

2012-2013

North Carolina School of Science and Mathematics Distance Education Course Descriptions

All Courses require student access to a computer and internet during class

SCIENCE

Honors Forensic Science (Fall & Spring semesters) NC Wise Course Code 30805

This course focuses on the application of basic biological, chemical and physical science principles and technological practices to the purposes of justice in the study of forensic science as it relates to judicial and civil issues. The class is designed around authentic performance assessments with students working in teams to solve crimes using scientific knowledge and reasoning. Through lab work, students will apply inference and deductive reasoning to the investigation and potential solving of crimes. It involves all areas of science including biology, anatomy, chemistry, physics, and earth science with an emphasis in complex reasoning and critical thinking. In addition, students must incorporate the use of technology, communication skills, language arts, art, family and consumer science, mathematics and social studies.

This course requires the ability to write clear and concise lab and investigative reports. Good writing skills are imperative.

Prerequisite: Completion of Biology I and completion of Algebra II

Grade Level: 11th and 12th only

Consumables Fees: A \$25 per student consumable materials fee will be invoiced at the start of the semester.

Materials: *Books must be supplied by your school*

Some equipment on loan from NCSSM; schools are responsible for materials. A list of additional needed materials will be provided.

Site requirements: **Students must have computer access to Internet in classroom and Facilitator assistance to set up labs.**

Recommended weight: Honors

Honors Forensic Science: Anthropology (Spring Semester) NC Wise Course Code 30805

This upper level science course provides a broad overview of forensic anthropology – an applied field of biological anthropology that seeks to recover, identify, and evaluate human skeletal remains within a medico-legal context. In this course, students will learn to identify the bones of the human skeleton, as well as basic recovery techniques and crime scene investigation. We will then apply this knowledge towards the techniques used by forensic anthropologists to determine sex, age at death, ancestry, and stature; and how to estimate time since death and identification of trauma to bone. Finally, students will explore the role forensic anthropologists play in mass disaster and human rights investigations, as well as the associated ethical responsibilities that come with working with human skeletal remains.

This course requires the ability to write clear and concise lab and investigative reports. Good writing skills are imperative.

Prerequisite: Completion of Biology I and completion of Algebra II. Student must demonstrate maturity in other classes be highly motivated and have a strong background in science.

Grade Level: 11th and 12th only

Consumables Fees: A \$25 per student consumable materials fee will be invoiced at the start of the semester. **Site**

requirements: **Students must have computer access to Internet in classroom and Facilitator assistance to set up labs.**

Materials: Links to articles and academic journals supplied by NCSSM. Some equipment on loan from NCSSM; schools are responsible for materials. A list of additional needed materials will be provided.

Recommended weight: Honors

Honors Genetics and Biotechnology (Fall & Spring semesters) NC Wise Course Code 30295

What do crime scene investigations, agriculture, medicine, conservation biology and manufacturing have in common? They have all been revolutionized by biotechnology! Almost every day we read about new developments in the rapidly changing fields of genetics and DNA-based biotechnology. In this course, students will first explore classical genetics and then move onto examining the structure and function of DNA and proteins. With state-of-the-art laboratory experiments, students will analyze DNA fingerprints from a crime scene, genetically transform bacteria and investigate their own DNA! Finally, they will survey the applications of biotechnology in many diverse fields and discuss in depth how biotechnology is changing our daily lives and our future. With the decline of traditional manufacturing in North Carolina, biotechnology is positioned to become a vital part of North Carolina's 21st century economy.

Prerequisite: Completion of Biology I with a B or higher and completion of Algebra II

Grade Level: 11th and 12th only

Materials requirements: A \$25 per student consumable materials fee will be invoiced at the start of the semester.

Books supplied by your school

Site requirements: **Students must have computer access to Internet in classroom and Facilitator assistance to set up labs.**

Recommended weight: Honors

Honors Physics (Fall & Spring semesters) NC Wise Course Code 30605

This course is a hands-on, inquiry based introductory course which combines both "conceptual" and "mathematical" approaches to learning physics. The course covers the laws of mechanics and their applications. Students will learn to solve real problems by investigating real systems. Investigations will cover physics topics that are fun and engaging for the students. Students will design experiments, use accurate measuring equipment and construct and test conclusions based on accurate data.

Books supplied by your school

Prerequisite: Completion of Algebra II with a C or higher

Grade Level: 11th and 12th only

Materials: A \$25 per student consumable materials fee will be invoiced at the start of the semester. Each student must have a graphing calculator (TI-83, TI-84 or TI-89) that they may take home. **Books supplied by your school**

Site Requirements: **Students must have computer access to Internet in classroom**

Recommended weight: Honors

Honors/AP Environmental Science - year-long, two course sequence

Honors Environmental Science - NC WISE Course Code

This course is designed to survey key scientific information and policy issues in environmental science in order to prepare students for the Advanced Placement examination and good citizenship. During the first semester of the course we will study natural Earth processes in order to understand how these processes have grown interdependent over millennia to form life-sustaining Earth systems.

Prerequisite: two years of a laboratory science (earth science, biology or chemistry).

Textbook TBD.

Site requirements: **Students must have computer access to Internet in classroom**

Recommended weight: Honors first semester

AP Environmental Science - NC WISE Course Code

The second half of the two course sequence continues to develop the student's understanding of these concepts. In the second semester of the course, we will evaluate the effect of human activity on the Earth's natural processes in order to consider how economic development, policy and human activity can be practiced in a sustainable manner.

Prerequisite: Successful completion of Honors Environmental Science

Textbook TBD

Site requirements: **Students must have computer access to Internet in classroom**

Recommended weight: AP second semester

Cosmology and Culture, Past and Present - Fall and Spring Semester NC Wise Course Code

This course will introduce students to cosmology, the study of the universe, and how it has influenced human cultures from ancient times to the present-day. Using a case-study approach, students will examine ways humans have imagined and explored the universe and will compare/contrast ancient perspectives with modern scientific theories (such as the Big Bang theory) and popular representations of cosmology in Hollywood film. Students will develop skills in critical thinking, research, writing, computer animation and modeling, basic astronomy, and will be invited to attend a field trip at the Morehead Planetarium in Chapel Hill. As a culminating project, students will investigate a topic related to cosmology and culture and develop a multimedia presentation for the class.

Prerequisite: TBD

Textbook TBD

Site requirements: **Students must have computer access to Internet in classroom**

Recommended weight: Honors

MATHEMATICS

Honors Calculus/AP Calculus AB Course - year-long, two course sequence

Honors Calculus: NC Wise Course Code 20735

This course is rich in technology and applications, and prepares students for the AP Calculus AB Exam. AP Calculus develops the student's understanding of the concepts of calculus (functions, graphs, limits, derivatives) and provides experience with methods and applications. The course encourages the geometric, numerical, analytical, and verbal expression of concepts, results, and problems.

Prerequisite: Completion of Precalculus with an "A" and the recommendation of the math teacher. Students should have a strong background in algebra and functions, including polynomial, exponential, logarithmic, and trigonometric. Students should also have knowledge of basic graphing calculator functions ... graphing an equation, determining a Window, use of the built-in Intersect, Zero, & Value functions. A summer assignment will be sent to those students that NCSSM feels will be successful and recommend to the course. The completion of the summer assignment is mandatory. ****Schools will be asked to supply the following student information: PSAT score, EOC Algebra II (raw or adjusted score), Precalculus teacher recommendation**

Material requirements: Each student must have a graphing calculator (TI Inspire, TI-89 preferred, TI-83+, TI-84 acceptable) that they may take home. ***Books on loan from NCSSM***

Site requirements: **Students must have computer access to Internet classroom**

Recommended weight: Honors first semester

AP Calculus AB Course: NC Wise Course Code AP 20767

The second half of the two course sequence AP Calculus continues to develop the student's understanding of these concepts of calculus (functions, graphs, and integrals) and provides experience with methods and applications. The course continues to encourage the geometric, numerical, analytical, and verbal expression of concepts, results, and problems.

Prerequisite: **Successful completion of Honors Calculus**

Material requirements: Same as for semester one

Site requirements: Same as for semester one.

Recommended weight: AP second semester

Honors Precalculus Algebra/ Honors Precalculus Trigonometry - year-long two course sequence

Honors Precalculus Algebra: NC Wise Course Code 20705

In conjunction with the Honors Precalculus Trigonometry, this course is designed to provide skill development in order to prepare students for NCSSM Distance Education year-long Honors Calculus/AP Calculus course sequence. Precalculus topics include: (functions power, polynomial, rational, radical, exponential and logarithmic) and their transformations, data analysis as it applies to functions, iteration, sequences and series and parametric equations. A heavy emphasis will be placed on problem solving.

Prerequisite: Students should have the following: an "A" in Honors Algebra II (a 4 on the EOC), recommendation by the Algebra II teacher

Material requirements: Students must have a graphing calculator (TI Nspire, TI-89 preferred, TI-83+, TI-84 acceptable) that they may take home. ***Books on loan from NCSSM***

Site requirements: **Students must have computer access to Internet in classroom**

Recommended weight: Honors

Honors Precalculus Trigonometry: NC Wise Course Code 20415 year-long two course sequence

In conjunction with the Honors Precalculus Algebra this course is designed to provide skill development in order to prepare students for NCSSM Distance Education year-long Honors Calculus/AP Calculus course sequence. Precalculus topics include: the six trigonometric functions and their inverses, transformations, sinusoids, equation solving, identities, solving triangles, both right and oblique, polar graphs and parametric equations. A heavy emphasis will be placed on problem solving.

Prerequisite: **Successful completion of Honors Precalculus Algebra**

Material requirements: Same as for semester one

Site requirements: Same as for semester one

Recommended weight: Honors

Honors Statistics/AP Statistics year-long, two course sequence

Honors Statistics: NC Wise Course Code Honors 20655

This first part of a year-long course covers the content of a typical introductory college course in statistics. In colleges and universities, the number of students who take a statistics course is almost as large as the number of students who take a calculus course. (At least one statistics course is typically required for majors such as engineering, psychology, sociology, health science, mathematics, and business.) The first semester will provide an overview and introduction to statistics, and introduce students to the major concepts and the tools for collecting, analyzing, and drawing conclusions from data. The completion of the summer assignment is mandatory. ****Schools will be asked to supply the following student information: PSAT scores- both Verbal and Mathematical, EOC Algebra II (raw or adjusted score), Algebra II teacher recommendation**

Prerequisite: Students must have completed a course beyond Algebra II with a C average or better and have satisfactory algebra skills. They must also possess **strong verbal skills as well as sufficient mathematical maturity and quantitative reasoning ability.**

Material requirements: Each student must have a TI-83+ or TI-84 (preferred) graphing calculator that they may take home. ***Books must be supplied by your school***

Site requirements: **Students must have access to internet in classroom**

Recommended weight: Honors first semester

AP Statistics: NC Wise Course Code AP 20667

The second semester covers the methods of inferential statistics (hypothesis testing and confidence intervals). There is continued review of the first semester topics and preparation continues for the AP exam. .

Prerequisite: **Successful completion of Honors Statistics**

Material requirements: Same as for semester one

Site requirements: Same as for semester one

Recommended weight: AP second semester

HUMANITIES

Honors African American Studies (Spring semester only) NC Wise Course Code 40115

This interdisciplinary course provides an introduction to African American history, literature, and culture. Students examine significant social, political, economic, and religious issues as well as issues of identity in the lives of African Americans from the sixteenth century to the present. In addition to readings in historical backgrounds and documents, students explore texts ranging from slave narratives, folktales, and spirituals to the works of writers, artists, and musicians during the Harlem Renaissance to contemporary works by such writers as Alice Walker and Henry Lewis Gates and filmmaker Spike Lee. Through a variety of assignments and activities, students continue to develop their skills in reading, speaking, and research, with special emphasis on the writing process.

Prerequisite: None

Grade Level: 11th and 12th only

Materials: *Books must be supplied by your school*

Site requirements: **Students must have access to internet in classroom**

Recommended weight: Honors

Mandarin Chinese I/ Mandarin Chinese II year-long, two course sequence

NC Wise Course Code: Mandarin I 10462

Mandarin Chinese I is designed to provide students with the fundamentals for learning to understand, speak, and begin to read and write Mandarin Chinese. The course focuses on developing accurate pronunciation and tones, learning to understand the spoken language in context and developing a foundation of basic sentence patterns, questions and every day vocabulary. The writing system (radicals and stroke order) is introduced and computers are used to help students develop their character recognition skills. The course is proficiency-based and the focus is on the development of aural and oral skills.

The following link is to a newsletter that has an article about the value of studying Chinese. Students may find it valuable when making their course decisions.

<http://asiasociety.org/education-learning/chinese-language-initiatives>

Prerequisite: Recommendation by school counselor for Mandarin Chinese I; C or better in the first semester Mandarin Chinese I course to continue in the Mandarin Chinese II level in second semester.

Grade Level: 11th and 12th only

Materials: *Booklet series must be supplied by your school*

Consumables Fees: (NCSSM invoices the site for all fees)

- \$5 per student for calligraphy supplies.
- \$10 per student for course packet

Site requirements: Student access to computer with Internet during class time. Computers must be installed with the following software PRIOR to the start of the school year: Microsoft's East Asian language support in Windows so as to enable simplified Chinese characters typing recognition, and Pinyininput typing pinyin with tone marks. **Students must have access to internet in classroom**

Mandarin Chinese II

NC Wise Course Code: Mandarin II 10472

Mandarin Chinese II is designed for students who are able to carry out simple conversations about every day topics in Mandarin. Students are expected to have mastery of pinyin, knowledge of stroke order, and recognition of a high-frequency radicals and a limited number of characters. The focus in Intermediate Chinese continues to be on the development of aural and oral skills, with the specific goals of expanding vocabulary, strengthening listening comprehension and exposing students to more complex sentence patterns. There is an additional focus on word/character analysis and reading strategies. The course is proficiency based and class is conducted primarily in Chinese.

Prerequisite: Successful completion of Mandarin Chinese I

Grade Level: 11th and 12th only

Materials: Same as for semester one

Site requirements: Same as for semester one