expected to be active participants in their learning. Students are expected to seek out assistance from teachers when needed. Advisories will take place 1 day per week for students to interact with 1 teacher over all 4 years of attendance. In addition, students will be able to explore personal interests during Genius Hour activities that rotate every 9 weeks. Students are encouraged to attend tutoring sessions held by their instructors to deepen their learning and access the support often needed by students to be successful in a challenging academic environment.

Students are expected to progress through each grade level, achieving at high levels. Should students not meet the academic or behavioral expectations of the L&N STEM Academy, they are at risk of having their transfer revoked.

KNOX COUNTY GRADUATION REQUIREMENTS		
Required Courses	Grade Taken	No. of Credits
English 1, 2, 3, 4	9-12	4
Math (Algebra 1, Geometry, Algebra 2, additional higher math course)*	9-12	4
Science (Biology, Chemistry or Physics, additional lab science)	9-11	3
World History and Geography	9	1
US Government and Civics	10	1
US History and Geography	11	1
Economics	12	1/2
Personal Finance	12	1/2
Lifetime Wellness	10	1
Physical Education	9-12	1/2
Elective Focus of Study***	9-12	3
Fine Art**	9-12	1
Foreign Language	9-12	2

Students are required to earn 28 total credits. Of these 28 credits, 22 are required credits shown on the chart to the left. Students must earn at least 6 additional credits above the 22 required credits.

All students will be required to enroll in a math course each year of high school.

\*\* The Fine Art and Foreign Language requirements may be waived and be replaced with courses designed to enhance and expand the Elective Focus for students who are sure they are not going to attend a 4-year university.

\*\*\* The three credits of Elective Focus must be in one of seven areas

Career and Technical Education (CTE)	Advanced Placement (AP)
Science and/or Math	ROTC or Physical Education
Humanities	Human Services
Fine Arts	

**University Admissions.** Students must complete two units of the same world language and one unit of fine/performing arts in order to meet the college/university requirements.



*Graduation Requirements for Knox County Schools and the L&N STEM Academy*



And a Fine Art  
 This could be an Art class, Orchestra, Band, Choir/Ensemble, or Theater  
 1 Credit is REQUIRED

*Be sure to know what is required to graduation before you begin the process of requesting courses for an upcoming year.*

**L&N STEM Academy**

**Student Course Selection Planning Guide**

The following document is for planning purposes only. Course offerings and teacher recommendations will determine the exact placement for each student. The progression of classes is shown by an arrow (➔).

English:	English 9	English 10	English 11	English 12
<b>Start at:</b> (English Explore score 20-25)	Honors Will be automatically placed in Honors World History & Geography & Latin ➔	Honors ➔	AP English Language and Composition ➔	AP English Literature and Composition
<b>Start at:</b> (Explore score 19 or below)	Standard (CP) (=Honors) ➔	Standard (CP) ➔	Standard (CP) ➔	DE/Standard (CP)

You must have a 28 on your English & Reading EXPLORE score in order to take Latin 1 your Freshman year, otherwise Etymology.

Math:	Math 9 <sup>th</sup>	Math 10 <sup>th</sup>	Math 11 <sup>th</sup>	Math 12 <sup>th</sup>
<b>Start at:</b> (Algebra I HS Level in 8 <sup>th</sup> grade = 200)	Hon Geometry ➔	Hon Algebra II ➔	Hon Pre-Calculus ➔	AP Calculus AB & AP Calculus BC
<b>Start at:</b> (EXPLORE Score: 19-25)	Hon Algebra I ➔	Hon Geometry ➔	Hon Algebra II ➔	Hon Pre-Calculus (AP Calculus AB & AP Calculus BC)
<b>Start at:</b> (EXPLORE Score 15-18)	Algebra I ➔	Geometry ➔	Algebra II ➔	Adv. Math: Finite, Pre-Calculus, AP Stats, AP Computer Science, AP Physics

Science	Science 9 <sup>th</sup>	10 <sup>th</sup> Science	11 <sup>th</sup> Science	12 <sup>th</sup> Science
<b>Start at:</b> (Must take Physical Sci AND Algebra I HS Level in 8 <sup>th</sup> grade)	Honors Chemistry I ➔	Honors Biology I ➔	Honors Chem II & AP Chem Hon Bio II & AP Bio Intro/Organic Bio/Chem, Anatomy & Physiology Autonomy, Geology ➔	Advanced Level Science: Honors Chem II & AP Chem Hon Bio II & AP Bio Intro/Organic Bio/Chem, Anatomy & Physiology Autonomy, Geology
<b>Start at:</b> (EXPLORE Math Score 19-25)	Honors Physical World Concepts (Must have honors math rec) ➔	Honors Chemistry I ➔	Honors Biology I ➔	Honors Chem II & AP Chem Hon Bio II & AP Bio Intro/Organic Bio/Chem, Anatomy & Physiology Autonomy, Geology
<b>Start at:</b> (Explore Math Score 18 or below)	Physical World Concepts ➔	Chemistry I ➔	Biology I ➔	Honors Chem II & AP Chem Hon Bio II & AP Bio Intro/Organic Bio/Chem, Anatomy & Physiology Autonomy, Geology

Social Studies	Social Studies 9 <sup>th</sup>	Social Studies 10 <sup>th</sup>	Social Studies 11 <sup>th</sup>	Social Studies 12 <sup>th</sup>
<b>Start at:</b> (English & Reading Explore score 20-25)	Honors World History & Geography (With Hon English I) ➔	AP Comparative Government & Politics (w/Honors English II) ➔	AP US History (w/AP English III) ➔	Economics/ Personal Finance
<b>Start at:</b> (Eng & Reading Explore score 19 or below)	World History & Geography ➔	U. S Government / Civics (Both - 5 credits each) ➔	CP or DE US History & Geography or ➔	Economics/ Personal Finance

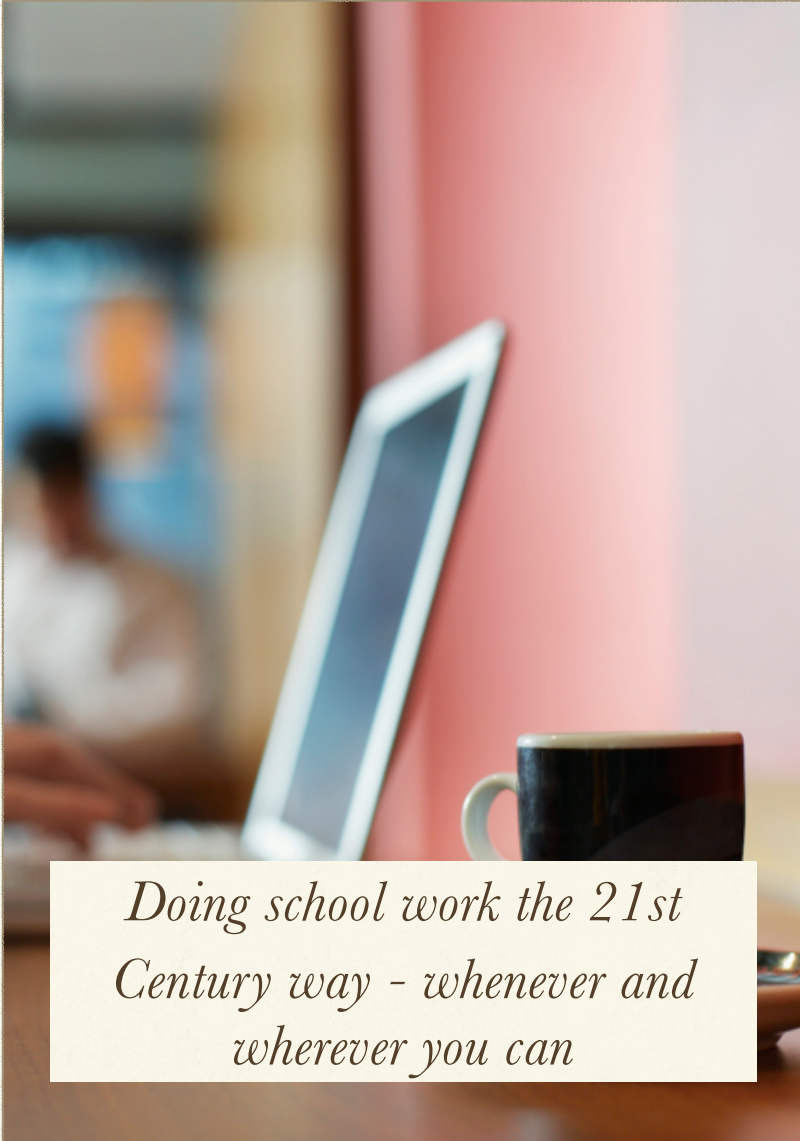
Adapted from: Susan Nault, EMS 2/18/2014 updated for STEM by Elchta Kozner 11/2014

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**L&N STEM ACADEMY AP COURSE EXPECTATIONS 2016-17**

Course	Grade Level	Amount of Reading Per Week	Outside of Class Time Expected (Reading, Homework, etc)	Summer Assignments
AP Combined Studies (AP US History & AP Language & Composition)	Grade 11	60-80 pages per week	6-8 hours per week	Yes, multiple assignments to satisfy both English and History
AP US Government	Grade 10	30-60 pages per week	3-5 hours per week	Yes
English Lit. & Composition	Grade 12	60-120 pages per week (fiction & poetry)	3-5 hours per week	Yes
AP European History	Grades 10-12	20-50 pages per week	3-4 hours per week	Yes
AP Psychology	Grades 11-12	40 pages per week	3-5 hours per week	No
AP Human Geography	Grade 9	30-60 pages per week	3-5 hours per week	Yes
AP Music Theory	Grades 11-12	10-20 pages per week	3-5 hours per week	Yes
AP Art Studio	Grades 11-12	Portfolio and Sketchbook	2-4 hours per week	Yes
AP Physics 1	Grades 11-12	30 pages per week	3-5 hours per week	No
AP Computer Principles	Grades 10-12	30-40 pages per week	6-7 hours per week	Yes
AP Computer Science	Grades 11-12	30 pages per week	2-3 hours per week	No
AP Environmental Science	Grades 11-12	20-30 pages per week	3-5 hours per week	Yes
AP Biology	Grades 11-12	30-40 pages	3-5 hours per week	Yes
AP Chemistry	Grades 10-12	30-50 pages	6-8 hours per week (2 classes)	Yes

# Blended Learning



*Doing school work the 21st  
Century way - whenever and  
wherever you can*

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At the L&N STEM Academy we are opening up new avenues of learning through piloting blended learning courses. Because these courses are new - and challenging - we are requiring parent approval to be involved.

### **What IS blended learning?**

Blended learning, in its simplest terms, is a course built on two foundations. First, there is time with a teacher in a classroom or office setting. Second, there is a lot of work to do independently online in various formats.

The time with the teacher will vary from course to course. At times, our blended learning classes will have an established time in the schedule, usually Mondays, when teachers will meet with students in a classroom to discuss aspects of their learning. Class content could be made up of lecture time, group discussion, testing, small group work, or a combination of these. During this time, students have the opportunity to ask questions and dive further into the study of the subject. Teachers closely monitor the progress of all students and may take this opportunity to offer more personalized tutoring or other interventions for students who are struggling with the content.

Online learning is the key aspect of our blended learning courses. Teachers may create flipped instruction videos (teaching the content to students through a video format), assign readings, and give students opportunities to work individually and in groups as they process their learning in the subject. Assignments are typically turned in through online resources such as Canvas, Dropbox, or Google Drive.

These assignments might include a research paper, a video demonstrating mastery of a topic, the results of an experiment done outside of class, or even online chat documentation in which

students have met in small groups and each offered their thoughts and learning to the other group members.

### **Where does blended learning take place?**

Students involved in blended learning classes will have an “open” spot in their schedule on L or N days that can be used to meet together in groups or study independently. This time is completely student-led. Students are expected to take ownership of their learning and use the time to their advantage.

In other scenarios, students may do some of their individual work whenever or wherever they choose. They will not always need an Internet connection to do class activities, but they should have access to the Internet whenever possible. The beauty of the online aspect of blended learning classes is that students can continue to work even if life events preclude them from actually being “at school.” In particular, their learning does not have to stop because of a snow day that prevents a trip to the school building.

### **What are the requirements for blended learning enrollment?**

As part of our pilot, blended learning classes are predominantly limited to Juniors and Seniors. With administrative approval, a Sophomore could be enrolled if he or she is on an accelerated track to graduation.

Students in blended learning classes must have a GPA of 2.5 or higher. They must have already demonstrated a solid work ethic that would help them stay focused without the need of a teacher standing in front of them 2 or 3 days every week.



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We are establishing two summer bootcamps as requirements for blended learning as well. The first will be a time for students to come in and talk with an administrator, school counselor, or a blended learning instructor to more accurately understand the requirements of the course and the expectations that will be placed on the student. After the bootcamp, recommendations will be made to determine which students to accept into one of our blended learning classes.

The second bootcamp is for parents. We want our parents to be fully informed regarding what the class will require, expectations placed on the students, and how they can help their child be successful in this new learning environment.

### **Why blended learning?**

There are several reasons for this new program of study. Some are quite pragmatic. We have, at times, over 600 students enrolled at the L&N STEM Academy. In our current environment, we only have seating capacity for 500 students. Every class period of the day, we need to find a way to have at least 100 students not in a classroom. That's a daunting task.

Others are forward looking. Colleges, for example, are requiring online learning modules for their students in greater and greater numbers each year. By exposing our students to this environment on a limited scale in high school, we will better prepare our students to succeed in college.

Other reasons include establishing a strong work ethic in our students. In blended learning, more and more responsibility for learning, keeping up with timelines and project details, working in cohesive groups, and advocating for one's self moves to the student.

These important life skills that are part of blended learning by default.

Rising Juniors and Seniors who think they would qualify for a blended learning experience at the L&N STEM Academy, should talk to their Guidance Counselor about their options, course requirements, and getting teacher approval.

# Genius Hour



*Failure is simply the opportunity to  
begin again, this time more intelligently*

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## **What is Genius Hour?**

Genius hour is a movement that allows students to explore their own passions and encourages creativity in the classroom. It provides students a choice in what they learn during a set period of time during school. It's not easy to determine where the idea was originally created, but there are at least two events that have impacted genius hour.

### **Genius Hour Origins**

The search-engine giant, Google, allows its engineers to spend 20% of their time to work on any pet project that they want.

The idea is very simple. Allow people to work on something that interests them, and productivity will go up. Google's policy has worked so well that it has been said that 50% of Google's projects have been created during this creative time period. Ever heard of Gmail or Google News? These projects are creations by passionate developers that blossomed from their their 20-time projects.

Another origin of genius hour projects came from the book Drive by best-selling author, Daniel Pink. In a blog post he writes about how the Google-time projects are also used in other corporations.

Each week, employees can take a Genius Hour — 60 minutes to work on new ideas or master new skills. They've used that precious sliver of autonomy well, coming up with a range of innovations including training tools for other branches.

## **Genius Hour in Education**

The same genius hour principles apply in the classroom as they do in the corporate environment. The teacher provides a set amount of time for the students to work on their passion projects. Students are then challenged to explore something to do a project over that they want to learn about. They spend several weeks researching the topic before they start creating a product that will be shared with the class/school/world. Deadlines are limited and creativity is encouraged. Throughout the process the teacher facilitates the student projects to ensure that they are on task.

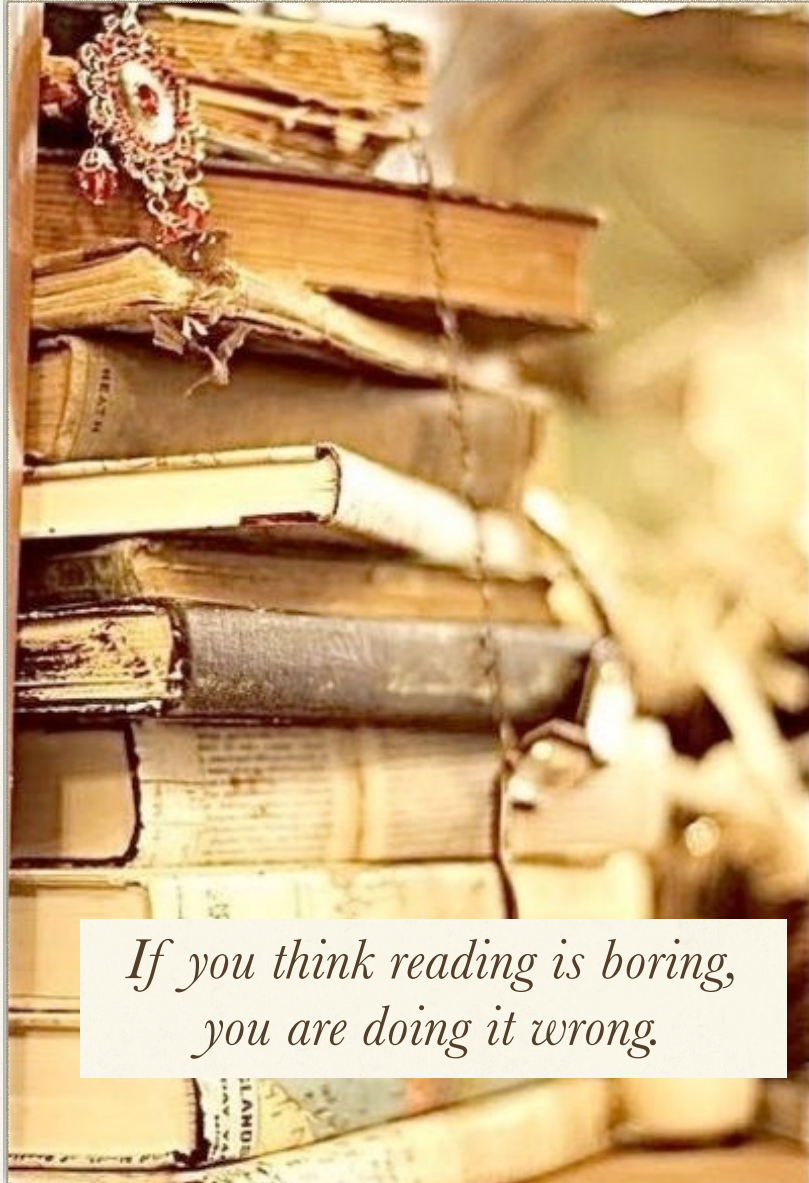
*(Adapted from <http://www.geniushour.com/what-is-genius-hour/>)*

### **Genius Hour at the L&N STEM Academy**

At our school Genius Hour provides many different opportunities for students. They range anywhere from tutoring time with teachers; projects such as 3D printing, knitting, or environmental concerns;

*Chapter 2*

# ENGLISH



*If you think reading is boring,  
you are doing it wrong.*



**NuLit English College Prep****9th Grade**

Aligned with Tennessee State standards, this course is an intense integration of Algebra I and English I skills. Co-taught by an English and a Math teacher, units of study combine necessary algebraic skills with literacy skills, as emphasis is placed on collaborative problem solving. Successful completion of this course prepares students for English 2.

**English 1 College Prep****9th Grade**

For students who are functioning on grade level or above in Language Arts and Reading. The curriculum includes a study of grammar and language, study skills, library skills, composition, literature, and vocabulary development. *Summer reading is required.*

**English 1 Honors****9th Grade**

For students who are functioning above grade level in Languages Arts and Reading and have demonstrated competency in grammar and composition skills in the 8th grade. Students must have motivation and desire to participate in this program. English 1 Honors includes in-depth study in composition, research and literary analysis, and it requires advanced study techniques and outside readings. *Summer reading is required.*

**English 2 College Prep****10th Grade**

For students who have successfully demonstrated an average or above average ability to perform on-grade-level language, analytical, composition, and reading skills. The curriculum includes further development in literary analysis, vocabulary development, and composition.

**English 2 Honors****10th Grade**

For students who have demonstrated a mastery of grammar, writing, and reading skills in the English 1 standard College Prep or Honors level. The curriculum is an in-depth study of critical thinking and analytical skills and includes the development of composition, literary analysis, research, and speaking skills. Summer reading is required. This course is preparation for success in the Advanced Placement curriculum at the 11-12 grades.

**English 3 College Prep****11th Grade**

This course is for students who have successfully demonstrated an average or above average ability to perform on-grade-level language, analytical, composition, and reading skills. The literature component focuses on a survey of British/World Literature with continued development of literary analysis skills. In combination with U.S. History, this course will explore the cross curricular connections between history and literature. The course also emphasizes study of rhetorical appeals in real-world argumentative writing. The curriculum includes further development of analytical, composition, and research skills in preparation for college English.

**English 3 College Prep Blended****11th Grade**

**NEW.** The course also emphasizes study of rhetorical appeals in real-world argumentative writing through a survey of American literature. This course is designed for students who are functioning above grade level in Languages Arts and Reading and have demonstrated competency in self-paced, digital, and online environments. Students must have motivation and desire to participate in this program. *Students and parents must attend a blended orientation to participate.* The curriculum includes further development of analytical, composition, and research skills in preparation for college English. **(Prerequisites: Teacher recommendation, GPA of 2.5 or higher)**

**AP Combined Studies****11th Grade**

Upon completion of Honors English 2, AP Government, or demonstrated competency of rhetorical skills, students will focus on thinking and writing at the college level. The course is designed to develop students' abilities to think conceptually about U.S. History from approximately 1491 to the present and apply historical thinking skills as they learn about the past. Seven themes of equal importance---identity; peopling; politics and power; work, exchange, and technology; America in the world; environment and geography; and ideas, beliefs, and culture---provide the framework for research, writing, and discussion. A college level course, students will be prepared to take both the AP Language and Composition and AP U.S. History exams in May of their junior year. AP Combined Studies satisfies both the English 3 credit and Social Studies credit. Summer assignments are required. **(Prerequisite: Teacher recommendation)**

**AP Language & Composition Blended****11th Grade**

**NEW.** Upon completion of Honors English 2, AP Government or demonstrated competency of rhetorical skills, students will focus on thinking and writing at the college level. This course is designed for students who are functioning well above grade level in Languages Arts and Reading and have demonstrated competency in self-paced, digital, and online environments. Students must have motivation and desire to participate in this program. The curriculum includes further development of analytical, composition, and research skills at the level of a college freshman. Students will be prepared to take the AP Language and Composition exam in May of their junior year. *Students and parents must attend a Blended Orientation to participate.* Summer assignments are required. **(Prerequisite: Teacher recommendation)**

**English 4 College Credit (Dual Enrollment)****12th Grade**

A Senior English course for college credit. The curriculum is a composition and literary study equivalent to English Composition I on the college level. The course includes analysis of reading materials through formal compositions and tests. Students may receive Senior English credit and 3 hours of college credit. **(Prerequisite: Students must meet entrance requirements of the cooperating institution of higher education)**

**AP Literature and Composition****12th Grade**

A course for students who have successfully completed AP English 3 or demonstrated competency in literary analysis skills. Students must be highly motivated and have above-average writing and analytical skills. The curriculum is an in-depth study of American, British, and World Literature with expectations commensurate with the first year of college English. Outside readings are required. The course is designed to help develop the cognitive and communicative skills necessary to do well on the AP English Literature and Composition Test. **(Prerequisite: Teacher recommendation)**

**English 4 College Prep****12th Grade**

This course is for students who have successfully demonstrated an average or above-average ability to perform on-grade-level language, analytical, composition and reading skills. The literature component focuses on a survey of British/World Literature with continued development of literary analysis skills. The course also emphasizes study of rhetorical appeals in real-world argumentative writing. The curriculum includes further development of analytical, composition, and research skills in preparation for college English.

**English 4 College Prep Blended****12th Grade**

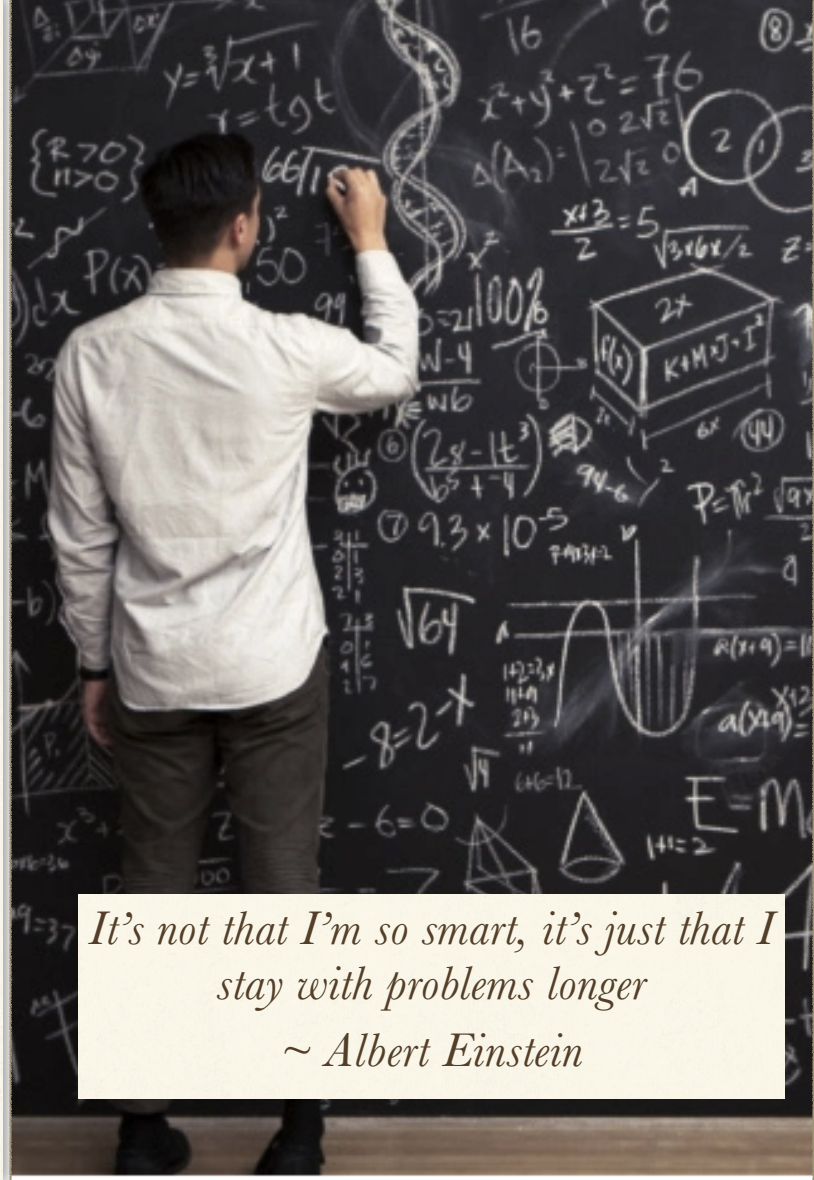
**NEW.** This course is for students who have successfully demonstrated an average or above-average ability to perform on-grade-level language, analytical, composition, and reading skills. The literature component focuses on a survey of British/World Literature with continued development of literary analysis skills. The course also emphasizes study of rhetorical appeals in real-world argumentative writing. This course is designed for students who are functioning above grade level in Languages Arts and Reading and have demonstrated competency in self-paced, digital, and online environments. Students must have motivation and desire to participate in this program. *Students and parents must attend a Blended Orientation to participate.* The curriculum includes further development of analytical, composition, and research skills in preparation for college English. **(Prerequisite: Teacher recommendation)**

**Yearbook****10th to 12th Grade**

For students interested in Print Journalism, photography, and graphic design. Must demonstrate abilities to work within schedules and timelines, work collaboratively, and may be expected to attend events before and after school. Final project is the successful completion of the school Yearbook. **(Prerequisites: Students may have to demonstrate ability to write well; may be required to apply for this course; and may be required to receive an English teacher recommendation)**

Chapter 3

MATH



*It's not that I'm so smart, it's just that I stay with problems longer*  
~ Albert Einstein



**NuLit Math College Prep****9th Grade**

Aligned with Tennessee State standards, this course is an intense integration of Algebra 1 and English 1 skills. Co-taught by an English and a Math teacher, units of study combine necessary algebraic skills with literacy skills, as emphasis is placed on collaborative problem solving. Successful completion of this course prepares students for Geometry.

**Algebra 1 College Prep****9th Grade**

Algebra 1 emphasizes the systematic development of the language of mathematics. Students learn to apply algebraic concepts in contextual situations and to generalize from the concrete to the abstract. Topics covered include: properties of the number system, linear and quadratic functions, inequalities, operations on real numbers and polynomials, exponents and radicals. Successful completion of this sequence prepares students for Geometry.

**Algebra 1 Honors****9th Grade**

This course is for students who did exceptionally well in the 8th grade mathematics. Course content covers the topics of Algebra 1 in greater depth and at a faster pace, thus providing time for enrichment through the study of additional performance objectives.

**Geometry College Prep****10th Grade**

This course is an introductory survey of plane geometry, three-dimensional geometry, coordinate geometry, and transformational geometry. The curriculum develops the vocabulary and reasoning skills students need to formulate algebraic and geometric proofs using an axiomatic system. The course also develops algebraic skills begun in Algebra 1 in preparation for further work in Algebra 2. Applied problems help students to understand how math is used in diverse careers. Successful completion of this course prepares a student for further work in Algebra 2 (**Prerequisite: Algebra 1 or Departmental recommendation**)

**Geometry Honors****9th and 10th Grade**

Topics found in College Preparatory Geometry are covered in greater depth with emphasis placed on problem solving, writing skills (especially in writing proofs) and algebraic applications. Additional enrichment objectives are covered as time permits. Successful completion of this course prepares a student for further work in Algebra, usually Algebra 2 Honors. (**Prerequisites: Algebra 1 in the 8th grade or Algebra 1 Honors in the 9th grade and Departmental recommendation**)

**Algebra 2 College Prep****10th and 11th Grade**

Algebra 2 involves the study of functions and an extension of the concepts of Algebra 1 and Geometry. Topics covered are: quadratic equations and functions; systems of equations and inequalities; polynomials and rational polynomial expressions; polynomial functions; conic sections; exponential and logarithmic functions; and probability and statistics. Satisfactory completion of this course prepares students for entry into Pre-Calculus or Advanced Algebra and Trigonometry.

**(Prerequisites: Algebra 1 and Geometry)**

**Algebra 2 Honors****10th and 11th Grade**

This course provides a rigorous preparation for Honors Pre-Calculus. An emphasis is placed on algebraic proof and provides an enriched version of Algebra 2 through the study of additional objectives and topics.

Successful completion of this course prepares students for entry into Pre-Calculus or Honors Pre-Calculus. **(Prerequisites: Algebra 1 and Geometry Honors with grades of at least a “B” or Departmental recommendation)**

**Algebra 2 Honors Blended****10th and 11th Grade**

This course provides a rigorous preparation for Honors Pre-Calculus. An emphasis is placed on algebraic proof and provides an enriched version of Algebra 2 through the study of additional objectives and topics.

Successful completion of this course prepares students for entry into Pre-Calculus or Honors Pre-Calculus. Students must have motivation and desire to participate in this program. *Students and parents must attend a blended orientation to participate.*

**(Prerequisites: Algebra 1 and Geometry Honors with grades of at least a “B” or Departmental recommendation)**

**Advanced Algebra and Trig****College Prep****11th and 12th Grade**

This course is designed for students who have completed Algebra 1, Geometry, and Algebra 2, but who may need a review of Algebra 2 skills and concepts, or who may be entering fields which require mathematics, but not necessarily calculus. The content includes the study of algebraic, exponential, logarithmic, and trigonometric functions. The course also explores discrete mathematics topics such as matrices, probability, and statistics. Students who successfully complete this sequence will have the skills necessary for Pre-Calculus at the college level.

**(Prerequisites: Algebra 1, Geometry, and Algebra 2)**

**Pre-Calculus College Prep****11th and 12th Grade**

Pre-Calculus develops the topics essential for success in Calculus. Content includes a study of algebraic, transcendental, and trigonometric functions, as well as their compositions and inverses, vectors, polar graphing, complex numbers, conic sections, and sequences and series.

Students who complete this course successfully will have a strong background for a first year Calculus sequence. **(Prerequisites: Algebra 1, Geometry, and Algebra 2 with “A/B” average recommended)**

**Pre-Calculus Honors****11th and 12th Grade**

The faster pace of this course provides the time to enrich the content of Pre-Calculus through the study of additional objectives and topics.

Successful completion of this course provides the student with the necessary prerequisites for Advanced Placement Calculus.

**(Prerequisites: Geometry Honors and Algebra 2 Honors with A/B average recommended)**

**AP Statistics****11th and 12th Grade**

This course is non-Calculus in its orientation with a major focus on data analysis. Students who study this course will be prepared to take the AP Statistics Exam and seek college credit. This course follows the topics listed in the College Board Advanced Placement course description.

**(Prerequisites: College Prep English or higher, Algebra 2 with a grade of C recommended, and Departmental recommendation)**

**AP Calculus AB****11th and 12th Grade**

Devoted mainly to the topics in Differential and Integral Calculus, students who study this course will be prepared to take the AP Calculus Exam and seek college credit. The scope of this course follows the topics listed in the College Board Advanced Placement Mathematics Course Description.

**(Prerequisites: Honors Pre-Calculus and Departmental recommendation)**

**AP Calculus BC****11th and 12th Grade**

This course is an extension of all the topics covered in AP Calculus AB and includes additional topics. Students who study this course will be prepared to take the Advanced Placement BC Calculus Exam and seek college credit. The scope of this course follows the topics listed in the College Board Advanced Placement Course Description.

**(Prerequisite: AP Calculus AB and Departmental recommendation)**

**Finite Math College Prep****12th Grade**

This course is a 4th year senior level math course that will focus on the big ideas of advanced mathematics. This course is designed to prepare students for both college and the workplace. Students choosing to take this course would be less likely to enroll in a STEM Calculus course upon entering college. However, this course will provide a foundation for students entering a business application Calculus course or other general education mathematics course.

**(Prerequisite: Algebra II)**

**AP Computer Science****11th and 12th Grade**

This course emphasizes object-oriented programming methodology with an emphasis on problem solving and algorithm development and is meant to be the equivalent of a first-semester course in computer science. It also includes the study of data structures and abstraction. The scope and sequence of this course follows the topics listed in the College Board Advanced Placement course description. Students who study this course will be prepared to take the Advanced Placement Computer Science "A" Exam and seek college credit. *A new element of the 2016 course is that it will include a service-learning component with out-of-class programming requirements. Our school has the distinction of being one of the few high schools nationwide offering the service learning version of this course.*

**(Prerequisite: Math or Science teacher approval)**

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## **AP Computer Principles**

## **11th and 12th Grade**

This is a second AP programming course. The L&N STEM Academy is one of the few high schools nationwide offering this course. This is equivalent to a college first-semester introductory computer engineering course. The course will be design-project-based, with students preparing group and individual portfolios. Students will acquire skills in the Swift programming language and will use it to create computational artifacts to be used in several school courses. Design teams will be collaborative and involve technical writing, programming, and system design. *Summer reading is required.* Prior programming skill is not required but will be an advantage. (**Prerequisites: Algebra 1, Geometry, and teacher approval**)

*Chapter 4*

# SCIENCE



*Somewhere, something incredible  
is waiting to be known.*



**Physical World Concepts College****Prep****9th Grade**

This course is designed to provide a strong foundation for all students taking higher level science courses such as Honors Chemistry, Physics, and AP Physics. Physical World Concepts will ensure that students pursuing STEM as a post-secondary major will have the necessary preparation for success in college work. An embedded mathematics strand enables students to utilize mathematical skills in much greater depth, e.g., analyzing, interpreting, articulating, assimilating, modeling, and demonstration.

**Physical World Concepts Honors****9th Grade**

This course is designed to provide a strong foundation for all students taking higher level science courses such as Honors Chemistry, Physics, and AP Physics. Physical World Concepts will ensure that students pursuing STEM as a post-secondary major will have the necessary preparation for success in college work. An embedded mathematics strand enables students to utilize mathematical skills in much greater depth, e.g., analyzing, interpreting, articulating, assimilating, modeling, and demonstration. The honors course is designed to meet the needs of the more academically able student.

**Chemistry 1 College Prep****10th Grade**

Chemistry 1 develops an understanding of the relevance of chemistry as it relates to standards of living, career choices, and current issues in science and technology. Course content includes laboratory techniques and safety, properties and structures of matter in its various states, chemical calculations and quantitative relationships, chemical bonding and molecular structure, chemical reactions, solutions, gas laws, and acids and bases. The ability to make mathematical computations using fractions, decimals, ratios and proportions, and exponents is required.

**(Prerequisite: Algebra 1)**

**Chemistry 1 Honors****9th and 10th Grade**

This course develops an understanding of the relevance of chemistry as it relates to standards of living, career choices, and current issues in science and technology. Course content includes laboratory techniques and safety, properties and structures of matter in its various states, chemical calculations and quantitative relationships, chemical bonding and molecular structure, chemical reactions, solutions, gas laws, and acids and bases. The ability to make mathematical computations using fractions, decimals, ratios and proportions, and exponents is required. Honors Chemistry is designed to meet the needs of the more academically able student and will include a basic study of nuclear principles and organic chemistry. **(Prerequisites: Algebra 1 with eligibility for Geometry)**

**Chemistry 1 Honors Blended****10th Grade**

**NEW.** Chemistry 1 develops an understanding of the relevance of chemistry as it relates to standards of living, career choices, and current issues in science and technology. Course content includes laboratory techniques and safety, properties and structures of matter in its various states, chemical calculations and quantitative relationships, chemical bonding and molecular structure, chemical reactions, solutions, gas laws, and acids and bases. The ability to make mathematical computations using fractions, decimals, ratios and proportions, and exponents is required. As a blended learning class, students will only meet with their instructor one day per week. The rest of the time will be independent and group study outside of class. Students must have motivation and desire to participate in this program. *Students and parents must attend a blended orientation to participate.* **(Prerequisite: Algebra 1 and teacher and administrator approval)**

**Biology 1 College Prep****11th Grade**

Biology I introduces students to the world of living things. The goal is to develop an understanding of the diversity and unity in life. Concepts covered include basic life processes at the molecular, cellular, systemic, organismal, and ecological levels; the interdependence and interactions within the environment; cultural and historical contributions of men and women of the sciences; evidence of biological evolution; and current and emerging technologies in the life sciences.

**Biology 1 Honors****10th and 11th Grade**

This course develops an understanding of the diversity and unity in living things. Concepts covered include the interactions of organisms with their environment, chemical structures of organisms, transfer of energy of organisms, cell structure and function, continuity and change in living things, diversity of living things, and biology-related career opportunities. Honors Biology places increased emphasis on development of critical thinking skills. **(Prerequisite: Teacher recommendation)**

**Biology 1 Honors Blended****10th and 11th Grade**

This course develops an understanding of the diversity and unity in living things. Concepts covered include the interactions of organisms with their environment, chemical structures of organisms, transfer of energy of organisms, cell structure and function, continuity and change in living things, diversity of living things, and biology-related career opportunities. Honors Biology places increased emphasis on development of critical thinking skills. As a blended learning class, students will only meet with their instructor one day per week. The rest of the time will be independent and group study outside of class. Students must have motivation and desire to participate in this program. *Students and parents must attend a blended orientation to participate.* Student selection is based upon a combination of standardized test scores, past performances in science, and teacher recommendations. **(Prerequisite: Teacher and administrator recommendation)**

**Chemistry 2 Honors / AP****Chemistry****11th and 12th Grade**

**(2 Credits)** Develops an understanding of the properties of matter and the interactions of matter and energy. The course includes a more in-depth study of topics introduced in Chemistry 1, such as atomic structure, quantum theory, organic chemistry, electrochemistry, kinetic molecular theory, stoichiometry, chemical equilibrium, and thermodynamics. Student selection is based on a combination of past performance in science and mathematics and teacher recommendation. The Advanced Placement curriculum is designed to prepare students to take the AP Chemistry test. Students may be required to attend additional classroom or laboratory sessions beyond the typical schedule. **(Prerequisites: Chemistry 1, Algebra 1 and 2, and teacher recommendation required. Current enrollment in Advanced Math or Calculus is strongly recommended)**

**Biology 2 Honors / AP Biology****11th and 12th Grade**

**(2 Credits)** Biology 2 Honors offers an in-depth coverage of biology topics equivalent to the first semester of college cellular and molecular biology. This course is intended to be a pre-cursor or companion to AP Biology. Curriculum topics include biochemistry, cytology, genetics, animal physiology, plant physiology, and ecology. The Advanced Placement curriculum is designed to prepare students to take the AP Biology exam. The current syllabus includes the areas of molecular and cellular biology, genetics and evolution, and organismal and population biology. Students may be required to attend additional classroom or laboratory sessions beyond the typical schedule. **(Prerequisites: Biology 1, Chemistry, and teacher recommendation)**

**Anatomy and Physiology****11th and 12th Grade**

This course is a study of the body's structures and respective functions at the molecular/biochemical, cellular, tissue, organ, systemic, and organismal levels. Students explore the body through laboratory investigations, models, diagrams, and/or comparative studies of the anatomy of other organisms. Content includes the study of the structure and function of cells, tissues, organs, and body systems. **(Prerequisite: Biology 1 is required. Chemistry 1 is recommended)**

**Microbiology****11th and 12th Grade**

This course examines the role of microbes in everyday life. Major topics covered include microbial cell biology, microbial genetics, microorganism's interactions in the environment, and the interactions and impact of microorganisms with humans. **(Prerequisites: Biology 1 and Chemistry 1)**

**AP Environmental Science****10th to 12th Grade**

A first-year college level environmental science course, which follows the syllabus of the College Board's Advanced Placement Program. The AP Environmental Science course is designed to prepare students to take the College Board AP Environmental Science test given in May of each year. The goal of this course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them. Students may be required to complete a summer assignment and/or attend additional classroom or laboratory sessions beyond the regularly scheduled classes.

**(Prerequisites: Biology 1, Chemistry 1, and teacher recommendation)**

**AP Physics 1****11th and 12th Grade**

This is equivalent to a first semester in college in algebra based physics. This course covers Newtonian mechanics (including rotational dynamics and angular momentum); work, energy and power; and mechanical waves and sound. It also introduces electric circuits. **(Prerequisites: Geometry, currently taking Algebra 2 or equivalent course, and teacher recommendation)**

**AP Physics C (Calculus Based)  
(Mechanics)****12th Grade**

A first year, Calculus-based college level Physics course that has been audited and approved by the College Board's Advanced Placement Program. This course is equivalent to a semester-long, calculus-based college course in classical Mechanics that includes a strong laboratory component. The Physics C course requires a more advanced knowledge of mathematics than the Physics B course. Topics covered include the following six content areas: kinematics; Newton's laws of motion; work, energy and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation. Students may be required to complete a summer assignment and/or attend additional classroom or laboratory sessions beyond the regularly scheduled classes. **(Prerequisites: Algebra 1 and 2, Geometry, and Chemistry, along with current enrollment in Calculus as well as Department approval)**

**Astronomy College Prep****10th to 12th Grade**

The goal of Astronomy is to introduce students to the concepts, theories, and laws defining the motions of the planets and the properties of the sun, moon, stars, planets, and other bodies of the heavens. Students will actively observe the day and night skies; make measurements of astronomical phenomena; create projects and models; and use computers for simulations and research. **(Prerequisites: Algebra 1 and Geometry)**

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**Geology College Prep****10th to 12th Grade**

This course explores the origins and connections between the physical, chemical, and biological processes of the earth system. The student will investigate maps, matter, and minerals, the rock cycle, geologic history, oceanography, hydrologic cycle, geologic hazards, and plate tectonics. Geology focuses on the physical aspects of the earth process and cycles. Tennessee geologic features will also be a part of this study.

**(Prerequisites: Chemistry 1 Co- or Prerequisite Biology 1)**

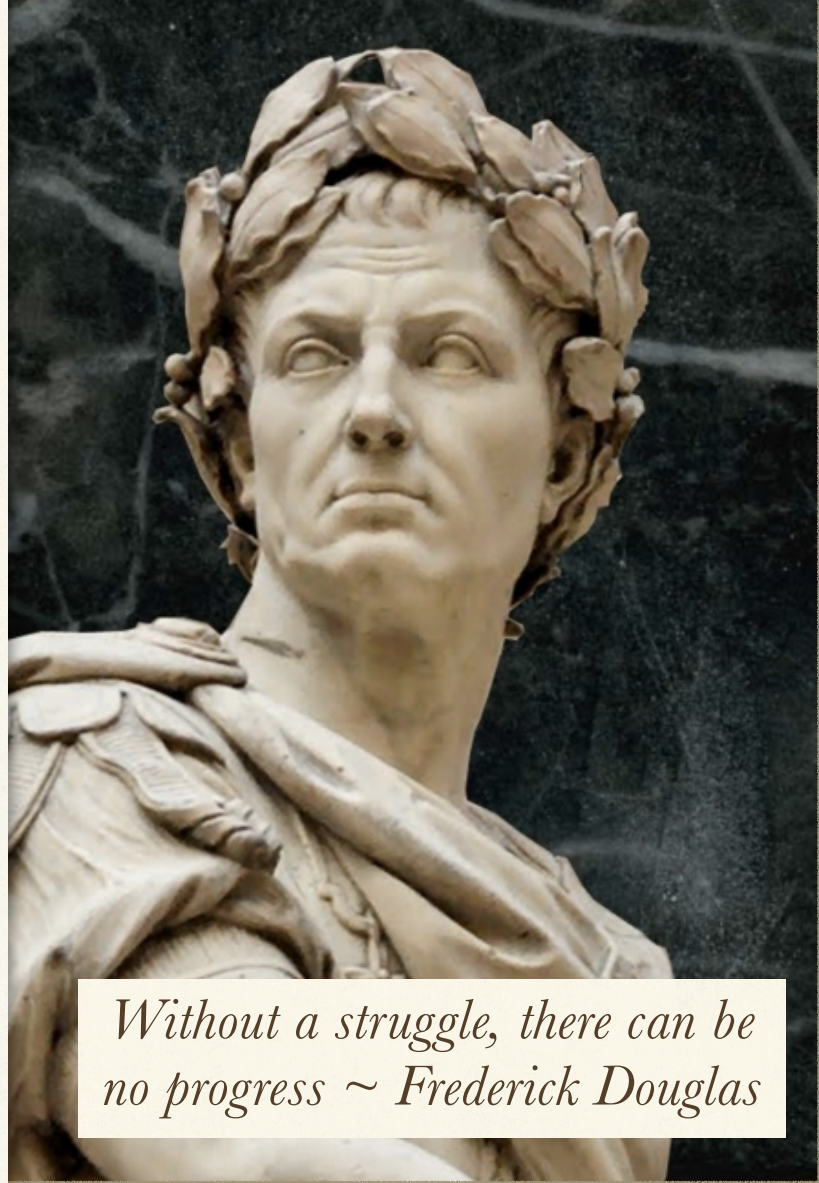
**Introduction to Organic /  
Biochemistry College Prep****11th and 12th Grade**

**(Zero Block Only)** This is a high-school-level survey of topics in Organic and Biochemistry. Topics will include organic compounds, reactions, nomenclature and the types, structure, and function of biological molecules and processes. This will be a rigorous class on par with an honors level class. **(Prerequisite: Chemistry 1 and Biology 1, and teacher recommendation)**



*Chapter 5*

# SOCIAL STUDIES



*Without a struggle, there can be  
no progress ~ Frederick Douglass*

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**World History and Geography****College Prep****9th Grade**

Students will study the rise of the nation state in Europe, the French Revolution, and the economic and political roots of the modern world. They will examine the origins and consequences of the Industrial Revolution, 19th Century political reform in Western Europe, and imperialism in Africa, Asia, and South America. They will explain the causes and consequences of the great military and economic events of the past century, including the World Wars, the Great Depression, the Cold War, and the Russian and Chinese Revolutions. Finally, students will study the rise of nationalism and the continuing persistence of political, ethnic, and religious conflict in many parts of the world. Relevant Tennessee connections will be part of the curriculum, as well as appropriate primary source documents. Students will explore geographic influences on history, with attention given to political boundaries that developed with the evolution of nations from 1750 to the present and the subsequent human geographic issues that dominate the global community. Additionally, students will study aspects of technical geography such as GPS and GIS, and how these innovations continuously impact geopolitics in the contemporary world.

**World History and Geography****Honors****9th Grade**

Students will study the rise of the nation state in Europe, the French Revolution, and the economic and political roots of the modern world. They will examine the origins and consequences of the Industrial Revolution, 19th Century political reform in Western Europe, and imperialism in Africa, Asia, and South America. They will explain the causes and consequences of the great military and economic events of the past century, including the World Wars, the Great Depression, the Cold War, and the Russian and Chinese Revolutions. Finally, students will study the rise of nationalism and the continuing persistence of political, ethnic, and religious conflict in many parts of the world. Relevant Tennessee connections will be part of the curriculum, as well as appropriate primary source documents. Students will explore geographic influences on history, with attention given to political boundaries that developed with the evolution of nations from 1750 to the present and the subsequent human geographic issues that dominate the global community. Additionally, students will study aspects of technical geography such as GPS and GIS, and how these innovations continuously impact geopolitics in the contemporary world. *This course requires in-depth reading and analysis and a work-load well beyond that of CP World History.*

**AP Human Geography****9th Grade**

The AP Human Geography course is equivalent to an introductory college level course in human geography. The course introduces students to the systematic study of patterns and processes that have shaped human understanding, use, and alteration of the Earth's surface. Students employ spatial concepts and landscape analysis to examine socioeconomic organization and its environmental consequences. They also learn about the methods and tools geographers use in their research and applications. The curriculum reflects the goals of the National Geography Standards (2012). *Replaces World History and Geography Credit.* **(Prerequisite: Teacher recommendation)**

**US Government and Civics and Contemporary Issues College Prep****10th Grade**

Students will study the purposes, principles, and practices of American government as established by the Constitution. Students are expected to understand their rights and responsibilities as citizens and how to exercise these rights and responsibilities in local, state, and national government. Students will learn the structure and processes of the government of the state of Tennessee and various local governments. The reading of primary source documents is a key feature of United States Government and Civics standards. Students will use inquiry skills to examine the issues that impact the contemporary world. Included in the course will be analysis of the historical, cultural, economic, and geographic factors that have raised certain issues to levels of concern in our nation and around the globe. Students will engage in research and problem solving in order to better understand and assess significant current issues.

**AP US Government and Politics****10th Grade**

AP United States Government and Politics introduces students to key political ideas, institutions, policies, interactions, roles, and behaviors that characterize the political culture of the United States. The course examines politically significant concepts and themes, through which students learn to apply disciplinary reasoning, assess causes and consequences of political events, and interpret data to develop evidence-based arguments. **(Prerequisite: Teacher recommendation)**

**US History and Geography  
College Prep**

**11th Grade**

Students will examine the causes and consequences of the Industrial Revolution and America's growing role in world diplomatic relations, including the Spanish- American War and World War I. Students will study the goals and accomplishments of the Progressive movement and the New Deal. Students will also learn about the various factors that led to America's entry into World War II as well as its consequences for American life. Students will explore the causes and course of the Cold War. Students will study the important social, cultural, economic, and political changes resulting from the Civil Rights Movement, the Cold War, and recent events and trends that have shaped modern-day America. Additionally, students will learn the causes and consequences of contemporary issues impacting their world today. Students will continue to use skills for historical and geographical analysis as they examine American history since Reconstruction with special attention to Tennessee connections in history, geography, politics, and people. Students will continue to learn fundamental concepts in civics, economics, and geography within the context of United States history. The reading of primary source documents is a key feature of United States history standards. Finally, students will focus on current human and physical geographic issues important in contemporary America and the global society.

**AP US History Combined Studies**

**11th Grade**

AP US History focuses on developing students' abilities to think conceptually about U.S. history from approximately 1491 to the present and apply historical thinking skills as they learn about the past. Seven themes of equal importance — identity; peopling; politics and power; work, exchange, and technology; America in the world; environment and geography; and ideas, beliefs, and culture — provide areas of historical inquiry for investigation throughout the course. These require students to reason historically about continuity and change over time and make comparisons among various historical developments in different times and places. A college level course, students will be prepared to take both the AP Language and Composition and AP U.S. History exams in May of their junior year. AP Combined Studies satisfies both the English 3 credit and Social Studies credit. Summer assignments are required. *This course is only offered in combination with AP Language and Composition.*

**(Prerequisite: Teacher recommendation)**

**Economics College Prep**

**12th Grade**

**(1/2 credit)** Students will examine the allocation of scarce resources and the economic reasoning used by government agencies and by people as consumers, producers, savers, investors, workers, and voters. Key elements of the course include the study of scarcity, supply and demand, market structures, the role of government, national income determination, money and the role of financial institutions, economic stabilization, and trade. *Taken with Personal Finance.*

**Personal Finance College Prep** **12th Grade**

(1/2 credit) Personal Finance is a course designed to inform students how individual choices directly influence occupational goals and future earnings potential. Real world topics covered will include income, money management, spending and credit, as well as saving and investing. *Taken with Economics.*

**Economics College Prep Blended** **12th Grade**

(1/2 Credit) Students will examine the allocation of scarce resources and the economic reasoning used by government agencies and by people as consumers, producers, savers, investors, workers, and voters. Key elements of the course include the study of scarcity, supply and demand, market structures, the role of government, national income determination, money and the role of financial institutions, economic stabilization, and trade. Taken with Economics Blended. Students must have motivation and desire to participate in this program. *Students and parents must attend a blended orientation to participate.* **(Prerequisite: Teacher Recommendation)**

**Personal Finance College Prep Blended** **12th Grade**

(1/2 credit) Personal Finance is a course designed to inform students how individual choices directly influence occupational goals and future earnings potential. Real world topics covered will include income, money management, spending and credit, as well as saving and investing. Taken with Economics Blended. Students must have motivation and desire to participate in this program. *Students and parents must attend a blended orientation to participate.* **(Prerequisite: Teacher Recommendation)**

**AP Human Geography** **10th to 12th Grade**

The AP Human Geography course is equivalent to an introductory college level course in human geography. The course introduces students to the systematic study of patterns and processes that have shaped human understanding, use, and alteration of the Earth's surface. Students employ spatial concepts and landscape analysis to examine socioeconomic organization and its environmental consequences. They also learn about the methods and tools geographers use in their research and applications. The curriculum reflects the goals of the National Geography Standards (2012). *Taken in grades 10-12, this course serves as an elective credit only.* **(Prerequisite: Teacher recommendation)**

**AP European History** **10th to 12th Grade**

The study of European history since 1450 introduces students to cultural, economic, political, and social developments that played a fundamental role in shaping the world in which they live. Without this knowledge, we would lack the context for understanding the development of contemporary institutions, the role of continuity and change in present day society and politics, and the evolution of current forms of artistic expression and intellectual discourse. In addition to providing a basic narrative of events and movements, the goals of AP European History are to develop (a) an understanding of some of the principle themes in modern European history, (b) an ability to analyze historical evidence and historical interpretation, and (c) an ability to express historical understanding in writing. **(Prerequisite: Teacher recommendation)**



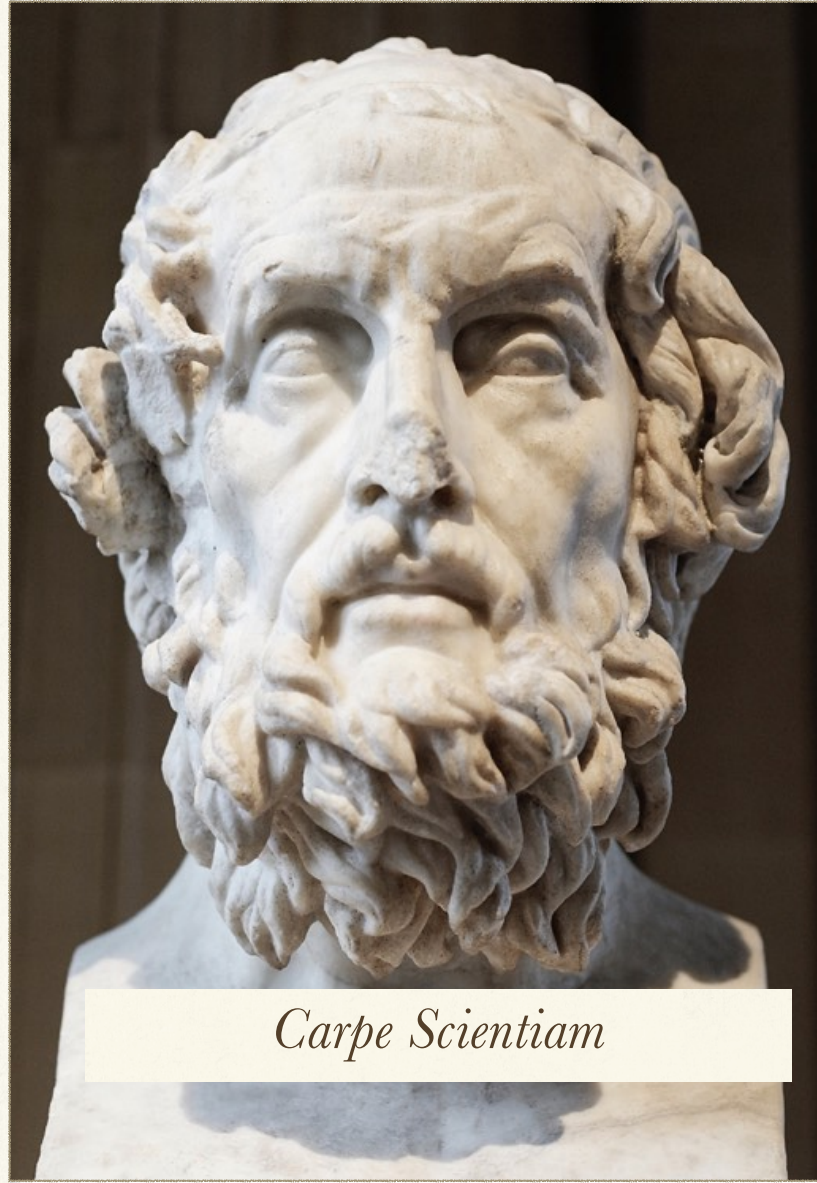
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**AP Psychology****11th and 12th Grade**

The content of this college-level course in psychology prepares students for the AP Psychology exam that falls under the auspices of the College Board and the Advanced Placement Program. AP Psychology, although offered at the high-school level, affords college-level instruction and demands advanced-learner productivity (reading, homework, and research). Participants will explore the behavioral and mental processes of animals and humans, and they will be exposed to the psychological facts, principles, and phenomena associated with each of the major subfields of psychology. Participants will also study ethics and methods used by psychologists in their science and practice. Perhaps most importantly, participants will learn more about themselves and those around them. Put simply, this course will help answer the question, “Why do people do the things they do?” (**Prerequisite: Teacher recommendation**)

*Chapter 6*

# WORLD LANGUAGES



*Carpe Scientiam*

**Etymology Mythology****9th Grade**

A one-unit course for students in 9th grade enrolled in English 9 CP, the curriculum includes a study of etymology, vocabulary development, classical mythology, and allusions found in literature, music, and the arts. This course lays a foundation for Latin 1. This course does NOT qualify as a foreign language credit for graduation.

**Latin 1****9th & 10th Grade**

For students who are interested in acquiring knowledge of the Roman language and culture, the curriculum includes the development of vocabulary, grammar, translation skills, knowledge of English derivatives, and the study of the historical and cultural values of Rome and its continuing contributions to western civilization. This course is for 9th grade students currently enrolled in English 9 Honors and any students in grades 10-12. This is a required course for graduation from the L&N STEM Academy.

**Latin 2****10th & 11th Grade**

For students who are interested in more deeply developing the skills learned in the first level, the Latin II curriculum includes further study of Latin grammar, vocabulary, and the history and culture of the Romans. Students who have successfully completed Level 1, or who have demonstrated proficiency as determined through a language proficiency test or through teacher recommendations, are eligible to take this course. Recommended for students in grades 10-12. This is a required course for graduation from the L&N STEM Academy.

**Latin 3 Honors****11th & 12th Grades**

For students who are interested in further developing and employing the skills learned in the first and second levels, the curriculum includes reading and translating the works of famous Roman authors such as Julius Caesar, Cicero, Pliny, Vergil, Ovid, and others. Level 3 is recommended for college-bound students who plan to take university placement tests in Latin. **(Prerequisite: Latin 2 or Teacher recommendation)**

**Latin 4 Honors****11th & 12th Grades**

For students who have completed previous levels of Latin and are motivated to move beyond the standard Latin curriculum. The curriculum includes translating and analyzing in more detail the works of Cicero, Horace, Catullus, Ovid, and Vergil. Students who take this course must be willing and able to work independently. The purchase of a workbook or other supplementary texts may be required. **(Prerequisite: Latin 3 Honors or Teacher recommendation)**

**AP Latin Vergil and Caesar****11th & 12th Grades**

This course is an intensive language study in preparation for the Advanced Placement examination in Latin. The class includes reading and translating Vergil's *Aeneid* and Caesar's *De Bello Gallico*. An overview of Roman literature, history, and culture is also a focus, along with identifying poetical and rhetorical devices and analyzing and writing about literature. Scoring at a certain level on the AP Exam may allow a student to use this course for college credit. At UTK a score on the AP Exam of 3 or better will allow the student to gain credit for Latin 111 and Latin 112, the first year of Latin. This will allow the student to fulfill his/her language requirement and will result in considerable cost savings at college. **(Prerequisite: Teacher Recommendation)**

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**Mandarin Chinese College Prep****9th to 12th Grades**

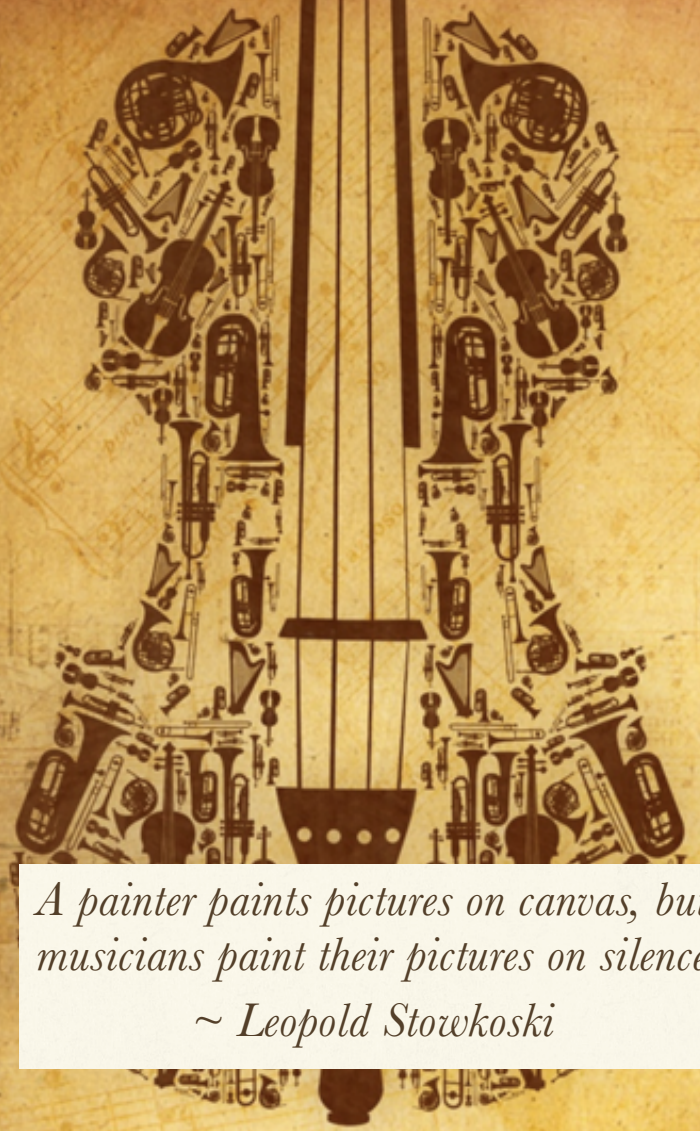
For students who are interested in acquiring knowledge of the culture and language. The curriculum includes the study of the culture and basic communicative skills in listening, speaking, reading, and writing.

Recommended for 9th grade students who are taking English 1 Honors, and for any students in grades 10-12 who need to meet the 2-year college entrance requirement. Students may wish to defer fulfilling this requirement until 10th grade or later.



*Chapter 7*

FINE ARTS



*A painter paints pictures on canvas, but  
musicians paint their pictures on silence  
~ Leopold Stowkoski*



## Fine Arts: Visual

### Art 1 College Prep

9th to 12th Grade

A survey course designed for students in grades 9-12 who are enrolling in a high school art course for the first time. This course provides a variety of experiences that build on the concepts, techniques, and use of media introduced in the middle school program. Generally laboratory in nature, Art 1 explores and gives experience in two-dimensional (drawing, painting, printmaking) and limited three-dimensional (sculptural) formats and integrates art history, design principles, and aesthetic criticism and response.

### Art Advanced College Prep

10th to 12th Grade

This course is for students who have successfully completed Art I and who, in the judgment of the instructor, show a sufficient level of interest and/or ability that would warrant continued study in Visual Art. This ensures that students who continue beyond the first year will grow in their artistic development. Students may continue in Advanced Art on a space-available basis and may repeat Advanced Art yearly at the determination of the instructor. **(Prerequisite: A/B in Art I and teacher recommendation)**

### Art Honors

11th to 12th Grade

Honors Art is for students who are just starting the AP portfolio or for students that need more time to complete the portfolio. It is also for students not planning on submitting an AP portfolio, but who are developing a portfolio for college application (for art, digital art careers, and design fields such as architecture, industrial and interior design, for example). May be repeated or taken concurrently with AP Studio Art. **(Prerequisite: Advanced Art and/or teacher recommendation)**

### AP Studio Art

11th to 12th Grade

The AP Studio Art portfolio is designed for students who are seriously interested in the practical experience of art. AP Studio Art is not based on a written examination; instead, students submit portfolios for evaluation at the end of the school year. **(Prerequisite: Advanced Art and teacher recommendation)**

### AP Studio Art: 2D Design

11th to 12th Grade

The Advanced Placement 2D Design Portfolio is intended to address a very broad interpretation of two-dimensional (2D) design issues, which involves purposeful decision-making about how to use the elements and principles of art in an integrative way. For this portfolio, students are asked to demonstrate proficiency in 2D design using a variety of art forms. These could include, but are not limited to, graphic design, typography, digital imaging, photography, collage, fabric design, weaving, illustration, painting, and printmaking. A variety of approaches to representation, abstraction, and expression may be part of the student's portfolio. **(Prerequisite: Advanced Art and teacher recommendation)**

**AP Studio Art: Drawing****11th to 12th Grade**

The Advanced Placement Drawing Portfolio is designed to include a very broad interpretation of drawing issues. Many types of painting, printmaking, studies for sculpture, and some forms of design, as well as abstract and observational works, could qualify as addressing drawing issues. The range of marks used to make drawings, the arrangement of those marks, and the materials used to make the marks are endless. Works of photography, videotape, and computer-generated works may not be submitted for the Drawing Portfolio. **(Prerequisite: Advanced Art and teacher recommendation)**

**Fine Arts: Vocal****Vocal Music 1****9th to 12th Grade**

Vocal Music I is for beginning choral students who seek to perform a wide variety of sacred and secular choral literature of easy to medium easy difficulty in a variety of styles. Emphasis is placed on vocal production and basic choral techniques, intonation, phrasing, sight reading, general musicianship skills, and understanding and attitudes of individuals to the group. There are no prerequisites for this course, although the teacher may recommend some very basic minimum requirements. Performances and after-school rehearsals may be required.

**Vocal Music 2****9th to 12th Grade**

Vocal Music 2 is for choral students who seek to perform a wide variety of sacred and secular choral literature of moderate difficulty in a variety of styles. Emphasis is placed on vocal production and moderately difficult choral techniques, intonation, phrasing, sight reading, general musicianship skills, and understanding and attitudes of individuals to the group. Performances and after-school rehearsals are required.

**(Prerequisite: Vocal Music I. [9th grade students must have a teacher recommendation])**

## Fine Arts: Instrumental

### Choral Ensemble

10th to 12th Grade

Choral Ensemble consists of students with previous choral experience approved by the director. Emphasis is placed on an advanced degree of musicianship, increased harmonic and rhythmic reading skills, and higher-level performance skills. Opportunities are provided for performance in school and community, including regional and state audition clinics. Performances and after school rehearsals are required. **(Prerequisite: Vocal Music 1 or Vocal Music 2 and teacher recommendation)**

### AP Music Theory

11th to 12th Grade

The AP Music Theory course corresponds to two semesters of a typical introductory college music theory course that covers topics such as musicianship, theory, musical materials, and procedures. Musicianship skills including dictation and other listening skills, sightsinging, and keyboard harmony are considered an important part of the course. Through the course, students develop the ability to recognize, understand, and describe basic materials and processes of music that are heard or presented in a score. Development of aural skills is a primary objective. Performance is also part of the learning process. Students understand basic concepts and terminology by listening to and performing a wide variety of music. Notational skills, speed, and fluency with basic materials are emphasized. Students who enroll in AP Music Theory are expected to also participate in a performance ensemble if possible, in order to help emphasize the course content. **(Prerequisite: Teacher recommendation)**

### Concert Band: Woodwinds and Brass

9th to 12th Grade

Concert Band – Woodwind and Brass is available to all 9th through 12th grade students who play either a woodwind or brass instrument. Students will be expected to maintain a regular practice schedule and adhere to all musical expectations of the director. The school provides low brass and low woodwind instruments to students of these instruments. All students are expected to provide auxiliary needs for their specific instrument (reeds, cloths, valve oil, etc.). Students will study a variety of literature, including marches, waltzes, orchestral transcriptions, world music, folk, and traditional band literature from 20th and 21st Centuries. Students are expected to be able to read music notation. Performances and after-school rehearsals will be required. Additional performance opportunities include invitational and audition clinics, festivals, and contests.

### Percussion Ensemble

9th to 12th Grade

Percussion Ensemble is available to all 9th through 12th grade students who are percussionists. This includes students who study piano. Students will be expected to maintain a regular practice schedule, and adhere to all musical expectations of the director. The school provides percussion instruments to students. Students are expected to be able to read music notation, and must have their own mallets and drumsticks for coursework. Students will study a variety of percussion ensemble literature, including marches, waltzes, orchestral transcriptions, world music, folk, and traditional literature from 20th and 21st Centuries. Performances and after-school rehearsals will be required. Additional performance opportunities include invitational and audition clinics, festivals, and contests.

**String Orchestra****9th to 12th Grade**

String Orchestra is for students studying violin, viola, cello, or double bass. Prior experience with one or more of these instruments is required. String Orchestra provides students with the opportunity of continuing the study and performance of orchestral literature from several musically historical periods. The course focuses on the development of performance skills for individuals and ensembles, based on the context of the programmed repertoire. Independent practice and concert performances are required. Additional performance opportunities include invitational and audition clinics, festivals, and contests.

**Digital Music Production****9th to 12th Grade**

Digital Music Production offers a practical, fully multimedia-based curriculum designed to teach basic musical concepts through the creative process of composition, recording, and editing. Students will have hands-on experience with digital audio workstation software, and learn how to create, edit, save, and produce digital music. This course is designed to create an in-depth general music experience without having to know traditional music theory. All students can have meaningful hands-on applied learning experiences that will impact not only their music experiences and learning, but also their understanding and comfort with 21st Century audio technology. *This is a lab-based course, and students will be expected to complete their coursework during class.*

**Theater Arts 1 for Film and TV****9th to 12th Grade**


This fine-arts elective is designed for students who have an interest in drama history and acting in front of the camera. The curriculum includes acting technique, stage directions, literary analysis, theater history, stage craft, filming and editing, and theatrical presentation. Students are expected to be outgoing and highly motivated as they collaborate on TV and film projects.

**Theater Arts 2 for Film and TV****10th to 12th Grade**

This fine-arts elective is designed for students who have successfully completed Theater Arts 1 and wish to expand their acting technique as applied to TV and film. The curriculum includes further study in acting technique, filming, editing, and focuses heavily on project-based learning (theatrical presentations). Students in grades 10 to 12 may repeat this class for multiple credits with teacher permission. **(Prerequisite: Theater Arts 1 for Film and TV)**

*Chapter 8*

# CAREER TECHNICAL



*Design is not just about what it looks like and feels like. Design is about how it works. ~ Steve Jobs*



**Web Design 1: Foundations****9th to 12th Grade**

This course introduces the student to HTML (hypertext markup language), the language used to create files for the web. Specific content includes programming static web pages and sites in HTML, coded to W3C Standards including accessibility, usability, and design. Students will learn the fundamentals of graphical user interface (UI) development, and user interactivity (UX), and search engine optimization (SEO). This course content provides students the opportunity to acquire fundamental skills in both theory and practical application of web design and development and of leadership and interpersonal skill development. Students will build and maintain a fully functioning, well-designed website.

**Web Design 2: Site Designer****10th to 12th Grade**

This course content builds upon Web Design I Foundations, and includes a focus on designing and developing dynamic web content. Specifically, advanced graphical user interface (UI) development, user interactivity (UX) are included. Additionally, ECommerce marketing, customer relations, and commercial website design and development, and E-Commerce are covered. Further, back-end operations of database integration, networking, server setup and maintenance (client-side / server-side), and security considerations are included. This course maps to the Certified Internet Webmaster “Site Designer” national certification examination. **(Prerequisite: Web Design I Foundations)**

**Digital Arts and Design 1****9th to 12th Grade**

This core course provides an overview of the graphics and media industries. This course is focused on introducing visual, conceptual, technical and design skills used in the creation of computer graphics, motion graphics, film and video, and animation.

**Digital Arts and Design 2****10th to 12th Grade**

This course is focused on visual, conceptual, and technical design skills used in the digital publishing of computer graphics, motion graphics, film and video, and animation. Focuses will be on finding collaborative design solutions to design problems along with the study of the conceptualization of a message and the process it must go through to accurately and effectively reach its audience. The student will explore various applications of design through extensive study of design principles, visual elements, digital color issues, typography, style, composition, and various problem solving skills. **(Prerequisites: Digital Arts and Design 1 and teacher recommendation)**

**Digital Arts and Design 3: Intro  
to Animation and Simulation**

**11th to 12th Grade**

In this course students develop an understanding of digital design principles and application of the Integrated Design Process as a means of strategic communication. Students will develop skills to interface the creative process, technologies and business objectives to communicate with targeted audiences. Students will develop problem solving skills and creative thinking (analytical and intuitive) related to digital design and an array of original designs for print and online applications that leverage technologies and software applications such as Adobe Creative Suite, Macromedia's Dreamweaver, Flash, and Fireworks to achieve effective communications. **(Prerequisites: Digital Arts and Design I and II and teacher recommendation)**

**Applied Arts and Design  
Practicum**

**12th Grade**

**(ZERO Block Only)** Engineering Practicum is a capstone course intended to provide students with the opportunity to apply the skills and knowledge learned in previous Engineering courses within a professional, working environment. In addition to developing an understanding of the professional and ethical issues encountered by engineers and technologists in the workplace, students learn to refine their skills in problem solving, research, communication, data analysis, teamwork, and project management. The course is highly customizable to meet local system needs: instruction may be delivered through school laboratory training or through work--based learning arrangements such as internships, cooperative education, service learning, mentoring, and job shadowing. Upon completion of the practicum, students will be prepared for postsecondary study in engineering and technology fields.

**(Prerequisite: Completion of an Elective Area of Focus within the CTE program and teacher recommendation)**

**Computer Systems**

**9th to 12th Grade**

Computer Systems is an intermediate course designed to prepare students with work related skills and aligned certification in the information technology industry. Content provides students the opportunity to acquire knowledge in both theory and practical applications pertaining to hardware, operating systems, safe mode, command prompt, security, networking, printers, peripheral devices, laptops, mobile devices, troubleshooting, and customer service management. Upon completion of the course, proficient students will have acquired skills and knowledge to install, configure, and maintain computer systems. Students who are proficient in this course will be eligible to pursue the IT industry standard credential, CompTIA's A+ certification. **(Prerequisite: Algebra 1)**



*Chapter 9*

PHYSICAL  
EDUCATION



*Don't let what you can't do stop you  
from doing what you can do ~  
Coach John Wooden*

**Lifetime Wellness****9th to 12th Grade**

The goal of Lifetime Wellness is for the student to learn a lifetime process of positive lifestyle management that works to integrate the emotional, social, intellectual, and physical dimensions of self for a longer, higher quality of life. The class consists of the following strands: Disease Prevention Control, Mental Health, Nutrition, Physical Fitness, Safety and First Aid, Sexuality and Family Life, and Substance Use/Abuse.

**Physical Education****9th to 12th Grade**

The focus of this class is on fitness and lifetime activities. It is designed to teach basic fitness principles while participating in a variety of activities. Lifetime activities include fitness, individual and team sports, games and outdoor activities. The purpose of this class is to demonstrate to students the positive benefits and impact exercise can have throughout their lives.

**Physical Education Advanced****10th to 12th Grade**

Advanced Physical Education provides progressive skills, techniques, and strategies in various activities. **(Prerequisite: Physical Education I or completion of a varsity level sport)**

**Physical Education Advanced Blended****10th to 12th Grade**

Blended Learning will allow students the ability to learn at their own pace and individualize their fitness plans. While most work will be done individually outside of class, some instructional time with the teacher is required. Students will develop their own system of reporting mastery of each concept assigned. Students must have motivation and desire to participate in this program. *Students and parents must attend a blended orientation to participate.* **(Prerequisite: Physical Education 1 and teacher recommendation)**



*Chapter 10*

# GENERAL ELECTIVES



*Intelligence plus Character - that is the  
goal of a true education ~  
Dr. Martin Luther King*

**Driver's Education****10th to 12th Grade**

A class available to students at least 15 years of age prior to beginning the course in grades 10-12. The instructional phase consists of classroom simulation, driving range, and on-street driving instruction. The course will be taught as a one unit course with sufficient instructional contact time with the driver education teacher and the inclusion of safety education. Learner's permits are not required but are highly recommended to allow parents to work with the student to coincide with the drive time they will receive in class to prepare for the driving test. All students must meet state requirements for attendance and academic progress.

**Introduction to Philosophy****10th to 12th Grade**

What is the true nature of reality? Do we have free will, or is our behavior causally determined? Is there a limit to the knowledge we can have about our world? Ourselves? How do we acquire personal identity, from society or ourselves? What's the best way to live our lives? Is there a legitimate form of government, or is government in principle a necessary evil? Is what we call right and wrong, good and evil, merely relative to our culture and conditioning? These questions and many others are posed to students who accept the invitation to philosophy. In addition, this course provides an introduction to the major philosophies and philosophers of the Western tradition, beginning with the ancient Greeks and continuing up to the present time. Emphasis is placed on interacting with primary texts; listening, thinking, speaking; writing clearly and persuasively; constructing logical, coherent arguments; and the Socratic method.

**Science Fiction****10th to 12th Grade**

**(Monday Seminar Only)** This reading intensive course is for students who have an interest in the genre of science fiction. It does not satisfy any required English credits for graduation. It includes units that represent prevalent themes in the genre, such as: Man and Science, Alien Encounters, and Visions of the Future. The curriculum includes projects, readings, vocabulary development, discussion, composition, and oral presentations. *This is a 2-block course on Mondays ONLY.* Done in seminar format. Could serve as a 9th credit for students if desired.

**(Prerequisite: Teacher recommendation)**

**Major Authors Blended****11th to 12th Grade**

**NEW.** This course is for students who have an interest in reading and writing about major canonical authors. Major Authors includes units that represent dominant literary forces, such as: Shakespeare and Comedy, African-American Literature, Southern and Appalachian Literature, and Film Adaptations of Literature. Students must have demonstrated competency in self-paced, digital, and online environments. Students must have motivation and desire to participate in this program. *Students and parents must attend a blended orientation to participate.* **(Prerequisite: Teacher recommendation)**

**Senior Out of School Experience:  
SOSE**

**12th Grade**

This is an independent study course. Seniors in good academic standing (on track to graduate) may participate in an off-campus experience (volunteer work or a research project) during their 12th grade year. Students wishing to enroll in SOSE must coordinate their own internship with a mentor before being allowed into the course. Prior to being officially enrolled for SOSE, students must submit an application and proposal to the SOSE Coordinator and schedule a meeting to review the application and proposal prior to beginning the experience (Fall 2016). Students are to complete 130 hours during fall and spring semesters (2016-2017). Applications will be available on the school website and Guidance Department webpage spring semester 2015. Students may not take more than two SOSE courses during their senior year.

**Work-Based Learning**

**11th and 12th Grade**

**NEW. (1/2 Credit).** At the L&N STEM Academy it must be taken both semesters to make a full credit. This course is designed to inform students how individual choices directly influence occupational goals and future earnings potential. Real world topics covered will include income, money management, spending and credit, as well as saving and investing. In addition, the student will engage in work-based learning projects on campus. These could include, but not be limited to, such things as audio-visual production, technology help, office work, bookstore, etc. Students must have motivation and desire to participate in this program. *Students and parents must attend a blended orientation to participate.* **(Prerequisite: GPA of 2.5 or higher, no Out of School Suspensions, and teacher and administrator approval)**

**Dual Enrollment**

**12th Grade**

Dual enrollment courses allow seniors to obtain both high school and college credit. These courses are offered through higher education institutions and are available in various locations across Knox County. Students are responsible for their own transportation if taking a dual enrollment course. Because the L&N STEM Academy operates on an alternating block schedule of L & N days, it is difficult to schedule dual enrollment classes during the school day and will only be approved for first or fourth block time frames. All dual enrollment classes must be approved by the School Counselor. The high school schedule of courses at the L&N STEM Academy always takes first priority over dual enrollment courses. A dual enrollment application will be available through the school website and is required for enrollment in a course. *Students must email a copy of their registration to their counselor before their schedule will be finalized.* Please visit the School Counseling page of the L&N STEM Academy's website for links to more information about eligibility and steps for enrollment.

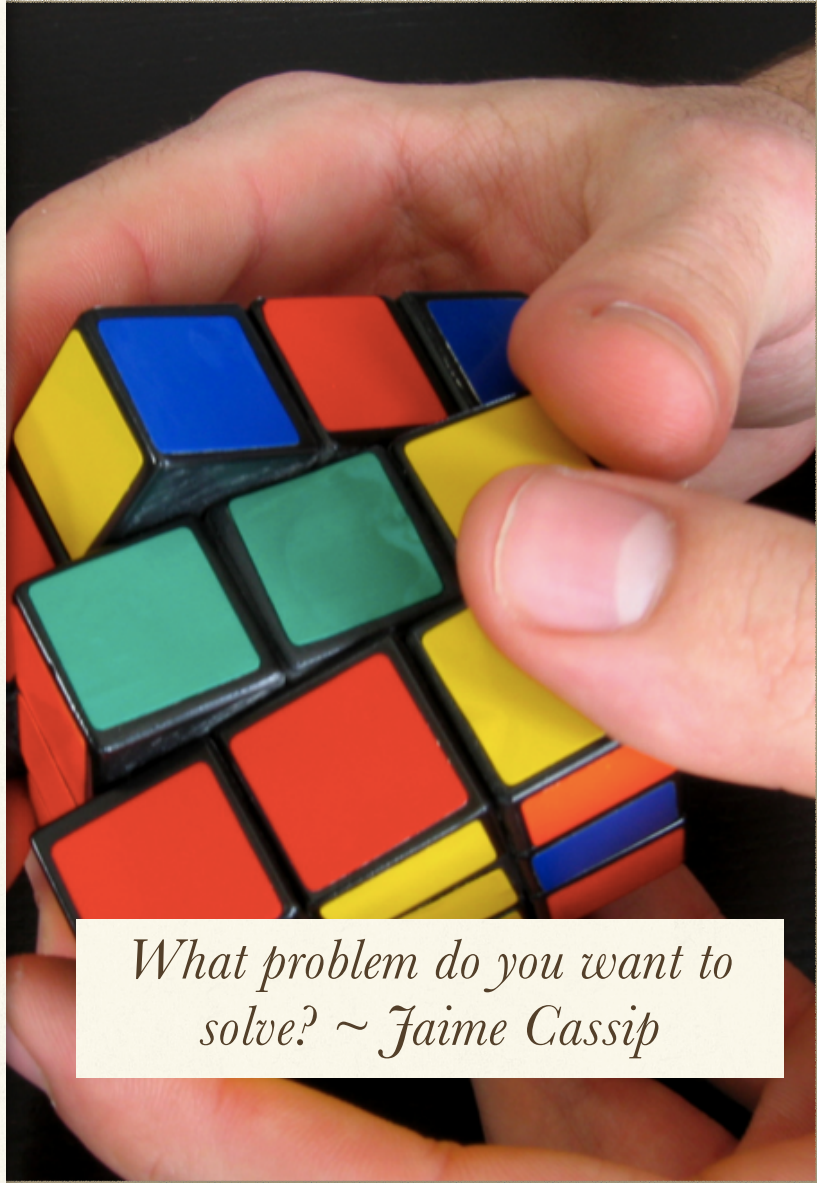
**Peer Tutoring**

**11th and 12th Grade**

A course designed for students who desire to help give academic and social support to fellow students. Students may earn multiple credits by working the Learning Center or other locations as assigned by the teacher of record. (Prerequisite: Application with administrator approval)

*Chapter 11*

# SCIENTIFIC RESEARCH



*What problem do you want to  
solve? ~ Jaime Cassip*



**Scientific Research 1****9th or 10th Grade**

**(Required Elective)** The Scientific Research 1 course is the foundational course in the sequence. The course introduces students to the Problem-Based Learning (PBL) approach that is unique to our school. Students will participate in activities that emphasize the following: knowledge acquisition, soft-skill development, foundational skills of research, presentation skills, communication skills, written reflections and critical thinking skills, while developing students' understanding of the Stanford d-School design process. It includes an introduction to technical writing, analysis of data, and conclusions. Students will be required to give audio-visual presentations appropriate to the areas of study given in the course. Students will be introduced to the 11 major areas of STEM in a way that will guide them toward selecting a focused area in Scientific Research 2.

**Scientific Research 2 Blended****10th or 11th Grade**

This is a course in which students, working in small group cohorts, conduct an in-depth research project and presents their findings through the Internet Science and Technology Fair. Two major components of the course are: 1) a technical report including sections for literature search, design, procedures, analysis of data, experimental results, conclusions, and future directions; and 2) an audio-visual presentation that is appropriate to the nature of the research and the type of audience. Student will choose from a list of critical technologies for their study. Critical technologies include Materials, Manufacturing, Information and Communication, Transportation, Living Systems, Energy, and Environmental Quality. Students work in a blended learning environment in which approximately 25 to 30% of their time is spent with a teacher and the remaining time is completed in outside of class interactions between the group and a STEM professional assigned to the project. The final project of the course will be a website created to display the project research and findings in accordance with the ISTF guidelines. Information on the Internet Science and Technology Fair can be found here: <http://istf.ucf.edu/>. Students must have motivation and desire to participate in this program. *Students and parents must attend a blended orientation to participate.* **(Prerequisite: Successful completion of Scientific Research 1 with a B or higher and teacher recommendation)**



**Scientific Research 3 Blended****11th or 12th Grade**

A continuation of Scientific Research 2, this is a course in which students, working in small group cohorts, conduct an in-depth research project and presents their findings through the Internet Science and Technology Fair.

Two major components of the course are: 1) a technical report including sections for literature search, design, procedures, analysis of data, experimental results, conclusions, and future directions; and 2) an audio-visual presentation that is appropriate to the nature of the research and the type of audience. Student will choose from a list of critical technologies for their study. Critical technologies include Materials, Manufacturing, Information and Communication, Transportation, Living Systems, Energy, and Environmental Quality. Students work in an online environment with minimal teacher interaction. Students work closely with a STEM professional assigned to the project. The final project of the course will be a website created to display the project research and findings in accordance with the ISTF guidelines and a prototype of the solution offered. Information on the Internet Science and Technology Fair can be found here: <http://istf.ucf.edu/>. Students must have motivation and desire to participate in this program. *Students and parents must attend a blended orientation to participate.* **(Prerequisite: Successful completion of Scientific Research 2 with a B or higher and Science Research 2 teacher recommendation)**

**Scientific Research 4 Capstone****12th Grade**

The Scientific Research 4 course is the fourth course in the elective sequence. This pathway involves an in-depth mentorship where students are embedded in STEM-related workplaces and/or laboratories. The expectation is completion of an original experiment or innovation conceived, developed, implemented, and studied for results by the student. Students are preparing year-long for a symposium-style event, in which student and mentor will present their experience to the school and public stakeholders. Students must not have had discipline issues that resulted in an Out Of School Suspension, on track to graduate, and maintain good standing in all classes throughout the mentorship.

**(Prerequisite: Successful completion of Scientific Research 1, 2, and 3; an overall GPA of 2.5 or higher, and teacher recommendation)**