

Western Reserve Academy
ACADEMIC COURSE DESCRIPTIONS 2018–19



COURSE DESCRIPTIONS

ENGLISH

Foundations of Text (full credit) Required of freshmen, this course introduces students to the study of composition and literature at WRA. The focus is primarily on texts in written form; however, students will engage in various modes of storytelling in an effort to learn and solidify reading and discussion strategies. Teachers encourage and promote active reading, including but not limited to paying attention to details and recognizing how those details contribute to the overall story. In connection, this class emphasizes effective annotation, class discussion, textual analysis, and thematic and esthetic appreciation. Writing instruction is centered on grammar, compelling statements, and logical development – all in the context of students’ own expository paragraphs (exemplification, definition, classification and division, comparison and contrast). Students write a short composition most weeks of each semester; moreover, they engage in the writing process, including revision. In the spring, students take a common grammar assessment that tests their mastery of language skills covered over the course of the year.

Explorations in Analysis (full credit) Required of sophomores, this course continues the study of composition, with focus on the use of paragraphs as building blocks of essays. Students extend the work of the freshman year, with sustained study of how to develop, coordinate, and organize ideas. Students also learn to format essays and integrate and cite evidence in MLA style. Students submit an essay every two to three weeks; most essays present analysis of the literary text under consideration. Students continue to work on developing their close reading and discussion skills. Readings include, but are not limited to, human fallibility and resilience. Students develop the vocabulary to handle the course’s increasing literary and rhetorical sophistication. In the spring, students take a common grammar and style assessment that tests their mastery of writing skills covered over the course of the year.

Angles in Writing I (.5 credit) Open to juniors, new seniors, and post-graduates, this course emphasizes a variety of approaches to critical thinking and effective communication. All aspects of Angles in Writing I revolve around the discussion of the choices authors make, and the value/impact those choices have on the text. Readings feature notable works in fiction, nonfiction, poetry, and American Drama. Although narrative and descriptive writings are assigned, students mainly respond to the text in the form of analytical essays. For the Semester Final, students participate in the Junior Writing Exam (an analytical essay written about a work of prose or poetry).

Angles in Writing II (.5 credit): This course is a continuation of Angles in Writing I. Students continue to explore and examine perspective and bias, and they engage in frequent conversations about craft and style; the goal being to inform their writing. Readings feature notable works in fiction, nonfiction, and poetry that underscore and examine the frame of the storyteller/speaker and on the nuances of the presented text. Texts include Shakespeare’s Hamlet and O’Brien’s The Things They Carried. Student writing is assessed every cycle. For the Semester Final, students either compose a research essay that focuses on scholarly literary criticism or they respond to a department-approved prompt regarding a contemporary text.

Note for SE and CL Offerings

Listed below are two separate elective systems offered to returning seniors and qualified post-graduate students for fulfillment of the English graduation requirement. In both of these systems, students sign up in late spring for an elective that will run from August to January; in early December, seniors sign up for a new elective that will run from January through May.

Studies in English (full credit) These offerings are open to all returning seniors. The department offers several half-year electives, giving students a choice of an array of writing, writers, texts, and themes (seniors must enroll in English both semesters in order to graduate). Teachers design offerings that present compelling perspectives

on the human experience and on writing in the world. Each of these electives will foster attentive reading, engaged discussion, critical analysis, and other forms of composition. Moreover, students will gain experience with other forums for the presentation of their ideas about literature.

Ex: Studies in English: American Nature Writing and Environmental Ethics

L: SEMINARS IN LITERATURE, COMPOSITION, AND RHETORIC

College Level Studies in English (full credit - 2 semesters) CL studies are designed to challenge and engage the most proficient and passionate WRA English students at the college level. Exploring literature, composition, and rhetoric on deep and profound levels, CL seminars are offered in half-year electives, and seniors must enroll in English both semesters in order to graduate. All CL offerings will engage a range of literary expression—from fiction to poetry to nonfiction to text in performance—and assume facility with literary and rhetorical terms. The creativity, research, and synthesis necessary for such exploration will demand that students go well beyond the conventions of standard literary essays. Students will write in a variety of modes, including argumentative, reflective, and persuasive forms. Independence and initiative are essential (and assumed) for success in this course. Students—having demonstrated a serious commitment to and interest in the advanced study of English—wishing to enroll in the CL seminars must have earned the recommendation from their teacher in Angles in Writing and must have earned at least a 6 or better for the year in Angles in Writing. Students who are not initially recommended may petition with the English Department Chair and current teacher to register for the course. Students will register for their specific CL seminar electives in late spring, after teachers have developed their courses for the upcoming semester. (NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exam offered in English Language or English Literature.)

CREATIVE WRITING ELECTIVES

Creative Writing: Fiction and Playwriting (half credit, Fall) This course is a half-year introductory creative writing class. Students produce, experiment, and react to a range of creative forms as a means of developing different imaginative approaches to experience. The emphasis will be on generating raw material specific to short stories and playwriting, in getting familiar with some of the essential strategies for reading and discussing the writing of others, and in understanding and recognizing the techniques and tools of effective writing and editing. To ground our study, students will be expected to read 1-2 full-length novel(s) and/or collection(s) of short stories (selections change yearly). For the final, students are required to submit for publication a polished work of any genre. Though open to sophomores through seniors, any interested rising sophomore wishing to enroll must have a conversation with the instructor in advance of course registration.

Creative Writing: Nonfiction and Poetry (half credit, Spring) In this class, students immerse themselves in the writing life, focusing on poetry and creative nonfiction. With the notion that good writers are great readers, students read a wide selection of primarily contemporary and primarily American poets and nonfiction writers. Students will learn to read and view literature as writers with a focus on understanding what makes a poem or a piece of nonfiction “work” as a successful, compelling piece of writing. This course employs the “workshop method” in which students will edit and discuss communally each other’s creative work in a professional, constructive manner. Additionally, students will be engaged in an intensive revision process -- taking risks as they seek to refine their own points of view as writers and their own particular (and, perhaps, peculiar) voices as artists. The culmination of the course is a portfolio of revised work representative of the best student writing. Though open to sophomores through seniors, any interested rising sophomore wishing to enroll must have a conversation with the instructor in advance of course registration.

FINE & PERFORMING ARTS

VISUAL ARTS

The aim of the studio art courses is to encourage all students to develop their creative aptitude and to heighten their sensitivity to the visual world. By solving problems dealing with line, form, color and space, students are actively involved in the process of seeing. By exploring varied possibilities of material and technique as means of expression, students are challenged in their inventive ability. Examples from art history and contemporary issues are used to help students relate their studio efforts to the basic human concerns that all art addresses.

Art I: This course includes both two-dimensional and three-dimensional art. Students get involved with drawing, color, painting, relief printing, two-dimensional design and typography. Plaster, clay, pottery, wood fabricating, plastics, sheet metal, 3D CAD design and prototyping are introduced for student investigations with form, shape, volume and three-dimensional structure. Full credit open to freshmen only.

Art I: (half credit) This course includes both two-dimensional and three-dimensional art. Students get involved with drawing, color, painting, relief printing, two-dimensional design and typography. Plaster, clay, pottery, wood fabricating, plastics, sheet metal, 3D CAD design and prototyping are introduced for student investigations with form, shape, volume and three-dimensional structure. Half credit is not open to freshmen.

Art II: (half credit) In this course students build on what they learned in Art I. They develop more in-depth drawing, painting, printmaking and design skills in the two-dimensional area. Mold making, stone and wood carving, steel fabricating and clay throwing skills are introduced while students devote extended periods of time to three-dimensional areas of their choice. Prerequisite: Art I, instructor's permission, and Machine Permission Form required. Offered in the spring only.

Photography: (half credit) The photography course includes camera controls using DSLR cameras, studio lighting and special effects/applications. Students use Adobe Lightroom for post-processing and will create both print and digital portfolios. Originality, concept development, design qualities and craftsmanship are emphasized. Prerequisite: Art I, and permission of the instructor. Offered in the fall only.

Studio Art: (half credit) Open to juniors and seniors. The course is offered for students who have exhibited a serious application of their talents in previous art courses. The students work in a studio environment, setting up their own visual problems for a specific material or process. At least three areas of in-depth investigation are required. Each student is expected to put together a portfolio of original work. Prerequisite: Permission of instructors, Art I and Art II or Photography.

DANCE

Dance: This course is for students who have no, minimal or intermediate dance experience. Dance is a performance art that incorporates mind and body. It takes discipline, dedication and hard work. The main focus of the course will be technique, which gives students a strong foundation for dance. Students will be given the opportunity to work on their technique in the areas of ballet, modern and jazz. There will also be opportunities to experience other forms of dance such as tap, contemporary and hip hop. While studying technique, the learning, understanding and practice of dance vocabulary is stressed. Students are required to participate in two performances, which are in the second and fourth marking periods. Over the course of the year, students will study other areas of educational dance such as kinesiology, history, composition and how to analyze/critique.

Honors Dance: Students must audition prior to enrolling in this course, which is a full-year course. Honors Dance is for students with substantial dance experience, which includes strong technical ability and training in the areas of ballet, modern and jazz. Dance is a performing art that incorporates both mind and body. It takes

discipline, dedication, and hard work. The main focus of the course will be technique, which gives students a strong foundation for dance. Students will be given the opportunity to work on their technique in the areas of ballet, modern and jazz. There will also be opportunities to experience other forms of dance such as pointe, tap, contemporary and hip hop. While studying technique, the learning, understanding and practice of dance vocabulary is stressed. Students are required to participate in the two performances, which are in the second and fourth marking periods. Over the course of the year, students will study other areas of educational dance such as kinesiology, history, composition and how to analyze/critique.

MUSIC

Music students find ample opportunity for the study and performance of music at all levels at Western Reserve Academy. Courses are offered in choir, string orchestra, symphonic winds and music theory. Students may elect to take our performance courses — choir, string orchestra and symphonic winds — repeatedly for credit and are strongly encouraged to do so.

Choir: The Academy Choir is WRA's traditional mixed chorus and is open to all students regardless of level of experience and without audition. While emphasis is placed on developing vocal skills and independent music reading, the primary focus of this group is performance. The choir performs music of many style periods and genres and is particularly proud of its history of multicultural works. Performance opportunities include a mid-winter Madrigal Feast, Vespers, a major work with chamber orchestra, singing at numerous WRA events as well as occasional off-campus opportunities. Students seeking a more selective opportunity may also audition for a 24-member Chamber Choir, which is an extension of The Academy Choir.

String Orchestra: The Academy String Orchestra brings together students who play violin, viola, cello and bass. The ensemble primarily plays classical repertoire for string orchestra, occasionally combining with members of Symphonic Winds to play music written for full orchestra. String players will also have the opportunity to play chamber music and partner with The Academy Choir.

Symphonic Winds: The Reserve Symphonic Winds is WRA's ensemble for students who play brass, woodwinds and percussion. This group plays standard concert band repertoire as well as occasionally working in jazz or contemporary music. Band members will also have the opportunity to participate in small ensembles and pep band. WRA has a small cadre of instruments for students who may not have their own. While most members have prior experience, it's never too late to learn!

CL Music Theory: This course is intended to help students master the tools necessary for understanding the building blocks of music; they will gain fundamental understanding in musical notation, rhythm and meter, scales and chords. Some prior music experience (playing an instrument or singing) is helpful; students will gain expertise in active listening and do some composing as well as focusing on building aural skills. During the second half of the year, the focus will be on extensive work in harmonic analysis and writing music using the rules of the Common Practice Period as well as more advanced aural skills and sight reading.

(NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exam offered in Music Theory.)

Studio Music: (half credit) Open to serious musicians looking to develop their skills and explore performance in a sophisticated way. Students will work on repertoire illustrative of developing excellence in their particular instrument/voice. Students must be able to practice independently and will be expected to demonstrate exemplary progress towards their targeted goals through performance. A final program/recital to showcase progress will be expected during each semester of participation. Prerequisite: Permission of instructor, demonstrated expertise via audition or participation in WRA's ensembles.

THEATER

Acting for the Stage: This course uses both improvisational work and scene study to teach the student-actors how to effectively prepare for and perform a theatrical role. It introduces the basic idea of acting being grounded in utilizing an individual's inner and outer resources. Coursework will focus on the same characterization development as explored in Stanislavski's method of physical action. The course is also grounded in textual analysis and the development of certain physical techniques to create a character.

Stagecraft: (half credit) This course provides theory, explanation and practice of technical aspects supporting live presentations. Both the basic similarities and distinct differences of mounting and enhancing performances of theater, dance and music are considered with events at Western Reserve Academy as examples. At least 50 percent of the course includes hands-on work in the Knight Fine Arts Center preparing for and changing between these events.

TECHNOLOGY ARTS

Digital Engineering and Fabrication: (half credit) This course introduces students to the principles and applications of digital fabrication. It is a hands-on course designed around rapid prototyping and discovery of digital fabrication tools. The course will specifically look at project management, design thinking, computer aided design, computer controlled cutting, electronics production, 3D scanning and printing, electronics design, machining, molding and casting, input devices, output devices, composites, mechanical design, invention and intellectual property. Each student will complete a series of projects illustrating his or her competence in each category. Not open to freshmen.

Advanced Digital Engineering and Fabrication: (half credit) This course builds upon what students learned in the Digital Engineering and Fabrication course while maintaining an immersive hands-on approach to the exploration of digital fabrication tools and methods. The course focuses on an introduction to CNC milling, CNC lathe, CNC router, CNC plasma cutting, water jet cutting, advanced electronics, robotics, microcontrollers, printed circuit boards, molding, casting and welding. The student should have some familiarity with CAD design.

Each student will complete a series of projects based upon each technique and method explored to illustrate his or her competence.

MODERN & CLASSICAL LANGUAGES

FRENCH

French I: This is the foundational course in French. It introduces students to grammar essentials and basic vocabulary with conversation, oral composition, reading and some writing. Emphasis is placed upon comprehension, pronunciation and self-expression. It also provides an introduction to Francophone culture.

French II: This course is the continuation of the foundational course. It introduces students to complex grammatical structures and focuses on strengthening communication skills through written compositions, readings, oral reports and discussions. The cultures of Europe, Africa and the Caribbean will be explored. Prerequisite: French I.

French III: The focus of the third-level course is the development of proficient expression in the language and the review of essential grammar structures. This goal is achieved through the reading of French and Franco-phone literature and the use of authentic materials from electronic and audio-visual resources. Prerequisite: French II.

Honors French III: This course concentrates on the development of reading, writing, speaking and listening skills. Through class discussion, oral presentations, and written compositions, students will learn how to interpret the materials critically and continue to improve their oral and written expression in French. While fluency is of utmost importance, students are expected to be precise in their use of grammar and vocabulary. The development of vocabulary and grammatical sophistication will also be cornerstones of the course. The class will be taught entirely in French. Prerequisite: French II and departmental permission.

Topics in French Language and Culture I (half credit) and **II** (half credit): This course explores how current global challenges, and social, technological and environmental issues are treated and experienced in the French-speaking world. Authentic materials include essays, short stories, novels, radio programs, films, podcasts, newspapers and magazine articles. Students collaborate on research and evaluation of the sources, form and express opinions, discuss these issues with their peers and make presentations to the community. May be taken for half credit in the fall or spring. Prerequisite: French III/placement test.

CL French Language and Culture: This course explores how current global challenges, and social, technological, and environmental issues are treated and experienced in the French-speaking world. Authentic materials include essays, short stories, novels, radio programs, films, podcasts, newspapers and magazine articles. Students collaborate on research and evaluation of the sources, form and express opinions, discuss these issues with their peers and make presentations to the community. Prerequisite: Honors French III/placement test. (NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exam offered in French.)

LATIN

Latin I and Latin II are spent in mastering the vocabulary, forms and grammatical structure of Latin, and in reading sentences and extended passages of graded difficulty. Toward the second half of Latin II, students make the transition from a predominantly grammar-centered class to a predominately reading-centered class, and students of all sections finish their second year in reading genuine Latin authors, usually either Caesar or Vergil. The reading of Latin authors of different genres continues into Latin III, in which students move beyond simple translation to the understanding and appreciation of the several poems, orations and histories as works of literature set in specific historical contexts. After completing Latin II, students move on to Latin III. Students receiving instructor permission may enroll in CL Latin Literature.

Latin I: The fundamentals of vocabulary, forms and syntax are stressed to promote accurate reading comprehension and translation.

Latin II: The first marking period of Latin II is dedicated to the review of the material covered in Latin I, and the remaining vocabulary, grammar and syntax required to read Latin authors are introduced in the second marking period. The third and fourth marking periods are spent reading extended passages of Latin, and all WRA students begin reading a genuine Latin author by the fourth marking period at the latest. Prerequisite: Latin I.

Latin III: Students read a selection of authors from the Late Republic and Early Empire and make the transition from simple translation to the close reading of the texts as works of literature set in specific historical contexts. Prerequisite: Latin II.

Topics in Latin Literature I (half credit) and **II** (half credit): This course is designed for those students who wish to pursue the study of Latin beyond a third year, but who are disinclined to commit themselves to the rigors of CL Latin Literature. Students in this course will continue their exploration of Latin texts, with emphasis given to the exploration of the historical and cultural backgrounds to those texts. As they engage with Caesar's commentaries of the Gallic and civil wars, for instance, they will supplement those texts with more contemporary accounts of the fall of the Roman Republic. May be taken for half credit in the fall or spring. Prerequisite: Latin III.

CL Latin Literature: Comprises two semesters, and students who meet the prerequisites for the course may choose to enroll either in one or both of the semesters. The first semester will give emphasis to a particular

genre of Latin literature, while the second semester will focus attention upon Latin composition, whether in the form of oratory, poetry or prose. Students who wish to enroll in CL Latin Literature must have achieved a cumulative average in Latin III of 6.0 or higher. (NOTE: There is no corresponding AP exam for this CL course.)

MANDARIN CHINESE

Mandarin Chinese I: The first year of Chinese study introduces Hanyu Pinyin and basic characters as well as simple grammar structures. It helps learners build solid communicative skills as they discuss a wide variety of topics. Graded activities on essential topics such as greetings, dates and times, family, food and sports are quickly introduced. Students will study Hanyu Pinyin, the internationally recognized system of phonetic spelling for Chinese, above Chinese character texts, as an aid to speaking and pronunciation. Films, songs, Chinese cuisines and culture activities are part of the curriculum to foster the Chinese culture awareness.

Mandarin Chinese II: This course is a continuation of Mandarin Chinese I designed for students who have a command of the material in the first-year textbook Integrated Chinese (Level One). The course introduces 450 more characters and contains topics such as family life, social issues, and aspects of Chinese culture. It expands learners' understanding of Chinese grammar by focusing on important linguistic structures. It introduces the more formal written-style expressions, which are used in news broadcasts and speeches. Films, songs, Chinese cuisines and culture activities are part of the curriculum to foster the Chinese culture awareness. Prerequisite: Mandarin Chinese I.

Mandarin Chinese III: This course continues the development of the skills and focuses on reading, writing, speaking and listening, with special emphasis on effective oral communication with native speakers of the language. Video clips, news and authentic materials created for native Chinese speakers will be frequently used in class. Chinese art, history, films, music and culture will also be discussed. Prerequisite: Mandarin Chinese II. Topics in Mandarin Chinese I (half credit) and II (half credit): The emphasis of this course is on communicative skills and cultural exposure. Formal expressions and structures will be introduced through class discussions, oral responses, presentations, and email responses as well as short story writing. Topics studied include college life, Chinese holidays, geographic, relationships and performance art. May be taken for half credit in the fall or spring. Prerequisite: Mandarin Chinese III.

CL Mandarin Chinese: The emphasis of this course is on communicative skills and cultural exposure. Formal expressions and structures will be introduced through class discussions, oral responses, presentations, and email responses as well as short story writing. Topics studied include college life, Chinese holidays, geographic, relationships and performance art. Prerequisite: Mandarin Chinese III and departmental recommendation. (NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exam offered in Mandarin Chinese.)

SPANISH

Spanish I: This is the foundational course in Spanish. It introduces students to grammar essentials and basic vocabulary with conversation, oral composition, reading and some writing. Emphasis is placed upon comprehension, pronunciation and self-expression. It also provides an introduction to the culture of Spain.

Spanish II: This course is the continuation of the foundational course. It introduces students to complex grammatical structures and focuses on strengthening communication skills through written compositions, readings, oral reports and discussions. The cultures of Mexico, Central America and the Caribbean will be explored. Prerequisite: Spanish I.

Honors Spanish II: This course is the continuation of the introductory course, which builds on the grammatical structures and vocabulary previously learned and completes the presentation of all rudimentary elements of the Spanish language. The focus in the course is on strengthening communication skills through written compositions, readings, oral reports and discussions. The cultures of the Spanish speaking world will also be explored. As an honors course, it is differentiated from the standard course in the pace, breadth and sophistication in lan-

guage learning. This course is taught entirely in immersion. Prerequisite: Spanish I and department approval.

Spanish III: This course involves an intensive overview of prior grammar as well as introduction of the remaining tenses and compound structures. The communication skills are further refined through short essays, oral presentations, and readings of well-known Hispanic authors. The culture of South America will be explored. Prerequisite: Spanish II.

Honors Spanish III: This course concentrates on the development of reading, writing, speaking and listening skills. Through class discussion, oral presentations, and written compositions, students will learn how to interpret the materials critically and continue to improve their oral and written expression in Spanish. While fluency is of utmost importance, students are expected to be precise in their use of grammar and vocabulary. The development of vocabulary and grammatical sophistication will also be cornerstones of the course. Prerequisite: Spanish II and departmental permission.

Topics in Spanish Language and Culture I (half credit) and **II** (half credit): This course examines a wide variety of geographic, cultural and historical settings, as well as current topics and important figures in Latin America and Spain. Students will explore the roles of men, women and children in different societies, immigration, human rights and issues of social justice. Students will also learn grammar in context, and complete writing activities related to their daily lives and the world around them. To meet the course objectives, the class will draw upon Spanish-language movies and videos, short stories, novels and many other sources. May be taken for half credit in the fall or spring. Prerequisite: Spanish III.

CL Spanish - Spain: This course will focus on the culture and civilization of Spain from ancient times to the present. History, politics, literature, art, and social structures will be explored to help understand the contemporary world in Spain. Students in this course will discover treasured works of Spanish prose, poetry and drama that span centuries of literary tradition in Spain. Critical analysis of texts will follow the historical and sociopolitical contexts that formed the backdrop of each author. Students will be required to take turns leading class discussions and conduct research on authors. Students will be required to write regular compositions, give oral presentations and lead class discussion. This course is taught entirely in Spanish immersion. Prerequisite: Honors Spanish III and permission. This course will alternate with CL Spanish Latin America and will be taught in even numbered graduation years (2020, 2022, etc.)

CL Spanish - Latin America: This course will focus on the culture and civilization of Latin America from pre-Columbian times to the present. History, politics, literature, art, and social structures will be explored to help understand the contemporary world in Latin America. Students in this course will discover treasured works of Spanish prose, poetry and drama that span centuries of literary tradition in Latin America. Critical analysis of texts will follow the historical and sociopolitical contexts that formed the backdrop of each author. Students will be required to take turns leading class discussions and conduct research on authors. Students will be required to write regular compositions, give oral presentations and lead class discussion. This course is taught entirely in Spanish immersion. Prerequisite: Honors Spanish III and permission. This course will alternate with CL Spanish Latin America and will be taught in odd numbered graduation years (2019, 2021, etc.)

ELECTIVES IN GREEK

Ancient Greek I (Full Year): This course is designed for those Latin students who wish to broaden their Classical horizons by engaging in an intensive study of ancient Greek. Its pace is akin to that of any intermediate Latin course, with the ultimate objective of achieving a comprehensive and thorough understanding of the grammatical rudiments and vocabulary of Attic Greek. In the final quarter of the academic year, students will read short works or selections from Herodotus, Xenophon, Aristophanes, Plato, et al. Prerequisite: Department approval

Introduction to Ancient Greek (One Semester): This course is designed for students with an interest in learning the ancient Greek language. Emphasis will be given to achieving an introductory understanding of the language, together with the civilization and culture in which it was spoken. Students in this course need not have studied Latin prior to enrollment.

HISTORY

Introductory History Seminar: Exploring Global Foundations: This course, required of freshmen, provides an entry-level introduction to topics relating to the origins and development of several of today's global societies. Building essential skills by learning to read critically, ask insightful questions, research and write effectively, and analyze and construct compelling arguments will be weighed equally with examining the historical roots of several societies across time and place. The history of a number of representative civilizations will be viewed through a lens of literary traditions. Students will explore these histories in two parallel paths: one path emphasizes the historical data pertaining to the civilization under study, while a second path focuses on the same civilization's literary tradition. This approach is slightly different from a straightforward analysis of primary source excerpts which, at times, results in a shallow understanding of their historical significance. Instead, this approach will encourage students to understand literature as an expression of universal human aspirations and a constitutive element of human cultures. The course of study will prepare students to meet the requirements not only of a rigorous secondary school education but also the responsibilities of global citizenship.

Intermediate History Seminar: Building the Modern World: This course, required of sophomores, begins its historical focus circa 1750, moves through the nineteenth and twentieth centuries, and finally, ties into current events today. It seeks to develop students' abilities to think and question analytically through the study of the crafting of modernity in religious systems, developing political structures, artistic expressions, and emerging economies, industry and technologies. Students focus on political, economic and social concepts in association with a selective survey of world cultures and also apply a comparative lens. The teaching of skills will include the analysis of both primary and secondary sources, to acquiring geographical knowledge and learning research methodology. Students will conduct a major research project culminating in a research paper, teaching session, and participation in a poster conference featuring their topics.

United States History: This course, intended for juniors but open to upper classmen, employs the inquiry method and a thematic approach to studying the history of the United States. Each marking period students will explore a different theme that has influenced the development of our nation's history across time periods. Possible themes include migration, religion, gender/race, personal liberty vs. civic responsibility, and industry. The investigation into each theme will be organized around the asking of a number of central questions that will help guide students through their study. Students will examine essential moments and/or crucial problems within the American experience from colonial times through to the current era. In addition, the U.S. History course will seek to have students better understand the global forces and interactions that have affected our nation's people, influenced its institutions, and shaped its ideals. Emphasis will be placed on gaining a better understanding of the notion of citizenship and the incumbent responsibilities of a citizen within a democratic republic.

CL United States History: This course, intended for juniors but open to upper classmen, requires departmental recommendation. Unlike the regular United States History course, this course is designed to provide a chronological survey of the history of the country, starting from the early colonial settlement of British North America through to the end of the 20th century. The broad aims of this course are twofold: first, it aims to introduce students to some of the major themes, events, and people that together comprise the history of the United States of America; second, it is designed to get students to begin to think as historians do. The aim here is to have students start to ask themselves some meaningful questions about the society in which they presently find themselves and thereby more fully appreciate how it came to be as they now see it. In addition to trying to gain a better working knowledge of key historical events and a greater familiarity with individuals and groups who have had a significant impact on the nation's development, emphasis will be placed on analyzing primary source documents and understanding the nature of historical causation. (NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exam offered in United States History.)

Topics in Social Studies: Introduction to Arabic and Arab Cultures: (half credit) Introduction to Arabic and Arab Culture is an exposure to the Arabic language similar to a first semester university Elementary I course. Using the

first text of the popular Al-Kitaab Arabic language program entitled Alif Baa: Introduction to Arabic Letters and Sounds students learn the alphabet, both by writing Arabic script and correct pronunciation. Emphasis is placed on the development of basic listening, speaking, reading, and writing skills. Classroom teaching is accompanied with online drills and exercises in addition to cultural notes. With the introduction of new vocabulary simple conversations and dialogues will be practiced. The second component of the course focuses on the culture of the Middle East through viewing films and popular media, attending a Friday prayer service at a local mosque, tasting the regional cuisine, and listening to popular music artists from Egypt and Lebanon.

Topics in Social Studies: Middle East Studies: (half credit) A survey of Middle East/North African history from the beginning of Islam to the present day with particular emphasis on the period since 1800. A comprehensive review of the emergence and expansion of Islam and its impact on the region will be an integral component of the course. Selected topics such as Arab nationalism, the impact of western expansionism and colonialism, and the strategic and economic importance of this region will also be examined. In order to gain an understanding of the varied and rich cultures, complex history, and tensions in this region of the world, current events, art, film and poetry will also be introduced. Students will be assigned secondary and primary source readings in history and current events. They will also select a particular issue in a Middle Eastern country to explore in depth, which will culminate in a final presentation to the class.

Topics In Social Studies: Reading the City: (half credit) The world's urban populations rose from 13 percent in 1900 to 53 percent in 2015 with 100 percent in some countries. This means that there are increasing pressures to provide solutions to the problems that come with city life. This course is about how cities, suburbs, and metropolitan areas worldwide address those problems. Students will use the tools of geography, history and social sciences to understand the global transformations shaping urban life. Students will use Cleveland as a visual laboratory, but students will also look into how cities like Chicago, Paris, Beijing, Rio, Delhi or Johannesburg manage growth, attract capital, create jobs and appeal to tourists in order to position themselves globally. As this course requires hands-on student involvement, field trips and short assignments, culminating in a final project, will constitute opportunities for students to learn and use new skills in "reading" the city.

Topics In Social Studies: Mediating Globalization: (half credit) What does it mean to live in a global village? How do "villagers" stay informed about themselves and others? Is traditional media becoming obsolete with the advent of "new" media (e.g., Twitter)? The purpose of this course is to understand the intricate relation between globalization and mass media, and to encourage students to examine media portrayals of various issues on a global scale. As such, students will explore theories and concepts from globalization and media studies and connect them to current events. As this course requires hands-on student involvement, case studies and short assignments, culminating in a final project, will constitute opportunities for students to investigate different regions of the world as well as the economic, political, cultural, social, gender, class and race issues that drive media content worldwide.

Topics in Social Studies: 1968: The Year that Changed America (Fall Semester) (.5 credit): The Vietnam War, protests and assassinations were on the news. Peace signs, love-ins, Andy Warhol's pop art, and psychedelic rock had arrived on the scene. There were space missions that beamed back images of planet earth for the first time, riots at the Democratic National Convention in Chicago, assertions of Black Power at the Olympic Games in Mexico, and feminist demonstrations at the Miss America pageant. A groundbreaking musical, Hair, opened on Broadway. The social forces that swirled through the turbulent 1960s crested in 1968. It was a turning point for a generation coming of age and a nation at war. From the darkest hours to luminous moments, the year 1968 comes alive in this interdisciplinary elective.

Topics in Social Studies: Un-American Hollywood - Politics, Paranoia and Film in the Cold War Era (Spring Semester) (.5 credit): This course looks at the intersection of art and cultural context by examining an historical era in America during which the film community became directly intertwined with politics--years when fear of communism governed Hollywood and the nation it sought to entertain and inform. This course will encourage students and the teacher alike to consider the Hollywood film as a valid and interesting subject for research. To achieve this goal teacher and students will focus on specific films from the Cold War Era of the Fifties and Sixties in order to show how their visual text as well as the details of their production, release, and reception, relate to

the broader historical and cultural questions of the day. In short, traditional techniques of historical scholarship are applied to the study of film and thus the films are analyzed as historical documents.

Art History: Raphael to Renoir: (half credit) This course focuses on the Western Canon established in the early Renaissance and follows the development of various art mediums through the Impressionist Masters. The arrival of the artist as personage/celebrity will be one of the themes as students examine famous “masters” (both male and female) through the lens of how they worked, their styles, and the way in which they lived and crafted their image as professional artists. The course will seek to look at movements and their masters in depth, studying their lives and the evolution of their catalog of works. Students will have the opportunity to read and study artist sketchbooks and manuscripts (such as Brunelleschi’s Treatise on Perspective, Vasari’s Lives of Artists, Da Vinci’s diaries, Gauguin’s Paradise Found, and memoirs and letters by artists such as Claude Monet, Berthe Morisot and Emily Carr). Students will watch documentaries detailing the artistic process and artists’ lives, and examine issues such as collection, theft, restoration and art curation. Additionally, guests — such as alumni working in the art world/industry — will be invited to interact with our class in person or digitally. (Not offered in the 2018-19 school year).

Art History: Paint, Build, Shoot!: (half credit) This course focuses on art, architecture and photography of the 20th century. Beginning with the post-impressionists, students will explore how the art world explodes with new schools of art (futurism, abstract expressionism, minimalism and pop art). Students will also look at innovations in architectural design from art deco to art nouveau to the groundbreaking work of Frank Lloyd Wright and Frank Gehry. Finally, students will explore photography as art using the lenses of photographers such as Ansel Adams, Annie Leibovitz, Margaret Bourke-White, Dorothea Lange, Robert Mapplethorpe and Sally Mann. Students will delve into the catalogs, the collections and the writings of these photographic pioneers. Documentaries, museum visits and guest speakers will also form part of the experience of “Paint, Build, Shoot!”. (Not offered in the 2018-19 school year).

CL Art History: During the first half of the year, this course focuses on the Western Canon established in the early Renaissance and follows the development of various art mediums through to the Impressionist Masters. The arrival of the artist as personage/celebrity will be one of the themes as students examine famous “masters” (both male and female) through the lens of how they worked, their styles, and the way in which they lived and crafted their image as professional artists. The course will seek to look at movements and their masters in depth, studying their lives and the evolution of their catalog of works. Students will have the opportunity to read and study artist sketchbooks and manuscripts (such as Brunelleschi’s Treatise on Perspective, Vasari’s Lives of Artists, Da Vinci’s diaries, Gauguin’s Paradise Found, and memoirs and letters by artists such as Claude Monet, Berthe Morisot and Emily Carr). Students will watch documentaries detailing the artistic process and artists’ lives, and examine issues such as collection, theft, restoration and art curation. Additionally, guests — such as alumni working in the art world/industry — will be invited to interact with our class in person or digitally. During the second half of the year, the course focuses on art, architecture and photography of the 20th century. Beginning with the post-impressionists, students will explore how the art world explodes with new schools of art (futurism, abstract expressionism, minimalism and pop art). Students will also look at innovations in architectural design from art deco to art nouveau to the groundbreaking work of Frank Lloyd Wright and Frank Gehry. Finally, students will explore photography as art using the lenses of photographers such as Ansel Adams, Annie Leibovitz, Margaret Bourke-White, Dorothea Lange, Robert Mapplethorpe and Sally Mann. Students will delve into the catalogs, the collections and the writings of these photographic pioneers. Documentaries, museum visits and guest speakers will also form part of the experience of this course. (Not offered in the 2018-19 school year).

CL Economics: The aim of this course is to provide an advanced introduction to the basic principles of micro- and macroeconomics. The course will begin with a general overview of the nature of “economic thinking.” It will then relatively quickly transition into an investigation of the basic microeconomic concepts of demand, supply, market equilibrium, market regulation, market failure, the effects of taxation and subsidies, the four basic product markets, and the operation of resource markets. After this, the remainder of the course will be devoted to gaining understanding of the workings of the macroeconomy: GDP, unemployment, inflation, the banking system, the operations of the Federal Reserve system, fiscal and monetary policy, and international exchanges of currency, capital, and goods. Students will also acquire understanding as to how various schools of economic thought

have arisen, and competed with one another over time, to explain the driving forces at work within the macro-economy, guiding it either to stability or erratic behavior. Much of the course will entail gaining a working knowledge of the basic graphic models used to describe and explain all of the aforementioned concepts. (NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exams offered in Economics.)

CL Government: This yearlong course examines various political concepts and key government institutions around the world. Students completing the course will understand and be able to critically analyze important concepts in the governments of the United States and a number of other sample countries, which may include the United Kingdom, Mexico, Nigeria, Iran, Russia, India and China. The following topics are covered in depth: state and its constitutional underpinnings; political beliefs and behaviors; political parties, interest groups and mass media; institutions of national government: parliaments, presidencies, bureaucracies, courts; public policy; and civil rights and liberties. Emphasis will be put on exploring the rich diversity of political life, showing available institutional alternatives, and explaining differences in processes and policy outcomes. Through their final project, the students will be able to explore and communicate the importance of global political and economic changes. (NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exams offered in government.)

CL Philosophy: This course will serve as an introduction to philosophy, and students will have the opportunity to read how some of the greatest thinkers throughout history grappled with the most important questions. Professor Andreas Teuber stated about his own introductory philosophy course: "In its aim and format, the course is more an invitation to do philosophy than an introduction. Introductions seek to map out a territory or lay the groundwork for more detailed study. There will be some of that here, but insofar as invitations beckon and introductions point, the course beckons students to the study of philosophy rather than points the way." The aim of this course is the same. Students should view the class as an invitation and opportunity to engage in critical thinking: reading and studying philosophy is not a passive activity. The course will begin by explaining a few fundamentals about logic and critical thinking so that the class has the tools to engage in academic discussions about philosophy. Although students will read articles from many different branches of philosophy, they will spend the bulk of the year studying metaphysics, epistemology and ethics, which will open the door to some of life's most interesting questions. Here are a few examples: 1) What is existence? Does a higher power exist? In what sense, do humans exist outside of themselves? 2) How do we acquire knowledge? How do we know if our beliefs are true? 3) What is the meaning of life? How do we find happiness? 4) How should humans act towards one another? This course will examine how thinkers from Plato to contemporary philosophers have tried to answer these questions. (NOTE: There is no corresponding AP exam in philosophy.)

MATHEMATICS

Math 11 Algebra I: A first-year course designed for students who would benefit from greater focus on the fundamentals of algebra needed for more rigorous high school mathematics. Topics may include numerical and algebraic operations, linear equations and graphs, exponents and radicals, linear systems, proportions, areas and volumes, distance and the Pythagorean Theorem, and displaying univariate and bivariate data. The focus is to create a solid foundation and to develop good habits in preparing students for future success at WRA. Placement is based on previous coursework, standardized test scores, and/or a WRA placement test. *Prerequisite: Departmental permission.*

Math 21 Geometric and Algebraic Reasoning: This course is designed for students who have successfully completed an algebra course, combined with demonstrated proficiency on the appropriate placement test. Combining geometry, statistics, probability and spaced-interval practice of algebra, this course draws upon the abstract reasoning and spatial visualization skills necessary for future success. Students develop and apply basic theorems and constructions in geometry, discern details and applications of visual displays for quantitative and categorical

data in statistics, and apply basic counting methods of probability. Development of basic algebra will be spiraled into the daily practice and built upon as a final springboard towards the next year's course in mathematics. Prerequisite: Math 11 or Departmental permission.

Math 22 Honors Geometric and Algebraic Reasoning: This course is designed for students with a strong background in mathematics. Students have the opportunity to study topics in greater depth, and encounter more challenging problems. In addition to offering more challenging problems, the course is designed to develop students' ability to learn independently, setting the stage for future work at the honors level. A previous course in geometry is helpful, but not required. Prerequisite: Departmental permission.

Math 31 Intermediate Algebraic Reasoning: This course allows students to expand their view of algebra while adding depth to connections with geometry, trigonometry, and statistics. Topics include composite and inverse functions, quadratic and radical functions, exponential and logarithmic functions, sampling methods, intermediate probability, basic trigonometry, areas of polygons, and volumes of solids. Emphasis will be placed on understanding the behavior and graphs of the various "toolkit" functions. Extensive use of the graphing calculator is expected. Prerequisite: Math 21 or Departmental permission. Not open to freshmen.

Math 32 Honors Intermediate Algebraic Reasoning: This course and Math 31 have similar descriptions, though this course demands more from students. They will be expected to synthesize understandings independent of teacher instruction, transfer ideas to new contexts, and prepare more rigorously for class meetings. Collaboration and inquiry during class are especially important. Prerequisite: Math 21/22 and Departmental permission

Math 33 Accelerated Algebraic Concepts: This course is designed to meet the needs of students ready to excel in a very challenging high school curriculum. As such, the course is often more problem-centered than topic-centered, where students encounter math in context, enabling them to draw their own conclusions. Students must be capable of critical assessment and the ability to thrive in an atmosphere where they and their classmates drive the discussion each day. Topics may include manipulating, graphing, and modeling with polynomial, rational, exponential, logarithmic, and trigonometric functions, analytic trigonometry, sequences, linear regression and probability. Prerequisite: Math 22 and Departmental permission.

Math 41C: Precalculus Intensified: This course is designed for students who have developed a mastery of the algebra skills taught in Math 31. This course provides an in-depth study of elementary functions, with an emphasis on the mathematics of change, in preparation for calculus. As such, students work in new ways with familiar topics, honing the algebraic skills needed for continued study with our familiar families of functions: polynomial, rational, exponential, logarithmic, trigonometric. Students will extend their study of statistics and probability as well. Building on those understandings gained in previous courses, students will now analyze the data they know how to depict and collect and they will explore margin of error, sampling, and the normal distribution. Prerequisite: Math 31 and Departmental permission.

Math 41S: Precalculus and Statistics: This course is designed for students who seek more emphasis in preparation for CL Statistics than for Calculus. Building on those understandings gained in previous courses, students will now analyze the data they know how to depict and collect and they will explore margin of error, sampling, and the normal distribution. To round out their study of algebra, this course will also feature essential algebraic skills and understandings with elementary polynomial, rational, exponential, logarithmic, and trigonometric functions. Prerequisite: Math 31 and Departmental permission.

Math 42 Honors Precalculus: A rigorous Precalculus course designed to prepare students for Honors Calculus. This course examines polynomial and rational functions and their applications, trigonometric functions, exponential and logarithmic functions, conic sections, polar coordinates and complex numbers, and introductory limit theory. Prerequisite: Math 31/32/33 and Departmental permission. Not open to freshmen.

Math 43 Accelerated Precalculus: This course examines the elementary functions in depth, with an emphasis on graphing and modeling applications. Particular attention is paid to the trigonometric functions. In addition, a study of conic sections, sequences and series, polar coordinates, parametrics, probability and statistics, vectors,

matrices, and limits will round out the precalculus syllabus. In the spring, students will begin their study of differential calculus in preparation for Calculus BC the following fall. Accelerated Precalculus is designed for students who have successfully completed Math 33 and have demonstrated the ability to learn independently at an accelerated pace. Prerequisite: Math 33 and Departmental permission.

Calculus: This introductory calculus course provides students with an in-depth treatment of limits, continuity and derivatives, as well as an introduction to integrals. Working with a variety of applications, this course is appropriate for students likely to study business, economics, or social sciences, as well as those preparing to study science or engineering. In both cases, this course is not meant as a substitute for college calculus, but rather to prepare students for more rigorous study of the subject at the university level. Prerequisite: Math 41/42.

CL Calculus AB: Topics will include a calculus-based analysis of graphs, computation and applications of the derivative (graphing functions and calculating rates of change), computation and application of the integral (Riemann sums and accumulated change), and differential equations. Prerequisite: Math 42 and Departmental permission. (NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exam offered in Calculus AB.)

CL Calculus BC: Primary topics include a calculus-based analysis of graphs, computation and applications of the derivative (graphing functions and calculating rates of change), and computation and applications of the integral (Riemann sums and accumulated change). Other areas of study include slope fields, differential equations, sequences and series, Taylor series, and the analysis and calculus of parametric, polar and vector functions. Prerequisite: Math 43 and Departmental permission. (NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exam offered in Calculus BC.)

CL Statistics: This course is comparable to a typical non-calculus based introductory college statistics course. Topics covered include data exploration, sampling and experimentation, probability and simulation, and statistical inference. Technology will be incorporated for simulation and calculation. Prerequisite: Math 41/42/43. Math 42/43 may be taken concurrently. (NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exam offered in Statistics.)

CL Calculus-based Probability and Statistics: Statistics is the art and science of drawing conclusions from data. Probability is the study of chance behavior, while Calculus provides a methodological basis in both disciplines. This course blends probability theory and mathematical statistics with real-world applications. Students will: apply the principles of data analysis, probability models, and inference in a variety of settings; use calculus and other mathematical techniques to develop key results; and communicate statistical and probabilistic reasoning both orally and in writing. (NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exam offered in Statistics.) Prerequisite: CL Calculus AB or BC and Departmental permission

ADVANCED TOPICS IN MATHEMATICS

CL Multivariable Calculus: (half credit) Multivariable Calculus is a course intended for students who have successfully completed CL Calculus BC. While designed in part to maintain skills developed in CL Calculus BC, CL Multivariable Calculus also extends the calculus to higher dimensions and further explores connections to the sciences, in particular physics. The course deals primarily with the techniques and applications of multivariable differentiation and integration, differential equations, physics applications and problems in three-space. Prerequisite: CL Calculus BC and Departmental permission

CL Linear Algebra: (half credit) Linear algebra is a branch of mathematics that studies vectors. Linear algebra has a concrete representation in analytic geometry and is central to modern mathematics and its applications. It has extensive applications in engineering, computer science, physics, the natural sciences and the social science. Topics include systems of linear equations, matrix theory, linear transformations, basis and eigenvectors, and vector spaces. Prerequisite: Math 42/43 and Departmental permission.

CL Advanced Topics in Geometry: After a brief review of the important theorems and concepts of plane geometry, students in this upper level elective will investigate systems of Non-Euclidean Geometries including hyperbolic and spherical settings. Students will also explore material from Topology and Boolean Algebra, as well as other advanced topics founded in geometry. Prerequisite: CL Calculus AB or BC and Departmental permission (Not offered in the 2018-19 school year).

COMPUTER SCIENCE

Computer Science I: (half credit) Open to sophomores, juniors and seniors. This course is designed to introduce students to a range of computer science topics, such as computer architecture, logic, algorithmic thinking, data representation, and the internet. Students will develop critical thinking skills and a deeper understanding of digital technology through a variety of hands-on learning experiences, such as designing a website, developing a mobile app, and writing computer programs in the JavaScript programming language.

Computer Science II: (half credit) This course will focus on the fundamentals of computer programming in Java and will build on previous experience in computer science. Through design study, testing, and implementation, students will develop problem-solving skills in a project-based environment. This course is open to students who have completed Computer Science I or those who have some previous programming experience and receive the permission of the instructor. Open to sophomores, juniors and seniors.

CL Computer Science: The course emphasizes object-oriented programming methodology, with a concentration on problem solving and algorithm development. It also includes the study of data structures, design, standard algorithms, program analysis and abstraction. This course is open to students who have completed Computer Science II or who have previous programming experience and receive the permission of the instructor. (NOTE: This course will prepare students for the AP exam offered in Computer Science.)

SCIENCE

Biology: This is a life science course designed for underclassmen, the first science course most students will take upon entering Western Reserve Academy. This course introduces students to the study of living things at many different levels of organization: molecular, cellular, organismal, population, community and ecosystem. Overriding biological themes include continuity and change over time, the complementary nature of structure and function, and energy relationships. Major topics included are biochemistry, cellular structure and function, metabolism, genetics, evolution and ecology. Additionally, topics are connected to current events throughout the year. Classroom activities combine learning and doing; including laboratory exercises and investigations, data collection and analysis, laboratory report writing, and varied hands-on activities. Upon completion of this course, students should be able to understand and confidently use the vocabulary and methodology of modern life science in their everyday life.

Biotechnology: (half credit) This course covers basic methods in biotechnology. Emphasis is placed on techniques commonly employed in most research institutions including prokaryotic and eukaryotic cell culture, nucleic acid technologies, and protein purification along with the use and care of common laboratory instruments. Upon completion, students should have an understanding of the theory, practice, and application of these techniques. Students will demonstrate competency in these objectives by performing experiments in the laboratory, by performing well on laboratory practicals, and by participation in class discussions. Prerequisite: Completion of Biology.

Cancer Immunology I: This course covers basic methods in biotechnology during the first semester. Emphasis is placed on techniques commonly employed in most research institutions including prokaryotic and eukaryotic cell culture, nucleic acid technologies, and protein purification along with the use and care of common laboratory instruments. During the second semester, students will apply these skills to a research project involving cancer immunology. Upon completion, students should have an understanding of the theory, practice, and application of these techniques in research. Students will demonstrate competency in these objectives by performing experiments in the laboratory, performing well on laboratory practicals and participation in class discussions. Open to sophomores and juniors.

Cancer Immunology II: During the second year as investigators, students will continue to work on their research projects and on the further sharpening of the basic laboratory skills learned in Cancer Immunology I. These include but are not limited to bacterial, cancer, nucleic acid and protein work. These young investigators will also be expected to help teach these skills to first year students. They will develop their scientific communication skills through assigned research articles and an end of the year PowerPoint presentation. Prerequisite: Cancer Immunology I and a well-established research project.

Cancer Immunology III: During the third year as investigators, students will continue to work on their developed projects and on the maintenance of the basic laboratory skills learned in Cancer Immunology I and II. These investigators will also be expected to help teach these skills to other students and assist with the development of their new research projects. They will continue to advance their own scientific communication skills through assigned research articles, PowerPoint and poster presentations. Prerequisite: Cancer Immunology II and a second-year research project with propitious data submitted for evaluation.

Microbiology: Explore the Unseen: Students will be exploring the world of microbes and begin to see the previously unseen. This will be a hybrid course; part in-depth exploration of specific topics, part survey. Goals include developing an appreciation for the "simpler" forms of life while revealing the complexities of these supposed simpler forms and how this information has allowed us to better understand more complex forms of life. Students will learn the foundational laboratory skills employed by microbiologists as they make the invisible visible. Many concepts familiar to students from biology class will be explored as they pertain to microbes — this variation on core concepts will allow students to gain an appreciation for the diversity of life and the advances in understanding of biology made by research on microbes. Applications of this understanding will be explored and

the field of synthetic biology will be introduced. Prerequisite: Successful completion of Biology (6 or above) and completion of Honors Chemistry (5 or above) or Chemistry (6.5 or above).

CL Pathobiology of Human Disease: In this course, students are taught the basic principles of biology through a hands-on experience using human disease as a model. Students are introduced to the organization and structure of the human body, its development, and evolution. Topics include the various body systems, structures, cells, tissues, and the principles of homeostasis. Through the dissection of cats, fetal pigs, mice and various organs, common diseases such as Type 2 Diabetes, cancer and parasitic infections are explored. Prerequisite: Biology and Honors Chemistry with 5 or above. (NOTE: Students wanting to take the AP Biology exam will have to have additional preparation by accessing online videos from the previous AP Biology class.)

Ecological Sustainability: Working from Thomas Friedman's premise that the world has become hot, flat and crowded the past 20 years, Ecological Sustainability exposes students to the social and environmental implications of consumer and sustainable development behaviors, population patterns and associated geopolitical implications, and the impact these have on climate change. Comparisons of least, moderate and highly developed nations frame the study of these issues. Additionally, course concepts and skills are applied to campus, regional, national, and international contexts. Prerequisite: Biology and Chemistry.

Chemistry: The purpose of this course is to provide students a strong scientific experience through the reading, writing, problem solving and practice of Chemistry. Students will become more literate in the sciences and extend their understanding of science as an important component of our world. The educational goals of Chemistry include learning the processes of chemistry, chemistry's connections to other disciplines, and how chemistry relates to life. All fundamental chemistry concepts regarding the structure and function of matter and its energy are studied. Laboratory work emphasizes laboratory techniques, concept application, and chemistry problem solving. Open to sophomores, juniors and seniors not intending to pursue extensive math and science studies at the college level. Prerequisite: Completion of Biology. Students taking Math 32 or higher should enroll in Honors Chemistry.

Honors Chemistry: Honors Chemistry offers a theoretical approach to the structure of matter, the changes it undergoes and the energy involved. The course provides a scientific experience through the reading, writing, and problem solving of chemistry. Laboratory work emphasizes conceptual application and advanced chemistry problem solving. This course is typically taken during the sophomore year. Open to sophomores, juniors, and seniors intending to pursue extensive math and science studies at the college level. Prerequisite: Math 32 or higher (may be taken concurrently) and completion of Biology.

CL Advanced Topics In Chemistry: This course builds upon the chemical principles learned from Honors Chemistry. Students will experience a variety of college-level chemistry topics to apply their knowledge of chemical principles to real-world scenarios. Laboratory work will focus on experimental design, inquiry based learning, and the conceptual application of chemistry. This course is open to juniors or seniors who are intending to pursue math, science, or pre-med in college or beyond. Prerequisite: Students eligible for this course must be enrolled in Math 42 or higher, and have completed Honors Chemistry with a grade of 6.5 or higher. (NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exam offered in Chemistry.)

Physics: This course is an algebra-based introduction to the study of physics that strives for conceptual understanding, problem solving skills and laboratory exposure. Students will study topics in mechanics such as one and two-dimensional kinematic motion, Newton's Laws, force, work, energy and momentum. Modern physical ideas such as electricity and electronic circuits will be covered during the second semester. Through in-class lectures and discussions, nightly homework sets and frequent laboratory experiments, students will receive a solid introduction to the study of physics.

Honors Physics: An advanced introductory physics course. Algebra will be used extensively in this course and basic calculus concepts will be introduced and utilized with appropriate topics. Lab work is integrated throughout the curriculum as necessary. Physics topics include: kinematics (1 and 2 dimensions); Newton's Laws; dy-

namics; work and energy; linear momentum; rotational motion; gravitation; simple harmonic motion and waves; electric charge and fields; electric potential; electric circuits (DC). Math topics include: differential calculus; integral calculus; vectors and vector operations. Honors Physics is recommended for students who have a firm grasp of algebra and an interest in the sciences. The student who plans to take CL Advanced Physics should select this course. Prerequisite: 6 or higher in Math 33, or Math 42 or higher.

CL Advanced Physics: A college level calculus-based course that emphasizes the fundamental laws and basic concepts of physics. The use of calculus will be explored and utilized where appropriate. Labs are integrated throughout the curriculum where and when appropriate to aid understanding of the concepts explored. There will be a strong theoretical component to this course as well. This is especially true when dealing with modern physics topics. This course will cover various topics from classical and modern physics. The topics covered include: kinematics in one- and two-dimensions; dynamics; work and energy; impulse and momentum; rotational motion and angular momentum; gravitation; simple harmonic motion; fluid dynamics; electric forces and fields; electric potential; electric circuits; magnetic forces and fields; electromagnetic induction; basic optics and light; special relativity; basic quantum physics and mechanics. Prerequisite: CL Advanced Physics is open to juniors and seniors who have received the recommendation of the science department, have completed Honors Physics and have completed or concurrently enrolled in CL Calculus BC. Students enrolled in CL Calculus AB may take the course with the instructor's permission. This course will be ideal for students with the appropriate mathematics background who are interested in studying the natural/physical sciences, mathematics or engineering. (NOTE: With some additional outside preparation, the most accomplished and capable students will be prepared for the AP exam offered in Physics C.)

Astronomy: (half credit) Astronomy is designed to develop a basic understanding of the universe from the small to the very large. The main emphasis of this course will be in understanding astronomical processes and the basic science involved in these processes. An emphasis will also be placed on the history of science and how to use scientific evidence to answer questions. Topics covered include the constellations and motion of the sky, the solar system including our planet and the Sun, light and telescopes, the lives and deaths of stars, neutron stars, black holes, galaxies and cosmology. Students will have the ability to use the telescope at the school's Frost Observatory during stargazing nights. Prerequisite: Chemistry, physics (may be taken concurrently), or departmental permission.

Advanced Astronomy: (half credit) This course will focus heavily on astronomical observations, data collection and data processing. It will begin with the basic optics, the branch of physics that deals with light and its properties. This course will explore the mathematics and physics of lenses and mirrors — equipment used in optics to focus or gather light. The main goal of this portion of the course will be for students to design and build their own telescopes. The second portion of this course will focus on data analysis using data generated by other observatories around the world and in space. Student will have the opportunity to contribute, through their analysis of the data, to the larger field of astronomy. Other special topics are explored as well. This course will be more mathematical in nature than Astronomy and is intended as a follow up to that course, however students do not need to have completed Astronomy prior to taking this course. Prerequisite: Physics (may be taken concurrently). (NOTE: There is no corresponding AP exam.)

HEALTH

Health: (half credit) Health covers all of the concepts taught during the Sophomore Health Seminar, only in a more traditional classroom setting. This is a discussion-based course, with class preparation coming from readings, worksheets, journal writing and simple research. Open to new juniors/seniors who have not yet completed the State of Ohio health graduation requirements.

LITERACIES

FRESHMAN DIGITAL LITERACIES

[Literacies classes meet two of every four class meetings in a cycle.]

Learning to Code: While exploring the digital world, students learn how data is digitally encoded and transmitted. They deepen their understanding of the internet and the underlying structure of digital devices. Students consider the power of current technology and the possibilities for the future. Together, we discuss the societal impact and challenges of our digital technologies. Throughout the course, students will learn basic programming skills and concepts that will translate to any programming language and will work individually and collaboratively to create dynamic apps to solve a variety of problems using the JavaScript language.

Learning to Make: This course is a hands-on introduction to personal fabrication and innovation in The Wang Innovation Center. The course specifically looks at design thinking, computer-aided design, computer controlled cutting, electronics production, 3D scanning and printing, electronics design, machining, molding and casting, input devices, output devices, composites, mechanical design, invention and intellectual property. Students in this course can explore their own interests to develop creative projects that foster critical thinking, entrepreneurship, communication and collaboration while engaged in active learning with others. Students will demonstrate their competence by completing a series of projects utilizing the full capabilities of the Wang Center.

SOPHOMORE LITERACIES

[In addition to meeting during Monday-Friday courses, each sophomore literacies courses will also meet on two Class Seminar Saturdays.]

Learning to Communicate: To navigate an increasingly complex, technologically-advanced, and global society, students must have strong skills in oral and written communication. Augmenting the learning that happens across the WRA curriculum with regard to effective communication, this course will give sophomores the opportunity to learn traditional and contemporary ways to craft a message and reach cogently intended audiences. Students will collaborate, think critically and creatively, and see projects through from idea to production and performance, all the while enhancing their speaking and writing skills. At the conclusion of the course, students will have demonstrated their enhanced communications skills through a portfolio of well-executed artifacts of communication.

Learning to Live Well: This course introduces students to the dynamic processes of change and growth so that they make informed, healthy decisions about their self-care. Students learn the risks associated with certain behaviors and understand when to seek help for themselves and others. Completion of this portion of the sophomore literacies satisfies the State of Ohio health graduation requirement.

COMPASS

Compass: Compass aims to connect students with the world beyond the walls of Western Reserve Academy by cultivating their unique interests and talents and applying them to a "real-world" setting. A second, but not secondary, aim of Compass is to bring coherence to WRA students' broader academic pursuits. Over the course of the academic year, enrolled students will meet regularly with the Compass Coordinator and work to develop skills in the areas of project design, collaboration, scheduling and implementation, budgeting, proposal development, making a pitch, leadership and resilience, process reflection, professionalism, marketing, research, interviewing, presentation, et al. At the end of the academic year, it is expected that enrolled students will present their work for assessment before a chosen assembly. In order to be eligible for this program, students must submit an application, which will be evaluated by the various members of the program's steering committee. Only rising juniors and seniors are eligible to apply.

ALL COURSES 2018–19

ENGLISH

Foundations of Text
Explorations in Analysis
Angles in Writing
Studies in English
CL Studies in English
Creative Writing: Fiction & Playwriting (half credit, Fall)
Creative Writing: Nonfiction & Poetry (half credit, Spring)

FINE & PERFORMING ARTS

Art I
Art I (half credit)
Art II (half credit)
Photography (half credit)
Studio Art (half credit)
Dance
Honors Dance
Choir
String Orchestra
Symphonic Winds
CL Music Theory
Studio Music
Acting for the Stage
Stagecraft: (half credit)
Digital Engineering & Fabrication (half credit)
Advanced Digital Engineering & Fabrication (half credit)

MODERN & CLASSICAL LANGUAGES

French I
French II
French III
Honors French III
Topics in French Language and Culture I (half credit)
Topics in French Language and Culture II (half credit)
CL French Language and Culture
Latin I
Latin II
Latin III
Topics in Latin Literature I (half credit)
Topics in Latin Literature II (half credit)
CL Latin Literature
Mandarin Chinese I
Mandarin Chinese II
Mandarin Chinese III
Topics in Mandarin Chinese I (half credit)
Topics in Mandarin Chinese II (half credit)
CL Mandarin Chinese
Spanish I
Spanish II
Honors Spanish II
Spanish III
Honors Spanish III
Topics in Spanish Language and Culture I & II (half credit)*
CL Spanish - Spain
CL Spanish - Latin America
Greek (Elective)

HISTORY

Introductory History Seminar: Exploring Global Foundations
Intermediate History Seminar: Building the Modern World
United States History
CL United States History
TSS: Introduction to Arabic and Arab Cultures (half credit/Fall)
TSS: Middle East Studies (half credit/Spring)

TSS: Reading the City (half credit/Fall)
TSS: Mediating Globalization (half credit/Spring)
TSS: 1968: The Year that Changed America (half credit/Fall)
TSS: Celluloid Paranoia: Hollywood & the Cold War (half credit/Spring)
Art History: Raphael to Renoir (half credit)^
Art History: Paint, Build, Shoot! (half credit)^
CL Art History^
CL Economics
CL Government
CL Philosophy

MATHEMATICS

Math 11 Algebra I
Math 21 Geometric and Algebraic Reasoning
Math 22 Honors Geometric and Algebraic Reasoning
Math 31 Intermediate Algebraic Reasoning
Math 32 Honors Intermediate Algebraic Reasoning
Math 33 Accelerated Algebraic Concepts
Math 41C Precalculus Intensified
Math 41S: Precalculus and Statistics
Math 42 Honors Precalculus
Math 43 Accelerated Precalculus/Calculus A
Calculus
CL Calculus AB
CL Calculus BC
CL Statistics
CL Calculus Based Probability and Statistics
CL Multivariable Calculus (half credit)
CL Linear Algebra (half credit)
CL Advanced Topics in Geometry (half credit)^
Computer Science I (half credit)
Computer Science II (half credit)
CL Computer Science

SCIENCE

Biology
Biotechnology (half credit)
Cancer Immunology I
Cancer Immunology II
Cancer Immunology III
Microbiology: Explore the Unseen
CL Pathobiology of Human Disease
Ecological Sustainability
Chemistry
Honors Chemistry
CL Advanced Topics In Chemistry
Physics
Honors Physics
CL Advanced Physics
Astronomy (half credit/Fall)
Advanced Astronomy (half credit/Spring)

NON-DEPARTMENTAL

Health (half credit) – Seniors w/o Health
Compass
Learning to Make
Learning to Code
Learning to Communicate
Learning to Live Well

SATURDAY ACADEMY

Class Seminars
ECHO

COLLEGE LEVEL COURSES 2018–19

ENGLISH

CL Seminars in Literature, Composition and Rhetoric

FINE & PERFORMING ARTS

CL Music Theory

MODERN & CLASSICAL LANGUAGES

CL French Language and Culture

CL Latin Literature

CL Mandarin Chinese

CL Spanish - Spain

CL Spanish - Latin America

CL German Language and Culture

HISTORY

CL United States History

CL Art History

CL Economics

CL Government

CL Philosophy

MATHEMATICS

CL Calculus AB

CL Calculus BC

CL Statistics

CL Calculus Based Probability and Statistics

CL Multivariable Calculus (half credit)

CL Linear Algebra (half credit)

CL Advanced Topics in Geometry

CL Computer Science

SCIENCE

CL Pathobiology of Human Disease

CL Advanced Topics In Chemistry

CL Advanced Physics